

12-15-2018

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### Recommended Citation

Dooley, K. E., Dobbins, C., & Edgar, L. D. (2018). Using Participatory Rural Appraisal for a Community Needs Assessment in Timor-Leste. *Journal of International Agricultural and Extension Education*, 25(4), 63-73. DOI: <https://doi.org/10.5191/jiaee.2018.25405>

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### Abstract

Conducting timely and effective needs assessments in the field is important for international development work. In many cases, a researcher has only a couple of hours to build rapport with a community, visually examine the state of the field, and conduct the needs assessment and achieve open, honest, and valid data. Working with translators further constrains the process by cutting available time. Thus, research focused on conducting these types of international assessments is valuable. This study aimed to identify the key needs of the Fatubesi community in Timor-Leste using a combination of techniques for Participatory Rural Appraisal (PRA)—a transect walk and a small group discussion that included guided questions and ranking priorities. PRA is context specific and emphasizes facilitation of co-learning between local knowledge and outside expertise (Toness, 2005). Water, new fencing, and technical training/seeds were identified as the top three priorities for the community and their gardens, and the transect walk revealed issues with infrastructure that provided visual context for the small group discussion. The results of this study reflect the unique challenges faced by many communities in international development settings. The techniques described in this article are beneficial when used together for PRA to shift roles from expert facilitator to local empowerment.

### Keywords

Participatory Rural Appraisal, Needs Assessment, Timor-Leste, Community Needs

doi: 10.5191/jiaee.2018.25405

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### **Abstract**

Conducting timely and effective needs assessments in the field is important for international development work. In many cases, a researcher has only a couple of hours to build rapport with a community, visually examine the state of the field, and conduct the needs assessment and achieve open, honest, and valid data. Working with translators further constrains the process by cutting available time. Thus, research focused on conducting these types of international assessments is valuable. This study aimed to identify the key needs of the Fatubesi community in Timor-Leste using a combination of techniques for Participatory Rural Appraisal (PRA)—a transect walk and a small group discussion that included guided questions and ranking priorities. PRA is context specific and emphasizes facilitation of co-learning between local knowledge and outside expertise (Toness, 2005). Water, new fencing, and technical training/seeds were identified as the top three priorities for the community and their gardens, and the transect walk revealed issues with infrastructure that provided visual context for the small group discussion. The results of this study reflect the unique challenges faced by many communities in international development settings. The techniques described in this article are beneficial when used together for PRA to shift roles from expert facilitator to local empowerment.

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## Using Participatory Rural Appraisal for a Community Needs Assessment in Timor-Leste

*We are a free country, but we are not free if our children are malnourished.*

Mana Rosaria, Hiam Health

### Background and Introduction

Thirteen years ago, we had a post conference workshop on Participatory Learning and Action (PLA) in Junction, Texas, led by Dr. Anna Toness. For many Association of International Agricultural and Extension Education (AIAEE) members at the time, that may have been our first exposure to the use of participatory development, rapid rural appraisal, and participatory rural appraisal (PLA). It seems appropriate as we consider the past 25 years of research dissemination for the *Journal of International Agricultural Extension Education* that we would celebrate the development approaches that allowed us to actively engage with local communities, learn from local voices about the needs of communities, and empower communities for a sustainable future. We began this article with a quote from the director of a local NGO who reminds us why PLA is so important. Her title of Mana (or Maun for a male) is not just a title of respect but means sister (or brother). When we work together, we become part of one global family.

For background and context, the PLA needs assessment took place as a part of a United States Agency for International Development (USAID) project, Avansa Agrikultura, focused on health and nutrition in the country of Timor-Leste. The Democratic Republic of Timor-Leste is a new country, having gained their independence in 2002, with many economic and social barriers. One in six children under the age of five are malnourished, with close to 60% of children stunted, and an infant

mortality rate close to 50% (Hughes, 2015). Some factors that contribute to malnutrition include a lack of dietary diversity, inadequate sanitation and hygiene, and a lack of clean water. The agency that provided access for us to work directly with village farmers was HIAM Health. HIAM stands for Hamutuk Ita Ajuda Malu, meaning “together we help each other.”

Prior to the needs assessment, we were briefed by HIAM Health about the Fatubesi community in the Maliana district. HIAM Health had been working in this community for less than a year. They had conducted a land and water survey using observations and basic measurements. They selected leaders in the community who were already small-scale farmers. The project objective was to include and promote the growing and eating of moringa for nutritional security. Moringa, native to parts of Africa and Asia, is also referred to as the drumstick tree. Moringa species grow quickly in tropical environments and are good sources of protein and other nutrients. The harvesting and processing of moringa is important for the improvement of nutrition, and as it enters the value chain, it becomes an economic driver for the community.

HIAM Health works with the local municipality leaders to select communities for participation and offers training on composting, planting, and nutrition/cooking for the introduction of moringa into the diet. HIAM Health also does screening of children under five years (weight, height, age) to determine the severity of malnutrition based upon stunting. HIAM Health staff did the initial survey in the Fatubesi community. Based upon the initial survey, HIAM Health can provide resources for the community (like a water storage tank), but they only pay half and the community pays the other half. This way, the community is economically invested in the project. After planting moringa for the

first year, the community can harvest it every 40 days, with a potential income stream that is intended to become sustainable. The moringa can also be made into a powder to mix with food as a supplement with an organic certification, another value-added characteristic of the project.

### **Theoretical and Conceptual Framework**

Several scholarly works within AIAEE have used participatory needs assessment methods like Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) (Baker, Pomeroy, Liberato, & Mashburn, 2006; Carey & Etling, 1997; Düval, 2002; Etling, 2003; Kelling & Bruening, 2004; Koundiny et al., 2010). Toness (2005) illustrated the importance of extension professionals being actively involved in the transfer of training, including agricultural, natural resource, health, economic, and social dimensions. The move in international development was to involve local expertise to facilitate learning as a shared activity (Chambers, 1994; Pretty & Vodouhe, 1997). Farming communities often work together, using the motivation, skills, and knowledge that result in actions from the community (Roling & Pretty, 1997). Participatory methods assume that learning is cumulative and diverse perspectives are sought through group inquiry and site-specific knowledge leading to consensus (Roling & Pretty, 1997; Pretty & Vodouhe, 1997).

Participatory Rural Appraisal (PRA) grew out of Rapid Rural Appraisal (RRA) techniques to include: (a) activist participatory research, (b) agro-ecosystem analysis, (c) applied anthropology, and (d) field research on farming systems (Chambers, 1994 as cited by Toness, 2005, p. 7). The key difference between PRA and RRA is the role of external experts. “Experts fulfill their role as agents of change when

they help locals to become more aware of what are the technical options suitable to their own interest and development” (Ahmad, 1989 as cited by Toness, 2005, p. 7). Rather than the “giver” or “gatherer” of information (expert), the role is to share facilitation roles to equally value local knowledge (empowerment). This shared facilitation between expertise and empowerment is manifested through interactive data collection techniques, like transect walks, group discussion, matrices for ranking needs and other active ways of engaging the community and giving them “voice.”

PRA is a systematic methodology that considers (a) multiple perspectives, (b) group learning, (c) specific contexts, and (d) facilitation among experts and stakeholders, thus (e) leading to change (Toness, 2005). It parallels the qualitative/action research paradigm (Guba & Lincoln, 1981) and the empowerment of local communities with learners as co-creators of knowledge (Freire, 1970). It is a credible tool for needs assessment and evaluation research in communities with low numeration and literacy skills.

Transect walks are important tools in PRA and RRA. They allow external evaluators to link visual observations with farmers’ management practices (Oudwater & Martin, 2003). Transect walks also generally allow for animated discussion between farmers, community members, and the research team, helping to build rapport for future group discussions. Local knowledge is complex and dynamic, and methodology and context heavily influence the expression of this knowledge (Oudwater & Martin, 2003). Thus, finding and providing different methods of integrating local knowledge at multiple points in the research process is critical.

A needs assessment is the process for determining gaps between current conditions

and desired conditions. Needs assessment has theoretical foundations from Maslow's Hierarchy of Needs (2014 reprint of 1943 edition), Appreciative Inquiry (Cooperrider, Barrett, & Srivastva, 1995), and Expectancy Theory (Vroom, 1964). Maslow's theory is based upon human motivation. It is expressed as a pyramid with the physiological needs at the base (food, water, shelter, etc.) and abstract needs (such as self-actualization) at the top. In this research, the local communities did not have all their physiological needs met, so we were working at a basic level of the hierarchy. Appreciative inquiry is a method for examining social systems using collective inquiry to determine an ideal future for planned change. Expectancy theory proposes that people will act in a certain way because they are motivated by the potential outcome. If you consider the context for PRA, a developing country like Timor-Leste would be best served prioritizing basic psychological needs based upon indigenous knowledge for planning a sustainable future with outcomes that are agreed upon collectively.

### **Purpose and Research Objective**

The purpose of this research was to collect needs assessment data in a rural community in Timor-Leste using Participatory Rural Appraisal (PRA) techniques. The research questions were: (a) What was the initial impact of the HIAM Health project on the community? (b) What current challenges does the community face? (c) What are the priorities/needs for future implementation of the project?

### **Methods**

This research used Participatory Rural Appraisal (PRA) to collect open-ended data about community needs. This research fits most closely with the

qualitative research paradigm and critical action research designs. Data were collected in the local community using a combination of a transect walk with farmers and a small group discussion (two groups simultaneously facilitated and translated). Many people in the community could not read, so oral data collection, participant observation, and field notes were used for data collection. Field notes were shared for triangulation across multiple observers. The convenience sampling was representative of the local community. Thick description is provided in the result section to promote the transferability of the data (Lincoln & Guba, 1985).

A methodological approach that supports the voices of nationals and locals was developed by Lincoln and González y González (2008). Transporting data across cultures can often result in a "lost in translation" experience, where cultural assumptions and language impact the interpretation and meaning-making. This method considers the role of the investigator as a living part of the study and the partnership of the researcher and locals (Lincoln & González y González, 2008). The researchers used the HIAM Health staff to translate and assist in facilitation and interpretation. This group already had a relationship in the community with one staff member living in the village. Their native language was Tetum and they were fluent in English. These approaches are considered emerging decolonizing methodologies that "foregrounds the voices of nationals and locals...in democratic and liberatory ways that effect research collaboration...to foster social justice and locally desired change" (Lincoln & González y González, 2008, p. 784).

The results will be presented in three sections: (a) the transect walk, (b) the narrative triangulated with the field notes and observations, and (c) the ranking of

needs. In group one, there were eight local participants (five women and three men), a translator, two HIAM Health representatives (one local and one from Dili, the capital city where HIAM Health is located), and four participant observers. In group two there were five local participants (two women and three men), a translator, a facilitator who also worked with HIAM Health and three participant observers taking field notes. Following the small group discussion, there was a nominal group technique implemented to rank the priorities and needs of the village.

## Results

### The Transect Walk

Timor-Leste is a country that faces many geographic barriers, including isolation as an island, dramatic rainy and dry seasons, poor soil, as well as countless others. On top of the geographic barriers faced by the whole country, every community faces their own unique physical barriers. There was a fence to climb over to enter the farm, meant to keep out roaming animals, but also acting as a physical barrier to community members to enter the garden. There was no drip irrigation like we saw in other gardens. This community is three kilometers from the nearest water source, which at this point in the season was a dried-up river, and it limited their irrigation capacity. Many of these characteristics

noticed in the transect walk were discussed in the small-group meetings.

Further descriptions of the community and the garden help to provide a rich context for the needs assessment. There was a variety of plants growing in the garden (Bok choy, papaya, onion, moringa—trees and smaller plants that were recently harvested), but the primary focus of the project was the production and consumption of moringa. A Bali cow and her calf stood in a wooded area outside of the garden. There was no water storage tank for the community to use. The women were preparing food and washing on a table outside, while simultaneously cooking on a fire inside a cinderblock house. Several dogs were wandering around and children were in a room beside the “kitchen”. There was a covered porch behind the house of the community leaders with plastic chairs for us to sit. We were seated in one area together and local men and women were seated across from us. There was a formal welcome from the community leader and a HIAM Health trainer who worked and lived in the community. (See Figure 1 for a pictorial depiction of the farm in the community). Formal welcomes are an important cultural ritual that occurs whenever guests are present—from the capital and governmental buildings in the major cities to the remotest villages.



*Figure 1.* Photograph of the transect walk in the Fatubesi village.

The transect walk provided a rich, visual context for the visiting experts before participating in the small-group discussions. Without a transect walk prior to the discussions, the visiting experts would not have understood the physical barriers faced by the community that were so important in the resulting discussion. The walk also provided a chance for the visitors to build rapport with community members; thereby, increasing the potential for honest and open responses in the small groups. Combining transect walks with the group discussions is an invaluable mechanism for empowerment, knowledge-sharing, and meaning-making that provides depth to the needs assessment.

#### **The Small Group Discussion**

First, the researchers and members of HIAM Health discussed the process of the needs assessment with the community members, and the participants were asked to choose a spokesperson to represent the group. An interesting observation was that for one group, the question was asked in English and then translated to Tetum. The sub-village leader asked the participants the question again and there was a “private”

discussion among the group before answering with the translator. The other group originally asked the question in Tetum, so participants would respond directly without having a group discussion first.

#### **Project impact/future implementation.**

The community was thankful for the training on how to plant the moringa and believed things were going well. One garden bed was collected and harvested to feed the family and share with the neighbors. “They have tried to make it into tea. They boil it and put it in soup for the children. They are happy, because it is ‘health’ for the children.” They first started by learning from the staff of HIAM Health to build walls for garden beds and clean the soil [weed and hoe]; then they received the seeds and planted the beds, all by instruction of the staff.

They weed and hoe the soil and add compost to maintain the garden daily. They water the garden from the river [no drip irrigation]. They collect



moringa in 40 days... hope we could have a good result in the garden to feed the children and community. [We were reminded to share this with other partners] because 'our lives are simple.'

When asked about how the garden impacted time usage, the participants discussed "how time is divided by the amount of sun, with most work being in the afternoon. Everyone waters their own garden which is quite time consuming." Of the 13 CO-OP members selected by a local leader, the community divides themselves into four groups to assist one another based upon proximity to the garden.

HIAM Health provides training to the farmers and technical staff who work directly with the community. They have one staff member living in the community permanently, so they do not need the Dili staff to come all the time. Typically, the technical staff come to the community once a month. The women in the group noted that they would prefer the Dili-based staff to come more often to inspect the progress. They would also like financial support for the installation of more water tanks in the community.

When asked about what changes to their diet/meals with the introduction of moringa, the community indicated that "they already know moringa because their grandparents used it, but they didn't know the [health] benefits...now the community knows more." Moringa was given to children and improvements were seen in their weight gain and overall health. "[A] post-clinic comes to take measurements and tells them to cook porridge with moringa and they can see the health benefits...bodies look better, they aren't thin." It was indicated that people in the village eat moringa once a day. Many people drink it as tea, put it in rice, or mix it with the porridge.

Another says, "his children get diarrhea, but [I] tried to explain to my wife to add it to porridge and they add it every day." During the dry season this is the only green vegetable they have in the community.

**Challenges/needs.** The focus was on needing water. Community members currently bring water from three kilometers away. Water pipes were developed by the Catholic Relief Services project in 1987, but the piping system has become dilapidated and not as effective. Some pipe was broken, and bamboo was used to patch it. If possible, they want to have the "black pipe" [made of polyethylene] instead of the bamboo. They also would like a tank to store water close to the gardens and community. This would reduce the amount of work required to get water. The tank would be for household use during the dry season, including watering the garden [moringa]. They also would like a fence to keep animals out of the crop area, since animals roam freely in the community. Currently, they are using local trees as the fencing, but they desired something like barbed wire for greater security. They went on to say that the community has different gardens and thus different challenges.

They have 13 members in the CO-OP. There are two rivers in the community to collect water. They could make more gardens with a consistent water source. The owner of the garden we visited were only two of the people in the CO-OP. One tank is enough for six members of the group; however, some gardens are far from each other, so they would need their own tanks [every household in the community would be 13 tanks].

Another challenge facing the community was related to their lack of

experience with farming moringa. They were concerned about yellow leaves after harvest and believed that the plant would die if they harvest every 40 days. Although “they began with layered gardens and added compost during plantings,” they were unclear about soil fertility. They also had questions about the use of moringa juice as a fertilizer and insecticide. “Should it be applied to the soil or the leaf... Does it prevent insects or provide fertilizer?” Local farmers had problems with insects and indicated that spraying did not help. The discussion entailed how moringa can be used to prevent insects from attaching to the leaf and the appropriate head height before dicing off the stems/leaves at an angle. There were several farms with this problem, but it was only one or two plants from the garden. It was suggested that “farmers replace the dying plant with seed and if it also dies, it may be from too much watering. Techniques for observing the soil for moisture and ways to better prepare the clay soil was important so roots can grow deeper.” [The plants were dying from the roots and there were not many plants for their first harvest]. This analysis would indicate a need for training, with technical staff demonstrating appropriate field management techniques. This section demonstrates the interaction that occurs within the needs assessment to directly influence farming practices.

### **Priorities ranked.**

After the discussion, participants provided a rank order for the priorities/needs.

*#1: Water.* The community consistently and independently ranked water as the greatest challenge. Within this priority were three sub-categories: pipe for transport from the local river, tanks for water storage, and hoses/watering cans for watering the gardens. A lack of infrastructure (pipe) to

bring water into the community causes an increased work load for collecting water for household and agricultural uses. The community believed that HIAM Health could provide support by linking the spring to the community with updated piping. “The local spring is used for the school, health clinic, church, and then divided among moringa farmers...no one person controls the water; everyone controls the water.” Their one connection to water is used by 45 families—too many households utilizing it which prevents sufficient watering. The moringa must be watered by hand (not all have hoses or even watering cans) and this impacts the growth of the plant for harvesting.

There is a rainy and dry season in Timor-Leste, so there can be an over-abundance of water (and more difficulty traversing the “roads” to get to market) during the rainy season. During the dry season, families must travel to the rivers to bring back water to the community. Typically, HIAM Health implements drip irrigation into the farming system, so piping of water into the garden would address many of these issues.

*#2: Fencing.* Another area of need was fencing to protect the garden from animals. Fences need repairs to keep the animals out and for expansion of community gardens. The community prefers barbed wire but can make it out of natural palm stems using trees for the posts.

*#3: Seeds and technical training.* The community expressed the need for seeds for other crops (like vegetables) to diversify the diet and to sell at the local market. “Two days ago, the staff came here and brought seeds (lettuce, pumpkin, mustard, tomato) but some received seeds and others did not...we want to eat and sell vegetables [to the local market].” They recognized moringa does not bring in income now, so it is a long-term investment. They would like

seeds for eggplant, melons, squash, broccoli, and cauliflower and want to be successful with the vegetable gardens. They would like to share [crops] with others in their community. They indicated that they did not know when the seeds from the moringa tree could be planted again. They need technical training on expanding the gardens and improving current practices.

### **Conclusions, Recommendations, and Implications**

This research is an important component of expanding knowledge and experience with Participatory Learning and Action (PLA) through the use of Participatory Rural Appraisal (PRA) (Toness, 2005) to assess community needs. This assessment highlighted needs in the Fatubesi village in Timor-Leste, specifically noted in the transect walk, project impact/future implementation, challenges/needs, and priorities ranked. Challenges in this new country include severe malnutrition and infant mortality (Hughes, 2015), so there is a tremendous need and focus on nutrition in this country.

The greatest needs for this community were identified as water, fencing, seeds, and technical training. The questions presented in this assessment were ordered to allow for an investigation into general needs first, followed by prioritization by the community members. This allowed for open and honest discussion about the wide array of community needs before narrowing the focus to distinguishing priorities.

The transect walk was an important aspect of this research, due to the observations made with this community. It allowed for a rich, visual context of the gardens and community, and allowed researchers to build rapport with community members by asking them about their practices and admiring the hard work put

into maintaining this garden. Using the combination of the transect walk and the small-group discussion allowed for an integrated research methodology that encouraged cumulative learning and enhanced the understanding of local knowledge (Oudwater & Martin, 2003). Based upon the results and conclusions of this study, it is recommended that multiple methods be used in PRA, such as those presented in this paper, to express the complexity of local knowledge and to continually focus on community empowerment throughout the research process.

PRA can be a useful tool in cross-cultural research between Global North and Global South countries. It also has wide potential applications for international development work. Continual checks on quality assurance are important, to ensure that the rapidity of the process does not overpower the quality of collected data, but the integration of local knowledge, evaluation by locals, and community empowerment are all important aspects of PRA that leads to positive outcomes from this relationship between experts and practitioners (Chambers, 1994b). These quality assurance mechanisms help researchers to maintain the support of national and local voices described by Lincoln and González y González (2008). Uses of PRA and RRA with a maintained focus on local knowledge and expertise allow researchers to help local practitioners achieve self-empowerment and share in the experience of meaning-making. Evaluation is not a one-sided approach, especially when the needed outcomes are so dire. Remembering the words spoken by Mana Rosaria at the beginning of this paper, working towards community empowerment through these evaluation methods will hopefully lead to sustainable impacts for these malnourished communities.

### References

- Ahmad, A. (1989). Evaluating appropriate technology for development: Before and after. *Evaluation Review*, 13(3), 310-319.
- Baker, M., Pomeroy, C., Liberato, A. S. Q., & Mashburn, D. (2006). Challenges in community forestry management: A case study of the indigenous tribal village of Santa Teresita in Bolivia. *Proceedings of the 22nd Annual AIAEE Conference*, Clearwater Beach, Florida, pp. 47-59.
- Carey, H. A., & Etling, A. W. (1997). Constructing and conducting rural appraisals. *Journal of International Agricultural and Extension Education*, 4(3), 27-37.
- Chambers, R. (1994a). The origins and practice of participatory rural appraisal. *World Development*, 22(8), 953-969.
- Chambers, R. (1994b). Participatory rural appraisal (PRA): Challenges, potentials and paradigm. *World Development*, 22(10), 1437-1454.
- Cooperrider, D. L., Barrett, F., & Srivastva, S. (1995). Social construction and appreciative inquiry: A journey in organizational theory. In Hosking, D., Dachler, P., & Gergen, K. (eds.) *Management and Organization: Relational Alternatives to Individualism* (pp.157-200). Aldershot, UK: Avebury.
- Düvel, G. H. (2002). A comparative evaluation of some participatory needs assessment methods in extension. *Proceedings of the 18th Annual AIAEE Conference*, Durban, South Africa, pp. 81-88.
- Etling, A. (2003). U.S. Universities partnering with universities in other countries. *Proceedings of the 19th Annual AIAEE Conference*, Raleigh, North Carolina, pp. 248-258.
- Freire, P. (1968). *Pedagogy of the oppressed*. London, UK: Penguin Books.
- Guba, E. G. & Lincoln, Y. (1981). *Effective evaluation: Emergence of responsive evaluation*. San Francisco, CA: Jossey-Bass Publishers.
- Hughes, C. (2015, June 29). Malnutrition in Timor-Leste. *Borgan Magazine*. Retrieved from <http://www.borgenmagazine.com/malnutrition-timor-leste/>
- Koundinya, V., Chilamdurthi, S., Mekala, R., Pandrju, S., Babu Rega, G., Muvvala, U., & Reddy Chagamreddy, K. (2010). Assessing the needs of farmers using participatory rural appraisal techniques: Experiences from India. *Proceedings of the 26th Annual AIAEE Conference*, Saskatchewan, Canada, pp. 82-83.
- Kelling, E., & Bruening, T. (2004). Benefits of engaging graduate students in participatory rural appraisals. *Proceedings of the 20th Annual AIAEE Conference*, Dublin, Ireland, pp. 185-195.
- Lincoln, Y. S., & González y González, E. M. (2008). The search for emerging decolonizing methodologies: Further strategies for liberatory and democratic inquiry. *Qualitative Research*, 14(5), 784-805.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.
- Maslow, A. (2014). *A theory of human motivation*. Floyd, VA: Sublime Books.
- Oudwater, N., & Martin, A. (2003). Methods and issues in exploring local knowledge of soils. *Geoderma*, 111, 387-401.
- Pretty, J. N., & Vodouhe, S. D. (1997). Using rapid or participatory rural

- appraisal. In B. E. Swanson, R. Bentz, & J. Sofranko (Eds.), *Improving agricultural extension: A reference manual* (pp. 47-55). Rome: FAO.
- Roling, N., & Pretty, J. N. (1997). Extension's role in sustainable agriculture development. In B. E. Swanson, R. Bentz, & J. Sofranko (Eds.), *Improving agricultural extension: A reference manual* (pp. 181-191). Rome: FAO.
- Toness, A. (2005). Participatory learning and action (PLA). *A Training Manual to Accompany the Post Conference Workshop for the AIAEE Annual Conference*. Junction, Texas.
- Vroom, V. H. (1964). *Work and motivation*. New York: Wiley.