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Examining Livelihood Diversification for Chronically Food Insecure Households in Ethiopia

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Introduction
Many families in developing nations teeter on the edge of severe food insecurity, income and livelihood diversification can greatly help them face the threats of drought and famine. Diversification is a key strategy to survival for the chronically food insecure (CFI) households of Ethiopia. Livelihood diversification is defined as the process by which rural households construct a diverse portfolio of activities and social support capabilities to maintain or improve their ability to make a living (Ellis, 1998). A study conducted by the Food and Agriculture Organization (FAO) pertaining to farming systems and poverty suggested that diversification is an important source of poverty reduction for small farmers (FAO/World Bank, 2001). This, however, is not a new concept for rural households. An examination of the literature suggests that for many generations, African rural people have diversified their efforts to include a number of different activities (Hussein & Nelson, 1998). Through increasing the range of livelihood activities to include on and off farm activities, CFI households are able to enhance their livelihood security and the ability to cope with a crisis.

Purpose and Objectives
The purpose of this research was to investigate livelihood diversification amongst chronically food insecure households in Ethiopia. The objectives of this presentation are to examine the barriers to livelihood diversification and to provide a critical perspective of livelihood diversification and its effects on food security.

Methodology
A generic qualitative design was used for this study (Merriam, 1998). Semi-structured interviews were conducted with key informants to investigate livelihood diversification. These key informants were representative of the donors, implementing partners, and beneficiaries of food aid. Interviewees were identified using purposive sampling to give further depth through a range of perspectives (Flick, 2009; Lincoln & Guba, 1985). To further add insight, focus groups
were held at the local level with a representative sample of beneficiaries. Two separate focus groups for program beneficiaries were conducted in each village visited.

Conclusions

There were many barriers identified for livelihood diversification. These barriers can be classified as external and internal. The external barriers included: finances (capital, investment), resources, market linkages, household location, availability of off farm activities, and a lack of training. Finances repeatedly arose as a major concern. The beneficiaries themselves claim this as their number one barrier to diversification. “How can I buy the fertilizer and seeds for my farm if I don’t even have money to buy what my family needs?” (Participant). Lack of capital can directly lead not having the required resources which can in turn impact their potential market involvement.

The internal barriers identified by the beneficiaries were: lack of confidence, fear (of loan repayment, impending hardship), and risk aversion. Lack of confidence was described as inhibiting beneficiaries from diversifying because they lacked confidence: in themselves and/or business development and management. This lack of confidence can influence their fear and risk aversion. These barriers are not adequately addressed in program interventions targeting the CFI households. Both internal and external barriers are complementary in making diversification difficult for CFI households.

Results of the focus groups suggested that approaches to diversification need to be adapted to the culture of each particular area. Additionally, beneficiaries continue to have an attitude of dependency because their main needs are still not being met. This is a very important consideration as they will not change this attitude unless their immediate and most important needs are met, therefore allowing them to take part in new activities.

Implications

Food aid is not enough for families to address issues of food security. Livelihood diversification is meant to be an approach through which households are able to build their assets and move themselves out of chronic food insecure status. Diversification is not completely absent; CFI households are diversifying. However, the extent and the type of diversification should be taken into consideration. Despite the efforts of local NGOs and government, CFI households in Ethiopia are still deeply entrenched in food insecurity and poverty.

Extension workers and development practitioners should view livelihood diversification through a multilateral approach. The structures surrounding food and livelihoods need to be improved to facilitate the most beneficial diversification. In order to achieve this, those working with CFI households should collaborate to alleviate the barriers facing beneficiaries. Livelihood diversification by itself may not be the complete answer to raising food security status for CFI households. It should be incorporated into a holistic program as an intervention to achieve a means.

References


A Case Study Analysis of Organizational Climate and Food Safety in a Federally Inspected Beef Packing Plant in Veracruz, Mexico

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Keywords: Food Safety, Extension, Behavior, Training, Organizational Climate

Introduction
Food-borne illnesses have increasingly become a growing human health and economic problem and have become more prevalent since 2001 (Recourt, 2003). In 2004, the World Health Organization reported 2.9 million deaths of children age 0-14 caused by diarrheal disease, which results primarily from contaminated food and water sources (World Health Organization, 2012). The Centers for Disease Control and Prevention (2011) reported that 48 million Americans (roughly one in six) get sick, 128,000 are hospitalized, and 3,000 die from food-borne diseases each year. Workforce training for those individuals in the food industry is imperative for increasing food safety awareness and ultimately reducing food borne illness.

Yiannas (2009) noted unsafe human behavior is one of the most common contributing factors for food-borne disease. Organizational climate has been shown to influence individual and organizational outcomes (James et al. 1990; James & Jones 1974; Kopelman et al. 1990) and has been identified as a key factor in determining worker behavior (Ball et al. 2010). Climate is a reflection of management attitude and leadership (Stringer, 2002). To understand this relationship it is necessary to assess and quantify management attitude and climate in order to evoke effective change in the workforce behaviors.

Climate influences and has an impact on worker behavior, which directly affects the quality of the final food product. It is imperative organizational climate be assessed prior to any needs assessment activities so that agricultural educators may develop training that will effectively impact food safety-related behaviors.

Purpose and Objectives
The purpose of this study was to analyze organizational climate, workforce training and food safety as measured by *Salmonella* prevalence in a federally-inspected packing plant in Mexico. The following research objectives were created to guide this study:
1. Describe organizational climate at the packing plant in Mexico in 2009 and 2013.
2. Describe workforce education efforts and other factors contributing to change between 2009 and 2013.
3. Report *Salmonella* prevalence data collected at the packing plant in Mexico from 2009 to 2013.

**Method**

A case study was deemed most appropriate as it is an empirical inquiry, with a focus on a contemporary phenomenon within its real-life context (Yin, 1994). The researcher used a pre-post design to analyze organizational climate. A survey instrument consisting of 39 scale items, as well as demographic questions, was adapted from a similar instrument developed by Ball et al (2010). Response options were based on a 7-point Likert-type scale. The instrument was divided into five constructs including food safety training, work unit commitment, infrastructure, personal understanding, and behavior. Over the course of the study, *Salmonella* sampling was conducted periodically and reported in conjunction with the findings of the climate instrument in an effort to overlay the training/education schedule with *Salmonella* prevalence levels. In addition to the quantitative data, interviews were conducted in March 2013 to provide richer, more descriptive data about the changes and workers perceptions since 2009.

**Results**

The instrument was administered and completed by all available employees at the plant in 2009 and 2013. Independent *t*-tests were conducted to determine significant differences between collections on all five constructs as well as the overall score. Means and standard deviations were calculated and effect size using Cohen’s *d* was reported. Notable effect size changes were observed in several constructs and statements including the statement “I believe that how well I do my job can affect the safety of the food the consumer gets” (*d* = .40).

*Salmonella* testing at various points along the production line indicated a reduction in pathogen prevalence at each data collection point. The improvements in climate scores and reduction of *Salmonella* during processing mirrored similar improvements in the food safety of the final product as demonstrated by measurable decreases in the number of *Salmonella* contaminated carcasses detected at the conclusion of processing. Additionally, the interview with the food safety managers was supportive of the findings from the climate survey.

**Recommendations**

Organizational climate has been shown to have implications for worker behavior and for educators’ ability to alter that behavior in a desired fashion. This research indicates that not only is climate related to behavior, but in turn, is related to the quality of the final product. Results will be used at the plant to improve food quality through continued training. In addition, because climate is a reflection of leadership, researchers will implement leadership workshops for plant managers and continue research on this topic.

**References**


Analysis of Human Health Risks Linked to Irrigation with Treated Wastewater in Oued Souhil, Tunisia

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Keywords: Tunisia, Wastewater Reuse, Irrigation, Agriculture, Health Risks

Introduction  
Farmers in the Oued Souhil region of Tunisia irrigate with treated wastewater due to unreliable rainfall and contaminated groundwater; 95% of the nation’s water supply has been exploited (OECD, 2012). Treated wastewater presents human health risks to farmers, their families and consumers. Farmers are at risk for contracting intestinal illnesses, skin infections and parasites, such as hookworm and schistosomiasis, due to direct water contact (WHO, 2006; Salem, 2011). Typical post-irrigation behaviors enhance the potential for disease exposure to farmer’s families. Consumers of crops irrigated with treated wastewater are also at risk to disease exposure from contaminated food (WHO, 2006).

Purpose and Objectives  
This purpose of this study was to assess farmers’ knowledge of health risks and their behaviors linked to irrigation with treated wastewater. A specific objective of the project was to identify critical intervention points to prevent disease transmission from treated wastewater during and after irrigation.

Methods  
Data was collected using baseline surveys, structured participant observations, and a focus group discussion. Analysis was conducted using Stata 13.0 software and the World Bank’s FOAM framework, which evaluates the focus, opportunity, ability and motivation of behaviors in target populations (Coombes & Devine, 2010). Five percent of farmers (13 of 250 landowners) who irrigate with treated wastewater were randomly selected in Oued Souhil to be surveyed. To gain a perspective of gender roles in agriculture, a separate focus group was held for women. Results from both these activities were used to develop a health and hygiene education workshop for a mixed-gender farmer audience. The topics presented included human
health risks linked to irrigation with treated wastewater, primary risk exposure routes, and best irrigation practices. The workshop concluded with an assessment survey.

Results

Survey results revealed that 30.8% of farmers do not associate human health risk with treated wastewater and 30.8% answered they were unaware of specific risks, while 38.4% felt risks exist. 60% of the respondents who indicated some understanding of potential health risks stated that skin problems could result from direct contact. No direct relationship between the farmers’ education level or gender and their knowledge of human health risks was found.

Perceptions and behaviors associated with wastewater reuse for irrigation were identified by adopting the FOAM framework to identify potential intervention points (figure 1). Farmers in Oued Souhil often lack information or only have a basic understanding of health risks from experience or word of mouth. Protective equipment, such as gloves and boots, are readily available. However, glove use is rare, and while boots are often employed they are viewed as practical rather than as a means to limit contact with the treated wastewater. Following irrigation, only about 60% of the farmers shower and over 50% bring their contaminated clothes and boots inside the house, providing a contact route for other household members.

After the workshop, all participants indicated an increased awareness of the importance of wearing protective equipment while irrigating, and 89% considered wearing them. Agricultural extension services are limited in the region (Bedo & Dooley, 2004), but the farmers expressed an interest to obtain more information on better irrigation practices using treated wastewater.
Figure 1. FOAM framework.

**Focus**

**Target Behavior**
Use of protective equipment (boots and gloves) while

**Target Population**
Farmers who irrigate with treated wastewater in Oued Souhil, Tunisia.

**Opportunity**

**Access/Availability**
Protective equipment is readily available.

**Product Attributes**
Boots and gloves protect from direct contact with wastewater.

**Ability**

**Knowledge**
Farmer is lacking information or only has a basic understanding of human health risks from experience or word of mouth.

**Social Support**
Information lacking about human health risks. Irrigation with treated wastewater is common, so discussion of risks is welcome.

**Motivation**

**Belief and Attitudes**
Widely varying views held regarding potential health risks. Boots perceived as practical; gloves are not.

**Outcome Expectations**
Protective equipment can lower risk for skin infections.

**Threat**
Belief that showering after irrigating eliminates health risk.

**Intention**
Boots sometimes worn to protect from thorns.
Recommendations

It is recommended that support be provided to upgrade wastewater treatment plants serving Oued Souhil, as the facilities are operating well over capacity. A multiple-barrier approach should also be adopted. For instance, additional improvements in water quality could be achieved by facilitating the ability of farmers to implement basic on-site practices (e.g., sand filter, settling pond). In the meantime, enhanced extension activities are needed to disseminate information on the proper use of treated wastewater for irrigation and general hygiene practices to help minimize farmers’ health risks in Oued Souhil.

References


Keywords: Organizational Climate, Role of Management, Food Safety, Education, Mexico

Introduction
Throughout the world, microbiological contamination of food is a major cause of food-borne illness. The issue of food safety is especially critical in developing countries. In Mexico, food-borne illness is the number one cause of death in children under five (Keusch et al. 2006, Todd, 1997). Improvements in food safety knowledge and practices in this country could serve to reduce the presence of pathogenic bacteria in the food supply, and in turn, reduce the occurrence of food-borne illness, and possibly death.

Purpose and Objectives
In non-TIF (non-Tipo Inspección Federal, or non-federal inspection type) meat packing plants in Mexico, food safety is considered a low priority. Poor sanitation practices, a lack of management commitment to food safety, and low levels of food safety knowledge in Non-TIF plants often contribute to the presence of food-borne pathogens in the Mexican food supply (Hernandez et al., 2007; Batres-Marquez, Clemens, & Jensen, 2006). The objective of this study was to analyze how food safety training and organizational food safety climate were related to the prevalence of Salmonella on beef carcasses processed in two non-TIF plants in Cuautla, Morelos, Mexico.

Methodology
Sampling trips were taken in February, June, August, September and October. Organizational climate survey instruments were administered to management and employees of the two non-TIF plants at the beginning of the study, prior to food safety training. Results from
the climate survey revealed a weak commitment to food safety among management and employees in the municipal plant (referred to as Plant 1 in study), while the results for the privately owned and operated plant (Plant 2) showed an atmosphere more favorable to food safety. Good Manufacturing Practices (GMP) audits were conducted during each plant visit, along with microbial testing of carcasses for \textit{Salmonella} contamination. For all plant visits, an average of 10 samples was taken at each plant at the following locations in the slaughter process: i) hides, ii) pre-evisceration, iii) post-evisceration. Gaps in food safety knowledge and training were assessed using the baseline information collected from the following: GMP audits, organizational climate and food safety knowledge surveys, and \textit{Salmonella} microbial data. In April, a food safety workshop was conducted for plant managers and veterinary inspectors from 12 non-TIF plants in the state of Morelos, with topics derived from the food safety needs assessment. The veterinary inspector for Plants 1 and 2 and the owner of Plant 2 attended the workshop. Based on the topics covered in the manager’s workshop, an employee behavior audit was developed by the researchers and used during the June, August, September and October samplings to monitor changes in food safety habits among plant employees. In August, a second workshop was conducted at the request of the private plant management. Hands-on training demonstrated proper carcass dressing procedures to line workers during a shift of work.

\textbf{Results}

As the study progressed, the GMP and employee behavioral audit results were consistent with the findings of the organizational climate survey, as Plant 1 showed minimal improvement in basic tasks such as carcass dressing procedures and employee hygiene. The overall score for Plant 1 employee behavior went from 1.41 at the beginning of the study to 1.42 at the end of the study (on a 6-point Likert-type scale). On the other hand, Plant 2 overall behavior increased from 2.02 to 2.73, which was attributed to Plant 2’s improvements in carcass dressing procedures and intervention use. The \textit{Salmonella} results indicated throughout the study that pathogen loads on hides entering Plant 2 were consistently higher than those entering Plant 1, representing a higher level of burden for Plant 2. In Plant 2 the pre-evisceration levels of \textit{Salmonella} on the carcasses were closely related to hide levels, indicating cross contamination during slaughter. However, after the line worker training was conducted in September, the October sampling revealed a decrease in \textit{Salmonella}. The hides in September and October were 100% positive for \textit{Salmonella}, but pre-evisceration levels decreased from 60% in September to 20% in October in Plant 2, indicating an improvement in carcass dressing procedures. There was little improvement noted in Plant 1 as shown by the minor changes in percent positive \textit{Salmonella} samples.

\textbf{Conclusions/Recommendations}

The results indicate the importance of an organization’s management being committed to the implementation of food safety practices, as this has a direct impact on worker food safety behaviors. Results also emphasize the effectiveness of hands-on training as compared to classroom style learning.

\textbf{References}


Developing Extension Pre-service Training Programs for Sub-Saharan Countries

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Keywords: Extension education; Sub-Saharan Africa; Agent training; International Extension

Introduction

In 2009, a grant from the United States Agency for International Development (USAID) was utilized to create a consortium of universities and NGOs designed to improve the livelihoods of rural farmers in the world’s poorest nations by modernizing and strengthening their agricultural extension systems. The Modernizing Extension and Advisory Systems (MEAS) includes a Teach component that involves disseminating modern approaches to extension through user-friendly materials and training programs that promote new strategies for extension and advisory services delivery.

Extension agents are critical to the success of any extension program (Oakley & Garforth, 1985; Easter, 1985). Practitioners and researchers have addressed the issues surrounding the need for and preparation of field-based personnel. “One of the weakest yet most critical resources needed to strengthen agricultural extension . . . are the staff members” (Swanson & Rajalahti, 2010, p. 115).

Cho (2002) and others found that most field agents have little knowledge and experience in extension education (Cho, 2002; Mutimba & Bekele, 2002; Adovor, Estrada-Valle, & Yin, 2009). Others indicated extension personnel training had not been sufficient in planning/conducting programs that meet local needs (Cho & Borland, 2003; Tladi, 2004; Botha & Stillwell, 1997; Seevers, 1995). Extension field agents in developing countries need competence in program planning and delivery, evaluation, communication, teaching methodology, human behavior, and administration (Raad, Yoder, & Diamond, 1994; Rigyal & Wongsamun, 2011), indicating a need for training. Mulder emphasized the notion that a professional development program must be based on well-defined intended competencies (Mulder, 2010). Therefore, a workshop was designed to assist agriculture faculty in developing countries to determine the content and delivery mode to prepare agriculture extension agents.
Purpose and Objectives

The purpose of the project was to bring together personnel from several colleges of agriculture in developing countries to determine the content areas and modes of delivery to incorporate extension education into the master’s degree program. The objectives of the workshop were to:

1. investigate the potential for extension education programs;
2. identify skills/competencies needed by agriculture graduates; and
3. propose an extension education program model.

Methods

In May 2013, MEAS and the Alliance for a Green Revolution in Africa (AGRA) co-sponsored a workshop, Preparing Agriculture Science Graduates for Extension, in Kumasi, Ghana. Participants included 32 faculty and administrators from six universities in sub-Saharan Africa and five international agencies plus several graduate students. The workshop was conducted in five phases over a four-day period. Only brief descriptions follow of how some phases were organized and the results of participant discussions and decisions.

Results

The workshop was conducted in five phases, using group activity to identify needs and competencies. During Phase 3, participants identified options for an Extension Education program: 1.) an overview course; 2.) a certificate/minor; and 3.) a major in extension education. Five focus areas previously identified were developed into competencies. The final step in the process included developing content/objectives in extension education, one for a course in extension and one for a certificate program (Table 1).

Table 1.
Potential Extension Education Programs and Objectives (detail omitted)

<table>
<thead>
<tr>
<th>Program</th>
<th>Objectives</th>
</tr>
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<tbody>
<tr>
<td>Course: Extension Education and Practice</td>
<td>• Conduct needs assessment</td>
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<td></td>
<td>• Design/implement extension programs based on needs</td>
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<td></td>
<td>• Manage/supervise extension programs</td>
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<td></td>
<td>• Identify different socio-cultural settings</td>
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<td>• Apply communication theories</td>
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<td></td>
<td>• Network with different actors/institutions</td>
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<td></td>
<td>• Apply principles of adult teaching/learning</td>
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<tr>
<td>Certificate: Certificate in Extension (three courses)</td>
<td>• Program planning</td>
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<td></td>
<td>• Communication skills</td>
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<td></td>
<td>• Teaching methodology</td>
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Recommendations and Implications

While various models of extension exist in Europe and the Western hemisphere, the intent of MEAS is not to impose existing systems but to support countries in identifying and implementing their own extension program model. If countries/institutions are to make change, participants must work through the process that leads to change, regardless of how mundane or ordinary the effort appears to the developed world. The process followed and the results of this project are an example of lending assistance to universities to make changes. This program can
serve as a model for similar ventures in additional locations, providing guidance to the participating universities and others in developing extension education programs.

Since conclusion of the workshop, participating universities have made some progress. Participants have shared materials, planned workshops, and initiated planning with the Ministry of Agriculture. As part of the “next step” a workshop is scheduled at one of the universities that participated in the workshop in Ghana. Faculty members will further develop plans for including an extension education program within the curricula and participate in activities designed to enhance teaching, hopefully serving as a model for other institutions to adopt.

References


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National Guard Agribusiness Development Team Members’ Experience of Agricultural Extension and Development in Afghanistan

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Keywords: extension, conflict, agribusiness development teams, National Guard, agricultural development

Introduction
Agricultural extension systems are important for re-establishing functioning agricultural systems in conflict-affected areas (Christoplos & Farrington, 2004; Robertson & Olson, 2012). For ten years, it has taken on the task of development in Afghanistan as a part of Counterinsurgency Strategy (COIN) (Kemp, 2011; Fick & Nagl, 2009; Barfield, 2012). COIN strategy encourages agricultural development in order to improve rural economies (Fick & Nagle, 2009; Holterman, 2012; Wissing, 2010; Harbrom & Walleensteen, 2010).

The U.S. military began utilizing agricultural extension expertise from national guard units (Center for Army Lessons Learned, 2009). Members of National Guard troop deployments were selected for their agricultural backgrounds (Center for Army Lessons Learned, 2009). The main work undertaken by National Guard Agribusiness Development Teams (ADT) was working together with Afghanistan government partners to implement agribusiness projects.

The purpose of this phenomenological study was to describe the essence of the shared experiences of ADT team members. The social implications for this research is understanding the experience of the agricultural specialist in this one year deployment will help decision-makers better utilize ADT members and develop better training and support mechanisms.

The US military National Guard ADT strategy trained ADTs by utilizing land-grant universities (Center for Army Lessons Learned, 2009). Land-grant universities who host National Guard units would often be contracted to provide “reach back” agricultural information support while the ADTs were deployed (Center for Army Lessons Learned, 2009). This interaction between land-grant universities and National Guard units will be utilized in the future by the U.S. military (Center for Strategic and International Studies, 2011).

Purpose and Objectives
This study was conducted (1) to describe the essence of the experience of being a National Guard agribusiness development team member conducting agricultural extension activities in a conflict affected area.

Methods and Data
National Guard Agribusiness Development Team members were contacted to determine their willingness to participate in the study. Five ADT members were interviewed (Creswell, 2007; Moustakas, 1994). A one hour interview was conducted. The data was analyzed utilizing Nvivo 10® software. The data was coded, analyzed, themes were developed, and the essence of the experience was developed (Creswell, 2007).

Results

The themes of duty, cultural conflict, frustration, danger, empathy, and grief explain the meaning of being an ADT member as they progressed through a three-hundred-day deployment in country. The six themes holistically reveal the essence of the shared experiences of ADT members in Afghanistan which is described best as a Shackled Ambassador. ADT members are, more than anyone else in the regular United States military, an ambassador in the implementation of COIN strategy. The ADT members’ mission was to engage local communities. Although these National Guard units were well trained, they were not professional soldiers. Because of this they are more like a citizen’s representative. The idea of a citizen’s army reaching out to the people of Afghanistan is exactly what the U.S. Military wants to bring about in its peace building efforts there (Leppert, 2010). In this way the ADT member is an ambassador. The themes of duty and empathy speak to this. They represent the olive branch of the United States military in the rural provinces Afghanistan.

The ambassador is shackled through the military structure they are a part of. The ADT member implemented projects and, through the contracting system, millions of dollars were dispersed for a myriad of agribusiness projects and farm-to-market roads (Strimling, 2011). These alone brought about some change within the provinces and districts but it remains to be seen whether the program of using ADT members within National Guard units in Afghanistan is an effective tool.

Recommendations and Implications

If the ADT concept is continued as a part of United States military counterinsurgency strategy, then decision makers should lessen the shackling. The danger aspect cannot be changed, but improving the cultural understanding of ADT members and their commanding officers is key to effectively improving relationships with Afghan partners in agricultural extension. Concerns of the use of the military commander’s fund for projects have been brought up in other studies (Strimling, 2011) and (Minami, 2011). The shackling that occurs from grief can be alleviated by making sure that missions are realistic from the outset, are properly funded, and handed off clearly to the subsequent. Finally, better understanding of the problems faced by national guard agribusiness development team members will help policy makers can improve the effectiveness of using them for strengthening agricultural extension systems in conflict affected areas.

References


An Evaluation of the Needs of Stakeholders within the Bahamian Food Production – Consumption Continuum

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Keywords: Food Security, Sustainability, Development, Needs Assessment, Production

Introduction
The Commonwealth of the Bahamas is an archipelago consisting of a chain of 700 islands, 2,400 cays and islets located about 760 miles southeast of Florida and northeast of Cuba, covering an area of 5,359.1 square miles in the Atlantic Ocean (Central Intelligence Agency [CIA], 2013; Karagiannis, Katsivela, Madjd-Sadjadi, & Stewart, 2012). The latest census indicates a total population of 353,658, the majority living in the New Providence Island. About 16% live in rural areas (Department of Statistics of the Bahamas, 2012). Their economy depends heavily on tourism and offshore banking accounting for about 60% and 32% respectively of the Gross Domestic Product (GDP) while agriculture provides only 2% (CIA, 2013). Consequently relying heavily on imports to meet the food demands of the Island, being their main source of their food imports the United States (Department of Statistics of the Bahamas, 2013; Inter-American Institute for Cooperation on Agriculture [IICA], 2011; Godfray, 2013; Karagiannis, Katsivela, Madjd-Sadjadi, & Stewart, 2012). Even though there is approximately 191,000 acres of agricultural land to produce significantly more food to meet the country food demand, farmers throughout the years have disserted from agriculture activities, the latest agriculture census in 2005 showed a decline since 1978 in small farmers by almost 25% (Godfray, 2013). Additionally in 2000 the IICA estimated their productivity at 10% of their capacity (IICA, 2011). The country main food productions are poultry, winter vegetables and citrus fruits (Karagiannis, Katsivela, Madjd-Sadjadi, & Stewart, 2012). A rapid assessment from the IICA identified 5 key priority areas to revitalize the agriculture in the Bahamas: (1) vegetables, root crops and herbs, (2) tree crops, ornamentals and horticulture, (3) livestock, (4) agro-processing/value adding, and (5) land and water resources (IICA, 2011).

Purpose and Objectives
The purpose of this evaluation was to conceptualize the Bahamian food system from farm to fork and determine stakeholder needs at each level. The main objective was to determine barriers to success for stakeholders at each level.

Methodology
Following the three-phase model of needs assessment (Witkin & Altschuld, 1995) a pre-assessment was conducted through a review of literature, current records and personal interviews. Researchers visited multiple islands in the Bahamas in the fall of 2013 at the invitation of the Inter-American Institute for Cooperation on Agriculture (IICA). IICA representatives in the Bahamas arranged multiple interactions with stakeholders including visits to multiple farms, governmental agencies, a feed mill, an abattoir and a resort butcher department. The research team also conducted a three-hour workshop for livestock producers and met with the Minister of Agriculture and his staff. The purpose in each of these stakeholder meetings was to identify barriers to the food production/consumption system. Notes were taken by all researchers and compared for accuracy.

Results
Researchers reviewed previous studies, production records and conducted personal interviews. Themes emerged within the following stakeholder groups. Producers faced the widest variety of issues including, 1) Lack of product standards and certification, 2) security from theft and feral dogs, 3) inconsistency of availability and price of inputs, 4) land availability and 5) unfair trade regulations. Processors indicated the following barriers: 1) Lack of access to employee training, 2) equipment availability/cost, 3) consistency of governmental of support, and 4) facility security. Additional barriers were determined for education, wholesalers, retailers, tourism, restaurants and governmental agencies. The results were consistent with research conducted by Penn State University in the 1970’s.

Recommendations - Implications
There is an expressed desire at every level of the food continuum in the Bahamas to improve food security for the archipelago nation and continue emphasis on becoming more self-sufficient by increasing domestic production of food products; however, many barriers exist that will delay or defeat this effort. This preliminary needs assessment was the first step in identifying and communicating those barriers to IICA. Following this evaluation, the researchers made several recommendations to IICA for the purpose of focusing stakeholder resources. Educational efforts must be coordinated through IICA and governmental agencies to provide effective training programs and eliminate redundancy. Communication at all levels of government related to food production/consumption should be improved. The single abattoir on the island of New Providence should be evaluated for feasibility of continued operations or elimination. Alternatives for providing humane animal slaughter in multiple locations were proposed with the goal of improving processing quality to WTO food safety guidelines. Efforts to open an agricultural branch of the College of the Bahamas on Andros Island should be strongly supported.

References
Effective Extension Service Delivery for Sustainable Agricultural Development of Communities around Bayero University Kano, Nigeria

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Keywords: Extension service delivery, Development, Effective, Innovation, and Mass media.

Introduction
For sustainable Agricultural development, it is essential to determine the most efficient method of disseminating new agricultural technologies in the areas of crop, livestock, and fisheries to farmers. Agricultural extension services include transferring knowledge to farmers, advising and educating farmers in their decision making, enabling farmers to clarify their own goals and possibilities, and stimulating desirable agricultural development. Most researches are lying on shelves because they could not reach farmers as a result of ineffective extension delivery system (Daneji, et al 2006). Investigating effective methods of getting across research results to farmers at the grassroots is a prerequisite to meaningful and sustainable agricultural development.

Purpose and Objectives of the study
The main purpose of the study was to identify various agricultural extension teaching methods utilized for effective extension service delivery to farmers in communities around the Bayero University State, Nigeria. The specific objectives were; to describe the socio-economic characteristics of the respondents, identify the various extension teaching methods used in the study area, access perception of the farmers on the effectiveness of electronic media in
disseminating agricultural information and describe the major constraints militating against the effective extension service delivery.

**Sampling Procedure and Statistical Analysis**

The study adopted a probability random sampling technique to select respondents. Data were collected from 100 randomly selected small scale farmers through personal interviews using a pre-tested questionnaire. The data collected were analyzed using descriptive statistical tools such as frequency distribution, percentages, mean. Chi-square was used to analyze the perception of the farmers on the effectiveness of the use of electronic media in disseminating agricultural information.

**Results**

The result revealed that all the respondents were male, majority (66.25%) fall within the active age group (20-40 Years) with a mean age of 41 years. About 82.50% were married with a mean Household size of 9 persons. Majority (60.75%) of the respondents had more than eight (8) years of farming experience, while 53.75% cultivated more than 1 hectare of land and only 28.75% practiced mixed farming. Majority (87.5%) had contact with extension agents out of which 45.71% had contact with extension agents once a month. About 83.75% received technical assistance on crop production practices. Group contact was identified as the most important extension teaching method in the study area with 80% of the respondents received technical assistance in group (Group contact). Furthermore, majority (68.75) of the respondents owned both radio and television sets. However, all the respondent preferred extension programmes aired on radio than television. This is because radio is more accessible and affordable. The result of Chi-square analysis revealed that $X^2_{\text{cal}}$ (25) was greater than $X^2_{\text{tab}}$ (14.4, P< .05) which indicates that electronic media was effective in passing extension messages to farmers and should therefore be improved and sustained. The major constraints reported by the respondents were low ratio of extension officer to farmer (95%); epileptic electricity supply (72.5%); insufficient agricultural credit (65%) and unavailability of agricultural input (50%).

**Conclusion**

In conclusion, radio was found to be the most effective method of disseminating agricultural information to farmers because of its affordability, accessibility and the fact that it does not necessarily require electricity to be used. However, low extension officers to farmers’ ratio and epileptic power supply were among the major constraints.

**Recommendations and Implication**

It is recommended that extension contact should be increased. Also, the ratio of extension officer to farming household should be improved. Power/electricity supply should be also improved for the farmers to fully utilize other media for better understanding of new techniques, practices and procedures. It is also recommended that a full programme for extension education be introduced and more farmers encouraged to practice mixed farming for sustainable agricultural development. Emphasis should be given to the use of radio programmes to educate farmers on agricultural innovations (crops, livestock and fishery) because almost all farmers have access to radio which can be used even without electricity. This will go along way in uplifting the standard of living of the resource poor farmers and ensure sustainable food production for domestic use and even export.
References
Factors influencing the attitude of high school agricultural science teachers towards agricultural education and training, the case of KwaZulu-Natal province, South Africa
Factors Influencing the Attitude of High School Agricultural Science Teachers Towards Agricultural Education and Training, The Case of KwaZulu-Natal Province, South Africa

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Introduction
In South Africa, high school level agricultural science experiences one of the highest failure rates of all secondary level subjects. A study was undertaken to try to understand the cause of this situation which negatively impacts on tertiary level agricultural curricula and consequentially on the development of manpower and information in the wider agricultural sector. One contributing factor is the attitude of agricultural science teachers about the subject they teach. Teachers teach to implement the official agricultural science curriculum via teaching and learning processes. Their study suggests that teachers’ attitude towards the subject they teach could influence the agricultural sector’s knowledge development. In the teaching and learning processes, teachers’ personal effort and attitudes towards the subject affect students’ emotions and attitudes about the Agricultural Education and Training (AET) they are receiving and, ultimately, their level of knowledge and achievement as they progress through the curriculum. An efficient teacher who is well disposed to the subject matter could positively impact student learning and consequently transform students’ knowledge and skills and thereby contribute to the agricultural sector’s knowledge and manpower base (Kumar & Kashyap, 2012). Identifying factors influencing teachers’ attitudes towards AET would help foster attitudes that conduce to school and student achievement.

Purpose and objectives
This study investigated what factors influence the attitude of high school teachers towards AET. More specifically, the study sought to determine whether the identified factors would have a positive or negative effect on teacher’s attitudes. Knowing and understanding what influences teachers perspectives regarding AET would assist AET planners to develop and deliver AET programs that improve the image of agriculture as a career, improve student performance and encourage higher registration numbers at tertiary level.
Methods and data sources

To isolate those parameters impacting teachers’ attitudes towards AET offered by South Africa’s high school sector, the research was organized in nested concurrent mixed sampling designs. The study area was KwaZulu-Natal, one of South Africa’s nine provinces. A total of 180 agricultural science teachers were selected as the sample group for this study, using the methodology as described by Johnson and Christensen (2012). A survey was conducted using a pre-tested, structured interview schedule and questionnaires with both structured and unstructured questions. The collected data was coded, described and interpreted for analysis using descriptive statistics and the Tobit model. The reliability coefficient result was found to be 0.8. Relevancy coefficients of the independent variables were selected based on relevancy determined through a panel of experts.

Results

The result showed that the age category varying between 20 and 29 years, availability of internet access and having salary satisfaction had a negative and significant \((P \leq 0.05)\) influence on teachers’ attitudes towards teaching AET. Racial background, area of teachers’ specialisation, teachers’ satisfaction with support from administration, social value (societal respect for agricultural science teachers) and the nature of communication in the school micro-environment had a positive and significant \((P \leq 0.01)\) effect on the teachers’ perception towards teaching AET.

Recommendations and educational implications

Armed with an understanding of what influences teacher attitudes, the relevant national and provincial departments governing agriculture and higher education should collaborate to develop coordinated responses, such as creating information sharing platforms for high school agricultural science teachers and administrators, to address general and specific conditions that govern the factors influencing teacher attitudes. These could be in the form of short- and long-term training programs relevant to secondary school agricultural education, formally organized in-service programs and attention infrastructural and other practical issues that affect offering AET. Through such interventions it is possible to redress the faltering progress of agricultural science education and training in South Africa.

References


An Analysis of High School Students’ Attitudes and Beliefs Toward International Agricultural Concepts

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Keywords: international, attitudes, beliefs, agricultural education

Introduction
Students today face a world where knowledge and experience in a global context is increasingly important (National Research Council, 2009). This study examined attitudes and beliefs of high school students studying agriculture toward international agricultural concepts across geographical and temporal distance by synthesizing new data from the southeastern United States with the work of Elliot and Yanik (2004) and Radhakrishna, Leite, and Domer (2003) conducted in the southwest and northwest regions of the U.S. respectively.

Purpose and Objectives
The purpose of this study was to identify attitudes and beliefs of high school students studying agriculture toward international agricultural concepts. The objectives were to:
1. Determine the attitudes and beliefs of students toward international agricultural concepts.
2. Determine student’s views of the importance of concepts to be included in a curriculum focusing on international agriculture.

Methods
The target population for this study was students studying agriculture in U.S. high schools. Data analysis included three samples; Sample 1 included primary data collected by the researchers in 2013 from 2 high schools in the southeast U.S. (n = 69). Sample 2 was secondary data based on the work of Elliot and Yanik (2004) and included 98 urban high school students located in the southwestern U.S. over a three-year period. Sample 3 was also secondary data from the work of Radhakrishna et al. (2003) who surveyed 62 high school students attending the 2002 Pennsylvania Governor’s School for Agricultural Sciences located in the northeastern U.S. The researchers used survey methodology to collect primary data using instrumentation from Radhakrishna et al.’s work who modified an instrument from the work of Elliot and Yanik
The reliability and validity of the instrument was established in these previous studies. The instrument contained 44 items organized in three sections. Each statement was measured using a five-point rating scale from 1 = strongly disagree to 5 = strongly agree. Following the precedence established by Radhakrishna et al., the data were treated as four constructs.

Results and Conclusions

Overall students had positive attitudes, with an overall mean score for attitude being 3.51 from the southwest U.S., 4.00 from the northeastern U.S., and 3.79 from the southeast U.S. Students also had positive beliefs toward international agricultural concepts, with an overall mean score for belief being 3.55 from the southwest U.S., 3.80 from the northeast U.S., and 3.77 from the southeastern U.S. Students believed that an understanding of U.S. and world geography was important in relation to international agriculture with an overall mean score for understanding being 3.66 from the southwestern U.S., 4.17 from the northeast U.S., and 3.84 from the southeastern U.S. Students were generally in agreement with all the suggested statements concerning potential curricular design of international agricultural concepts, with an overall mean score for instruction being 3.56 from the southwestern U.S., 3.94 from the northeastern U.S., and 3.76 from the southeastern U.S. The southwestern U.S. had the lowest scores on all four constructs and the northeastern U.S. had the highest scores on all four constructs.

Table 1

High School Students’ Attitudes and Beliefs Toward International Agricultural Concepts

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Attitudes Toward International Agricultural Concepts</td>
<td>3.51 *</td>
<td>4.00 .84</td>
<td>3.79 .52</td>
</tr>
<tr>
<td>Beliefs Toward International Agricultural Concepts</td>
<td>3.55 *</td>
<td>3.80 .91</td>
<td>3.77 .40</td>
</tr>
<tr>
<td>Understanding of Geography in Relation to International Ag Concepts</td>
<td>3.66 *</td>
<td>4.17 .73</td>
<td>3.84 .58</td>
</tr>
<tr>
<td>Instruction for Understanding International Agricultural Concepts</td>
<td>3.56 *</td>
<td>3.94 .84</td>
<td>3.76 .44</td>
</tr>
</tbody>
</table>

Note. Scale was 1 = strongly disagree to 5 = strongly agree; * = data not provided.

Recommendations

First, it is recommended that curricula developers begin integrating international agriculture concepts into their products. It is also recommended that researchers continue to study this phenomenon by: (a) replicating this study with other groups of students, specifically in the midwest U.S., and northwest U.S., (b) determine why these students have positive attitudes and beliefs, and (c) testing the efficacy of newly developed curricula. Second, research should be conducted to determine what students actually know regarding an understanding of U.S. and world geography and its importance in relation to international agriculture. Finally, further research is merited to determine the degree to which themes discussed in this abstract are...
universal to schools and individuals of varying characteristics. The findings of this study imply that resources should be provided to develop curriculum pieces focused on providing students education in international agriculture.

Reference
Introduction

Attracting youth to and retaining them in agriculture remains a global challenge. Although the opportunities continue to increase for graduates in agriculture, in many countries, too few youth have stepped up to the challenge (Russell, 1993). Agriculture teachers, together with school counselors, need to make students aware of the variety of career opportunities in the agriculture sector (Jackson & Williams, 2003).

In developing countries, such as Uganda, ensuring a viable labor force for the agriculture sector remains a challenge. Uganda’s population is approximately 37.5 million and the fifth fastest growing population worldwide (Natukunda, 2013); it is projected to reach 103.2 million by 2050 (Oluka, 2011). Therefore, attracting youth, who constitute about 70% of Uganda’s population, to careers in agriculture is critical to ensuring food security and national employment (Mukembo, 2013). Youth organizations or clubs, such as FFA and 4-H, have been a successful approach in the United States (Connors, 2013; Lindley, 1993; National 4-H History Preservation Program, 2013). However, increased understanding is needed of how agricultural organizations may foment the career interests and aspirations of youth in developing countries regarding post-secondary education, including the study of agriculture and preparation for related careers.

Purpose/Objectives

The multifold purpose of this study was to determine the perceptions of YFC members regarding their career interests and the factors influencing their career choices/aspirations with relevance to career preparation at the post-secondary school level. The study also sought to describe students’ interests in agriculture-related careers, their personal characteristics, and their reasons for joining YFCs. Four objectives guided the study: (a) describe select personal
characteristics of the YFC members; (b) determine why the students joined YFCs; (c) determine the career interests of the YFC members; and (d) determine the factors that influenced career choices/aspirations of the YFC members.

Conceptual Framework
This study was guided mainly by human capital theory. “[H]uman capital refers to [all] the acquired skills, knowledge, and abilities of human beings” (Hornbeck & Salamon, 1991, p. 3), as attained through education and training for the support of their productive potential (McFadyen, 2006). In addition, integrating the theory of planned behavior, as espoused by Ajzen (1987, 1991, 2002, 2006), and the factors influencing career choice (Hackett & Betz, 1981; Lent, Brown, & Hackett, 1994, 2002) broadens our understanding of the synergy between human capital theory and an individual’s career choice(s).

Methods & Data Sources
The study used a single case (embedded) study design (Yin, 2009). Case selection was purposeful (Gay, Mills, & Airasian, 2009) and involved 102 members of YFCs from two schools in eastern Uganda; the researchers also used cross-sectional survey methodology (Creswell, 2011; Gay et al., 2009). Several question formats and response scales were employed to measure students’ attitudes or preferences (Gay et al., 2009). The data were analyzed using the Statistical Package for Social Scientists (SPSS) version 21 to calculate frequencies and percentages.

Results/Conclusions
Almost an equal number of males (49.0%) and females (51.0%) participated in the study; most were 13 to 19 years of age. The students mainly joined YFCs to improve their academics (90.2%), because of personal interests (86.3%), and to gain life skills (82.3%). These findings implied students saw membership as an opportunity to learn and thus improve their academic performance. A high number were interested in pursuing careers related to science and three of the five highest ranked careers were related to agriculture. The main factors influencing the students’ career choices/aspirations were intrinsic and their clubs’ activities had less influence.

Implications/Recommendations/Educational Importance
Guidance counselors, teachers, parents, and other stakeholders should take into consideration the personal interests and abilities of students when advising them about career choices. Moreover, the students in this study may not have perceived an association between their clubs’ activities and preparation for careers, even in regard to agricultural careers, because few club experiences were offered to which students could make those connections. Therefore, club advisors should provide meaningful learning experiences for club members to explore their career interests and aptitudes (Leung, 2008; Super, 1980), especially in regard to agriculture.

Most club members were interested in careers related to science. Therefore, could YFCs be appropriate venues for introducing students to scientific knowledge, principles, and concepts given the fact agriculture is the oldest of all sciences (Duncan, Ricketts, & Shultz, 2011) and involves application of the life and physical sciences (Ramsey & Edwards, 2004)? Further study is needed to examine this and related questions.

References

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Science Laboratory Learning Environment Perceptions of Agricultural Technical School Students in Egypt

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Keywords: Science learning; Agriculture technical students; Egypt agricultural education

Introduction

A theory of educational productivity espoused and tested by Walberg identified nine factors that contribute to the variance in student outcomes (Walberg, 1981; Walberg, 1984). Those factors included student factors, instructional factors and environmental factors. Environment factors were of particular importance, even as other factors were controlled (Walberg 1986; Walberg, Fraser, & Welch, 1986). Getzels and Thelen (1960) described the school classroom as a social system that includes personality, role expectations, and classroom environment. Based on Walberg’s work, Henderson, Fisher, and Fraser (1998) described relationships between classroom and laboratory environment specifically in Environmental Science classes and student attitude, cohesion within the class, and student involvement in class activities.

The Science Learning Environment Index (SLEI) was developed by Fraser, Giddings and McRobbie (1992) to assess the perceptions of psychosocial environment in the science laboratory classrooms at the post-secondary level. Subsequently, various researchers have utilized the SLEI in studies throughout the world. Aladejana and Aderibigbe (2007) found that students in the chemistry classes studied in Nigeria indicated student cohesiveness highest on the index and material environment as the lowest. A study by Harrison, Fisher, and Henderson (1997) discovered a differentiation on the index among chemistry, biology, and physics students in Tasmania, citing the influence of a more open-ended environment in physics. Burleson and Myers (2013) applied the concepts regarding laboratory environment in a study of students enrolled in a college-level entomology course. Using the SLEI, the researchers noted little
congruence between the actual and preferred classroom environment as perceived by the students. Students preferred more cohesiveness, greater open-endedness, integration and rule clarity, and better laboratory facilities.

A USAID-funded effort in Upper Egypt addressed the needs of agriculture technical schools (ATS) in terms of curriculum development, teaching enhancement, and laboratory instruction. The overall purpose of the project was to help ensure that ATS instructors are conducting programs that meet workforce needs in agriculture (authors). To coincide with identifying laboratory equipment needs, an assessment of laboratory instruction was essential.

**Purpose and Objective**

The purpose of the study was to investigate the perceptions of Egyptian agriculture technical school students regarding the science laboratory environment. The objective was to determine science laboratory environment perceptions of ATS students.

**Methods**

Students enrolled in five agriculture programs at two ATSs completed the SLEI under the direction of the researchers in March 2010. A total of 40 students completed the 35-item instrument. Most students were juniors; half were male and half female. The instrument was translated into Arabic from the English original. The 35 items required a response regarding how often that particular practice occurs in the laboratory. Students responded on a 5-point scale from “Almost never” to “Almost always” regarding how often each practice actually takes place in the laboratory. Approximately half of the items were reverse-coded. The instrument is divided into five sub-scales (Fraser et al., 1992) as reported in the next section.

**Results**

The most frequently occurring lab practices were in the area of Student Cohesion: the extent to which students know, help and are supportive of one another. The remaining sub-scales, in order of frequency, were Open-Endedness: the extent to which students have interest, share ideas, do additional work, and participate; Rule Clarity: the extent to which it is important to complete activities planned and stay on the subject matter; Material Environment: the extent to which the laboratory equipment and materials are adequate; and Integration: the extent to which the lab activities are integrated into non-lab and theory classes.

**Recommendations and Implications**

Students appeared to be most satisfied with the social context of the laboratory environment and the clarity in which they are expected to work. The results of the study indicate that teachers need to coordinate more closely the content that is taught in the classroom and the learning activities that occur in the laboratory. There also may be a need for additional and improved equipment and materials for students to conduct the activities that are planned for the laboratory classes. An inventory of equipment and materials currently in the labs is needed, with the inventory compared to course objectives, to determine the specific needs.

**References**


Determinants of farmers' decisions in adopting hybrid rice in Bangladesh

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Introduction
Rice is a major source of livelihood in terms of providing food, income and employment in Bangladesh. It covers 77.07 percent of the total cropped area in the country, providing food for 142.3 million people (BBS, 2011). Even though Bangladesh has achieved significant progress in rice production and yields, the demand for rice still outstrips domestic production. As such the country remains a net importer of rice. Assuming a constant price, the annual increase in per capita rice demand in Bangladesh is in the range of 0.85 to 1.2 kg across the alternative income scenarios (Ganesh-Kumar, Prasad, & Pullabhotla, 2012). Research leaders and policy makers in Bangladesh have considered hybrid rice, an innovative technology, as a viable option for sustaining growth in rice production in the face of upcoming food security challenges. In the hopes of having this effect, hybrid rice was introduced in 1998-1999 boro season in Bangladesh without a clear deployment strategy (Hossain, Janaiah, & Husain, 2003) and its cultivation continues today.

Purpose and objectives
The purpose of the study was to understand the farmers’ response to this innovation over the last decade. To achieve this, we used the “diffusion of innovation” model as developed by (Rogers, 1995). The specific objective guiding the study was to: i) assess the extent of adoption of hybrid rice in Bangladesh, ii) investigate the influence of selected characteristics in influencing farmers’ decisions on adopting hybrid rice, ii) identify the problems faced by farmers in cultivating hybrid rice.

Method and data source
A concurrent embedded design using a cross sectional survey was employed (Creswell, 2009). The study was conducted in five regions of Bangladesh approved through the gazette notification of the Government of Bangladesh for the evaluation and registration of every single variety of hybrid rice (GoB, 2003). The population of this study consisted of rice growers of the boro season who were responsible for farming decisions. A multistage stratified random sampling design as proposed by Babbie (1990) was employed in drawing the sample of 440 farmers following sample size suggestions as proposed by Israel (2009), Dillman (2007) and
Corbetta (2003). Three categories, namely, non-adopters, de-adopters and continuing adopters of hybrid rice were sampled. Data was collected through face–to–face interview of the sampled farmers using a pre-tested and back translated questionnaire. Through gleaning knowledge from various sources, we designed an 8-page questionnaire comprising 183 items in a series of 21 questions sequencing from general to specific. The questionnaire was formatted with both open and closed ended question items for securing quantitative and qualitative data. The internal reliability of the multiple item scale variables was calculated using Cronbach’s alpha, which was found satisfactory. For data collection the first named investigator spent 120 working days travelling different places of the selected research site during the tenure of March 2 to 30 June 30, 2012.

Measuring extent of adoption

The extent of adoption was measured as the percentage of the total potential area belonging to an individual farmer brought under cultivation of hybrid rice. If farmers continued cultivating hybrid rice for successive years, the average of both actual area and potential area was calculated to find the extent adoption of a given time period using the following formula.

\[
\text{Extent of adoption of hybrid rice (\%) = } \frac{\text{Average of acreage planted to hybrid rice}}{\text{Average of total of potential acreage for hybrid rice}} \times 100
\]

Statistical analysis

In order to compare the groups of non-adopters, de-adopters and continuing adopters, Analysis of Variance (ANOVA) was performed. Logistic regression analysis was performed to assess the significant contribution of the independent variables to farmers’ decisions on adopting hybrid rice.

Results and conclusions

Data confirmed that the overall extent of adoption of hybrid rice during the period of 2001-2011 boro seasons was relatively low in the sample areas. Logistic regression results after fitting the full model of 11 selected predictive variables on farmers’ decisions in adopting hybrid rice showed that education, annual family income, communication exposure, and attitude towards hybrid rice made significant contributions to farmers’ decisions in adopting hybrid rice. Farmers faced some problems in cultivating hybrid rice. The key problems were its unsuitability for domestic use, lower market price, higher input cost, and a lack of pure seeds.

Recommendations

With the knowledge gained in this study about the current status of hybrid rice, the Government of Bangladesh may address the following five areas. Firstly, we recommend establishing a functional coordination of public sector extension organizations (such as Department of Agricultural Extension), and private sector organization such as seed companies under the tutelage of the ministry of agriculture to monitor and supervise the cultivation procedures of hybrid rice on a regular basis. Secondly, we recommend giving preference for targeting farmers from high-income category for accelerating the rate of adoption. Thirdly, we recommend undertaking research on how to suit the taste and preference of consumers. Fourthly, Government should regulate the market price to help farmers achieve a fair price and to deliver required complementary inputs at subsidized rates. Lastly, the field level extension staff should guide farmers to obtain quality seed on time.
Implications

There is an enormous potential for improving the level of adoption of hybrid rice. This study might help the concerned authority to recommend productive varieties and launch promotional activities for further expansion of hybrid rice. Getting informed about the current status of hybrid rice, the Government of Bangladesh may refine policy guidelines to maximize advantages of this promising technology in the days to come.

Reference

Assessing the Diffusion of Integrated Farming System for Sustainable Fish Production in Kwara State, Nigeria

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Introduction
Fish contributes to over 60% of the world animal protein intake of the people (FAO, 2007) with per capital consumption of 7.5-8.5kg and contributes 3-4% of nation’s GDP, but its production is dwindling. The demand for fish in Nigeria is 2.66 million metric tons (mt) while the local production is 1.38 million mt (Oyinbo and Lekwot, 2013). This created a demand-supply gap of 1.28 million mt. Consequently, Federal Government of Nigeria expended about 100 billion naira (about $625 million) on fish importation annually (The fish site, 2011). Olomola(1991) shows that only infinitesimal proportion of resources available are being utilized. Exploring other strategies for fish production would go along way at making fish and its products available on sustainable basis. Kwara State alone is endowed with over 400,000 hectares of land suitable for fish integrated with rice production (MANR, 2004). Therefore, integrating fish with either rice or poultry has the potential to boost fish production on sustainable basis and cut down reliance on importation to meet local needs of fish.

Purpose and Objectives of the Study
The purpose of the study was to assess the diffusion of integrated farming system for sustainable fish production in Kwara state, Nigeria. The specific objectives were to:
- describe the socio-economic characteristics of fish producers,
- investigate awareness of integrated fish farming,
- determine the spread of integrated fisheries and poultry; fisheries and rice production,
- identify implications of integrated fish farming on land resources and sustainability of fish production,
- determine perceived ways of overcoming identified constraints.

Methods and Data Sources
The study area was Kwara State, Nigeria. It is one of the 36 States of Nigeria, created in 1967. It falls within the North Latitudes 11° 21' and 11° 45' as well as 6° 40' East of Greenwich Meridian with a land Area of 32, 250 square kilometers. Rice, fish and poultry are commodities which production can be integrated. The target population comprised rice farmers in Edu and Patigi LGAs, that is, rice producing areas of the state, members of Fisheries and Poultry Associations in Kwara state. A purposive sampling technique was used to select 50 respondents from rice farmers, 50 (fisheries) and 50 poultry associations in the state to constitute
150 respondents used for the study. Primary data were elicited from the 150 respondents by structured interview schedule. Secondary data were collected from journals, Ministry of Agriculture. Data were analyzed with percentages, frequency distribution and means statistical tools.

Results, products, and/ conclusion

The result showed that rice farmers, members of poultry association of Nigeria (PAN) and Fisheries society of Nigeria (FISON) in Kwara state were with mean age of 40.6, 45.4 and 43.5 years respectively. This showed that respondents were relatively young and should be venturesome, adopt innovations aimed at improving their fishery output. Majority of the respondents were married. This may have positive effects on the availability of family labour for farming. Similarly, 66.7%, 98.3% and 91.5% of rice farmers, members of PAN and FISON respectively were literate. This can have a positive effect on the adoption of recommended practices. This agreed with Ekoja (2004) that significant difference exists among farmers in the adoption of innovations on account of educational qualifications. Majority (82.5%) of rice farmers were not aware of integrated farming. However, 71.6% of members of PAN were aware of integrating poultry with fish production. A small proportion of PAN (4%) and FISON (3%) adopted integrated fish with poultry while 1% of rice farmers adopted integrated rice with fish production. Effective use of land resources was guaranteed while environmental pollution due to poultry manure was curtailed by the system. The major constraints commonest to respondents include inadequate access to credit, skills, knowledge, and incidence of flood. Extension teaching methods such as lecture, farm and home visits by experts and use of mass media can be used to create awareness and skills acquisition. The respondents perceived integrated fish farming as a sure way to increasing fish output, regular income generation, cost minimization and sustainable fish production approach.

Recommendations, Educational Importance, Implications and /or Application

Empowerment of respondents on skills and knowledge of integrated farming system would assist the respondents to overcome the constraints militating against diffusion of integrated fish farming. The empowerment should be intensified through extension education involving the use of technology demonstration and mass media for airing of messages on the system, sponsored by government extension agencies, PAN, FISON and other donors. These would increase awareness and adoption of integrated fish farming system by the respondents.

References


Applicability of APSIM in decision making by small-scale resource-constrained farmers: A case of Lower Gweru Communal area, Zimbabwe

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This study was conducted among resource-constrained, small-scale farmers in Gweru, Zimbabwe to test the applicability of the Agricultural Productions Systems Simulator Model (APSIM) to their decision-making. Lower Gweru is a developed communal settlement in the Midlands province of Zimbabwe. Gweru’s climate is semi-arid to arid with summer rainfall ranging from 450mm to 600mm annually but experiences periodic seasonal droughts and severe dry spells. Thus decision-making capacity to cope with these climatic fluctuations is critical to successful, profitable farming. Farmers traditionally use, almost exclusively, indigenous methods to predict weather and to inform their production decisions. If it is applicable to their farming and farm management systems, APSIM offers these farmers – and others like them – the opportunity to strengthen their decision-making capacity and thereby reduce risk and their vulnerability to climate variations.

Stratified random sampling was used to select 30 small-scale, resource-constrained farmers from the two study areas, Nyama and Mdubiwa. These farmers participated throughout the two-year duration of the study. Data were collected using four data collection tools: focus group discussions; resource allocation mapping; APSIM simulations; and semi-structured interviews. These methods were used sequentially, each building on the results of the previous data collection exercise.

APSIM simulations were run to simulate the farmers’ farming systems to establish model credibility and validate the model with the local data and to explore “what if” questions to discuss ways to improve maize yields in a below-normal season. After interacting with model outputs for two years, semi-structured interviews were conducted with the farmers to assess their continued use of APSIM in decision-making.

Keys findings spanned farmers’ perception of climate change, decision-making processes and using APSIM as a decision-making tool. All the farmers noted that the climate of their area is changing. Their evidence was indicators they have noted over the last 15 years, having lived and farmed in the area for most of their lives. They identified the following changes: Increased number of seasons without adequate rains; Increased rainfall extremes in the last 10 years; Long dry spells during the rainy season; Rains starting late into the season; Rains ending earlier than in the past; Temperature extremes; and Drying up of perennial streams and rivers.
Regarding decision-making processes, at the beginning of this study, all the farmers indicated that they exclusively used their indigenous indicators, which signal low rainfall and good rainfall seasons, to make climatic and crop management decisions. However, farmers were willing to use APSIM when they saw for themselves its accuracy and relevance to their farming systems. They found it useful for making decisions relative to climate variations, but noted APSIM’s limitations as the lack of accurate data, the need for expert support and access to computers.

The study found that continued reliance by small-scale farmers on local indicators to interpret current climate change conditions is due to a lack of clear proven alternatives that are understood and tested by the farmers through first-hand experimentation. APSIM cannot and should not replace or displace the use of local indicators but can add value by quantifying risks associated with strategies identified to manage climate change. These indigenous indicators, although waning in reliability and accuracy, can be strengthened when revisited with models such as APSIM thus suggesting an interplay between local knowledge and so-called modern technologies through a deliberate learning programme designed to engage farmers in scientific enquiry.

The implications are that through working first-hand with new technologies – even sophisticated computer-based technologies – enables farmers to learn in their individual contexts the value of those technologies and their applicability to their farming systems. Further, farmers are motivated to learn when their livelihoods are at stake. However, being risk-averse and perceiving themselves as highly vulnerable to the many influences on their farming activities, including climate change, the farmers proceed with caution and wisdom. They will not rush to adopt any significant change unless they have hard facts that they themselves have participated in generating. Whether introducing a model like APSIM or any other technology, unless the farmers are directly involved with its testing in the field – preferably on their own farms – they are unlikely to adopt what is offered.

The implications are that extension, which in Southern Africa continues to operate from a framework of technology transfer, would do well to reconsider this position and adopt a more genuinely participatory and experiential learning approach particularly when engaging with resource-constrained, risk-averse farmers who perceive themselves as vulnerable.

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Limiting Factors and Barriers to Adoption of *Moringa* in Agricultural Development

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**Keywords:** Moringa, technology transfer, adoption barriers, limiting factors

**Introduction**

*Moringa oleifera* is often referred to as the ‘Miracle Tree’ (Ashfaq, Basra, & Ashfaq, 2012; Hewitt, 2013; Hulick, 2011; Soumen, Garg, & Varshney, 2008) due to the vastness of its attributed uses that range from supporting economic development for smallholder farmers; human and animal health and nutritional needs; environmental, forestry and agricultural practices (water purification, pest management, soil fertilization, erosion control, reforestation, living fences); and providing raw materials for the cosmetic, oil, pharmaceutical, and energy industries (Asare et al., 2012; Ashfaq et al., 2012; Dhakar et al., 2011; Fahey, 2005; Lea, 2010; Mahmood, Mugal, & Haq, 2010; Price, 2007; Radovich, 2011). In addition, Moringa is said to be tolerant to water and temperature stresses (adaptable to rainfall and temperature ranges between 250 mm and 1500 mm and -1°C and 48°C), tolerant to poor soils, and adaptable to a wide range of environments (Ashfaq, Basra, & Ashfaq, 2012; Dhakar, et al., 2011; Mahmood, Mugal, & Haq, 2010). Despite this promising potential, the tree remains underutilized.

It is important to determine what variables affect the rate of adoption of *Moringa* as an agricultural development innovation. As a theoretical framework for this study, the researchers used Rogers (2003) technology transfer framework. Specifically, Rogers indicated that the variables determining the rate of adoption of innovations were the following: 1) perceived attributes of innovations (relative advantage, compatibility, complexity, trialability, and observability); 2) type of innovation decision; 3) communication channels; 4) nature of the social system; and 5) extent of the change agents’ promotion efforts (Rogers, 2003).

**Purpose**

The purpose of this study was to identify the limiting factors and barriers to adoption of *Moringa* in agricultural development.

**Methods and data sources**

This was a non-experimental, descriptive study. Data was collected through online (email and Qualtrics Survey Software) self-reporting questionnaires.

The sample population included individuals around the world who have promoted the use of *Moringa* and have likely experienced barriers and identified limitations to the use of *Moringa.*
The request to volunteer to participate was sent to organizations and individuals identified as working with *Moringa*.

Responses to the open-ended questions were analyzed following guidelines proposed by Lincoln and Guba (1985) for content analysis of qualitative data, including unitizing, categorizing, and filling in patterns. To establish trustworthiness, the researchers engaged in different techniques following suggestions by Lincoln and Guba (1985) including prolonged engagement, peer debriefing, member-checks (follow-up phone interviews and e-mails), and triangulation of researchers and data sources.

**Results and conclusions**

Most of the limiting factors and barriers to adoption of *Moringa* described by participants paralleled the variables described by Rogers (2003) in his technology transfer framework. In fact, the limitations most frequently cited by respondents were limitations on many of these variables:

1. Lack of compatibility. The lack of acceptance of *Moringa* as food was the single most cited “compatibility” limitation. Respondents cited personal preferences such as bitter taste and texture, the lack of acceptance for human consumption because it was associated to animal feed, or the stigma of the ‘extreme poor and sick.’ Other compatibility issues addressed were the lack of accessibility, availability and limited resources (seeds, water, fertilizer, etc.), lack of market options, and the fact that it is a labor-intensive crop. Other reasons involved hesitancy to support non-native species.

2. Lack of knowledge and awareness that could be attributed to relative lack of research and information available. Further, the lack of research and the stigma of ‘folk medicine’ contributed to many institutions’ reluctance to support *Moringa* as a solution to hunger and malnutrition.

3. Complexity. Many respondents mentioned complexity in relation to value chain, quality assurance and hygiene, protection from animals and livestock, horticulture and environmental challenges, and marketing difficulties.

4. Negative consequences attributed to adoption (undesirable, indirect, or unanticipated) (Rogers, 2003).

5. Nature of the social system and institutional and organizational limitations such as lack of funding support and a ‘short-term’ funding culture.

6. Low relative advantage when compared to the costs of adopting the innovation or when compared to other alternatives available through development programs or charitable organizations.

7. Barriers in communication channels.

**Recommendations, educational importance, implications, and application**

Understanding the limitations and barriers to adoption of *Moringa* in agricultural development programs is key to the improvement and continued positive impact of development efforts. By addressing the identified barriers change agents will be able concentrate in meaningful and efficient efforts, and *Moringa* can be used to its full potential to benefit food-insecure smallholder farmers.

**References**


Factors Affecting UK Farmers’ Adoption of On-Farm Renewable Energy Generation Practices: A Logistic Regression Analysis

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Introduction

Recent academic and policy discourses regarding renewable energy (RE) generation on UK farms reflect the desire to promote an integrated model of agriculture, underpinned by the premises that, alongside food production, RE generation provides opportunities for UK farmers to diversify their businesses, mitigate climate change, and enhance energy security (Department for Food, Environment, and Rural Affairs [Defra], 2007, 2012; Plieninger, Bens, & Reinhard, 2006). Despite such potential benefits, however, a government survey carried out in the year
2010 found that only 5% of the farmers in England were generating RE (Defra, 2012). Although, other more locally-focused studies (Mbzibain, Hocking, Tate, & Ali, 2013; Tate, Mbzibain, & Ali, 2012) found the adoption to be as high as 14% and the most recent survey (Farmers Weekly, 2013) found the figure to be 38%, it is apparent that the full potential of farm-based RE is yet to be realized in the UK.

Previous studies have identified a number of factors affecting the adoption of RE enterprises on UK farms (e.g. Farmers Weekly, 2013; Mbzibain et al., 2013; Tate et al., 2012; Tranter, Swinbank, Jones, Banks, & Salter, 2011), but these studies are largely descriptive and hence do not provide statistically valid predictors of UK farmers’ adoption behavior. These studies are also unable to specify which of the factors are more important than the others.

**Purpose and Objectives**

This study was set out to explore, using a statistical modelling approach, whether and to what extent some of the factors commonly identified in the descriptive literature affected UK farmers’ likelihood of adopting (non-adopting) RE generation practices. The factors were: farmers’ selected demographic and farm business characteristics – including age, gender, education, farm size, annual business turnover, farm ownership status – as well as their attitudes towards renewable energy enterprises, and the constraints in the business environment (financial, informational, political, and community-related). In addition to contribute to the academic literature, the findings are expected to provide statistically valid evidence for relevant UK stakeholders and enable them to improve the targeting of their interventions.

**Research Methods**

This study was based on an online survey carried out in the UK during April 29 to May 29, 2013 as part of the scoping phase of an on-going project called “Farm as Power Station”, being implemented through a partnership between Nottingham Trent University (NTU), Forum for the Future (an NGO), and Farmers Weekly (a farm Magazine). A random sample was drawn from the database of Farmers Weekly subscribers, which is over 100,000 farmers coming from all over the UK. A branded e-mail was sent to these farmers and the survey was also hosted on a landing page on “fwi.co.uk” and promoted in social media. A total of 693 farmers completed the online questionnaire.

Farmers’ adoption of RE generation practices was measured as a dichotomous variable by asking whether or not they were generating any renewable energy, e.g. solar, wind, anaerobic digestion, biomass, hydro, or geothermal energy. Among the demographic characteristics, farmers’ age was measured as a categorical variable: up to 24 years, 25-44 years, 45-64 years, and ≥65 years; gender as: male and female; and education as: up to secondary, further education (FE) or apprenticeships, graduate degree, and post-graduate degree. Among the farm business characteristics, annual business turnover was measured as: <£10,000, £10,000-19,999, £20,000-29,999, £30,000-49,999, £50,000-99,999, £100,000-199,999, £200,000-499,999, ≥£500,000; farm size as: <20 ha, 20-99 ha, 100-199 ha, 200-499 ha, and ≥500 ha; enterprise type as: arable, livestock, mixed, and other (including forestry); and ownership status as: owner, tenant, and other.
Farmers’ attitudes towards renewable energy enterprises was measured as a continuous variable using Likert’s method of summated ratings. The scale included 10 statements (six positive and four negative) regarding the economic, environmental, and cultural (aesthetic) impacts of RE enterprises and the respondents were asked to indicate whether they: strongly agreed, slightly agreed, were undecided, slightly disagreed, and strongly disagreed with these statements. The scale scores could range from 5 to 50 and higher scores meant more favorable attitudes. A similar method of summated ratings was used for the variable constraints in the business environment. Respondents were asked to indicate on a five-point scale how easy or difficult they found in: raising enough capital to start an RE enterprise, applying for planning permission, accessing credible information, finding markets for their energy-related products, receiving support from the local community in establishing an RE enterprise, and accessing government RE grants/subsidies/incentives. The responses were scored as “1” for very easy and “5” for very difficult indicating that a higher score meant a higher confrontation of barriers.

To identify the extent to which the above factors affected UK farmers’ likelihood of adopting (non-adopting) renewable energy enterprises, a logistic regression modelling technique was used. Although a total of 693 farmers participated in the survey, only 375 were included in the model as many farmers didn’t answer the questions regarding demographic and farm characteristics that required a pair-wise deletion to compensate for these missing values.

Results
Among the factors entered into the model, farmers’ attitude towards renewable energy enterprises, and the constraints in the business environment, were highly significant (p<0.001) predictors of renewable energy adoption. The odds ratios for these variables were 1.11 and 0.885, respectively. The other variables having significant effects were farmers’ annual business turnover, and ownership status. Farmers with higher business turnover were significantly more likely to adopt RE enterprises and tenant farmers were significantly less likely (p<0.05; odds ratio 0.25) to do so. Importantly, of all the independent variables, annual business turnover appeared to be the strongest predictor of RE adoption in terms of odds ratios. For instance, the farmers with an annual turnover of ≥£500,000 were 11.42 times more likely (p<0.01) to adopt RE enterprises compared to the farmers with an annual turnover of <£10,000 (reference category). The other variables – age, education, gender, enterprise type, and farm size – did not have any significant effects. Overall, the model was good fit to the data (omnibus tests: Chi-square 100.589, p<0.001; Hosmer and Lemeshow test p=0.569). It correctly classified 74% of the cases, and explained between 24% (Cox & Snell R square) and 32% (Nagelkerke R square) of the variance in the dependent variable.

Conclusions and Implications
The results of this study refute the findings in the descriptive literature (Farmers Weekly, 2013; Mbzibain et al., 2013; Tate et al., 2012) that farmers’ age, education, gender, enterprise type, and farm size affect the adoption of RE enterprises in the UK, but confirms the significance of some other factors, e.g. ownership status, attitudes, government policy and/or planning regulations, availability of funding, and community support (Farmers Weekly, 2013; Mbzibain et al., 2013; Tate et al., 2012; Tranter et al., 2011). This means that whilst there are many “perceived barriers/drivers” to RE adoption in the UK, all are not the “actual (statistically
valid) predictors” of farmers’ adoption behavior. Also, some factors are more important than the others, as is the case of farmers’ annual business turnover.

The above findings suggest that, in order to improve RE adoption on UK farms, policy and other interventions should target low-income and tenant farmers. Moreover, the significance of farmers’ attitudes in adoption calls for more investment in extension or advisory campaigns that are crucial for influencing attitudes. Currently, much of the government investments in the UK agrifood sector is directed towards technology development (e.g. material/physical science research) and subsidy payments, and very few examples, if any, are found of investments in extension. There is also a need to improve the conduciveness of the RE business environment, including such measures as: creating new financial packages, especially for low-income farmers; reducing bureaucracy and red-tape in local planning permissions; improving the credibility of RE information; involving local communities in RE projects (currently UK government is supporting this through community-based RE projects), and improving access to government grants (again, this might mean reducing bureaucracy and red-tape). This implies a much broader role for UK advisory services, e.g. that of “innovation brokers” (Klerkx & Leeuwis, 2009) rather than just of “information providers”. Also, there is a need to identify the factors that affect the credibility of RE information in the UK and figure out ways that could improve this situation.

References


Twelve Elements of Influence for Success of Extension and Outreach Programs

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Keywords: Collaboration; Economic Growth; Organizational Development; Information Technology, Public-Private Partnerships; Sustainability, Value Chains

As a bilateral agency, the Millennium Challenge Corporation (MCC, 2013) is eleven years old. Founded on eight core goals, MCC has galvanized efforts to reduce poverty, child mortality, and disease while increasing education, gender equity, maternal health, environmental sustainability, and global partnerships. While MCC has made marginal progress, five megatrends point to an impending tsunami for the 2040 global ecosystem. These megatrends are 1) population growth, 2) environmental degradation, 3) impacts of technology, 4) migration-immigration, and 5) global terrorism. There are no silver bullet solutions, but core elements in agricultural education and extension provide promise for global triage of poverty, hunger, illiteracy, and conflict.

Purpose and Objectives

This research intentionally identified, compared and contrasted 12 elements that influence program success. The researchers re-examined Rogers (2003) diffusion-adoption principles and suggest a path forward toward innovation for program effectiveness and performance. Three objectives guided the inquiry; 1) What are the perceived strengths that contribute to diffusion and adoption of promising practice? 2) What are the perceived opportunities that offer promise to accelerate diffusion and adoption of practice? 3) What adoption-diffusion principles are appropriate to accelerate diffusion and adoption of practice?

Methods and Data Sources

This research collected and analyzed Cameroonian stakeholders’ perceptions (Nyambi, 2012). This research also conducted a content analysis of a decade of extension and advisory service journal articles. Researchers examined post-hoc how form, function, policy, and mission shaped perceptions and performance of extension and outreach programs among Cameroonian and American stakeholders.

Four focus groups plus 28 individual interviews provided data from 59 Cameroon stakeholders that included farmer-leaders, NGOs, extension representatives, and governmental
counterparts. Thirty-nine articles from the *Journal of Extension* were analyzed and the conclusions and recommendations were juxtaposed against Cameroonian perceptions.

**Results, Products and Conclusions**

Twelve elements (strengths and opportunities) emerged that influenced outreach program success; strengths were 1) collaboration and linkages, 2) decentralized program structure, 3) education and training, 4) infrastructure, and 5) productivity. Opportunities were 6) community-based value chains, 7) empowering producer organizations, 8) enabling affirmative environments, 9) expanding markets, 10) exploiting information technology, 11) exploiting natural resources and human capital, and 12) increasing institutional collaboration.

Promising practices exploit 1) collaboration and linkages by intentionally promoting interdependent organizational charts. The trans-organizational charts arrange formal structures for technology transfer and feedback among stakeholders. Stakeholders can adopt system-managed platforms that increase coordination and synergy. Both groups agreed that 2) decentralized program structures and 4) improved infrastructure would increase outreach effectiveness. 3) Educational programs must have a core mission, but deliver innovation using a variety of appropriate methods. A commitment to exploit technology transfer and staff competence promises increased 5) agricultural productivity. 6) Improved markets begin within the community and increase from the inside out. As food security increases, surplus foods will be traded among adjacent communities that fill export demands and reduce poverty. As the community-based value chain matures, 7) producer-processor organizations will position to leverage cooperative functions, 9) expand markets and enable 8) affirmative environments. Stakeholders recognized 10) information and communication technology as a potential to accelerate diffusion and adoption of innovations. A well-developed and communicated plan of work will leverage 11) natural resources and human capital, thereby improving 12) collaboration among the larger global outreach goals.

This research re-examined Rogers’ (2003) adoption-diffusion principles and recommend a strategy to improve global outreach. Rogers envisaged five characteristics that influence adoption or rejection. Robust communication channels compare and contrast relative advantage for the elements. Stakeholders have opportunities to examine compatibility, trialability, and observability in community venues. Using care in designing simplicity into the elements is essential. Result and method demonstrations provide incentives for adoption by stakeholders. Opinion leaders and early adopters provide legitimacy for adoption. Select stakeholders who are able leverage the adoption among adopter categories. A caveat in the paradigm is to insure a more uniform distribution of value added by the innovation. Community-owned cooperatives offer a parity advantage for diffusion and adoption.

**Summary and Implications**

Although intertwined, these 12 global elements position agricultural outreach and extension advisory services for success. Americans and Cameroonians view the core elements as strengths and opportunities to leverage agricultural education to increase literacy, food security, health, wealth, and peace building. Certainly, it is difficult to simultaneously diffuse and adopt 12 elements. However, by seeking consensus from the larger community of stakeholders, it is possible to prioritize and sequence the
elements to optimize adoption. Christensen, Marx, and Stevenson (2006) encouraged us to select the correct tools of cooperation and change—and to get to work.

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American Extension References


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Supporting References


An Investigation of the Household Asset Building Program (HABP) in Ethiopian Extension

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Keywords: Food insecurity, Ethiopia, extension, asset building

Introduction

Agriculture dominates Ethiopia’s economy, contributing 46.4% of GDP, 83.9% of exports, and employing 85% of the workforce (World Bank, 2013). Ethiopia’s agriculture potential is enormous, with possible self-sufficiency and surplus in crops and livestock (Food and Agriculture Organization [FAO], 2013). However, chronically food insecure households (CFI) are numerous and poverty rates are high in rural areas where subsistence agriculture predominates (Bachewe, 2009). In response, the Ministry of Agriculture (MoA) created the Household Asset Building Program (HABP) to improve rural livelihoods. The HABP helps households receiving direct food aid to increase their assets. Moving away from a technology only approach and working through a people-centered approach has been seen to be more effective (Worth, 2002). Households with accumulated assets may endure shocks, increase resiliency, and avoid falling back into severe food insecurity. The HABP works to reach these goals. Further research is needed to determine how this model could best function in the Ethiopian extension system.

Purpose

This study was conducted to determine factors affecting the potential for HABP to increase food security in Ethiopia. The objective was to better understand the benefits and the barriers of the HABP to the beneficiaries.

Methods

A constructivist theoretical perspective (Crotty, 1998) and generic qualitative design was used for this study (Merriam, 1998). Participants were identified using purposive sampling (Flick, 2009; Lincoln & Guba, 1985). Multiple variation sampling was also used to examine the program with different stakeholders and in different contexts (Denzin, 1989; Patton, 1987). The final sample ($n = 19$) included individuals at the national, regional, and township (woreda) levels (Flick, 2009; Morse, 1998). The three woredas each in different HABP regions were selected due to logistical considerations and access.

Data was collected with the support of USAID-Ethiopia through semi-structured interviews using researcher-developed questions (Creswell, 2013). In-person interviews were conducted for 60 to 90 minutes. An interpreter translated exchanges between English and Amharic. Trustworthiness and credibility were established through member-checking, whenever
possible, with participants. Data triangulation was conducted with the MoA and USAID-Ethiopia (Lincoln & Guba, 1985). Data were analyzed using the constant comparative method to identify emergent themes (Merriam, 1998; Corbin & Strauss, 2007). The lead researcher is an American female who worked as a summer intern for USAID-Ethiopia investigating livelihood diversification of CFI households through the HABP.

**Results and Conclusions**

Participants identified both positive aspects and challenges to the HABP. Beneficiaries benefit from community Development Agents (DAs) who provide technical assistance. A variety of incomes generating activities (IGAs) are presented to the beneficiaries through HABP. More opportunities for financing of IGAs are increasingly available, which were scarce before HABP intervention.

Challenges were also found which inhibit the success of the HABP. CFI households enter the program with limited capacity (resources, knowledge, and capital). This can make it difficult to begin new activities. Loans for IGAs are not being used appropriately due to lack of financial literacy or necessity for other spending. DAs have an enormous task, too many obligations, and find it difficult to ensure quality support due to lack of training and resources. Additionally, external and environmental factors limit the effectiveness of the HABP.

Many beneficiaries continue to struggle with food insecurity despite HABP intervention. Some beneficiaries also remain risk-averse as they continue to rely primarily on on-farm income options rather than diversifying to off-farm activities. They seem to continually demonstrate a dependency mentality, lack of entrepreneurship, and failure to recognize their own potential.

**Recommendations and Implications**

The HABP provides needed support to Ethiopian CFI households. Through HABP, these households have intensified support for asset building. They acquire important agricultural and business knowledge, access to credit, and community recognition. However, several aspects of the program could be improved. Efforts to lessen the burden on DAs could improve capacity building in beneficiaries. Also, refocusing on entrepreneurial and financial skills could improve utilization of IGAs and promote better income diversification.

The HABP structure, along with lessons learned from the investigation, provide a good extension intervention model for similar populations in other countries. CFI households require more than just food aid. They need support to help them build their assets and resiliency. This requires a multifaceted strategy with multisectoral collaboration. Market-driven technical support from extension is essential. Furthermore, improved livelihoods require better collaboration with partners to develop the proper infrastructure. Partners can provide appropriate on- and off-farm IGAs, market access, and increased availability and access to physical and financial resources. This will increase the long-term success of the HABP and similar programs to improve food security and resiliency for CFI households.

**References**


A Content Analysis of Letters of Support from Participants in a Food Security Fellows Program: What did They Really Learn, Appreciate, and Actualize from Their Experiences?

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Introduction
The Food and Agriculture Organization (FAO) reported 7.6 million people in the Horn of Africa were unable to meet their daily food needs in 2009 (Halweil & Nierenberg, 2011). One way the U.S. Department of State intervened to improve food security in East Africa was to fund a Food Security Fellows (FSFs) Program, as proposed by Oklahoma State University faculty in 2010.

The 26 FSFs included media professionals, community leaders, and policymakers from Kenya and Uganda. Their participation in the program was expected to impact food security in both countries. The training included ways to improve communication within-groups and between Fellows; internship experiences were tailored to the Fellows’ professional needs. Textual content analysis was made possible when the project’s leaders solicited letters of support from the Fellows for a new proposal.

Conceptual/Theoretical Framework
According to Harnett (2012), an espoused theory-of-action constitutes an individual’s claimed stance in regard to a behavior. In contrast, a theory-in-use is what the individual is actually observed to do (Argyris & Schön, 1974). Theories-in-use are shaped by the forces of the context in which practice occurs. This theoretical lens was used to examine the changes Fellows made toward food security. Because of the training, Fellows left the USA with mental models (espoused theories) of what they sought to do. However, their perceptions on what they actually did and its impact was the study’s focus. Analysis of their letters offered unique insight into what the Fellows truly valued about the training and how they were using that in their work.
**Purpose/Objectives**

The purpose of the study was to analyze the content of the letters of support and describe the enduring impacts of the training program. Perceptions of impacts on the Fellows’ communication behaviors were of special interest. Three objectives guided the study: 1) describe the Fellows’ lasting impressions of the program; 2) describe how the Fellows perceived their personal/professional transformation as a result of the training; and 3) describe the Fellows’ post-training communication behaviors and other initiatives for food security.

**Methods/Data Sources**

Hsieh and Shannon (2005) stated content analysis was a method for analyzing textual data. This research method emphasizes the meaning, content, and context of the data; such meaning may be direct or implicit. Using content analysis, it was possible to understand the Fellows’ views on their program experiences through subjective interpretation of the letters. Conventional content analysis was undertaken, including the iterative reading of 21 letters. These readings provided an impression of the statements that held significance to the study. Through subsequent readings, related statements were clustered to form seven meaningful codes (Creswell, 2007). Further readings led to merging two codes, which resulted in six overall. Wolcott’s template (as cited in Creswell, 2007) was used for description and interpretation. It involved reading and highlighting significant information, looking for text patterns, and interpreting the text through specific variables of interest. Eventually, a composite description of the content analysis emerged.

**Results/Conclusions**

Nearly two years later, the Fellows still had vivid memories of their experiences. Their letters passionately communicated lingering positive emotions, attachments, and loyalty to Oklahoma State University. These were indicators of enduring change in attitudes and perspectives. The participants perceived they were transformed by the training. They were recognized as resource persons on their return home and several experienced upward mobility in their jobs, funding for education, and desire for more professional growth. Some extended networks of colleagues and collaborations with other stakeholders on food security issues were realized.

Policy formulations of agricultural initiatives in Kenya were reported. Improvement in maize yields was mentioned as the result of collaboration between one Fellow and agricultural extension officers. Advocacy for youth involvement in agriculture and the promotion of local baby foods that have higher nutritional value were done. At agricultural fairs, Fellows shared their knowledge and experiences from the USA with farmers. Contributions of the media Fellows included radio programs, television talk-shows, mentoring other journalists, and writing investigative feature stories on food security issues. The program had stirred the Fellows into actions on multiple fronts.

**Implications/Recommendations**

Many individual actions and accomplishments connoting changes in the Fellows’ behaviors were found. The letters, however, did not reveal much describing their collective efforts in regard to food security. The evidence of theories-in-use told discrepant stories from their espoused theories (Argyris & Schön, 1974) in this regard. Therefore, the project’s potential
impact had not been realized fully or, perhaps, not yet. Personal interviews and/or focus groups may reveal more evidence supporting collaboration. However, different follow-on strategies fomenting more post-training collaboration may be needed.

References
Intercultural Perceptions and Communications: Leadership Development of Industry Opinion Leaders

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Keywords: cross cultural perceptions, intercultural communications, opinion leaders, leadership development

Introduction

“Today’s world is a global society” (Ricketts & Morgan, 2009, p. 22) therefore the agricultural industry must be adaptive to diverse cultural needs to remain relevant. Agricultural and natural resource (ANR) leadership development programs (LDP) recruit and develop opinion leaders (OL) within the ANR industry (Lamm, Lamm, & Carter, In Press). Studies focused on the development of intercultural sensitivity in undergraduate students have been undertaken (Fabregas-Janeiro, Kelsey, & Robinson, 2011) as have studies examining global mindedness of Extension professionals (Smith, Jayaratne, Moore, Kistler, & Smith, 2010). However, there is a lack of empirical literature that examines ANR industry OL perceptual understanding of the differences between cultures (PU) as well as their level of comfort with intercultural communication (CIC) following an ANR LDP.

Purpose and Objectives

The purpose of this study was to determine ANR industry OL perceptions of non-native cultures and intercultural communications following participation in an ANR LDP. The objective was to describe levels of PU and levels of CIC of ANR OL.

Methods

A descriptive study using a census of an alumni class of 2012 graduates (n = 30) of an ANR LDP in a single southern state was conducted. To address the stated objective an online survey was used following the Tailored Design Method (Dillman, Smyth, & Christian, 2008). A response rate of 97% (n = 29) was obtained. The respondents were 62.1% (n = 18) male and 37.9% female (n = 11) aged 27 to 55. Respondent PU and CIC were measured using researcher-adapted scales developed by Olson and Kroeger (2001). To identify PU, respondents were asked to rate five statements on a Likert-type scale. To measure CIC, respondents were also asked to respond to five statements on a Likert-type scale. Both scales ranged from 1 – Strongly Disagree to 5 – Strongly Agree. Responses to the statements in each category were averaged to create
overall index scores. *Ex post facto* reliability was calculated. The PU construct had a Cronbach’s $\alpha = .75$, the CIC construct had a Cronbach’s $\alpha = .74$.

**Results**

ANR industry OL scored higher on PU ($M = 3.90$, $SD = .51$) than on CIC ($M = 3.63$, $SD = .58$). Table 1 displays respondents’ PU. Table 2 displays respondents’ CIC.

Table 1

*Perceived Understanding of Other Cultures*

<table>
<thead>
<tr>
<th>Statements</th>
<th>Strongly Disagree %</th>
<th>Disagree %</th>
<th>Neither Agree or Disagree %</th>
<th>Agree %</th>
<th>Strongly Agree %</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am conscious of my own perspectives and culture</td>
<td>0.0%</td>
<td>0.0%</td>
<td>10.3%</td>
<td>75.9%</td>
<td>13.8%</td>
</tr>
<tr>
<td>I want to continue to learn about the world’s peoples, cultures, and issues</td>
<td>0.0%</td>
<td>0.0%</td>
<td>3.5%</td>
<td>65.5%</td>
<td>31.0%</td>
</tr>
<tr>
<td>I question my own prejudices as well as all national and cultural stereotypes</td>
<td>0.0%</td>
<td>10.3%</td>
<td>27.6%</td>
<td>44.8%</td>
<td>17.2%</td>
</tr>
<tr>
<td>I recognize that my worldview is not universal</td>
<td>0.0%</td>
<td>3.5%</td>
<td>6.9%</td>
<td>55.2%</td>
<td>34.5%</td>
</tr>
<tr>
<td>I find people from other places exotic and unusual</td>
<td>0.0%</td>
<td>17.2%</td>
<td>41.4%</td>
<td>34.5%</td>
<td>6.9%</td>
</tr>
</tbody>
</table>

Table 2

*Comfort with Intercultural Communications*

<table>
<thead>
<tr>
<th>Statements</th>
<th>Strongly Disagree %</th>
<th>Disagree %</th>
<th>Neither Agree or Disagree %</th>
<th>Agree %</th>
<th>Strongly Agree %</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel uncomfortable when I am with people who are speaking a language I do not know [RC]</td>
<td>0.0%</td>
<td>17.2%</td>
<td>37.9%</td>
<td>34.5%</td>
<td>10.3%</td>
</tr>
<tr>
<td>I try to learn about people from other cultures so that we can work and socialize together</td>
<td>0.0%</td>
<td>0.0%</td>
<td>25.0%</td>
<td>57.1%</td>
<td>17.9%</td>
</tr>
<tr>
<td>I feel self-confident and comfortable socializing with people from other cultures</td>
<td>0.0%</td>
<td>0.0%</td>
<td>17.2%</td>
<td>58.6%</td>
<td>24.1%</td>
</tr>
<tr>
<td>I have long term friendships with several people from other cultures</td>
<td>3.5%</td>
<td>24.1%</td>
<td>13.8%</td>
<td>37.9%</td>
<td>20.7%</td>
</tr>
<tr>
<td>I can act as a cultural mediator and serve as a bridge between people of different cultures</td>
<td>0.0%</td>
<td>13.8%</td>
<td>51.7%</td>
<td>34.5%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
Implications and Recommendations

The results indicated that ANR LDP alumni have relatively high levels of PU and CIC. The surveyed class participated in an experience that included 18 days of international travel and four countries as part of the LDP. These results imply that OL that participate in ANR LDP are sensitive to global trends and are open to the needs of other cultures. The results further indicated there is an area of growth around CIC. Since CIC is lower than PU, international agricultural educators should ensure ANR LDP place an emphasis on communicating with diverse audiences. This could be done through the use of case studies or simulations, as well as opportunities to communicate about ANR when traveling abroad. Further research is encouraged to examine whether participants in ANR LDP programs in other countries have similar results and whether participation in an LDP changes levels of PU and CIC.

References


Students’ Perceptions of Their Learning after Completing an International Dimension Course: A Phenomenology Study

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Keywords: agriculture; cultural competence; global citizenship

Introduction
The course International Programs in Agricultural Education and Extension (AGED 4713) at Oklahoma State University aspires to assist students in improving their international awareness and global competence while informing them on aspects of the agriculture sector worldwide. Students’ course experiences stress agriculture- and food security-related issues, problems, challenges and opportunities, especially in regard to developing countries and their various cultural dynamics (Course Syllabus, Fall 2012). The course underwent significant revision in 2011 and continues to be updated. Therefore, we sought to gain a richer and fuller “picture” of the course’s impact, as perceived by students who completed the course and had time to reflect on its impact.

Knight and Wit (1995) indicated that internationalization of education is a must, as the advancement of knowledge and understanding is a global enterprise that has no borders. Huebner (1994) concluded that international education is one of the most important competencies companies consider for international assignment. Therefore, universities are giving more priority to integrating an international dimension into their teaching/learning, research, and service mandates (Knight & Wit, 1995).

Purpose & Objectives
The purpose of this phenomenology was to extract the essence of the lived experiences of students who completed an international dimension agricultural education course. Two specific objectives guided the research: (a) describe students’ experiences regarding changes in their personal thoughts about the world and plans for future involvement in the U.S. and in global agriculture sectors; (b) explore what factors influenced the lived experiences regarding the research topic.

Methods & Sources of Data
Transcendental phenomenology (Moustakas, 1994) was used because we were most interested in describing the experiences of participants in an effort to understand the essence of the shared phenomenon. All students enrolled in the course during the Fall semester of 2012 were asked to participate in the study. Five students consented to participate in 30-minute long,
semi-structured interviews. Qualitative inquiry procedures were followed and data were analyzed using qualitative analysis software, ATLAS.ti, to conduct line-by-line coding and memoing (Creswell, 2007). During researcher negotiations, codes were organized into “clusters of meaning” (Creswell, 2007, p. 61) leading to the development of five central themes. The final report was constructed using the central themes to present the data collected. All recruitment, research procedures, data analysis, and reporting was conducted according to IRB approved protocol and procedures of Oklahoma State University.

**Results/Findings**

The participants consisted primarily of Caucasian students from rural backgrounds who were majoring in agricultural education, communications, leadership, and animal science. Five central themes emerged when analyzing the data. The five themes, when studied holistically, allowed us to extract the essence of the shared lived experiences of the participants.

**Theme 1: Cultural Competence**

The students defined cultural competence as understanding and acceptance of others. The class had changed their attitudes towards other cultures and opened their minds to be more culturally competent.

**Theme 2: Need to Understand Global Issues**

The findings implied that participants learned about international agricultural issues and their impacts on the United States.

**Theme 3: Interconnectedness/Bridging cultures**

All participants amplified the fact that people are different but share similar cultural traditions, customs, and practices.

**Theme 4: Curriculum Improvement**

The participants made some suggestions regarding improvement for the course curriculum, i.e., in addition to reading books and lectures, a participant suggested more participative activities with international students on campus.

**Theme 5: Future Plans**

Participants expressed their willingness to undertake international activities and learning foreign languages in the future after this course.

The essence of the shared lived experiences of our participants can be described best as the beginning of an enthusiastic Journey Toward Global Citizenship.

**Recommendations, Educational Importance, Implications**

The 21st century advancements being made in science and technology related to agriculture demands more competent agriculturists with a broad knowledge of international agriculture and global challenges. Agricultural issues, e.g., food security, commodities trade, plant diseases, climate change, to name a few, require international solutions. The importance of international dimension courses must not be overlooked (Yemini, 2012). The emerging central themes of this study revealed the necessity to prepare students in colleges of agriculture for international careers. When students are culturally competent and globally aware they will be more competitive and ready to take international positions. Moreover, knowing students’ perceptions on their international dimension course experiences should inform curriculum improvement for this course and may have value for instructors who are teaching similar courses. Finally, the researchers recommend conducting a comparative study with other international dimension courses offered in the college.
References

Course syllabus. (Fall 2012). International programs in agricultural education and extension (AGED 4713). Department of Agricultural Education, Communications & Leadership, Oklahoma State University, Stillwater.


Introduction and need for research

The global population is expected to rise above 9.3 billion people by 2050 (Food and Agriculture Organization of the United Nations, 2011) initiating the question: How will we feed 9 billion people? Food security, while a flexible concept, has been defined by the Food and Agriculture Organization of the United Nations (2003) as “a situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (p. 3). Almost 20 years ago, Francis and Madden (1993) claimed food security and “long-term sustainable progress is possible only if we take into account a multiplicity of interacting resource, environmental, economic, social, and political issues” (p. 125). The undergraduate students of today will lead the way in solving this complex issue, so understanding their thoughts about this challenge will help guide international agricultural educators in creating applicable educational experiences. The purpose of this study was to explore undergraduate students’ thoughts about feeding the world in a sustainable manner.
Methodology

Researchers used an online open-ended survey to collect qualitative statements from undergraduate students in the College of Agricultural and Life Sciences at the University of Florida. Instructors requested 406 students complete the survey by sending a link through email. A 68% response rate was obtained with 278 responses. Respondents were asked to answer the question: Our growing world population is estimated to be nine billion by 2050. Please describe how you feel about the challenges society faces to feed those people in a sustainable manner. The qualitative research design allowed the researchers to gain an in-depth understanding of the participants’ thoughts through the identification of emergent themes (Lincoln & Guba, 1985) found in the undergraduate students’ statements (Neuendorf, 2002). The data were analyzed using content analysis where themes were identified, categorized, and combined to meet the objectives of the study (Lincoln & Guba, 1985).

Results

The results indicated six themes: worry, confidence, challenge, change to current behaviors/habits, more education and research, and improved food production and distribution processes. First, respondents expressed negative emotional words such as worry, nervousness, concern or fear. One respondent wrote, “I am very nervous for the future. I don’t know how it is going to function.” Second, respondents expressed confidence that society will find solutions. As an example, one respondent wrote, “I believe that humans will find a way to sustain the larger population.” Third, respondents felt food security in 2050 would be a challenge, with the potential for running out of resources. One respondent wrote, “It is going to be an enormous challenge... I think the human population may hit its carrying capacity and hunger may become a HUGE problem.” Fourth, respondents felt society must change current behavior and habits. The statement “we need to better utilize renewable resources and come up with better ideas on how to support the growing population” emphasized this point. Fifth, respondents felt “that more resources need to be allocated to research and education about agriculture and food security in the U.S.” to solve the problem. Lastly, respondents felt there was a need to improve food production and distribution processes to handle the growing food demand. This was captured by the quote, “we need to come up with cheap and efficient methods of providing food that is healthy and safe for consumption.”

Conclusions and Recommendations

Students had mixed emotions about sustainably feeding the global population. Overall, they felt there was a need for improving current education and expressed feelings of concern as well as confidence. Findings suggested that students have an appreciation for the complex nature of the challenge, and that both human behavior change and technological solutions are needed to feed the world.

International agricultural educators should consider incorporating teaching about sustainable food security issues into undergraduate courses to foster a prepared workforce to tackle the future global food security challenge. Fostering knowledge and a desire to understand international agricultural issues is an important way to prepare the future workforce (Wingenbach et al., 2003), and discussing the global food production needs of both developed and developing countries is a way to expose students to these differing challenges. This study only examined the thoughts of students in the U.S. Future research could examine student thoughts about global food security in both developed and developing countries and compare the
responses to gauge whether past experiences, or proximity to food insecurity, influences how they think.

References
The Use of Distance Education for Delivering Degrees focused on Agricultural Extension and Education: Challenges and Opportunities of Providing Useful Program Information

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Keywords: Distance Education, DE, Degree Program Information, Thailand

Introduction and Theoretical Framework

Agricultural extension is “a principal way that governments can disseminate information and the World Bank is financing many extension projects throughout the developing world” (Feder & Slade, 1986, p. 159). Academic Agricultural Extension Education (AEE) programs aim to achieve a similar goal by preparing individuals with knowledge in agricultural practices and competencies to educate those in need effectively.

Many AEE programs offer programs via distance education (DE) to meet the need of participants. Over the years, with the development of instructional technology and the broadening reach of the Internet, DE programs have been able to efficiently provide “students with the convenience to obtain an education while living in their own homes and retaining their jobs rather than relocating to campuses” (Caruth & Caruth, 2013, p. 122).

The conceptual framework of this study was based upon academic program delivery. While DE and traditional face-to-face delivery may be different in terms of learning technologies, both degree programs should be “consistent with the mission of the program and within the program’s established areas of expertise” (Council on Education for Public Health, p.23) and provide students with the necessary support services including administrative, academic information, trainings in instructional technology, and student services.

Purpose and Methodology

This qualitative study reviewed websites of DE programs of the leading AEE programs within the United States and Thailand to discover challenges and opportunities of providing useful program information within these websites. Selection of these programs was based upon their recognition as leaders in extension education, involvement in joint study abroad, and the inclusion of a DE program. Three universities in the United States were selected and coded: US-AEE-Program A, US-AEE-Program B, and US-AEE-Program C. Three universities in Thailand were selected and coded: THAI-AEE-Program A, THAI-AEE-Program B, and THAI-AEE-Program C. Each program website was reviewed using a rubric based on the literature: general academics information, administrative structure, technological tools and support for students.
Observations and suggestions are provided below.

**Results**

This study analyzed the strengths and weaknesses of each website and the similarities and differences between the programs. A review of the six websites revealed that in the area of academic information, all programs provided good information on general academics. Mission statement, program information, administration and faculty contact, and curriculum can be found on the first page of these websites. Furthermore, THAI-AEE-Program B and THAI-AEE-Program C’s department of AEE also provided the quality assurance results of the program on their website.

Regarding instructional technology used within the programs, THAI-AEE-Program B uses ATutor, and THAI-AEE-Program C uses Moodle. THAI-AEE-Program A did not have information regarding LMS use. THAI-AEE-Program B provided information regarding instructional media and educational services they offer on the first page of their website. US-AEE-Program A and US-AEE-Program B were found to use Blackboard, while US-AEE-Program C was found to use Desire2Learn.

Regarding administrative support, THAI-AEE-Program B provided the best structure for their DE program among THAI-AEE programs. US-AEE-Program B provided the best guidance on how to access and search for information on their DE program’s website among US-AEE programs. US-AEE-Program A and US-AEE-Program C provided contact information of specific administration and supportive personnel within their DE programs. Additional results and findings will be shared in the presentation.

**Recommendations, Educational Importance, and Implications**

The educational importance of this study relates to gaining an understanding of the challenges of promoting and portraying AEE DE programs for potential students. The findings provide insight for improvements such as the need for a better understanding of the target audience, need to improve navigation, and the need for examples of career paths for individuals who obtain AEE degrees. The goal of AEE programs is to produce leaders in agricultural practices who can utilize research and new knowledge to improve the lives of people. Graduates of these types of programs are vital for community development in the field of agriculture around the world.

Leadership of these programs must remember that developing new technology and approaches for DE programs should aim to “enhance learning and retention” (Murphrey & Christiansen, 2002, p.309). More importantly, the programs need to develop a collaboration unit that consists of administrative staff, faculty, and a technology support team that have the skill, expertise, and desire to develop interactive DE courses (Dooley & Murphrey, 2001, p.6). Such a unit must provide LMS support and training for students at a distance. It is only through a critical review of the websites promoting AEE programs that we can ensure we are providing the most relevant and useful information about the programs.

**References**


#safari: Using content analysis to describe sharing of an international high-impact experience

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**Keywords**: Social Media, Study Abroad, Namibia, High-Impact Experience, Content Analysis, Instagram

**Introduction**

High-impact experiences are important and prevalent in post-secondary education (Brooks, Frick, & Bruening, 2006). Of particular benefit are those derived from study abroad and/or international research. Smartphones with photographic capabilities have increased use of social media to share these experiences via visual imagery (Weilenmann, Hillman, & Jungselius, 2013). What happens when students are challenged to use social media, such as Instagram, to record international high-impact experiences?

**Purpose and objectives**

This study sought to describe an international high-impact experience from participants’ perspectives, based on photos shared via Instagram, an image-based social media site. The objectives were to a) describe the activities and experiences participants’ shared; b) describe how images were shared; and, c) describe the contexts participants shared.

**Methods**

Seven students and two instructors from a U.S. land-grant institution participated in a four week study-abroad program in Namibia. Throughout the program, students shared their experiences on Instagram. This offered an opportunity to reflect on goals from the prereflection period as suggested by Roberts (2009). Instagram allows observation of interaction among
users, and contexts (McNely, 2012). The ability to observe this interaction makes Instagram an ideally suited medium for this study. Researchers used process coding, a model of content-analysis, to categorize the images, creating gerunds to describe the actions connoted by the images. Process coding is used when respondents are faced with an interactive situation (Corbin & Strauss, 2008; Saldaña, 2009). In this study, this method was used to measure actions connoted by images that participants shared on Instagram, and interaction of users’ contexts. Images were mined for technical data to determine what techniques were used to share them; including operations such as tagging, framing, and photographic filters, and the number of interactions with other users. The locations of pictures were recorded to determine popularity of image context. The total repository included 318 images. Inter-rater agreement was tested on 20% of the sample. Cohen’s Kappa was calculated (d = .74) and inter-rater agreement was determined to be substantial (Landis & Koch, 1977).

Results
To describe participant experience images were categorized to reflect the action of the image, some images were coded in primary and secondary categories. Eight categories were identified: eating (f = 128), including images of food; touring (f = 65), including images of wildlife and cultural novelties; orienting (f = 52), including images of maps, signs, and landmarks; humanizing (f = 51), including images of people and human interaction; traveling (f=33), including images of transportation and gear; viewing (f = 34), including images of landscapes and vistas; cultivating (f = 8), including images of production agriculture; learning (f = 8), including images of photography teaching strategies; and familiarizing (f = 8), including images that reference participants’ home institution or country. Per objective two, 19 different Instagram filters were implemented; 74 users were tagged; frames were added to 215 images; and 1,518 likes for 318 images were recorded. Context, objective three, was described by the location at which the image was taken, 16 different locations were identified. The most popular context was University of Namibia Neudamm campus (f=41) followed by Windhoek (f=40) and the Swakopmund region (f=40). The least shared locations were Nakambale (f=2) and Oshakati (f=1)

Conclusions and Recommendations
Participants shared their experiences based on food, surroundings, people, animals, scenery, agriculture, photography, and their institution. Understanding the holistic nature of shared photos is essential to understanding how participants processed their experiences. Understanding what participants chose to share may help educators determine the value participants placed on each experience.

Participants utilized a variety of image techniques to share their experiences. The extent to which interactions were documented on Instagram ranged from 0 to 60 likes, which does not account for images views, because they are not currently tracked in the Instagram analytics. The images generated 1513 likes and 112 comments from 278 unique users in 97 cities covering 23 US states and 15 countries. This experience reached users globally, indicating that Instagram and other social media are a valuable and viable way to share high-impact experiences, and to extend the reach the experience. Social media is a powerful tool that can be used to chronicle and lengthen global education programming.

While the locations and contexts that images were shared from could have been influenced by many factors, we found that each stop on the study abroad program produced at least one shared
image, implying that each location impacted the collective experience. Further research should investigate why participants shared specific images and potential correlations between photographic techniques and social media interactions.

References
Examining the Motivations and Barriers Influencing the Decisions of Louisiana State University College of Agriculture Freshmen to Participate in International Experiences

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Introduction & Theoretical Framework

Encouraging participation in international experiences (IEs) among United States college students is important because IEs assist students in developing the skills necessary to succeed in today’s global workplace (Childress, 2009; Parsons, 2010). Therefore, many Universities have increased time and financial commitments to develop international curricula components, particularly student participation in IEs (Childress, 2009; Parsons, 2010; Van Hoof & Verbeeten, 2005). Sadly, in 2010/11, 1.3% of agriculture majors participated in IEs, compared to 98.7% in other fields (Institute of International Education, 2010). To better assist College of Agriculture (CoA) freshmen in becoming successful in today’s global workplace, it is important that agricultural educators examine students’ perceptions of participating in IEs. Ajzen’s (2002) Theory of Planned Behavior served as the theoretical foundation for this study.

Purpose and Objectives

The purpose of the study was to examine the motivations and barriers influencing the decisions of CoA freshmen to participate in IEs. The research objectives were to (a) describe students’ personal characteristics and interest in participating in IEs, (b) describe students’ desired locations for participating in IEs and desired activities while participating in IEs, (c) describe students’ perceived motivations and barriers influencing their decisions to participate in IEs, and (d) determine if students’ selected personal characteristics explain a statistically significant proportion of the variance in their perceived motivations and barriers.

Methods & Data Sources

The sample for this study consisted of freshman students enrolled in the CoA \(n = 239\) at Louisiana State University. A questionnaire (Bunch, Lamm, Israel, & Edwards, 2013; Lamm & Harder, 2010; Rieger, n.d.), modified by the researchers, was used to collect data. The seven section questionnaire included (a) potential interest, (b) previous participation in IEs, (c)
locations, (d) activities, (e) motivations, (f) barriers, and (g) personal characteristics. Responses were collected from 198 of the 239 CoA freshmen for a response rate of 83%. The reliability of the scales for the constructs, motivations and barriers were analyzed using Cronbach’s alpha coefficients ex post facto. The reliability analysis revealed alpha coefficients of .88 for both constructs. Descriptive statistics and stepwise multiple regression were used to analyze the data.

Results & Conclusions

CoA freshmen indicated they were interested in participating in IEs and perceived IEs as important. However, the overwhelming majority had not participated in IEs previously. The main source used to inquire about IEs was “word of mouth.” Over two-thirds of freshmen identified spring and summer semesters as preferred times of year to participate. The most appealing locations for IEs were Australia or New Zealand, and Europe. The most important activities while participating in IEs were acquiring hands-on experience/skills, and taking courses related to their major.

CoA freshmen were asked to indicate how important 10 motivation items were in determining whether or not they would participate in IEs. The most important motivation was the overall life experience they would obtain. Additionally, freshmen were asked to rate the extent they agreed or disagreed with 15 barrier items when determining whether or not to participate in IEs. The barrier freshmen agreed most with was financial expense. Finally, gender, ethnicity, college major, and interest level had a statistically significant impact on their perceived motivations and barriers.

Recommendations, Educational Importance, Implications, & Application

Because the majority of freshmen have formed favorable attitudes toward IEs (Ajzen, 2002), agricultural educators who teach orientation courses at Louisiana State University should include IEs as a topic of interest. Instructors could have students that have participated in IEs deliver presentations. The focus of the presentations should be on the overall life experiences the student would obtain as a result of participation and funding opportunities to support student participation. If an individual perceives a specific behavior as a norm within his or her social group, the individual is more likely to perform that behavior Ajzen (2002). A focused, student-lead effort of this nature could have a positive impact on students’ participation decision.

When designing IEs, educators should consider Australia or New Zealand and Europe as possible locations, preferably during the spring and summer semesters. When considering content, educators should consider including hands-on activities in which students can develop career-oriented skills and educational experiences/topics that align with the student’s college major.

Future analysis and interpretation regarding the impact that students’ personal characteristics had on perceived motivations and barriers is warranted. Additional research should examine why Australia or New Zealand and Europe are the most appealing locations for IEs. Finally, this study should be replicated at peer institutions and regional universities to allow for a better understanding of this phenomenon.

References


Intervention Framework for Agricultural Extension in Sustainable Agriculture: A Case of Rice Farmers in Egypt

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Introduction
Ensuring environmental sustainability is the seventh one of the eight Millennium Development Goals (MDGs) that all 193 United Nations member states including Egypt have agreed to achieve by the year 2015 (UNMDGs, 2009). According to “Röling & Pretty, 1998’ sustainability emerges out of shared human experiences, objectives, knowledge, decisions, technology, and organization.

According to Roling and Pretty (1997) the key elements of the enhancing sustainable agriculture by extension work are:
- The information system: Farmers need an information system that facilitates observation, record keeping, and monitoring.
- Conceptual framework: Farmers need to know about life cycles of pests and disease causing organisms and their identification, biological controls … etc.
- Skills: Sustainable farming requires a whole set of new skills, including observation and monitoring, application of bio pesticides and risk assessment.
- Higher system – level management: Sustainable management requires thinking at system levels higher than the farm so they can take part in the collective management of natural resources at those levels.

Purpose and objectives
The purpose of this study is to suggest an intervention framework for agricultural extension in sustainable agriculture work as a road map to clearly determine the tasks that must be done by agricultural extension alone, tasks could be done with facilitation with other organizations and tasks beyond its responsibility and as well as its role in promoting a favorable policy environment. This aim should be the preliminary step in developing extension programs to promote sustainability among farmers and the rural population. The present study was intended to be such a step.

The objectives of the study were:
(a) to measure the farmers’ adoption of sustainable agriculture practices.
(b) to identify the farmers’ perception of negative effects of conventional agriculture.
(c) to identify the reasons why farmers’ continue to adopt conventional agriculture.

Methods
Descriptive survey design for data collection was adopted in the present study. This study was carried out in El-Senblawin district of Dakhalia governorate, Egypt. This district was
selected purposively due to it is highest one in prevalence of different agricultural pollution aspects in the governorate regarding to annual report of Ministry of Environmental Affairs (2012). The population of the study consisted of 2536 of the rice farmers living in four villages were selected randomly to represent different geographical zones of the district. The Rice farmers were selected for this study because of the majority the farmers in the district were partially or wholly dependent on rice cultivation to earn their livelihoods. The sample included 242 farmers that were determined according to Cochran's formula (1978). Stratified random sampling method from different zones of the district was used in the selection of the respondents.

**Results**

The results of the study indicated a wide range between the mean sustainable agricultural practices scores of conventional (25.2%) and sustainable (55.9%) adopter categories. The percentage of farmers under the two groups revealed that 11 practices by 50% of the total practices studied were still adopted in conventional way by more than 50% of the respondents, however only 3 practices by 13.6% were adopted in a sustainable way. More than half of the farmers 57.3% had no perception toward negative effects of the practices studied.

There are seven main reasons for continuing to use conventional practices: lack of information about sustainable practices, sustainable practices not perceived to be farmers’ responsibility, farmers’ beliefs about effect of conventional practices increasing production and therefore their net profit, farmers’ negative attitudes toward sustainable practices, the farmers ignorance of the alternatives or their perception that there are no alternatives for their conventional practices whether true or not, negligence or laziness in doing different practices and finally insufficient funds to undertake more sustainable practices.

**Conclusion**

The proposed Extension intervention framework (EIF) can be used in practice in different ways. First it can be used for designing a new extension set-up. Second, the framework helps to analyse an extension situation. Third, the framework is a tool to gain a common understanding of sustainable agriculture.

The success of sustainable agriculture depends not just on the motivations, knowledge, attitudes and skills of individual farmers, but on the action taken by groups or communities as a whole. This makes the task more challenging. Sustainability being a multifaceted concept, extension systems need to change its emphasis from a technological and economic orientation to a system based on an educational approach through multidisciplinary teams.

**References**


In 2002, addressing South Africa’s extension dilemma (largely extension’s failure to appreciably improve in the welfare of smallholder, resource-constrained farmers), the Agriflection concept was posited as a refinement of facilitation approaches to extension emphasising the learning aspect of extension engagements. It highlighted the process of and commitment to the individual and collective learning required by the three participants in the engagement – farmers, extensionists and ‘enablers’ – in which learning was framed as a process characterised by iterations of investigating, applying and sharing. Agriflection further posited the need for a “facilitated learning agenda” employed by extensionists to actively and deliberately foster learning and learning capacity among farmers. Being vague and theoretical, further research was needed to more clearly define the “learning agenda”. Thus the purpose of this study was to clarify and further outline the nature, process, function and content of the facilitated learning agenda in the Agriflection model.

The research involved four data sources: curricula at 17 South African higher education institutions (HEI) offering agricultural qualifications; 125 extension practitioners (EP) selected by convenience sampling; key informants (KI) in South African agriculture and extension academia; and feedback from 10 students experimenting with the model during field placements. Data from HEIs were collected by questionnaire-based interviews and/or published handbook/syllabus (depending on willingness to participate), from EPs by self-administered questionnaires, and from KIs via semi-structured interviews. Data from students were collected via portfolios and interviews.

The results indicated that when engaging with farmers, it is essential that extensionists employ a broad framework that encompasses a range of production, economic and managerial factors viewed in the two over-arching contexts: social and environmental sustainability; and iterative learning. The production factors embrace: land, technology, input supply and infrastructure. The economic factors embrace finance and markets and marketing. The managerial factors embrace organisational capacity and information. Together these were depicted as an “Extension Carousel” comprised of learning base and a wheel of content encapsulated by the facilitated learning agenda. The engagement with farmers using the carousel is expressed as a conversation that explores the elements of the carousel along two lines – one referred to as the ‘practical’ line and the other as the ‘command’ line – with two sweeps – one investigating the status quo and the other constituting the content and learning processes of the facilitated learning agenda. The ‘practical’ line comprises an assessment of the status quo of each element investigating and exploring the current practices and context of the farmer(s) in the conversation. It surfaces issues around what the farmers are currently doing in terms the managerial, economic and production factors that affect their farming systems and business options. These are examined primarily on the basis of access, availability and affordability.
‘command’ line comprises an assessment of the status quo of each element in terms of the farmers’ command over the elements in the carousel. Effectively, it assesses this command on a scale of dependence – self-reliance measured by levels of skills, knowledge, attitudes and behaviour. The facilitated learning agenda drives the conversation from the investigation aspect of the learning dynamic to the application and sharing aspects of the learning dynamic. Embedded in the process between ‘investigating’ and ‘applying’ is developing lines of action to be applied. Embedded in the process between ‘applying’ and ‘sharing’ is reflection on the outcome(s) of the application. Together, these foster a methodical recursive process of research and action which define the facilitated learning agenda – the extension conversation – as a measured vehicle to build capacity through which farmers are engaged with scientific enquiry with a view to innovation in the context of their own farm systems flanked by the principles of livelihoods and development theory. The role of extension in the carousel is to deliberately drive the learning process with the two-fold objective of developing options to address problems and opportunities and of increasing capacity of farmers to command the learning process.

At least in the South African context, the triad of Agriflection, the extension carousel and the facilitated learning agenda suggests revisiting: curricula designed to train extensionists; job descriptions, employment criteria, and performance management indicators for extension; and goal-setting (and commensurate indicators) for developmental agriculture. It suggests in all three cases to move from a technology dominated paradigm to a farmer-learning dominated paradigm where the primary concern is not technology adoption, but rather creating a conversation aimed a building the capacity of the farmer to engage in scientific enquiry.

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Changing Attitude Towards Feeding Cattle through Extension Education in Siekourani, Mali

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Introduction
I was asked by Agricultural Cooperative Development International/Volunteer Oversees Cooperative Assistance (ACDI/VOCA) to provide technical assistance during August 2013 to a cattle cooperative. It is located in the village of Siekourani south of Mali. Raising cattle contributes to the livelihood of many villagers. (Traoré, Reiber, Zárate, 2013). There is a short rainy season from June to September followed by a dry season from October to May. Cows lost about 66 pounds and oxen about 160 pounds during the dry season (Wilson, 1986). Crop residues are the main source of feed for cattle during the dry season. Their availability determines how many cattle are fed. (Leloup, ’t Mannetje, 1996). These residues do not have enough energy and crude protein to meet the nutrient requirements of cattle. Additionally, the native forages are low in protein during the dry season. (Senock, Pleper, 1990). A lack of the quantity and quality of crop residues and forages has a negative impact on all phases of cattle production, and consequently on the life time production of a cow. The age of first calving for a Bos indicus Fulani breed of heifers was reported as 49.5 months (Wilson, 1986). An earlier study reported that the age of first calving was reduced to 31 months when they received adequate nutrition (Mukasa-Mugerwa (1989). The mean calving interval in Mali was reported as 22 months. (Wilson, 1986). Aiming for a calving interval of 17 months may be achieved with Bos indicus Fulani cattle. Supplemental feeding was suggested to improve the efficiency of cattle production. (Amadou, 2012). However, the profitability of supplementation depends largely on the prices of feed ingredients. (Baur, Sissoko, Debrah, 1986).

Purpose and Objectives
The objective of this assignment was to identify the main constraints to cattle production in the cooperative through a needs assessment session. In addition, 32 cattle producers increased their knowledge in improved methods of production by 80% through teaching and demonstrations. Eighty percent of them implemented the new production practices on their farms.

Methods
A listening session was held with cattle farmers from the cooperative to understand the constraints to production. These constraints were prioritized and summarized. A training program was developed to address their needs. The training consisted of eight days of teaching animal nutrition related to heifer growth and calving interval, balancing rations, the importance of feeding minerals and regular supply of drinking water for cattle. Classroom sessions were complemented with two farm visits to demonstrate to producers how to do body condition scoring on cattle. It is an important practice to feed cattle properly.
Result and Conclusion

Producers were asked what changes they would make on their farms based on the new knowledge they gained during the training. They recognized that adequate nutrition is a limiting factor in producing cattle, and they planned to use supplements through balanced rations for their cattle. They planned to provide water and feed minerals at all times. They have learnt how to body condition score their animals, and planned to use this technique to provide additional feeding to cow and heifer.

Recommendations and Implications

The combination of age of calving and long calving interval reduces the life time production of most breeding cows in the village. The average cow lives for 10 years. Its life time production is estimated to be (10 years x 12 months/year) minus (age of first calving which is 50 months) divide by (calving interval which is 22 months) = 120-50/22 = 3.2 calves. Ideally, if the animals in the village are fed well throughout the year, then the age of first calving can be reduced to 36 months and calving interval to 17 months for \textit{Bos indicus} Fulani cattle. If these can be achieved, then the productive life of a cow for 10 years is estimated to be 120- 36/17 which is 5 calves. This is a 40\% improvement on average in the life time production of a cow. There are about 8.8 million head of cattle in Mali. The impact of proper feeding has the potential to increase the current cattle population to about 12 million. This can be achieved when there is improvement in the regular supply of more quality feed and forage throughout the year, and continued training of producers in all aspect of the cattle business.

References


Training Needs of Agricultural Extension Agents in Babylon Province, Iraq

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Introduction
Agricultural extension plays an important role in rural development; the success of agricultural extension work depends on competency (knowledge & skills) of the extension agent, who is the critical element in all extension activities. Extension agents should possess professional competencies in many areas, which provide the critical skills and knowledge for them to be able to perform the work assigned to them. For any extension organization to improve its performance a continuous and systematic training of its staff is necessary (F.A.O., 2001). (Woods, 1988) mentions four constraints to extension workers’ training. First, training is done for the wrong reasons. Second, training is not continuous. Third, the training content is not to the jobs of extension workers; and fourth, the development and design of the programs are usually not based on any specific needs. So, the first step in designing a training program is to a needs assessment. Numerous studies have been conducted on extension agents training needs, both for orientation and in-service in many countries around the world. In U.S.A. (Gamon et al., 1992) found that the three most highly ranked items on training needs by males were manage time and resources, meet staff, and use interpersonal communication. Females ranked most highly meeting staff, involving volunteers and using computers. (Okwoche et al., 2011) found that the main training needs of extension agents in Nigeria are communication skills, planning demonstration, evaluation of trials, farmers training, evaluation of extension programs, subject- matter expertise and communication, and personal qualities. In Botswana, (Tladi, 2004) summarized the training need in 14 subject areas, they are fruit production, writing skills: writing reports, maintenance of farm machinery, public speaking: addressing meetings, practical farm skills, chairing meetings, bee keeping, organizing effective field trips & farm walks, organizing effective field days, conducting needs assessment surveys, mobilizing people to form groups, interpersonal communication skills, forestry production, and diploma or higher level training in agriculture. In Pakistan, (Hussain et al., 2010) indicated that the most prominent training needs are describe the agronomic practices of minor crops, advise about the plant protection of minor crops, guide farmers about the seed rate of minor crops, describe the agronomic practices of major crops,
advise about the fertilizer requirement of minor crops, make decisions based on statistical results, analyze statistical data, interpret statistical data, solve problems efficiency, apply scientific methods in decision making, make affective decisions, respond promptly to clients’ requests. While (Al-Rimawi, 2003) found that farm management and marketing skills are the most training needs in Jordan.

Objective of the Study

The objective of this study was to identifying the training needs of agricultural extension agents in Babylon Province, Iraq.

Research Methodology

The target population of this study consisted of all 42 extension agents employed in Babylon Province, Iraq. The main instrument for data collection was structured questionnaire. A four-point rating scale was used to rate the training needs (4 = strongly needed, 3 = moderate needed, 2 = least needed, 1 = not needed). Face to face interview schedule was used and data collected personally by the researchers’ visits to extension agents to their offices during October 10-25, 2012. The data were analyzed using frequency, percentage, and weighted arithmetic mean.

Results/Conclusion

Findings revealed that the mean age of respondents was (45.57) years. And the average years of service in agriculture extension was (20.7) years. The study identified high level of training needs for the respondents in the following areas: evaluation of agricultural extension programs (M=3.55), protected agriculture (M=3.52), integrated pest management (IPM) (M=3.48), biological pest control (M=3.38), writing reports, research and scientific studies (M=3.26), aquaculture (M=3.24), organic agriculture(M=3.14), beekeeping (M=3.1), flower cultivation and production(M=3.0). And moderate level in: used of computer and internet (M=2.88) , food industries (M=2.74) , management and soil conservation (M= 2.57) , irrigation methods and water conservation (M= 2.40) , planning and implementation agricultural extension programs (M= 2.24). Wile the following areas shoed a low level, poultry farming (M= 1.78), non-tillage (M= 1.62), farm management (M= 1.50), agriculture extension communication (M= 1.40) , agricultural extension methods (M= 1.11), foundations and principles of agriculture extension (M= 1.00).

Recommendations

1. It is further recommended that a training course should be held for extension agents in Babylon Province in areas where respondents showed a middle and high level of training needs.
2. Conduct similar studies in other provinces to determine if the training needs of extension agents a vary according to the provinces.

References


Assessing the Perception of the Current Issues in Extension amongst Agriculture Professionals Gathered at an International Agriculture Conference

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Introduction
Given the current trend towards pluralism in extension; this study aims to understand the views of a cross section of professional agriculturist on the extension process. In a Zimbabwean case study, FAO (2002) had recognized the diversity of professional input in an extension system. The Zimbabwean case study determined the negative effect on extension because of a lack of common understanding among the technocrats (Ibid). How do attendees at three simultaneous conferences recently held in Trinidad and Tobago think about the role of extension?

Purpose and objectives of the study
The study will discern the differences in perceptions and views on selected extension issues among the study professionals. These views are measured against four key variables namely Gender, Educational Level, Farmer Practitioner Status and Extension Practitioner Status. According to the FAO site, there is need to accommodate a gender perspective in these type of studies (“Food and Agriculture Organization,” 2013). Reynar and Bruening (1995) had proposed the need to obtain the views of extension professionals on extension issues. The study further seeks an interest in views related to educational levels, farmer practitioner status and extension practitioner status.

Methods and Data Sources
The study interviewed a random sample of 108 participants who attended an international agriculture conference in Port of Spain Trinidad during the period June 30th to July 6th 2013. The participants responded to Likert scale questions on the importance of Agricultural Extension to agricultural development, the need for policies which directly support the discipline, the role of the private sector, the role of other public agencies, the capacity for technical support and the use of farmer field schools. Additionally they responded to the need for continuous training in Extension, the use of appropriate ICTs, the need for service efficiencies, the need for improved
funding and the need for better monitoring and evaluation. Stavros, George and Crunkilton (1995) stated that addressing the extension issues listed above is critical for developing the extension process. The data was analyzed using Friedmans rank and the independent samples T-test.

**Results, products, and/or conclusions**

The sample ranked highest the importance of extension in addressing the issues of food and nutrition security among six factors. Gender issues were ranked the least important. The results generated showed that when compared to their male counterparts, women were more in favour of the following: the importance of agriculture extension to agricultural development, the need for policies to support agriculture extension, technical support for extension providers and more public sector involvement. Women agreed that extension providers need continuous training, appropriate ICTs in extension systems, service efficiencies, improved funding for extension services and better monitoring and evaluation. The respondents with at least a postgraduate degree were more in favour of the following: the importance of agricultural extension to agricultural development, the need for policies which directly support the discipline, the role of the private sector, the role of other public agencies, continuous training, the use of appropriate ICTs in extension systems, service efficiencies and better monitoring and evaluation. There was no significant difference between the perception of farmers and non farmers as well as the perception of practising extensionist and non extensionist. The study therefore proved the importance of women and senior personnel in the planning of the operations of Agricultural Extension. The fact that there is no difference in the views of personnel who practice farming and extension showed the universal acceptance of agricultural initiatives. The results justified gender mainstreaming in agriculture extension and continued training in agriculture extension.

**Recommendations, educational importance, implications, and/or application**

The study maintains the importance of technocrats and academic researchers in the planning of extension operations for agriculture development in lieu of their positive views. It would be important that women become part of the policy making framework for agricultural extension since this will be a way to include a gender perspective in extension.

**References**


An Analysis of Successful eLearning: Elements Impacting the Delivery of Extension Online Courses – Important Lessons for International Development

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Keywords: eLearning, Distance Education, Online Delivery, Extension

Introduction and Theoretical Framework

Elearning, also referred to as online learning, has continued to evolve and become a part of Extension initiatives to meet training and educational needs across diverse audiences. Interest in online learning has been documented in various areas. A study related to the wood products industry revealed that 88% of respondents were interested in instruction delivered online (Quesada-Pineda, Conn, & Sanchez, 2011) while a study focused on the assessment of the effectiveness of online education related to a nutrition education program found distance education to be successful in encouraging change as a result of participation in the program (Campbell, Koszewski, & Behrends, 2013). The focus on eLearning is not new; examples of the use of eLearning across the globe exist. A blended elearning system has been utilized in Ireland for rural development groups (Phelan & Mulhall, 2007) and students who participated in the program reported the system as equal or even better than traditional instruction. A virtual university project in Africa supported by the World Bank, which has been in place for over 16 years, was reported to now be “one of the most dynamic e-learning markets on the planet” (Nafukho & Muyia, 2013, p. 646). However, success of eLearning varies depending on how one defines success.

The theoretical framework for this study was grounded with an information systems model: DeLone and McLean Information System Success Model (2003). The DeLone and McLean model includes six areas: information quality, system quality, service quality, intention to use, user satisfaction, and net benefits (DeLone & McLean, p. 24, 2003). The model was described as being “multidimensional and interdependent” (p. 12). We applied these areas to the concept of eLearning within the Extension context and identified the following elements as those that define eLearning success: number of users, course completion rate, knowledge gain, and individual participation/engagement. Additional areas articulated in the DeLone and McLean Model will be examined in future research.

Purpose and Methodology
The purpose of this study was to identify common elements across successful eLearning courses. A case study methodology was employed. eLearning courses that were deemed to be successful based on criteria identified through the literature and confirmed with a panel of experts were analyzed based on type, purpose, audience, and materials. A total of four courses were analyzed with each case being selected because they represented a variety of delivery modes and content.

**Results**

A detailed review of each course revealed specific common elements that were present in all cases: a specific audience was identified, the need for the course was clearly articulated, multiple modalities of delivery were provided, and knowledge gain was identifiable. An element that was also found to have an impact was audience motivation. In our research we found for each of the courses that were deemed to be successful they dealt with compliance training or personal growth. The presence of an intrinsic or extrinsic motivation in the audience proved to promote course success. An examination of the courses revealed that two of the courses were self-directed and two were facilitated by an instructor. This proved that although facilitation is beneficial it does not determine success as defined by this study. Elements that were not found to be present in all cases included the design or look of the course or whether or not there was a participation fee associated with the course. Further details regarding the comparison across eLearning courses will be provided in the final presentation.

**Educational Importance, Recommendations, and Implications**

As Extension programming efforts continue to seek new and innovative ways to reach new clientele, it is critical that Extension agents understand and recognize the elements that directly impact the success of an eLearning course. The potential to reach international audiences and serve the needs of agriculturalists across the world is unlimited with eLearning methods. However, it is critical to build and deliver these courses in a manner that meets the needs of the intended audience. As noted by DeLone and McLean (2003), information quality, system quality, and service quality directly impact user satisfaction and the intention to use a system. The educational importance of this study relates to gaining a better understanding of what has impacted the success of certain eLearning courses so that others can benefit from this insight. It is only through understanding how to encourage success that we can be certain to spend the precious resources of time and money in ways that have the best chance of success.

**References**


Using Participatory Rephotography to Evaluate Food Security in Rural Guatemala

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Keywords: Food security, nutrition, photography, Guatemala, evaluation

Introduction
Researchers have called for developing participatory approaches to measure food security and enhance agricultural extension (Beyene, 2002; Düvel, 2006; Lindner & Dolly, 2013; Maxwell, 1996). Food security is most commonly evaluated through proxy measures such as household expenditure surveys, anthropometric methods (height to weight measurements), and food recall questionnaires (Barrett, 2010; Cunningham, 2005). International development agencies have difficulty monitoring and evaluating the food security of communities located in conflict zones and/or rural areas (De Soysa, Gleditsch, Gibson, & Sollenberg, 1999; Simmons, 2013). Haddad, Kennedy, and Sullivan (1994) found that “relatively simple” food security indicators could be used to locate the food insecure (p. 338).

Purpose
This exploratory qualitative study had two objectives which were to (a) evaluate the feasibility of using a new research methodology called participatory rephotography in agricultural extension; and (b) use this methodology to evaluate the food security of participants from three rural Guatemalan communities.

Methods
Participatory rephotography trains community members to repetitively take photographs of one construct to monitor change over time. Participatory rephotography combined Rieger’s (1996) rephotography method evaluating social change using systematic visual measurements and Chambers’ (1994) participatory rural appraisal (PRA) method.

This study used an emergent design to collect and analyze data in two phases (Morgan, 2008; Stebbins, 2001). The first phase of data collection consisted of semi-structured interviews of 20 participants about their food security and nutrition (Merriam, 2009). The participants represented a census of the Guatemalan Ministry of Health’s village health groups (who serve as informal contacts between government health workers and local communities) in three rural communities. In the second phase, the researchers supplied participants with disposable cameras; participants were asked to take pictures of their midday meal. In rural Guatemala, midday meals are the main source of calories and food variation (Engle & Nieves, 1993).
The researchers used content analysis to measure the food content of photographed meals (Neuendorf, 2002). Descriptive statistics were used to determine frequencies of meal types (e.g. carbohydrates vs. proteins). Credibility was established through data triangulation, respondent validation, and extended engagement with the community (Merriam, 2009). Consistency was established through the use of an audit trail, data triangulation, and reflexivity (Merriam, 2009).

**Results**

Analysis of the semi-structured interviews revealed participants’ diets primarily consisted of staple carbohydrates and green leafy vegetables. Participants reported a lack of access (financial purchasing ability) to meat and other types of vegetables. Food prices were lower in a nearby central towns’ market, but participants reported that they were unable to take the round-trip which would cost nearly $2 USD and take 3 to 4 hours of time. Potatoes and corn-based tortillas were the most common staple foods consumed. Meat was rarely consumed. The content analysis of 316 photographs from the 20 participants revealed that an average midday meal consisted of 62% grains, beans, or potatoes, 28% vegetables, and 10% meat (Table 1).

<table>
<thead>
<tr>
<th></th>
<th>Grains, beans, or potatoes</th>
<th>Vegetables</th>
<th>Meat</th>
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<tbody>
<tr>
<td>Community 1 (n=114)</td>
<td>67</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Community 2 (n=119)</td>
<td>52</td>
<td>38</td>
<td>10</td>
</tr>
<tr>
<td>Community 3 (n=83)</td>
<td>68</td>
<td>25</td>
<td>7</td>
</tr>
<tr>
<td>Average</td>
<td>62</td>
<td>28</td>
<td>10</td>
</tr>
</tbody>
</table>

**Discussion**

The content analysis of the photographs confirmed the findings of the semi-structured interviews. Participants’ midday meals primarily consisted of potatoes, corn-based tortillas, and green leafy vegetables; dairy and meat were consumed in limited quantities. The types of meat consumed were nearly always of low nutritional quality such as chickens’ feet or small fish. This research confirmed Haddad, Kennedy, and Sullivan’s (1994) study, which concluded that simple food security measurements could be used to locate the food insecure. The data also confirmed findings by the Guatemala’s Secretary of Food Security and Nutrition showing iron and protein deficiencies were common in the region (SESAN, 2013).

**Limitations and Future Research**

Because of the exploratory nature of this study, the results cannot be generalized to other populations. Future research efforts should cross-reference the results of this study against baseline household nutrition or food recall surveys to determine the reliability of using participatory rephotography as a food security measurement method. Participatory rephotography could potentially be used by international agricultural extension advisors to monitor crop growth, changing soil characteristics, and other important agricultural characteristics in regions where there is (a) a shortage of trained (i.e. regions with high illiteracy rates) data collectors; and/or (b) poor infrastructure, conflict, or political instability which prevent agricultural advisors from visiting project sites frequently.

**References**

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Achieving Environmental Sustainability: An Examination Of The Role Of Social Marketing in International Agricultural and Extension Education

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Introduction

Many human behaviors across the globe have been deemed environmentally detrimental, making increased environmental sustainability one of the key issues of our time (Lehman & Geller, 2004). According to Doug McKenzie-Mohr, “Changing individual behavior is central to achieving a sustainable future” (2000, p. 544) and methods for changing behavior are a vital issue for international Extension. Rogers (2003) validated social marketing as a promising approach to creating behavior change. However, social marketing has been absent from much of the colloquy about international Extension, despite its promise of creating behavior change. This topic has only been discussed twice at Association for International Agricultural and Extension Education (AIAEE) conferences (Mashburn et al., 2009; Strong et al., 2009).

Social marketing has been used successfully and internationally for decades to promote sustainable behaviors (McKenzie-Mohr et al., 2012) and fight public health issues such as AIDS and malaria (Andreasen, 2002; Mathanga et al., 2005). Social marketing is recognized by the United Nations as a valuable tool in the fight against AIDS (Fox, 2000) and it shapes Caribbean public health campaigns (PANCAP, 2012). This approach was likely first used in India in the 1960s in family planning and infant oral rehydration programs (Lefebvre, 2011). It has also been used to promote landscape water conservation in Ontario (McKenzie-Mohr, 2000), indoor water conservation in Jordan (Kotler & Lee, 2008), and composting in Nova Scotia (McKenzie-Mohr, 2000).

Despite evidence for social marketing’s success in changing behavior, the international Extension field has not yet fully explored this approach. This literature review sought to remedy the gap in conversation by examining principles of social marketing as they apply to international Extension and sustainable behavior change.

Social marketing is a practice that “seeks to develop and integrate marketing concepts with other approaches to influence [behaviors] that benefit individuals and communities for the
greater social good” and “… [integrates] research, best practice, theory, audience and partnership insight, to inform the delivery of competition sensitive and segmented social change [programs] that are effective, efficient, equitable and sustainable” (Lefebvre, 2013).

**Purpose and Objectives**

The purpose was to describe a technique for encouraging sustainable behavior change in communities across the globe. Objectives included: 1) document social marketing as a potential approach for encouraging sustainability in international Extension education; 2) provide a synthesis of social marketing best management practices from the literature; and 3) encourage discussion about this practice and further research among international Extension educators.

**Methods**

The literature review was conducted using social marketing texts and peer-reviewed research articles. The final paper and presentation offers implications for using social marketing to encourage sustainability and synthesizes best management practices for using this approach.

**Findings**

Social marketing has been used successfully throughout the world in diffusing environmental behaviors (Rogers, 2003). However, most programs that encourage sustainability have focused on high levels of information despite the fact that knowledge gain has shown to minimally effect behaviors (Frisk & Larson, 2011; McKenzie-Mohr, 2000; McKenzie-Mohr, 2011). In fact, as environmental awareness has increased, research addressing behavioral interventions has decreased (Lehman & Geller, 2004). Social marketing focuses on the human side of decision-making recognizing that education alone doesn’t change behavior.

The social marketing process includes selecting the desired behavior change and segment of the audience to target, researching the audience to identify perceived barriers and benefits, developing and piloting strategies, and implementing and evaluating the program on a large scale and evaluating its efficacy to encourage the desired behavior change (McKenzie-Mohr, 2011; Rogers, 2003).

**Conclusions**

The literature presents social marketing as a research-based, proven approach to behavior change that may be effective in international Extension education. It was concluded, based on the literature, that social marketing should be considered when planning educational programs related to natural resource use and sustainability in international agricultural and Extension education.

**Recommendations and Implications**

International Extension educators are working to build environmental, financial, and community sustainability throughout the world through agricultural, nutritional, and capacity-building programs. However, this field has only minimally used social marketing as a strategy for change. We recommend that social marketing be recognized as a tool in creating real behavior change through international Extension education. This approach is appropriate for this field, where consideration of the audience’s local, cultural, and human attributes is critical to
success. Consideration for the local context is what makes social marketing effective (Conroy & Allen, 2010). Given its proven outcomes in other fields around the world, international Extension’s exploration of social marketing and application to sustainable behaviors would be highly advantageous to our global clientele.

References


Information Sources and Educational Needs for Village Animal Health Workers (VAHWs) in Nepal

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Key words: Village Animal Health Worker training, information source, educational needs

Information and education are integral parts of human development. To attain an educated, healthy, and safe society, access to information, and education is essential (Dutta, 2009). Information helps people make better decisions; fill knowledge gaps, identify opportunities, understand customers better, and stay competitive (Hill, 2014). Information is as critical a resource in the operation and management of the agricultural system (Opara, 2008) as it is in other sectors. Information is needed for overall development of agriculture and improvement of the living standards of farmers (Bello & Obinne, 2012; Obidike, 2011).

In a fast changing world, new innovations and technologies evolve along with uncertainties – uncertainties that include threats to the environment. To minimize risks and remain sustainable, the most valuable asset a farmer can have is useful information (Ngathou, Bukenya & Chembezi, 2006). The livestock sector is the major source of livelihood for the rural poor in Nepal. The Village Animal Health Workers (VAHWs), most of whom come from farming backgrounds, provide farmers with much-needed animal health services. In order to remain competent, the VAHWs have to be familiar with new and improved technologies and be able to benefit from the opportunities (e.g. training, visit, credit, etc.) that are available around them. Literature about how and from where VAHWs seek information is non-existing.

Purpose and Objectives

The overall goal of this study was to evaluate the status of the VAHWs’ services in terms of the information sources VAHWs use and to help improve the quality of the VAHW services. The specific objectives were to:

i) understand how and from where VAHWs received information; and

ii) ascertain the educational needs of the VAHWs.
Methodology

A mail survey was conducted among 863 alumni who attended VAHW training in five regional livestock training centers from 2005 to 2010. The survey translated into Nepali language contained questions pertaining to respondents’ demographics, use of information source and problems in working as VAHWs and suggestions to improve the service. The first mail sent in late May 2012 contained a self-addressed stamped envelope, a set of survey instrument, and a cover letter. The second letter was a gentle reminder sent in two weeks from the date of the first mailing. The third mail sent in two weeks from the date of the second mail contained documents same as in the first mail. The annual reports of Directorate of Livestock Services Training and Extension (DLSTE) and regional training centers, and the current VAHW training curriculum were the sources for secondary information. Data were entered into Statistical Package for Social Science (SPSS) version 20 for analysis. Descriptive statistics and open-ended responses were used in analysis.

Results and Findings

The survey yielded 67% response rate. The respondents predominantly had ten years of schooling. About 60% of the respondents had their trainings funded by the Non-Governmental Organizations. Training materials and class-handouts were the preferred information source (36%) for the VAHWs, followed by advices of veterinarians and/or livestock technicians (33%). Agricultural bulletins were their second least preferred choice (19%) (Table 1). Self-learning (25%) and District Livestock Service Office staff (23%) were the main means and medium for other (14%) information.

Table 1.

VAHWS’ Sources of Information in Nepal

<table>
<thead>
<tr>
<th>Source</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=1186*</td>
</tr>
<tr>
<td>Training materials/class handouts</td>
<td>421</td>
</tr>
<tr>
<td>Livestock technicians and veterinarians</td>
<td>385</td>
</tr>
<tr>
<td>Agricultural bulletins</td>
<td>218</td>
</tr>
<tr>
<td>Others</td>
<td>162</td>
</tr>
</tbody>
</table>

*Respondents could select multiple answers.

The proportion of males, the youngest (25 years or younger), tenth graders, self-employed groups who used training materials and class hand-outs was higher than the other groups. The proportion of males who sought help from veterinarians and livestock technicians was higher among the 35 to 44 years old, employed, and bachelor’s degree holders than other groups. The current training curriculum does not have any session about environmental friendly and/or sustainable livestock production and animal health services. Most of the replies to open-ended questions were about seeking VAHW refresher training.
Conclusions and Recommendations

There were only a few information sources available for VAHWs to use. Information, Communication, Technologies (ICTs) (e.g., internet, cell phones) are the quickest and easiest ways to access information and they need to be promoted. The workers also need additional training—VAHW refresher, artificial insemination and laboratory analysis to hone their professional skills and knowledge and sustain their services. Orientation on environmental friendly production and services that include sessions on good animal health practices and judicial use of the chemicals like antibiotics and hormones seem necessary.

References


What Competencies Are Needed to Develop Instructional Strategies for Mobile Information Communication Technologies?

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Keywords: Information Communication Technologies (ICTs), instructional competencies, mobile learning

Introduction

The expanding presence of mobile devices has produced a need to examine educators’ competencies in using mobile technologies for learning (Demirbilek, 2010). The use of Information Communication Technologies (ICTs) has been studied by international agricultural and extension education researchers in a variety of contexts. Abi-Ghanem et al. (2013) studied Iraqi extension agent’s perceptions of farmer’s technology and communications use. Ganpat, Ramdwar, Stripling, and Roberts (2013) examined agriscience teachers use of ICT’s in Trinidad and Tobago. ICTs can assist the developing world in participating in the educationally competitive global economy (Akpan, 2003). Research is needed to identify the competencies required of ICT developers to maximize learning outcomes (Pina, Torres, & Royo, 2007).

Purpose and Objectives of the Abstract

The purpose was to determine competencies needed for the development of instructional strategies for the effective use of mobile learning. The objective of the study was to use expert knowledge to improve understanding and construct a framework for the development of instructional strategies for mobile technologies in agricultural classrooms.

Methods

The researchers incorporated a three round Delphi panel to determine competencies needed to develop instructional strategies for mobile technologies. Thirty \((n = 30)\) agricultural education faculty with expertise in eLearning and distance education composed the panel. The expert panel members were chosen from U.S. universities and had a publishing and research background in educational technology and agricultural education. The panel was composed of \(n = 13\) females and \(n = 17\) males. The expert panel consisted of \(n = 9\) Professors, \(n = 11\) Associate Professors, and \(n = 10\) Assistant Professors.

Qualtrics™ was used to create and distribute the web-based questionnaires for each round. The Tailored Design Method for creating and disseminating an electronic survey was utilized by the researchers (Dillman, Smyth, & Christian, 2009). The round two instrument was assessed for internal consistency and a reliability coefficient of \(\alpha = .96\) was achieved. The round...
three instrument was assessed for internal consistency and a reliability coefficient of $\alpha = .94$ was achieved.

**Results and Conclusions**

The first round asked panelists to generate six competencies needed to develop instructional strategies for mobile learning. Responses from twenty-eight panelists were used to create 108 original statements on the needed competencies.

The second round had the panelists rate their agreement with the 108 statements on a six-point summated scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *somewhat disagree*, 4 = *somewhat agree*, 5 = *agree*, and 6 = *strongly agree*. The items earning the highest scores were “Instructors need to be organized” ($M = 5.70$, $SD = 0.53$), “Instructors need effective written communication skills” ($M = 5.63$, $SD = 0.49$), “Instructors need effective visual communication skills” ($M = 5.63$, $SD = .49$), and “Instructors need to assess learning outcomes” ($M = 5.57$, $SD = 0.63$). Round three included competencies that two-thirds of the panel agreed or strongly agreed.

The third round had the panelists confirm their agreement on the 48 consensus competency statements. The highest scoring items were “Instructors need to facilitate learning” ($M = 5.80$, $SD = .41$), “Instructors need to be able to manage a course” ($M = 5.67$, $SD = .55$) and “Instructors need to be clear” ($M = 5.67$, $SD = 0.55$). The data suggested the 48 competencies should be grouped into seven areas: Communication, Technology, Learning, Course Management, Course Content, Assessment and Evaluation, and Instructor Skills. The data suggested the most important competencies needed for instructors developing instructional strategies for mobile learning include: oral, written, and visual communication skills; expert content knowledge; the ability to establish guidelines, policies, and procedures for courses; and the ability to assess learning outcomes.

**Recommendations/Implications/Educational Importance/Impact on the Profession**

While the advantages of employing mobile learning have been identified, these advantages can only be acquired if educators outfit themselves with the competencies related to effective use. Research is needed to investigate clientele acceptance and usage of mobile ICT’s. Learner’s level of self-directed learning and self-efficacy with mobile devices should be studied. Researchers should examine whether the use of the competencies in developing mobile learning ICTs has an effect on student acceptance of mobile learning (Pina et al., 2007).

Educators working with today’s learners must recognize the evolution of mobile learning and develop competencies to meet the needs of clientele (Akpan, 2003). AIAEE members are involved with preparing extension personnel, agriscience teachers, agricultural development officers, and undergraduate and post graduate students. Given the increased ubiquity of mobile devices and the challenges that face our world, international agricultural and extension education practitioners should develop the competencies necessary to teach ICTs on mobile devices to educate a larger and diverse group of clientele.

**References**


Challenges of Public Extension Service Delivery in Post-Conflict Settings:
A Comparison of Mali, Myanmar, and Timor Leste

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Keywords: post-conflict, public extension, service delivery, challenges

Introduction
Conflict disproportionately impacts agriculture by disrupting production and destroying livelihoods (United National Environment Program [UNEP], 2002; Zaur, 2006). Consequently, post-conflict nations often prioritize agricultural development and extension to recover (Arthur, 2011; Wiggins & Leturque, 2010). The governments of Mali and Myanmar emphasized agricultural extension to redevelop conflict-affected areas (Cho & Boland, 2004; Food and Agriculture Organization [FAO], 2013). Timor Leste also used extension to train farmers and improve food security (Ministry of Agriculture, Forestry, and Fisheries [MAP], n.d.). However, post-conflict service delivery to farmers is difficult. Success requires analyzing perspectives of extension personnel and farmers to identify challenges and improvements (Wiggins & Leturque, 2010).

Research Objectives
This study (1) explored the perspectives of field-level extension officers, non-government extension providers, and smallholder farmers in post-conflict Mali, Myanmar, and Timor Leste regarding extension service delivery, and (2) identified themes that might impact other post-conflict contexts.

Methods
This study used a generic qualitative design (Merriam, 1998). Data sources included Malian extension supervisors (n=7) and agricultural development personnel (n=8), Myanmar farmers (n=30) and non-government extension personnel (n=7), and Timorese smallholder farmers (n=50) and field-level extension officers (n=6). Malian respondents were identified using purposive sampling (Creswell, 2013). Myanmar farmers were identified using network sampling, and snowball sampling identified non-government personnel (Ary, Jacobs, & Sorensen, 2010). In Timor Leste, researchers used stratified random sampling to identify
farmers and purposive sampling to determine district directors, sub-district coordinators, and community-level officers (Creswell, 2013).

Data were collected through semi-structured interviews in respondents’ native languages and audio recorded. Informed written consent was obtained. Member-checking and triangulation between multiple sources established trustworthiness and credibility (Lincoln & Guba, 1985). Data analysis used Corbin and Strauss’s (2007) coding methods and the constant comparative method (Merriam, 1998) to identify emergent themes.

Results

Seven themes were consistent across countries. First, poor officer coverage and high farmer-to-officer ratios made serving farmers difficult. Consequently, 96% of Timorese farmers never interacted with extension. Similar dynamics existed in Mali and Myanmar.

Second, poor coverage excluded certain types of farmers. Malian extension worked with large producers and smallholder groups but struggled to reach poor and women farmers (Simpson & Dembele, 2010). In Myanmar, larger-scale producers of staple and export crops were prioritized (Cho & Boland, 2004). Timorese officers primarily served farmers’ groups and large landholders. Thus, smallholders, youth, poor, and women farmers were often excluded.

Third, officers lacked capacity in all contexts. Technical capacity in Mali was higher due to in-service training and stronger educational backgrounds (Simpson & Dembele, 2010), while Myanmar and Timorese officers lacked training and technical information. Poor capacity in participatory extension and teaching was consistent across countries.

Fourth, lack of funding limited extension’s effectiveness. Malian extension was chronically underfunded pre- and post-conflict. Myanmar officers described inadequate funds to properly conduct programs, and Timorese officers used personal salaries for materials to serve clients. Slow centralized funding mechanisms also restricted activities.

Fifth, NGOs both enhanced and hindered public extension. In Mali and Timor Leste, public extension and NGOs often duplicated programs. Officers felt unable to compete and lost clients to better funded NGOs, while farmers believed NGOs provided better services and incentives to participate. However, Myanmar farmers perceived NGOs favorably and as the only extension services available because public officers were so overextended.

Sixth, security conditions significantly impacted extension delivery. The Malian conflict removed extension from one-third of the country, seriously affecting farmers’ livelihoods (FAO, 2013). Security was also a constraint in Myanmar where officers faced threats when working in unstable areas. Conversely, Timorese respondents felt security did not impact extension services.

Finally, displacement and transmigration caused land tenure problems that compromised services. In Timor Leste, no farmers possessed legal land rights, and similar phenomena were observed in Mali and Myanmar. This caused hesitance to invest in land improvements, and pertinent information and training were often unused. Lack of perceived permanence, missing documents, and confusing government policies were cited as causes.

Recommendations/Implications

Challenges common to most public extension systems were exacerbated by conflict. Capacity deficiencies of both public institutions and individuals officers were particularly acute (Aron, 2003; Geda, 2011). Post-conflict governments should therefore prioritize funding to improve institutional capacity, expand coverage, train officers, and improve program quality.
(Arthur, 2001; Birner, Cohen, & Ilukor, 2011; Kwapong, 2012). As Ministries rebuild, better partnerships with NGOs can improve services while reducing financial burdens and legitimizing post-conflict governments (Longley, Christoplos, Slaymaker, & Meseka, 2007; Swanson & Rajalahti, 2010). Finally, security, peacebuilding, and land tenureship policies can enhance existing programs and improve access to stakeholders (Gebremedhin & Swinton, 2005; Unruh, 2009).

References


Impact of Experience and Participation in Extension Programming on Perceptions of Water Quality Issues

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Keywords: water quality, public opinion, education, issues

Introduction
Water quality issues are continually reported internationally even though water is an essential element necessary to the global ecosystem. Issues include water pollution and contamination, water scarcity, degradation of water quality, waterlogging, and water salinity due to increasing population and demand, climate change, and mismanagement of land use (Young, Dooge & Rodda, 1994). Water quality can be impacted by agricultural or urban activities and must be managed appropriately to maintain the sustainability of water resources. Awareness of environmental issues may be influenced by personal experiences (Arcury & Christianson, 1990) and by participation in extension programs (Singletary & Daniels, 2004), which could further affect behaviors that impact water quality (Mainieri, Barnett, Valdero, Unipan & Oskamp, 1997). Therefore, there is a potential position for international extension educators to enhance awareness of water quality issues with the intent of altering practices.

Purpose and objectives
The purpose of this study was to identify how water quality experiences and participation in extension programs related to perceptions of water quality issues. The objectives sought to describe:
1. Experiences with water quality issues, place of residence, and participation in extension programs;
2. Perspectives on the importance of clean water; and
3. Relationships between experiences with water quality issues, place of residence, participation in extension programs, and perceptions of the importance of clean water.

Methods and data sources
This descriptive and correlational study used an online survey based on the 2012 RBC Canadian Water Attitudes Study (Patterson, 2012) to capture Florida residents’ experiences with and perceptions of water quality issues. To measure experience with negative water quality issues, respondents indicated if they experienced five water quality issues. Second, respondents indicated the level of importance they associated with clean water in seven water bodies by rating their perceived level of importance on a five-point Likert–type scale. Responses were averaged to create an index score found to be reliable ($\alpha = .93$).
Next, respondents were asked if they thought water quality was getting worse or better in the seven water bodies. If they indicated it was getting better, their response was assigned a +1 score, no change a 0, and getting worse a -1. Scores were summed to create a perception of water quality score ranging from -7 to 7. Respondents were also asked to indicate if they had engaged in specific extension programs. Finally, participants were asked a series of demographic questions.

A non-probability opt in sample was obtained from a public opinion survey research company. The company sent the survey to 516 Florida residents. A response rate of 90.9% (N = 469) was obtained. To compensate for potential exclusion, selection, and non-participation biases weighting, using post-stratification methods, were implemented to ensure the data was representative of the population (Baker, et al., 2013; Kalton & Flores-Cervantes, 2003).

Results

According to the survey results, the water quality issue respondents experienced most often was poor home drinking water (22%) followed by poor water quality at beaches (20%). When asked about the importance of water quality, 82% considered clean drinking water extremely important, whereas only 58% considered clean water for shellfishing extremely important. Respondents perceived there was no change in the water quality of lakes, estuaries, rivers, groundwater, springs, and oceans, but thought the water quality in bays was getting worse. Almost 12% of the respondents lived directly on the coastline, with 88.5% living inland. When asked about participation in extension programs, 17% reported participating in Florida Friendly Landscaping™ Program and 8% in Online Resource Guide for Shellfish Aquaculture.

When relationships were examined, respondents who experienced poor home drinking water believed water quality was getting worse and felt clean water was an important issue. In addition, respondents that had attended the Florida Friendly Landscaping™ Program, Master Gardener Program, or Master Beekeeper Program, believed water quality was getting better. However, respondents who had been involved in the Master Gardener Program did not consider clean water as an important issue. Place of residence did not affect respondents’ experiences with water quality issues.

Conclusions and Recommendations

The results show personal perceptions of water quality was impacted by respondents’ experiences and participation in extension programming. Since water is essential, developing water quality programs that increase awareness and encourage behavior changes across the globe is necessary. Given direct experience with negative water quality had such a strong impact on awareness, international extension educators should integrate simulations into their programs that provide a real-life experience emphasizing the realities of poor water quality so that participants want to change their behaviors. Research could then be conducted examining the impact of simulation integration into extension programming.

References


The Impact of Community Based Extension System delivery on agricultural production in Northern Ghana

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Keywords: Community Based Extension, Impact of extension, extension delivery, extension system

Introduction
The agricultural extension systems in many developing countries play important roles toward rural development (Rivera & Qamar, 2003). The ministry of agriculture-operated general approach or public extension that brings development to the majority of the population living in rural areas has been under pressure due to its poor performance. The criticism of the poor performance of public extension include being inefficient and ineffective; lacking clear objectives, motivation, and incentives; being poorly managed and not accountable to clients; and lacking relevant technologies (Haug, 1999; Chapman & Trip, 2003).

The inadequacies of the public extension systems have called for the need for pluralism in extension to benefit the many small holder farmers in developing countries. Pluralism in extension involves the private sector (companies, nongovernmental organizations, rural producer organizations, or specialized consulting firms) and the public extension in the provision of extension services. Under its Sustainable Farming Systems Extension (FASE) programme, the CARE International, an international Non-Governmental organization (NGO) in Ghana sought to give meaning to pluralism through capacity building and strengthening the linkages between the public extension, NGOs and ‘farmer experts’ with knowledge on different indigenous farming systems at the district level in Northern Ghana (CARE International, 2004). The result is the Community-Based Extension System (CBES) that evolved to address the inadequacy of extension services provision in the three regions in Northern Ghana. Although the focus on extension seems to shift towards pluralism, the critical factors of success of extension pluralism have not been discussed extensively (World Bank, 2003; Davis, 2008).

Purpose and objectives of the abstract
The paper presents a study that sought to find out the extent to which the CBES has improved access to extension services to rural farmers and agricultural production. Specifically, the paper examines the nature, structures of operations of CBES, type of agricultural extension services delivered and technologies promoted and explore farmer perception of the impact of CBES on agricultural production.
Methods and/or data sources; or theoretical/philosophical themes

The study purposively selected the Mamprusi District due to the nature of the study and it being the first where CBES was initiated. The study used qualitative methods such as focus group discussions, observations and in-depth interviews to collect data from 100 farmers selected randomly from 10 communities in each of the 5 traditional areas or zones in Mamprusi District, Ghana. Quantitative method involving the use of structured questionnaire was used to collect data from 50 key informants from the service providers under the CBES.

Results, products, and/or conclusions

1. Membership of the CBES is mainly based on being resident in the community and willingness to offer voluntary services. The modes of operandi include sensitization at group meetings, formulation and strengthening of links between traditional authorities with other development partners and use of expert farmers to disseminate information.

2. The dominant extension service delivered mainly focused on the identified priority needs of the community such as crop and livestock production; bushfire, agro-forestry and conflict management.

3. The greatest impact of CBES was motivation of the farming communities to implement activities to change their livelihoods. There was high co-operation and increased sense of voluntarism among the members of community. Furthermore, farmers acquired the competencies to express their own needs. Selected farmers who were the villagers themselves acted as experts.

4. Farmers also perceived their expectations to have been met by the CBES as there were greater improvement in livestock health, increased crop harvest and availability of resources (human, financial and material) to build of the capacities of farmers.

Recommendations, educational importance, implications, and/or application

1. Pluralism in extension should focus of facilitating and strengthening of the linkages among the various service providers.

2. Involving expert farmers living in the localities in the extension delivery system will lead to change in the livelihood of the people and also address the problem of inadequate extension personnel to all farmers in rural communities.

3. There is the need to establish coordination units in the communities with strong farmer leadership where all rural development efforts could be channelled to bring about maximum impact to farmers.

References


Farmers’ Satisfaction with the Extension Service in Trinidad, West Indies

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Keywords: Satisfaction, Extension officers, Farmers, Trinidad, Trust

Introduction and Purpose
The role of extension in Trinidad has widened over the years to beyond agriculture education and may include other rural development services such as access roads, irrigation water subsidies etc. Farmers have continually expressed their dissatisfaction with the extension service they receive at various public fora claiming that Extension staffs are not dependable and not punctual, and they are not up to date with the practical aspects of agriculture among other things. Politicians and Administrators also claim in public that the farmers are dissatisfied with the extension services received. This has led to dwindling confidence in the extension service thus hampering program implementation and is demoralizing to staff. Absent are the periodic quality assurance checks for farmer satisfaction. Since Farmers’ satisfaction with the Extension Services in Trinidad has never been investigated this was the main objective of this study.

Literature Review
Cadotte, Woodruff and Jenkins (1987) stated that customer satisfaction is conceptualized as a feeling developed from an evaluation of the use of an experience; how satisfied or dissatisfied the user is about the service provided and/or the service provider. Swan, Trawick and Carroll (1982) reinforces the previous ideas of customer satisfaction stating that it is a conscious evaluation or cognitive judgment that the product has performed relatively well or poorly or that the product was suitable or unsuitable for its use/purpose. The user will make a judgment on a service provided and this will influence the expressed satisfaction level and this must be understood.
Methodology
Farmers (n=238) in the public Extension service were surveyed. The instrument consisted of 18 single-sentiment statements on a likert-type scale which assessed farmers’ satisfaction with extension services. Other personal and demographic factors were also collected.

Results

Characteristics of the Sample
The majority of respondents were males (75%), with (44%) being older than 50 years, 40% attained primary level education and 48% completed secondary education. Most (67%) were full time farmers and almost all farmers (88%) were primarily engaged in crop production. Some (67%) owned 1-5 acres of land and farmed only 1 parcel of their land. Some 43% reported monthly visits by extension officers, 44% annual visits, 7% were never visited. 4% of farmers were visited on a fortnightly basis, and 4% was visited weekly by extension officers. Most farmers’ (58%) did not belong to any farmers’ group.

Satisfaction towards Extension Services
The farmers’ satisfaction scale appeared to have good internal consistency (Cronbach's $\alpha$ = 0.97). The overall farmers’ satisfaction index (FSi) was 71.1 (range 25-100), suggesting that farmers was somewhat satisfied with the extension service. The most agreed to statements were “The Extension service plays an important role in agriculture development”, and “I am confident that the technology offered will improve my production”. On the other hand, this was a general similar disagreement towards the statements “I believe Extension treats all farmers fairly and equally” and “The Extension service is my most preferred source of farming information”.

ANOVA Results
Results of ANOVA test showed that there was significant differences in Farmers Satisfaction (FSi) based on individuals’ age (F=12.59***), education level (P=6.03***), farm size (P=4.39**), parcels of land in use (P=6.24***), extension visits (P=2.88**), access to other information sources (P=5.33**) and participation in farmers’ groups (P=12.72***).

Discussion, Conclusion and Implications
While the data suggest that there is some overall satisfaction with the extension service, a closer look at the responses reveals several areas that need attention. While the technical quality of the staff does not appear to be an issue, it is the trust that farmers have that is of concern; that extension officer will come and visit as promised and come more frequently and that they will be treated fairly and equally in the rendering of the service. It suggests that either there are insufficient staff for all farmers or that the methods used by the service is inappropriate.

ANOVA results show that satisfaction is quite varied among the sample of farmers and this calls for in-depth analysis of the reasons for this. The extension service delivery system needs to be rationalized. Some policy guidelines to specify which farmers will receive service as priority. These would have to be those who are in support of governments food and nutrition security programs. Retraining of staff to use alternative methods of extension work to increase the efficiency of their service is needed. This will include more work with groups. Unless these issues are attended to, farmers will continue to complain vociferously about the quality of service rendered to them.
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Intentions of Young Farmers Club (YFC) Members to Pursue Career Preparation in Agriculture at the Post-secondary Level: An Embedded Case Study in Uganda

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Keywords: agriculture; clubs; post-secondary education; youth

Introduction
Youth organizations provide opportunities for students to learn how to interact with others, improve academic performance, develop leadership skills, and also serve as forums in which students learn about as well as explore careers (Alfeld et al., 2007; Mukembo, 2013; Johnston, 1952; Shumow, 2003). For example, Alfeld et al. (2007) reported that participation in career and technical student organizations led to an increase in students’ “career self-efficacy and employability skills” (p. 29). But just how much does participation in agriculture-related organizations such as Young Farmers Clubs (YFCs) influence students’ aspirations toward agriculture as a career?

Purpose & Objectives
This descriptive study’s purpose was to determine the perceptions of members of YFCs on their intent to pursue agriculture-related career preparation after graduating from secondary school. The study also sought to describe associations between selected characteristics of the YFC members and their sex. Five objectives guided the study: (a) describe the level of parental support for students’ participation in YFCs; (b) determine the percentage of YFC members who had family members with careers in agriculture; (c) describe the level of intent of YFC members to continue their education at the post-secondary level; (d) determine the level of intent of YFC members to pursue agriculture-related career preparation at the post-secondary level; and (e) describe associations between YFC members’ sex and selected personal variables.

Conceptual Framework
This study was guided mainly by human capital theory. “[H]uman capital refers to [all] the acquired skills, knowledge, and abilities of human beings” (Hornbeck & Salamon, 1991, p. 3), as attained through education and training for the support of their productive potential (McFadyen, 2006). Integrating the theory of planned behavior (Ajzen, 1991) and factors influencing career choice (Hackett & Betz, 1981; Lent, Brown, & Hackett, 1994, 2002) also helped in understanding the synergy between human capital theory, including investments made in formal education, and an individual’s intention(s) in regard to career preparation.

Methods/Data Sources

The study used a single case (embedded) study design (Yin, 2009). Case selection was purposeful (Gay, Mills, & Airasian, 2009) and involved 102 Members of YFC from two schools in eastern Uganda; the researchers also used cross-sectional survey methodology (Creswell, 2011). Several question formats and response scales were employed to measure students’ attitudes or preferences (Gay et al., 2009). Data analysis involved calculating frequencies and percentages and strength of associations using Cramer’s $V$.

Findings/Results

Nearly three-fourths of the club members (74.5%) indicated their parents were either very supportive or supportive of their participation in the YFCs. A majority (70.6%) indicated either one or both parents had an agricultural career and nearly six-in-ten (59.8%) responded that a sibling or another relative did. A large majority of the members (95.1%) indicated they were highly likely or likely to continue with education at the post-secondary level. A high percentage (70.6%) of club members also reported they were highly likely or likely to study an agricultural field at the post-secondary level.

A student’s sex was significantly associated ($p < .05$) with several other variables, including personal interest as a reason for joining the YFCs (Cramer’s $V = .357$, sig. = .013). More females than males strongly agreed personal interest was a reason influencing them to join their YFC. Further, more females than males strongly agreed they joined YFCs to gain life skills (Cramer’s $V = .490$, sig. = .000). However, more males than females indicated they were likely to pursue agriculture-related career preparation after graduation from secondary school (Cramer’s $V = .370$, sig. = .007). These associations also had practical significance.

Conclusions/Recommendations/Educational Importance

Psacharopoulos and Patrinos (2004) found educated females provide increased socio-economic returns to their communities and to Uganda at large. However, this study’s findings indicated female club members were less certain than their male peers about pursuing additional education involving the study of agriculture. What is more, “only one in five agricultural researchers in the developing world are female” (Beintema, 2006, p. 1), and Kanté (2010) asserted Sub-Saharan Africa suffers from an acute shortage of female agricultural extension educators. Additional research, therefore, should be conducted on how to attract more females to study agriculture at the tertiary level, especially in developing countries. Further, more effort should be devoted to attracting females to agricultural careers and the professional preparation required thereof. YFCs could assist by inviting female agriculturists to address club meetings and by taking field trips to agricultural enterprises with female employees.
References


A year down the road: The benefits of the Iraqi 4-H program, a view from the youth, their parents and volunteer leaders of the Dar Al Salaam 4-H club.

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Introduction

After the fall of the Iraqi dictator Saddam Hussein, the country divided based on ethnic and religious fronts. Open elections ushered in quasi democracy, but sectarian divide became routine. In 2010, the USAID-Inma Agribusiness Program sought new avenues to enhance the agricultural sector and support democracy while working with marginalized or displaced people (USAID 2011). Youth have always played a role in Iraqi agriculture, primarily as field workers or working in processing centers (Kock & Altimimi, 2012).

Youth are the largest sector of citizens, over 50% of the Iraqi population (CIA, 2013). However, very little international assistance was implemented in the area of rural youth programming. In 2009 the United States Department of Agriculture-Provincial Reconstruction Team (USDA-PRT) program began working with rural youth in the Bagdad area. In the fall of 2010, the USAID-Inma agribusiness program stepped in as the US military and the USDA-PRT programs were beginning to pull out of Iraq. With the help of the Iraqi 4-H program 25 youth were identified in the Babil area, the youth came from families where the “bread-winners” (fathers) had been killed during the war.

Purpose

The purpose of this qualitative case study investigated the views of the youth, their parents and the leaders of the first 4-H club started with USAID-Inma assistance. The goal of the program was twofold; strengthen the agriculture in the Babil region of Iraq and support democracy.

Theoretical Framework

Iraq is not a country that was known for building positive social capital in youth, during Saddam’s regime youth programs were designed around military training camps. Programs designed to teach youth democracy and civic responsibility were not available. With the U.S. Military invasion, the trauma of war exacerbated the problem. Young people experienced violence firsthand, and had no social outlet to turn to for help. According to Robinson and Meikle-Yaw (2007) and Swanson and Rajalahti (2010) 4-H works as a vehicle to build social
capital in communities, the program allows youth to participate in elections and run meetings. It enhances the democratic process through hands-on participation.

Methods

This case study employed interviews and field reports for qualitative data collection during this yearlong research. The interviews were videotaped with the approval of the youth and their parents. Data was extrapolated from those interviews. The researchers collected data in January of 2011 and returned in April 2012 to interview members and their families of the Dar Al Salaam (Home of Peace) 4-H club after completing a year in the 4-H program.

Results/Conclusions

Data indicated that all twenty-five families are still active in the club, 18 of the 25 heifer calves have given birth, thus providing raw milk for consumption or sale. However, the families that raised a heifer that did not have a calf lost income which created a hardship on the families. Findings from the youth, parents and volunteer leader indicated some youth have helped other community members start another club, club members lives were a little better, they learned new things, shared what they were taught.

Data gleaned highlighted young people were learning the basics of democracy, learning responsibility, cooperating with others and learning to trust people. This was also evident through the data derived from parents. Parents indicated youth are inclusive in their thoughts and actions; children from all ethnic sects (Sunni, Shia and Kurdish) are included. Families are becoming more open regarding the lives of their daughters, young women now participate in community events and some girls are continuing their education. Data from the 4-H volunteer indicated 4-H membership has helped kids heal from their emotional wounds, taught them leadership, become civic minded, and opened up new interests.

The youth are very active in the club, serving as mentors to others, officers, and conducting community service in their villages. Parents and volunteers see positive outcomes in the youth, citing cooperation and sharing with others as two of the indicators. A quote from a parent explains it best, “politicians have failed in bringing sects together, 4-H succeeded in that mission, Sunni, Shia and Kurds…they all belong to one group.” The club is supported by the community; adults volunteer their time working with youth. Astroth and Haynes (2002); Kock (2010) suggested youth adult partnerships are needed to create positive learning environments for young people.

Recommendations, Educational Importance and Implications

This study indicated youth embraced the idea of democracy, were inclusive to gender and ethnicity and shared new ideas. Youth development activities may provide another avenue for providing long-term outcomes and impacts for other international development projects.

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Building Capacity of Agricultural Education and Training (AET) in Nepal: Challenges and Opportunities

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Introduction/Background
The agricultural sector dominates the Nepalese economy with 60% of its rapidly-growing population depending on agriculture for their livelihood. The agriculture sector has been prioritized for Nepal’s economic development, as it contributes 33% of the total GDP in a country of 28 million. (ADS, 2012; MHP, 2011). Equally important is the role of education in the overall development of Nepal, and of particular interest is the role of agricultural education in furthering Nepal’s development. Since the 1951 revolution, Nepal has made significant progress in enhancing agricultural education, primarily under Tribhuvan University. In the last 10 years, however, due to the growing demand for agricultural graduates, there has been a proliferation of agricultural education institutes and programs, with several private and governmental colleges established to offer degrees in agricultural sciences.

Purpose and Objectives
The overarching goal of this study was to examine the current status of the agricultural education and training (AET) system in Nepal under the USAID-funded innovATE program. The objectives guiding the study were: 1) identify the strengths and weaknesses of AET in Nepal, 2) identify the limitations that may hinder building the capacity of AET in Nepal, and 3) identify opportunities that exist and/or are needed to build the capacity of the AET system in Nepal.
Methods and Data Sources

Data for this study came from: 1) data using both primary and secondary sources (newspaper archives, websites, books, journal articles), 2) consultations with various AET system stakeholders in Nepal, and 3) focus group interviews (Krueger and Casey, 2008) carried out with Nepalese students and faculty members who had experience working in Nepal. Consultations were carried out by phone, e-mail and Skype.

Based on the three objectives, consultations and literature review, a set of questions suitable for focus group interviews was developed. Focus group questions were reviewed for clarity and appropriateness by a panel of experts. Probes were used to deepen the responses to questions, increase the richness and depth of responses, and provide cues to the participants about the level of responses desired (Patton, 2008). Each question was summarized and integrated to allow for an inductive analytic process guided by what the participants said (Creswell, 2007; Emerson, Fretz, & Shaw, 2011). A total of nine subjects (seven male, two female) participated in the focus groups--six Nepalese students and three faculty/staff with experience working in Nepal. Three of the students majored in agricultural sciences, while the others were students of sociology, literature, and physics.

Results

Key results from this study revealed that the current educational system consists of primary, secondary and higher secondary levels with higher education beginning after completing 12 years of schooling. Identified strengths of Nepalese AET include the strong theoretical grounding of students in agricultural disciplines, the generous student scholarship opportunities, and the recent establishment of new institutions of higher education with agricultural programs, e.g. the Agriculture and Forestry University in Chitwan. Weaknesses in the AET system include outdated curricula, the lack of agricultural value-chain and systems research, the poor connectivity between agricultural education, research and extension, poor infrastructure and lack of supplies at current agricultural institutions, and a weak system of ATVET (Agricultural Technical and Vocational Education and Training).

Results indicated that primary limitations to building capacity in the AET system stem from a poor perception of agriculture in the country. This perception is fueled by a lack of awareness at the primary and secondary levels about agricultural education and the various opportunities it offers, and furthered by parents’ emphasis on pursuing medical or engineering degrees. In addition, the “brain drain” of Nepalese agricultural potential into other more lucrative opportunities in other sectors and other countries is another significant limitation (Pokhrel, 2013).

Conclusions and Recommendations

The results of this study will serve as a springboard to carry out further needs assessment in Nepalese AET to determine priorities for capacity building activities. Opportunities already identified through this study for building the capacity of the AET system in Nepal include (but are not limited to): 1) stimulating interest in agriculture at the primary and lower secondary levels, including exploring the need/opportunity for career guidance counseling, 2) revitalizing agricultural education curricula and resources at higher education institutions, 3) enhancing linkages between agricultural education institutions and a wide variety of stakeholders including both the private and public sectors to identify opportunities for mutual benefit and 4) strengthening the TVET system. Building the capacity of AET in Nepal will facilitate...
agricultural and rural development and generate agricultural institutions that effect positive change in their environment (Maalouf, 1988).

References
Science Teacher Efficacy Beliefs of Agricultural Technical School Students in Egypt

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Introduction

The concept of self-efficacy has grown out of the larger framework developed by Bandura (1977) on Social Cognitive Theory (Aydin & Boz, 2010). Efficacy includes two components: outcome expectancy, or the belief that a certain behavior will lead to a certain outcome, and expectation efficacy, or the belief that one can execute the behavior required to produce the expected outcomes (Bandura, 1977). Perceived self-efficacy has been demonstrated to be an important construct in teaching (Mulholland, Dorman, & Odgers, 2004). Teachers’ belief in their own instructional efficacy is a strong predictor of student achievement (Saklofske, Michayluk, & Randhawa, 1988), and more positive teacher efficacy is associated with student self-direction (Bandura, 1977). Science teacher self-efficacy is related to the teacher’s use of problem solving and experimentation as well as student interest in science (Kahyaoglu, 2011). The aim of studying teacher self-efficacy is to better inform teacher development.

First developed by Riggs in 1988, the Science Teaching Efficacy Belief Instrument (STEBI) was modified for use in both in-service and preservice programs (Enoch & Riggs, 1990). The instrument was developed to provide a measure of teacher self-efficacy, based on the work of Bandura. The instrument addresses two constructs: Personal Science Teaching Efficacy, and Science Teaching Outcome Expectancy. The work of Enoch and Riggs has been utilized in a variety of settings. Mulholland and colleagues (Mulholland et al., 2004) investigated the relationships between science teaching self-efficacy and various attributes of pre-service teachers including prior courses completed in science and gender. Other researchers found that interest and confidence in teaching science increased with completion of a science teaching methods course (Jarrett, 1999; Wingfield, Freeman, & Ramsey, 2000).

A USAID-funded effort in Upper Egypt addressed the needs of agriculture technical schools (ATS) in terms of curriculum development, teaching enhancement, and laboratory
instruction. The overall purpose of the project was to help ensure that ATS instructors are conducting programs that meet workforce needs in agriculture (authors). To coincide with identifying professional development needs of agricultural science instructors in the ATS system, an assessment of science teaching self-efficacy was essential.

**Purpose and Objective**

The purpose of the study was to investigate ATS teacher self-efficacy as a part of ascertaining the professional development needs of ATS instructors in Upper Egypt. The objective was to determine the science teaching self-efficacy of the ATS instructors.

**Methods**

Agriculture technical school teachers from three ATSs in Upper Egypt participated in the study. Nearly all had completed at least one workshop on enhancing teaching. The instructors taught in six different agricultural science content areas. A total of 61 instructors completed the Science Teaching Efficacy Beliefs Instrument (STEBI), which had been translated into Arabic from the English original. The 25 items required a response regarding the extent to which the instructors agreed or disagreed with each item on a 5-point scale from “Strongly disagree” to “Strongly agree.”

**Results**

Instructors indicated the extent to which they agreed with each of 25 statements regarding their self-efficacy in teaching agricultural sciences. Instructors strongly agreed or agreed most frequently on the following: I will continually find better ways to teach science (98%); When student science grades improve, it is often due to their teacher having found a more effective teaching approach (93%); Students’ achievement in science is directly related to their teacher’s effectiveness in science teaching (93%); and When teaching science, I usually welcome student questions (92%). The instructors disagreed or strongly disagreed most frequently on the following: I will generally teach science ineffectively (87%); I do not know what to do to get students excited about science (84%); and When a student has difficulty understanding a science concept, I am usually at a loss as to how to help the student understand it better (82%). Instructors were most unsure of their beliefs on the following: I know the steps necessary to teach science concepts effectively (25%); Even if I try hard, I will not teach science as well as I will most subjects (21%); The teacher is generally responsible for the achievement of students in science (21%); and I wonder if I have the necessary skills to teach science (20%).

**Recommendations and Implications**

Generally, ATS instructors portray positive self-efficacy in terms of agricultural science teaching. Some concerns are evident in the results. Instructors may possess the need for additional training in the area of science they teach, and there may be a need for continued professional development programs to address strategies for teaching science.

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Training Center Staff's Perceptions of the Village Animal Health Working (VAHW) Training in Nepal

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Introduction
Staff members in educational institutions play crucial roles in creating appropriate learning spaces and in designing programs (Graham, 2012). Staff play both service providers’ and mentors’ roles (Pitman, 2000). The staff also facilitates programs, maintain their records. Dale and Drake (2005) contend that support staff (academic and support) have a bigger role to play from counseling to helping with conflict management, and ensuring that logistics required for the courses and training are in place.

In Nepal, Regional Livestock Service Training Centers (RLSTCs) provide one month long Village Animal Health Worker (VAHW) training to youth and adults on animal health. Training center staff are responsible for planning and implementation of this training. This VAHW training started in 1983 (Moktan, Mitchelhill, & Joshi, 1990) and has been running unabated. However, literatures on what and how these staff have perceived the VAHW training are non-existing.

Study Objectives
This study aims to evaluate the training center staff’s perceptions of the VAHW training; to find out the problems if any in training; and to suggest measures to improve the training.

Methodology
Dale and Drake (2005) advise to solicit academic and student affair’s input to improve educational program. This study conducted in June and July, 2012 had 27 staff, both technical and administrative working in five Regional Livestock Service Training Centers, as the study population. The evaluation expert at Michigan State University and development workers from Nepal reviewed the draft survey. The study had the Michigan State University Intuitional Review Board (IRB) approval. The survey was translated into local Nepali language. The survey contained Likert-type and multiple answer type questions pertaining to participant selection, training management, instructors’ availability, etc. The investigator met staff in person at their respective training centers and requested all the staff to fill out the survey in group. Both qualitative and quantitative data were collected.
Data were entered into and analyzed using SPSS version 20. The constructs derived to
draw major issues had reliability coefficient greater than 0.70. Open-ended responses were
grouped to generate themes.

Results and Findings

Majority (70%) of the respondents have been in public service for more than 16 years
with average service period of 20.5 years. However, two-thirds of them have been in training
centers for four years or less. More than half (59%) reported that they attended “Training-of-
Trainers.” About half (n=13) of the staff had either a bachelor’s degree or equivalent education.

The respondents used a scale of 1 to 5, with 1 being “strongly disagree”, 2 as “disagree”,
3 as “undecided”, 4 as “agree” and 5 as “strongly agree,” to rate seventeen statements. The
statements receiving highest ratings were participants actively participated in class-discussion (m
= 4.41), there were no difficulties in finding appropriate instructors (m = 4.37), and class
handouts were provided in time (m = 4.30). The responses to training participants were satisfied
with the daily allowance and participant selection was free and fair were almost neutral with
means of 3.05 and 3.35, respectively. In open-ended responses, most staff mentioned
inappropriate participant selection process as the major problem. One respondent suggested
“People with interest on animal health should be selected…” While others wrote, “Selection of
training should be done only after surveying the local needs and demands…” “There should be
appropriate standards (educational qualification, age, skill, etc.) for selecting the trainees.” Most
staff thought that training needs assessment must be carried out before training is proposed.

Two constructs—instructional and logistics qualities were derived from eight of the
seventeen statements. The findings showed that mid-western region staff rated instructional and
logistic (dorms, training halls) qualities higher than staff from other centers. The central region
received the lowest ratings for these constructs.

Conclusions and Recommendations

Training center staff felt that participant selection process was not practical. Some region
specific problems related to dorm management, instructors’ availability and their instructional
qualities were highlighted.

Training providers and funders should take into account local needs, participants’
backgrounds, and participants’ interest in working with animals when selecting participants.
Participants selection criteria should be more pragmatic so that appropriate participants get
training. There is also a need to appraise the work of the training centers regularly and address
the issues in a timely manner.

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Fuel Wood Marketing in Metropolitan Kano: Implication for Environmental Sustainability.

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Introduction

All energy systems from production to consumption have adverse and beneficial effects on the environment (Pasztor, 1998). One of the most outstanding usefulness of the forest is its ability to protect the environment. The source of fuel wood over the decades was simple, ecological impacts were minimal due to low human population. As human population continued to increase rapidly, people’s dependence on fuel wood as a source of energy started showing sign of inadequacy. The level of inadequacy today is reflected upon the rate at which deforestation is taking place. More frightening is the fact that if fuel wood is used unsustainably, it could lead to continued impoverishment of rural communities and long-term forest degradation (Ebe 2006, Onoja and Idoko, 2008). Oguntola (1995) highlighted some of the environmental problems associated with increased deforestation which are easily noticeable on the soil, hydrology and the atmosphere. The ecological implications of high fuel wood consumption are therefore multi-dimensional. Ebe (2006) observed that among all the tree products, fuel wood is the most utilized in Nigeria with more than 80% of households utilizing it as the most used form of energy (Sambo, 2009). Okafor, (1988) also reported that of all the factors contributing to the diminution of the entire forest resource base in Nigeria; the most significant is unrestrained fuel wood collection. Cline-cole et al (1998) identified desertification as the most serious problem threatening the vast Northern part of Nigeria where the bulk of food and livestock requirements of the country are grown and the use of fuel wood as a source of energy is also common.

Maconachie et al., (2009) observed that the over-dependence on fuel wood in the country had been attributed to its availability and affordability compared to other sources of energy. Ebe (2006) and Onoja and Idoko (2008) reported that increasing demand for fuel wood in rural and
urban areas of Nigeria has led to the development of a market system for the product thereby creating new business opportunities. Moss and Morgan (1981) reported that people in Northern Nigeria had since taken up fuel wood marketing as a result of high unemployment rate as well as increased demand for the commodity. The increasing demand for fuel wood as well as the increasing commercialization has resulted to increasing negative effects to the environment as well as its sustainability. Despite the significance of this to the environment, not much research has been carried out on the implication of fuel wood marketing for environmental sustainability. This study therefore makes an attempt at closing the research gap.

**Purpose and Objectives of the study**

The broad objective of this research is to evaluate the profitability of fuel wood marketing and its effect on the environment in metropolitan Kano. Specifically the study was designed to:

1. describe the socio-economic characteristics of fuel wood marketers in metropolitan Kano;
2. determine the profitability of fuel wood marketing in Metropolitan Kano; and to
3. determine the level of awareness fuel wood marketers had on the implication of indiscriminate cutting of trees for fuel wood.

**Methodology**

**Study area**

Kano state is located in the Sudan zone of Northern Nigeria between longitude $9^0\ 3'$ and $12^0\ 30'$ North and latitude $9^03'$ and $8^042'$ East. This makes the state to be vulnerable to draught and unfavorable weather conditions. NPC (2006) reported Kano state as the highest with respect to human population which also has a direct relationship with high demand for fuel wood.

**Sampling Procedure**

A purposive sampling technique was used for the study, metropolitan Kano is noted for high intensification of fuel wood marketing. Ten markets were therefore purposively selected from the eight local government area of Kano metropolis. Systemic random sampling was used to draw 10% of fuel wood marketers from each of the selected market which gave a sampling size of sixty.

**Tools of Analysis**

Descriptive statistics such as percentages and frequencies were used to determine the socio-economic characteristics and also level of awareness the fuel wood marketers had on the effect indiscriminate cutting of tress for fuel wood had on the environment. Net Income was used in evaluating the profitability of fuel wood marketing as recommended by Kay (1986). Net Income is the income generated from the enterprise which can be drawn without affecting the future rate of marketing operation.

**Result**

Result of socio-economic characteristics revealed that 56% belong to 16-30 years age group with 70% being married and 43% having no formal education. Majority (81%) had fuel wood marketing as their major occupation while 77% had between 1-10 years of experience in fuel wood marketing. Majority (98%) sourced their fuel wood from suppliers outside the state on a weekly basis. Net Margin Analysis revealed that fuel wood marketing was a profitable enterprise with wholesalers and retailers recording a net margin of N22, 997 and N27, 145 respectively for every heap of fuel wood marketed. Fuel wood marketers confirmed their
awareness on the pressure impacted on the environment as a result of indiscriminate cutting of trees for fuel wood marketing and consumption. Result also revealed that none of the fuel wood marketers made any effort in planting trees in order to regenerate the forest thereby sustaining the environment.

**Recommendations and Implication**

There is a serious need for extension advisory services in the area of awareness creation on the consequences of indiscriminate deforestation for fuel wood consumption and other uses. Tree planting campaign will also promote forest regeneration as well as replace depleted forest environment. Extension advisory services in the form of introduction and promotion of cheap, reliable and safe alternative to fuel wood is also needed. This will go a long way in freeing a large amount of forest trees. The overall impact of these would be a reduction in the domestic pressure on the forest thereby ensuring the sustainability of forest environment for better agricultural productivity and reducing the effect of climate change.

**References**


Introduction

The United States’ agriculture industry totaled $156.8 billion in 2012, placing it third in the world (World Bank Group, 2013). According to the White House, the strength of the agricultural sector is dependent on manual labor, “a crucial component of U.S. agricultural production” (Kruger, Abraham & Stock, 2013, p. 259). Because almost 50% of U.S agricultural laborers are comprised of immigrants, immigration policy is key to its continued success (Zahniser, Hertz, Rimmer, & Dixon, 2012). The public’s perceptions towards these immigrants can affect immigration policy by increasing restrictions and reducing the workforce (Zahniser et al., 2012). Thus, an understanding of people’s perceptions towards the immigrant agricultural worker population is needed.

The purpose of this study was to understand how personal characteristics and exposure to immigrants influenced perceptions of undocumented immigrants. Therefore, the objectives are to: (1) understand participants’ personal characteristics and exposure to immigrants; (2) understand participants’ perception of undocumented immigrants; and (3) identify if the participants’ characteristics and exposure to immigrants predict their perceptions of undocumented immigrants in Florida.

Theoretical Framework

In the contextual-level theory of attitudes toward immigrants and immigration, the theory of group threat (Blumer, 1958; Coser 1956) is the most used (Ceobanu & Escandell, 2010). Blumer’s (1958) model explicitly incorporates negative feelings and beliefs as well as a concern with the material conditions of group life (Bobo & Hutchings, 1996).

Methods

The study used an online survey design to capture public opinion of undocumented immigrants, personal characteristics, and exposure to immigrants. Ommundsen and Larsen’s (1997) Attitudes toward Illegal Aliens scale was used to assess opinions of undocumented immigrants. Nineteen of the original 30 items were used with respondents indicating their level of agreement with each statement on a five-point Likert-type scale. Responses to the items were
summed to develop an overall index score ranging from 19 to 95. Reliability was calculated \textit{a priori} and resulted in a Chronbach’s alpha coefficient of .93. Respondents were also asked if they were born in the U.S., if one or both of their parents were born in the U.S., and if they spoke a language other than English. If they had known a recent immigrant, they were asked to indicate their relationship with that individual. Finally, participants were asked several demographic questions.

A non-probability, opt-in sample was obtained from a public opinion survey research company. The company sent the survey to 656 Florida residents. A response rate of 77.3% (N = 507) was obtained. Weighting, using post-stratification methods, were implemented to ensure the data was representative of the population and to compensate for potential exclusion, selection, and non-participation biases (Baker, et al., 2013; Kalton & Flores-Cervantes, 2003). Descriptive statistics and regression was used in the data analysis process.

\textbf{Results}

Of the 507 participants, 98.8% were U.S. citizens, 91.5% were native born, and 90% had at least one native-born parent. Most participants (84.7%) self-identified as White. Only 29% spoke another language other than English, 17.2% Spanish and 6.7% French.

Perceptions showed participants generally perceived that undocumented immigrants cost the U.S. millions of dollars each year, infringed on the countries resources, and should not have the same rights as American citizens. Participants also felt access into the country was easy.

Native-born U.S. citizens were highly likely ($p = 0.001$) to have strong negative perceptions towards undocumented immigrants. Participants with at least one immigrant parent were highly likely ($p = 0.013$) to have a strong positive perception towards undocumented immigrants. Speaking a language other than English and positive perceptions were also highly correlated ($p=0.000$).

Participants were asked to indicate the type of relationship they had with an immigrant they knew best, and a friend was the most common relationship (17%). Among respondents with immigrant friends, those who also had immigrant family members showed strongly positive perceptions towards undocumented workers ($p =0.026$) while those with immigrant neighbors felt strongly negatively ($p =0.006$).

\textbf{Implications and Recommendations}

The results revealed there was a link between how participants’ personal characteristics and exposure to immigrants influenced perceptions of undocumented immigrants. The more exposure to immigrants through familial or romantic relationships, the more positive their perceptions were towards undocumented workers. This information can be used by extension agents, and other opinion leaders (Rogers, 2003) to help frame their message and educate the population about the important and necessary role immigrants serve in agriculture. Future research should include socio-economic stratification to determine if specific groups have strong positive or negative perceptions toward undocumented workers.

\textbf{References}


looking the wrong way? exploring relationships between color-blindness and opinions of undocumented immigrants

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introduction
historically, undocumented immigrants in the united states have comprised the majority of agricultural laborers (gonzález, 2012). tighter immigration laws are being considered that may protect national security, but can negatively impact the agricultural industry. while this is a current issue in the united states, it is one that could impact any country looking at tightening immigration policy.

public opinion can serve as a driver of political change because it influences decision makers (shamir & shamir, 2000). research has shown public opinion of undocumented immigrants may be impacted by how people feel about those different from them, expressed as a level of color-blindness (neville, lilly, duran, lee, & browne, 2000). being color-blind refers to the belief that race should not and does not matter (neville et al., 2000). while this concept appears admirable, plant and devine (1998) found that although people attempt to respond to racial issues without prejudice, they still retain prejudicial beliefs. previous literature has also shown that color-blindness can be problematic because it ignores the importance of differences (jones, 1997, west, 1992). by understanding how public opinions about undocumented immigrants relate to level of color-blindness, international agricultural educators can target their educational programs to inform and address misconceptions.

purpose and objectives
the purpose of this study was to identify how perspectives on undocumented immigrants relate to color-blindness. the objectives were to:
1. describe opinions of undocumented immigrants.
2. describe level of color-blindness.
3. identify the relationships between opinions of undocumented immigrants and level of color blindness.

methods
the study used an online survey to assess public opinions of undocumented immigrants and level of color-blindness. researchers adapted an attitudes toward illegal aliens scale (atia; ommundsen & larsen, 1997) to assess opinions of undocumented immigrants. respondents indicated their level of agreement with 19 statements on a five-point scale. responses were averaged to create an overall index score found to be reliable (α = .93).

the color-blind racial attitudes scale (cobras; neville et al., 2000) was used to assess level
of color-blindness. Respondents rated their level of agreement with 20 statements on a six-point scale. Responses were averaged to create an overall index score. Previous studies show CoBRAS is reliable with Cronbach’s alpha coefficients ranging from .70 to .86. A panel of experts reviewed the survey for racial bias, legal wording, and survey design to ensure validity.

A survey research company was used to obtain a non-probability opt in sample. The survey was sent to 656 Florida residents representative of the population of interest. A response rate of 77.3% (N = 507) was obtained. Post-stratification weighting methods were implemented to compensate for potential exclusion, selection, and non-participation biases (Baker, et al., 2013; Kalton & Flores-Cervantes, 2003). Descriptive statistics were used in the data analysis process.

**Results**

Respondents’ disagreed with 13 of the 19 statements on the ATIA scale including statements such as “our taxes should be used to help those residing without documentation in the U.S.,” and “there should be open international borders.” Respondents were neutral in regards to the other six statements. When an index was developed (based on a five-point scale), respondents expressed a negative attitude towards undocumented immigrants (M = 2.33, SD = .80). Responses to the CoBRAS instrument were also reviewed. When an index was developed on a six-point scale, respondents agreed with the color-blindness statements (M = 3.66, SD = .53).

Relationships between attitudes towards undocumented immigrants and color-blindness were calculated. A statistically significant Pearson’s correlation coefficient of -.47 was revealed. This result indicated there is a significant negative correlation between attitudes towards undocumented immigrants and color-blindness.

**Implications and Recommendations**

The results of this study showed the respondents had a negative attitude towards undocumented immigrants and therefore an undocumented workforce, despite the need for this workforce to ensure an economically viable agricultural industry (González, 2012). In addition, respondents expressed a tendency towards color-blindness, indicating they believed race should not or does not matter (Neville et al., 2000). As color-blindness increased, the negative attitude towards undocumented immigrants also increased, supporting Plant and Devine’s (1998) finding that while people attempt to respond to racial issues without prejudice, they still retain prejudicial beliefs. These results showed that as international agricultural educators discuss and teach about the impacts of immigration reform on the agricultural industry they need to stop focusing on eliminating perceptions of racial differences but rather teach about the importance of diversity (Hartmann, 2007) and the variety of contributions different groups bring to the industry.

**References**


Perceptions of the Faculty Members in the College of Agriculture at Cuttington University in Liberia about Agricultural Extension Undergraduate Curriculum: Implications for International Agriculture

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Keywords: Faculty inputs extension curriculum development

Introduction/Theoretical Framework
Rural development in Africa is a great challenge (Blanckenburg, 1982) due to lack of effective institutional capacity for research and development in rural communities in many African countries (Russell & Ison, 2000). Workforce preparation for various agricultural professions is paramount for achieving the development expectations of post conflict countries like Liberia. Declining relevance to development needs is a problem in African universities (Maguire, 2000). After ending the long civil war, Liberia started to develop its ruined higher education system with the assistance received from the US Agency for International Development (USAID). Development of the College of Agriculture at Cuttington University is a part of this USAID initiative. North Carolina State University is providing the technical assistance for the development of undergraduate agricultural extension curriculum. When a curriculum is developed, some seek inputs from stakeholders (Radhakrishna & Veerabhadraiah, 2002), from universities (Acker & Grieshop, 2004; Levander, 2000), and from faculty. The theoretical framework of this study is based on social reconstructionist views of curriculum development (Brameld, 1956). Reconstructionists emphasize the need for curricular relevance to socio-economic development.
Purpose and Objectives

The purpose of this study was to determine faculty perceptions about the courses and contents needed to be developed for an undergraduate agricultural extension curriculum at Cuttington University.

Methods

This survey research was conducted with all the faculty members in the college of agriculture at Cuttington University. There are 15 faculty members in the college and 14 of them participated in the study. The survey instrument used to determine faculty perceptions was consisted of 9 courses related to extension and a four-point scale ranging from 1=not important to 4=extremely important. The validity of the contents of the instrument was established by a panel of experts in agricultural extension. The Cronbach’s Alpha was 0.70 for the of the nine-item scale.

Results

Of the respondents, 31% had Bachelor’s, 46% had Master’s, and 23% had Doctoral degrees. Respondents’ teaching experience ranged from one to 34 years with the mean of 11.5 years. Seventy-three percent of the respondents had taught extension courses. Of the respondents, 83% said extension minor in undergraduate program at Cuttington University is a viable option.

The highest means were reported for courses in communication (3.5), public policy (gender issues and agricultural policies) (3.5), program planning (3.4), and leadership (3.3). The next highest means were reported for rural sociology (theory of adoption and diffusion) (3.2), and program evaluation (3.2). The lowest mean was reported for courses in educational psychology (2.9) followed by managing volunteers (3.0), and adult education (3.1) respectively.

Conclusions

Minor in extension education is a viable option for the undergraduate education at Cuttington University. Agriculture faculty perceived communication, public policy (gender issues and agricultural policies), program planning, and leadership as the most important courses for the extension education curriculum. Rural sociology (theory of adoption and diffusion) and program evaluation are the next most important courses to be considered. Educational psychology, managing volunteers, and adult education are the lowest important courses to be included in the curriculum.

Recommendations and Implication

It is important to develop a curriculum for Cuttington University with a minor in extension education with courses in program planning, communication, public policy, and leadership for preparing students for Liberian needs. Public policy course should include topics related to farmer organizations, role of extension in agricultural development, research and extension linkages, agricultural policy, and gender issues for meeting the expectations of faculty. If program evaluation, rural sociology, and adult education are not offered as separate courses due to resource limitations, it is important to integrate the necessary contents of these courses into the extension curriculum through other courses because these are essentials for preparing
extension professionals. The practical option for this would be integration of the essential contents of these courses into program planning course for teaching these topics.

The findings of this study will help in designing an extension education curriculum appropriate for Liberian situation. Teachers are important partners of curriculum revision (Carl, 2005) and university curriculum development has traditionally been considered the task of the faculty (Oliver & Hyun, 2011). Incorporation of the perceptions of the current faculty about the proposed extension curriculum has strategic importance in tailoring the proposed curriculum for meeting development needs and expectations of the country. Involvement of teachers in curriculum development contributes to greater professionalism and empowerment (Ramparsad, 2001). This is the major implication of this study.

References


Integrating Global Agricultural Experiences that Enable Students’ to Examine the Elements of Culture

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Keywords: elements of culture, food, cultural awareness, cultural competence, study abroad

Introduction
Courses on campus provide limited opportunities to teach cultural awareness; study abroad programs allow the growth of cultural awareness to occur in a real time learning laboratory in an international setting (Black, Moore, Wingenbach, & Rutherford, 2013). Immersing students into different cultures provides students opportunities to learn about different cultures (Sharp & Roberts, 2013). Faculty should offer experiences for students to develop a greater understanding of the diversity between their own culture and the culture they experience through participating in a study abroad (Gouldthorpe, Harder, Stedman, & Roberts, 2012).

Cultural competence requires awareness, productivity, and sensitivity when dealing with different cultural groups or working within a foreign culture (Behrnd & Porzelt, 2012). Delaney (2011) proposed systems of meaning to study when investigating culture, including space and time; language and social relations; body, food, and clothes; life structures; and public myths, religion, and rituals. Food describes how a culture is shaped by their views of eating and body self-image (Delaney, 2011).

Purpose and Objectives
This study was a part of a larger study conducted to assess students’ cultural awareness of Costa Rica upon completion of a study abroad experience. Participants’ responses were elicited in regards to their understanding of food as an element of culture. The study sought to:

1. Describe how student’s examined food as an element of culture; and
2. Describe student’s reflections toward food in Costa Rica as juxtaposed to food in their respective culture.

Methods
The researchers implemented a qualitative research design and purposively sampled twelve (N = 12) participants in Texas A&M University’s study abroad program in Costa Rica. The use of purposive sampling allows researchers to provide greater meaning to collected data in the context of the study (Lincoln & Guba, 1985).
Four semi-structured questions were used to conduct participant interviews. The interviews lasted between 45 to 60 minutes each. Audio recordings were used to collect and accurately transcribe data from the interviews to connect emerging themes.

Implementing triangulation strategies and member checks can achieve data trustworthiness (Dooley, 2007). Researchers used member checks by emailing respondents their interview data and obtaining written confirmation on the accuracy of the interview data. The constant comparative method was utilized by the researchers for dataset analysis. The study’s findings were limited to the twelve participants. However, the data does provide insight into the cultural awareness of participants in Texas A&M University’s study abroad program in Costa Rica.

Results and Conclusions

A qualitative summary is described due to space limitations. All (100%) participants indicated food was an essential cultural element of local communities in Costa Rica. The majority of participants ($n = 11$) indicated snack foods were sold in Costa Rica, but snack foods were less accessible as juxtaposed to their country. Ten ($n = 10$) participants believed fewer processed foods were obtainable in Costa Rica than their country. The majority of participants ($n = 10$) felt the availability of fresh food was a large aspect of the culture in Costa Rica. Nine participants ($n = 9$) indicated food was the common denominator of ceremonies and meetings.

All twelve participants (100%) identified the difference between food grown and sold in Costa Rica versus the food sold in their respective culture. The majority of participants ($n = 11$) suggested individuals in Costa Rica purchased less and consumed less processed foods than people in Costa Rica. Ten ($n = 10$) participants indicated beef was less available in Costa Rica compared to their culture. The majority of participants ($n = 9$) implied citizens of Costa Rica ate more fresh fruits and vegetables directly off farms compared to their culture. Eight of the participants ($n = 8$) believed Costa Ricans were healthier because of the food they consumed than people in their culture.

Recommendations, Educational Importance, Implications, and/or Application

Students’ study abroad experience provided the opportunity to assess Costa Rican culture and compare the culture to their own. International agricultural and extension education faculty should develop and integrate global experiences that enable students’ to examine the elements of culture. Regardless of location, students’ can experience and assess a diverse culture firsthand in order to improve their cultural competencies (Behrnd & Porzelt, 2012).

Understanding the global diversity of culture will best prepare students to be future members of a globally focused workforce and citizenry (Delaney, 2011). Faculty that lead study abroad experiences should go beyond the coursework and examine student’s awareness of the local elements of culture. The data could provide faculty alternative approaches to ensure that students are developing a comprehension of cultural differences (Sharp & Roberts, 2013) and better prepare students to be global agricultural and extension education practitioners.

References


High school students in post-conflict communities in rural Colombia have limited opportunities for post-secondary education and careers. Agriculture provides context for students to learn and apply academic content regarding careers and rural communities (Edwards, 2004; Martinez, 2009). In Colombia, high school students face challenges in rural communities that are difficult and exacerbated because of the historical context of violence in remote areas with limited services and opportunities for post-secondary education (Novelli, 2010). Students in rural areas are less likely to pursue baccalaureate degrees than their cohorts in urban areas (Ramirez & Marin, 2009).

Expectancy-value motivation (Eccles & Wigfield, 2002) and social cognitive career theory (Lent et al., 2005; Lent et al., 1994; Lent et al., 2002) were used as the theoretical framework of the study. As such, students will perform tasks if they expect positive outcomes and consider the task to be beneficial to attaining their goals or fulfilling their interests. The study was situated in a post-conflict context, which has historical, social, political, and cultural influences that can affect the emotions of the people living in the community and confound student motivation.

**Purpose & Objectives**

The purpose of this study was to explore high school students’ motivations regarding a dual-credit University in the Rural Communities program. The research questions were: (1) What were the reasons students enrolled in the program? (2) What were the reasons students dropped out of the program? (3) Among the graduates, what were the students’ motivation to continue their post-secondary studies in local and global contexts?

**Methods & Data Sources**

The exploratory study was conducted with 25 high school students enrolled a 2-year dual-credit program in a rural high school in a post-conflict rural community in Colombia. This was the first cohort enrolled in the new program. The study was situated in a small remote rural
community located 235 kilometers (~10 hours via car) from the University and was located in a post-conflict geographic area that was one of the most violent and hostile guerrilla and paramilitary zones in Colombia.

There were three data sources. First, all students wrote a letter to enroll in the dual credit program. Second, 13 students who dropped out of the program wrote letters explaining why they dropped out of the program. Finally, 9 of the 12 students who graduated from the program participated in a structured interview with a professor of Agricultural and Extension Education. Three students were not able to participate in the interviews because they did not meet the requirements for graduation. Open-coding (Saldana, 2013) was used to identify students’ motivation. All data sources were in Spanish and results were translated into English.

**Results**

Regarding Research Question 1, all 25 students enrolled in the dual-credit program to: (1) acquire knowledge and contribute to the development of their region, and (2) overcome the scars of violence that was stored in their memories.

Regarding Research Question 2, of the 13 students who dropped out of the program, 46\% (\(N=6\)) of the students’ families moved from the school due to the need to seek better economic opportunities, 30\% (\(N=4\)) of the students mentioned they did not see career opportunities for post-secondary education upon completion of the program (i.e., motivation), 15\% (\(N=2\)) of the students assumed responsibilities at home due to family problems, and one student (8\%) joined the military.

Regarding Research Question 3, students (\(N=9\)) who graduated and participated in the exit interview were motivated to complete the program for the following reasons: (1) make personal progress regarding their education (\(N=3\)); develop projects useful for their families and the region (\(N=2\)); improve their lives (\(N=2\)); gain new knowledge, and another student (\(N=1\)); and, happiness (\(N=1\)). When asked about their post-secondary education plans, 77\% (\(N=7\)) mentioned they plan to continue their education at the university.

**Recommendations, Educational Importance, Implications, and/or Application**

High school students who graduated in the dual-credit program had more personalized motivations regarding their education. As such, agricultural educators should prepare students to develop projects for career development, entrepreneurship, and life-long learning. Moreover, high school students who dropped out of the dual-credit program reported reasons due to economic difficulties in the rural community such as the socio-economic living the students and their families experienced during the armed conflict, and the desire to move to a city with the hope of a better future. Therefore, it is important to convince communities that the dual-credit educational program is an excellent opportunity for provide support for the students and families. Future studies should focus on assessing student motivation throughout the educational program so additional career development and student support can be provided at critical moments.

**References**


Are Students Ready for Leadership Positions in Agriculture? Analyzing Followership Styles of Caribbean Agricultural Undergraduate Students

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Keywords: followership, leadership, careers in agriculture

Introduction

Understanding students as followers in the classroom can give educators a more holistic perspective of their engagement and thinking processes and help create and develop relevant courses on topics with a global impact (Bruening & Shao, 2005). This is imperative for those working in an international context because as Ludwig (2007) recommended, students should be better globally prepared and Birner et al. (2009) suggested, the framework of best fit should be utilized in international agricultural education settings to ensure success.

There are two dimensions of followership: critical thinking and engagement (Kelly, 1992). Kelly (2008) described five types of followership styles based on their position in each dimension (see Figure 1). The sheep follower types are classified as dependent, uncritical and passively engaged in the organization. Yes-person followers are dependent and uncritical thinkers but actively engaged in the organization. The alienated followers are independent and critical in their thinking but passive in the organization. Pragmatic followers are moderate on both critical thinking and organizational engagement. Star followers are independent, critical thinkers actively engaged in the organization.
Figure 1. Kelly’s (2008) model of followership

Purpose and Objectives
The purpose of this study was to examine agricultural students’ levels of followership at University of West Indies - St. Augustine. The study sought to:
1. Describe students’ followership style;
2. Describe students’ levels of critical thinking and engagement; and
3. Examine the effect of personal characteristics on followership style.

Methods
The population of this study was \( N = 200 \) undergraduate students enrolled in agricultural courses at University of West Indies - St. Augustine. A combined 28 item instrument including Kelly’s (1992) Followership Style Questionnaire, and questions related to student’s personal characteristics was used to collect data. The Followership Styles Questionnaire utilized a seven-point summated scale with anchors: 7 = Almost Always, 5 = Occasionally, and 1 = Rarely (Kelly, 1992). Content validity of the combined instrument was assessed by leadership researchers at the University of West Indies - St. Augustine, and Texas A&M University. Constructs of the Followership Styles Questionnaire were calculated ex post facto. Critical thinking earned a reliability coefficient of .90 and engagement .88.

The Tailored Design Method for developing and distributing an electronic questionnaire was employed for this study (Dillman, Smyth, & Christian, 2009). One hundred eighteen \( n = 118 \) participants responded yielding a response rate of 59%. Four responses were deleted due to incomplete information, and the resulting 114 responses were utilized in descriptive and inferential statistical data analysis.
Results and Conclusions

The majority of students were Yes-Person followers \((n = 71)\) indicating students did not challenge traditional guidelines of the faculty and the university. There were too few students’ who aligned with star and pragmatic followers to complete further analysis. This finding indicated that the population were engaged followers who are not likely to independently evaluate the trustworthiness of a leader’s decision.

Overall scores for students’ critical thinking at University of West Indies - St. Augustine were \(M = 4.33, \ SD = .72\). The data suggested that students did not occasionally have critical thinking competence. Overall scores for students’ engagement at University of West Indies - St. Augustine were \(M = 5.26, \ SD = .88\). The results indicated students’ were more than occasionally engaged in the course content. The data suggested the majority of the majority of the University of West Indies agricultural students were engaged followers, but uncritical followers in the classroom.

There was a significant difference for Yes-Person followership, \(t(63) = 4.39, p < .05\), with students not preparing to have careers in agriculture having significantly higher means than students that were preparing for careers in agriculture. The effect size was small \((d = .39)\). While still active as followers, those who are not planning on a career in agriculture are less likely to be critical thinkers than those who are planning a future career in agriculture. This could be explained by the often accepted perception that corporate workers must support the leader without challenging the leader’s ideas. The industry of agriculture is based on the need for constant learning and experimentation, thus engaging critical thinking in followers.

Recommendations/Implications/Educational Importance/Impact on the Profession

International agricultural and extension education practitioners and researchers seek answers on how current and future students can be better prepared for teaching and leadership roles in the global agricultural community (Ludwig, 2007). Students’ level of followership around the globe should be studied to better understand followership styles and how the styles may relate to students preparing for careers in agriculture. The data could assist international agricultural and extension education faculty develop applicable courses with content that teach students critical thinking skills (Bruening & Shao, 2005) to positively impact the global agricultural community.

References


Reversal in Study Abroad: A Case of Tokyo University of Agriculture Summer Study Program in Michigan

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Keywords: Summer Study Abroad, evaluation, sustainable agriculture

Michigan State University (MSU) and Tokyo University of Agriculture (TUA) have worked in partnership since 1966 and in 2007 commenced a summer study program in which MSU serves as host to 10 to 15 students and their faculty escorts. The role that Michigan State University has taken is one that reverses the traditional role of the university in a study abroad program. In a collaborative effort between the two schools, TUA is responsible for student selection and academic credit, while MSU faculty and staff take responsibility for the program content. Every year the program consists of lecture presentations and site visits that include introductions to American culture, agriculture and natural resource management; as well as field trip experiences to Chicago, Detroit and the Great Lakes. All presentations are delivered in the English language. This past year students had an opportunity to visit both the MSU Student Organic Farm and a conventional American farm, offering them a look at contrasting, innovative and environmentally sustainable farming practices in the United States.

Both universities are committed to bettering the experience for the students, to this end, an evaluation is conducted and is used to guide the improvement of the program. This paper will report the findings of the most recent evaluation and how it guides improvements in the program. The purpose is to inform on ways MSU has worked with TUA to make this study abroad experience educational and enriching for both visiting and local students and faculty.

A summative evaluation of the 2013 summer study program consisted of two questionnaires with both open- and closed-ended questions. The first was given prior to departure from Michigan State University, and the follow-up was sent electronically to all students and their faculty escorts approximately one month after the completion of the program. The exit survey used a combination of Likert scale and open-ended questions to obtain feedback about the program as a whole and whether students felt the objectives of the program were met. The follow-up survey asked about the specific presentations, activities, accommodations and length of program, and how valuable each was to the students. Additional information was gathered from program faculty through informal interviews.

Response rates were 100% for the first survey and 85% for the follow-up survey. The lead faculty escort offered input through informal interviews. Results show that overall, participants enjoyed the experience offered by the 2013 TUA/MSU Summer Study Program and gained valuable knowledge. In relation to the objectives of the program, four study themes were identified and the participants were asked how their understanding changed with respect to the
various themes. A Likert scale of 1, “Not improved” to 4, “Greatly improved” was used and the mean responses ranged from 2.9 to 3.6 (S.D.’s 0.49 to 0.73) indicating overall improvement in understanding of the program themes. Student responses were also elicited to several statements about the summer study program as a whole. Again, a Likert scale was used with a 1 meaning “Strongly disagree” to 5 meaning “Strongly agree” with the statement. Response means varied from 3.9 to 4.8 (S.D.’s 0.44 to 0.86) revealing a general satisfaction with the program components. The results of the follow-up survey about the specific components reflected positively on all of the presentations and activities (means ranged from 3.1 to 4.5; S.D.’s 0.89 to 1.29). The favorite presentations and activities included the farms that were visited and the cultural trip to Chicago.

Open-ended responses allowed for extraction of details that could not be discovered with closed-ended questions. The major themes were around the food – both variety and amounts, the busyness of the schedule, and the site visits/field trips.

The lessons learned were that there is a need to reduce the number of activities and to be more culturally sensitive to the dietary needs of the group. Programs such as the TUA/MSU Summer Study offer dynamic opportunities with a different format than the traditional study abroad experience and allow students to compare the sustainable agriculture practices being implemented in American agriculture. It is the collaborative and cooperative relationship between the universities that is evident in the way this program is planned and in the successful outcomes felt by the students that make this program an example worth replicating. Each year, this program is modified according to survey results. This year we will carefully reconsider each presentation and field trip to restructure for the coming year and provide more interactive time for the students.

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Keywords: Africa, Development, Higher Agricultural Education, Needs Assessment, Q-Sort Methodology

Abstract

National Assessment for Higher Agricultural Education in South Sudan

A widening gap separates more developed countries, developing countries, and least-developed countries with regard to quality education. Without a critical mass of skilled and knowledgeable people, no country can hope to achieve self-development, self-sufficiency or self-direction.

Education in agriculture, natural resources, and environmental sciences contributes to public good. Higher education contributes even more. South Sudan has latent resources—human, economic, political and physical—that can increase food security, foster peacebuilding, improve human wellness and enrich the economic wellbeing of its people.

However, this potential is unrealized.

Worldwide, high performing universities have defining attributes. Recognizing these attributes is a first step toward development. Sequencing and harmonizing the attributes are essential steps for effective and efficient development.

Purpose and Objectives

A structured analysis identified attributes associated with high performing universities. This research intended to sequence and harmonize attributes as a path to improve higher agricultural education in South Sudan.

Objectives included—1) the development of a framework to adopt and sequence high performance attributes, 2) understand indigenous knowledge and values as a 360° perspective, 3) seek consensus of a processes for development, and 4) leverage collaborative solutions that improve the scope of work, enhance the quality of the curriculum, speed the adoption of innovation, and empower stakeholder ownership.

Methods and Data Sources

Four phases guided the research—1) process development, 2) data gathering, 3) preliminary hypotheses and analyses, and 4) recommendations for program planning and execution. The assessment included teaching, research, and community outreach functions.
The selection of participants used a snowball process “. . . through referrals made among people who share or know of others who possess some characteristics that are of research interest” (Biernacki & Waldorf, 1981, p.141).

Participants coalesced as six peer groups—administrators, faculty members, students, government administrators, indigenous entrepreneurs, and NGOs.

A pre-critical path method (PCPM™) uniquely deployed three tools by which to understand priorities, harmonize opinion and to sequence development activities.

Q-methodology rank-ordered attributes. Using an individual 6.5 x 11cm card format, attributes were ranked to sequence the position in the development process.

A seven-point Likert-type scale categorized statements according to agreement of contribution to development. Each statement was printed on a 6.5 x 11cm card.

Finally, a semi-structured interview recorded the influences of crosscutting constructs.

**Results, Products and Conclusions**

The 74 participants were members of an extended higher education community to whom others in their peer group often turned for advice, opinions, and views.

Among six peer groups, there was diversity of viewpoint for sequence and varying levels of agreement among 14 attributes and 50 linked statements. Summing data from six peer groups may mask under represented viewpoints. However, participants concurred that in any sequence, four well-ordered attributes should begin the development path—1) improving instructional technology and library resources, 2) improving technological infrastructure and facilities, 3) improving outreach, community development and extension, and 4) improving administrative services. The fifth attribute, improving research, development and innovation, followed but with slightly more divergence in viewpoints.

Greater diversity among groups was voiced when charting the next four attributes—6) increasing institutional capacity building, resource management, sustainability, 7) providing short-term human capacity building and short-term staff training, 8) improving curriculum development and design of academic programs, and 9) addressing gender issues.

Three attributes followed in the later phase of development—10) providing long-term human capacity building & long-term training, 11) improving faculty teaching, scholarship and writing, and 12) developing student leadership and student services. Peer groups held diverse views when sequencing the two remaining attributes—13) improving environmental practices, and 14) engaging stakeholders, donors, and partnerships.

The qualitative interview brought understanding of personal relationships within higher education and the context in which the participant lived and worked.

There was substantial diversity among peer groups regarding the perceptions of four crosscutting constructs. Understanding this diversity provides opportunities for dialogue, collaboration, considering alternative futures, adopting change strategies, and promoting sustainability.

**Summary and Implications**

Stakeholders accepted and embraced attributes associated with high performing universities. Participants were able to establish priorities, coalesce around themes, and appeared willing to reallocate resources to sequence pathways, improve communication, and encourage collaboration.
Participants universally expressed deep commitment to higher education and had sound rationale for development strategies. If skillfully integrated and articulated, diversity offers energy and innovation. Dialogue, trust and teamwork are crucial ingredients for development. Sequencing activities requires transactional communication with strong linkages between the source, message, channel, and receiver. It is the responsibility of leaders to seek pathways to narrow the educational gap while increasing self-development, self-sufficiency or self-direction.

However, in the aftermath of the violence that began on December 15, the pathway to narrowing the gap separating more developed countries from least-developed countries with regard to quality education became much more perilous.

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Critical Thinking Evidenced During a Ten-Day Graduate Study Abroad Experience

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Introduction
“Globally competent students will become globally competent citizens” (Russo & Osborne, 2004). Study abroad experiences can significantly influence a student’s life. Through these experiences, students are able to gain important skills that can help enhance their ability to relate to others through increased intercultural skills and communication. Additionally, students’ ability to reason through critical thinking skills can be directly influenced through their participation in these experiences. Study abroad programs promote the development of both creative thinking and critical thinking (Ngyuen, 2012).

Literature Review/Theoretical Framework
Dwyer and Peters (2004), found participants’ personal development, academic commitment, intercultural development, and career development were all enhanced through their participation in study abroad experiences, the same skills required for critical thinking.

In order for students to reach their full potential in society, it is important for them to be able to learn to think and reason critically (Meyers, 1986 in Irani and Lamm, 2011). Students proficient in critical thinking seek opportunities to use reasoning, are aware that problems are complex, and are open to varying points of view. Lastly, they are intellectually curious and innovative.

With these personal dispositions are six skills with additional sub-skills considered to be essential for critical thinking. Those skills include Interpretation; Analysis; Evaluation; Inference; Explanation; and Self-regulation (Facione, 1990). Study abroad can enhance many, if not all of these skills.

Purpose
The purpose of the study was to determine the use of critical thinking skills evidenced by graduate students on a study abroad trip in Trinidad Tobago.
The objectives established to address the purpose of the study are as follows:

1) to identify reflective statements associated with each of the five critical thinking skills and
2) to determine if over the course of the ten day trip if different CT skills were used.

Methods
The researchers chose a qualitative design using constant comparative methods (Glaser & Strauss, 1967), to create themes from journal entries of the study participants. The journal entries were the result of a ten-day study abroad trip to the island of Trinidad Tobago. The required journal entries included a variety of questions on student perception of their observations of culture and their learning.

Using the critical thinking skills outlined by Facione (1990), one researcher categorized journal reflection statements of participants. Coded statements were then evaluated by a second researcher for consistency, followed by a third researcher who was part of the faculty coordinating the trip. All three researchers agreed on the categorization of the statements.

Findings
For the first objective, statements were organized by theme or critical thinking skill evidenced in the journal entries. Of the 235 unique statements categorized, 104 were identified as interpretative. Examples include, “Also, the barbed wire setting has been seen throughout the city: a segregation of populations and properties,” (3) and “I thought it looked a lot like American small airports.” (4). Students also used the skill of inference during their trip with 66 unique statements in this category. Examples, included “he is very proud of the agricultural practices that go on,” (1) and “It seemed like everyone was pretty open to sharing” (4). The skill of self-regulation had 15 entries, including “I was probably naïve in thinking that everyone would be welcoming and accommodating…” (6) “My perceptions changed because I was able to personally experience it” (8). The least used skill was evaluation.

The intent of the second objective was to identify if the students’ used different critical thinking skills during the trip. Initially, and then most consistently used was the skill of interpretation. Many initial reflections were how Trinidad and Tobago compared to the U.S., but as the trip came to close and students had more experience to reflect, the skill of self-regulation was more prominent. The thought of heading back to the states prompted more thought into how the overall trip changed their previously held perceptions.

Conclusions
Students often need prompts to fully engage and utilize their critical thinking skills. This study provided that the use of specific consistent prompts permitted students to more thoroughly engage in their meta-cognition process through the use of critical thinking skills. Critical thinking can be influenced through a study abroad trip and the manner in which students examine their perspectives is greatly impacted by a rich cultural experience. This is consistent with the initial work by Ngyugen (2012) and promotes the use of study abroad experiences as a means to enhance career skill development (Dwyer & Peters, 2004).
Resources


Transforming Nigeria’s Agricultural Sector through Youth Entrepreneurship Development: Issue, Prospects and Implication for International Agricultural and Extension Education

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Introduction

After a long period of declining investments in African agriculture due in large measure to disappointing results from that past investments, there is a new realization that higher investments would be needed in order to achieve the goals of rural poverty reduction, and increased agricultural production and food security (FAO, 2009). With increased leadership from African governments and experts, a new paradigm for African agricultural development one characterized by a shift from public to private sector led investment, is beginning to emerge, African governments are also making a concerted effort to attract the millions of Africa’s highly educated and unemployed youths into agricultural enterprises. According to Ngogi (2012), a food-secure and economically prosperous Africa can only be achieved by marshaling the talents and energy of a new generation of agricultural scientists, extension professionals, and entrepreneurs across the agricultural value chain.

This paradigm shift represents both a challenge and opportunity for reforming agricultural and extension education if it is to remain relevant under the new dispensation.

Purpose and objectives

The purpose of the study was to identify the prospects and constraints facing young agricultural entrepreneurs in Nigeria and draw implications for integrating entrepreneurship education into agricultural and extension education programs. The study has the following specific objectives:

1. Identify and describe the agricultural entrepreneurship ecosystem in Nigeria.
2. Describe the demographic characteristics of young agricultural entrepreneurs in Nigeria.
3. Analyze the prospects and constraints faced by these young agricultural entrepreneurs in Nigeria.
4. Propose a role for agricultural and extension education for promoting agricultural entrepreneurship.

Methods and/or data sources

The study adopts a descriptive survey methodology. Its theoretical foundation is undergirded by the Isenberg (2013) six domains of entrepreneurship ecosystem, namely
conducive entrepreneurial culture, an enabling macro-policy and leadership, a robust finance infrastructure, investment in human capital, market infrastructure, and infrastructural support. The study population consists of a total of 1200 young entrepreneurs who received funding under the Nigerian Federal Government’s Youth Enterprise with Innovation in Nigeria program (YOUWIN). In collaboration with the Small & Medium Enterprise Development Agency of Nigeria (SMEDAN), 450 participants were randomly selected to participate in an online survey. A total of 362 respondents completed the survey presenting, 80% response rate. Both descriptive and inferential data analysis were completed using the SPSS package. A Cronbach reliability coefficient of .80 was obtained, indicating a highly reliable data.

**Results and conclusions**

The paper will report the following results:

1. Distribution of the young agri-entrepreneurs by gender is 66% male and 34% female, all of whom had at least a college degree with several holding graduate level degrees.

2. Respondents exhibited a higher level of agricultural enterprise diversity with 54.3% in manufacturing (agro-processing), 21% in service and 24% retail. Majority of the enterprises was less than 5 years. Forty percent of respondents had secondary source of income. Sixty-seven percent of respondents mentioned lack of formal employment as the reason for starting a business.

3. Nigerian young agricultural entrepreneurs ranked the following as constraints in the Nigerian agri-enterprise ecosystem: lack of financial infrastructure-59.4%, poor market and competitiveness- 58.5%, human capital- 52%, technology 51.9% and poor entrepreneurship infrastructure and institutions- 39.6%.

4. Identified entrepreneurship training needs: financial management (87%), agricultural supply chain (82%), sales and marketing (78%), personnel management (62%), and technology (62%)

**Recommendations, Conclusions & Implications**

Agricultural and extension education has a role in resolving several of the identified institutional constraints and training needs in the area of youth agricultural entrepreneurship development. Other scholars have recommended a role for extension in agri-entrepreneurship development. Shinn, et al. (2009) in their Delphi study to forecast the Doctoral-Level Content in International Agricultural and Extension Education included knowledge of business organization and entrepreneurship. Muske & Stanforth (2000) also noted that for future planning, it is important that the Cooperative Extension Service look at prospective demand for entrepreneurship education.

In addition to its traditional focus on pushing productivity-enhancing technology among Africa’s subsistence small-holder farmers, agricultural and extension education programs must incorporate agri-entrepreneurship value-chain development. This paper hopes to stimulate a vigorous discussion about the future role for extension service delivery under the new African agricultural development paradigm.

**References**


Exploring the changing university-based extension and small farmer relationship: A comparison of two systems

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Introduction
Various program models have been utilized across the world to enhance the agricultural productivity of nations (Bernet, Ortiz, Estrada, Quiroz, & Swinton, 2001). The United States and Scotland both use extension services to provide the knowledge generated within agricultural universities to the community, transforming the results of research into practical products for clients at the local level. In these countries, federal extension programming is conducted through university-based agricultural institutions (the U.S. Land-Grant University system and Scotland’s Rural University College [SRUC], respectively).

Each state extension service in the U.S. is currently funded through some combination of federal, state and local tax dollars. However, extension services in Scotland have been forced to transition from a publicly-funded system to a semi-privatized system within the last 30 years. Since many who question continued public funding for extension in the U.S. are looking for alternative funding sources to offset the perceived taxpayer burden, a comparison of the two systems is apropos (Nagel, 1998; Rivera, 1991).

Additionally, several extension systems researchers have called for extension services to utilize suitable methods when attempting to meet the needs of audiences which fall outside the “progressive farmer” paradigm (Albrecht, 1983; Röling, 1988; Somers, 1991). One such audience in the developed world is the small-scale farmer. In many communities, small-scale farmer groups have quite heterogeneous information needs, seeking advice about various products being raised under variable circumstances (Manganyi, Hartmann, Hildebrand, McGuire, & Russo, 2006; Robotham & McArthur, 2001).

Purpose and Objectives
This research investigated the existing relationship between small-scale farmers in one southeastern U.S. state and Scotland and their respective university-based agricultural extension/advisory system. Using social field theory, this study examined how the discourses generated by the participants revealed the nature of the social fields that exists within each of the systems.

Methods and Data Sources
Since the attitudes and perceptions of both local small-scale farmers and local extension agents are capable of enhancing or undermining the relationship, perspectives from both were collected using in-depth dyadic person interviews (Morgan, Ataie, Carder, & Hoffman, 2013). Cases for this study include:

1. Scotland:
   a. Small-scale farmers in five locations across Scotland’s main agricultural corridor and Scottish crofters who live in five locations across the Highlands and Islands, and
   b. The SRUC extension agents who provide services for those areas.
2. A state in the southeastern U.S.: Small-scale farmers and extension agents in 10 counties that represent a diversity of challenges to agricultural practices.

**Results and Conclusions**

The data was analyzed using discourse analysis (Gee, 2011; Phillips & Hardy, 2002) and cross-case synthesis (Yin, 2009). A thorough examination of the language used by all participants was conducted for each case, highlighting words and phrases that signaled the creation of significance, identities, relationships, politics, and connections that illuminate the nature of the social field that exists between the small-scale farmers and their local extension service. For each interaction nexus, both cultural and social aspects were examined. In Scotland, the agricultural traditions of the “farming community” remain completely intact throughout the case, with high levels of camaraderie and social networking existing both horizontally and vertically to the national government level. In Florida the “farming community” remains intact in locales with strong historical agricultural traditions; however, as a case, the state findings suggest that the social network scaffold for small-scale farmers tends to exist only horizontally, with occasional vertical interactions with county level services and even fewer with the state specialists. Many of the small-scale farmers interviewed in Florida felt that their individual interests and needs did not align with the services being provided through the extension service. In Scotland, the small-scale farmers interviewed had interests and needs that aligned with the services being provided; however, external factors beyond the control of extension (e.g., tenancy, tenure, the Common Agricultural Policy [CAP]) limited the ability of these farmers to use many of the services.

**Educational Importance**

Extension is often called upon to enhance the overall social and human capital within a community, as well as provide agricultural research and resources. Within the Scottish model, it is evident that a strong social field has remained intact over the 30 years the semi-privatized system has had to evolve. Having paid for services, small-scale farmers in Scotland held higher expectations for services that would be received, while demonstrating a shift in role and identity. As county extension services in Florida continue to face the proverbial chopping block, it may be time for Florida Extension to consider the lessons learned from the Scottish model.

**References**


Introduction

While technological revolution has shrunk the percent of the US population involved in agricultural production, paradoxically, demographic factors have increased its diversity. Reflecting the overall demographic trend in the entire US population, the 2007 Census of Agriculture showed that Hispanic farmers are the fastest growing segment of the US agricultural population with an estimated 82,462 Hispanic operators on 66,671 farms and ranches across the United States. This implies that the growth of the US agricultural industry will increasingly depend on providing Hispanic farmers with the necessary agricultural support services to enhance their productivity (Swisher et al., 2007).

However, data from several studies show that Hispanic farmers are underrepresented in access to agricultural support services including loans, extension services and other infrastructure support. For instance, Saldaña et al. (2005) reported an extension access parity of 69.3% for Hispanic farmers as a proportion of the population in Texas. Ariza and Suvedi (2009) reported discrimination, lack of information about agricultural agencies and lack of economic support to Hispanic farmers in Southwestern Michigan in gaining access as constraints. Given the demographic reality of a growing Hispanic population in the United States, identifying the constraints faced by these and other minority farmers is not just an issue of equity, but also one of maintaining the United States’ competitiveness in the global food supply chain.

Purpose and Objectives:

The purpose of this study therefore was to analyze the social, economic, demographic and institutional challenges faced by Hispanic and other minority farmers in South Florida in accessing extension and other support services for environmentally and economically sustainable agricultural production. The authors then propose institutional and human capital reforms to overcome these challenges.
Methods and/or Data Sources:
The theoretical framework for the study is the Institutional Analysis Model proposed by Ostrom (2005). Using a descriptive methodological model, a structured questionnaire in both English and Spanish was developed for data collection. Using available database from the Florida Nursery Grower & Landscape Association (FNGLA) and the Cooperation Extension Service, a random sample of 75 producers belonging to the demographic groups of interest was selected. Using a combination of mailed and hand-delivered questionnaires, a total of 40 respondents participated in the study, representing approximately 53%. The low response rate is emblematic of the challenges of engaging hard-to-reach minority farmer population. The SPSS statistical package was used in data analysis. A Cronbach reliability coefficient of 0.85 was obtained affirming the reliability of the data.

Results and conclusions:
The authors reported the following major findings:

- Over 73% of minority farmers in South Florida are Hispanics, 83% male, with 45% aged 50 years and older. Mean farm size is 17 acres with wide variance in acreage cultivated. Average farming experience is 15 years. Reflecting national trend, no African Americans were represented in the sample.

- The dominant commodity is tropical ornamental, followed by winter vegetables and tropical fruits.

- Major sources of loans are local bank (50%), family saving (33%), USDA FSA (11%).

- Sources of farm information in order of importance are: Florida Nursery Grower Association (55.6%), other farmers (39%), Internet (39%), Farm Bureau (28%), Farm Supply Companies (22%), and extension (22%).

- Institutional constraints include: lack of information about government programs (71%), foreign competition (71%), lack of access to loans (71%), unreasonable requirements to access government programs (61%), distrust of governmental institutions (22%) and discrimination against minority farmers (17%).

- Identified training needs: Information about government loans and programs (71%), compliance with government regulation and paperwork (71%), niche market and supply chain information (64%), access to foreign markets (50%).

- Hispanic and other minority farmers in South Florida in comparison with the majority population rely more on non-governmental agencies than governmental agencies for agricultural information and other support services due to institutional constraints.

Recommendations & Implications for Agricultural & Extension Education

- Realign agricultural support institutions to make them more congruent to the unique socio-economic, linguistic and demographic realities of minority farmers.

- To sustain its relevance, the extension service needs to intensify efforts to develop programs specifically targeted at minority farmer population.

- Tertiary institutions must address as a matter of urgency the underrepresentation of minority group in agriculture majors and strengthen their collaboration with Hispanic Associations of Colleges and Universities (HACU) and other minority serving institutions.
Finally, and effort to engage with minority farmer must go beyond a one-size-fit-all approach and would require structural changes in the operation of formal government institutions.

References
Smallholder Farmers’ Access to Extension Services under Privatization Policy: A Study of Misenyi and Kilosa Districts in Tanzania

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Keywords: Agricultural Extension, Pluralistic and demand-driven, Privatization of Extension

Introduction

Agricultural extension faces the challenge of establishing a well-managed, effective, and accountable system that meets the needs of hundreds of thousands of farmers engaged in diverse and complex farming systems (Feder, Willett, & Zijp 2001). Tladi-Sekgwama & Tselaesele (2010) stated that in some African countries extension systems face recurring problems dating back to colonial times. Davis (2008) noted that many African extension models have failed to meet their goals effectively and Oyaro (2010) added that Sub-Saharan Africa (SSA) is characterized by an “extension work sector that is failing to make the grade” (p. 2). Various reforms have been instituted in order to improve extension including promotion of pluralism, emphasizing multiple and diverse partnerships between public and private sectors (Nadhy, Byekwaso & Nielson, 2002; World Bank, 2002). The key issue of creating a pluralistic service is a need to find an appropriate ‘mix’ of public and private funding and delivery mechanisms for extension, which will achieve differing agricultural goals and serve diverse target populations (Anandajayasekeram et al, 2008).

Although the new private extension initiatives offer many opportunities for commercial farmers, there is less certainty about the implications for resource-poor farmers. In 2000, Tanzania adopted the privatization policy in order to strengthen agricultural extension (Rutatora & Mattee, 2001). This study therefore found it a right time to assess the extent to which the smallholder farmers have been able to benefit from the new policy 13 years after its implementation.

Purpose & Objectives

The purpose of this study was to describe the performance of pluralistic and demand-driven
extension system in Tanzania. The specific objectives were to:

1. Describe the level of innovativeness of smallholder farmers in the study area;
2. Describe the degree of contact between smallholder farmers and extension workers in the study area;
3. Describe the nature of contact in #2 if it is the result of performance by public sector extension, private extension or both.

Methods

This study conducted in June-July 2013 was based on the pluralistic and demand-driven approach as a philosophical theme. The study was conducted in two districts, Kilosa and Misenyi in the Morogoro and Kagera regions respectively in Tanzania. Three hundred smallholder farmers, 150 from each district were randomly selected to participate in the study. Data were collected through household interviews using a semi-structured interview schedule. A panel of experts (Professors) from the Ohio State University validated the research instrument which was then field tested in the study area for its reliability. The descriptive data analysis was done using the SPSS software.

Results and conclusions

Findings of the study are summarized under two themes: a) farmers’ level of innovativeness; and b) their access to extension whether public or private. With respect to the smallholder farmers’ level of innovativeness: of the 300, only 24 (8%) used improved seed while the rest recycling the seeds from previous harvests; 31 (12%) applied chemical fertilizers and 98 (33%) applied organic fertilizer/manure, while the remaining 171 (57%) applying nothing; 61 (20%) followed recommended spacing; and only 8 respondents (3%) used a tractor to cultivate their farms while the remaining using hand hoe. In short, the level of innovativeness of farming is extremely low.

On extension contact: of the 300 farmers, 207 (69%) reported knowing what an extension worker does; only 21 (7%) knew their extension workers; 98 (33%) knew where the nearest extension office was; more than half (55.3%) had never seen an extension worker; and of the 134 who were visited, 101 (75.4%) were served by government or public sector extension agents while the rest (24.6%) did not know whether the agent was a government or private extension worker. None mentioned a private extension worker. In summary, smallholder farmers hardly receive face-to-face extension contact.

Recommendations, educational importance, and implications

The educational importance of this study is that Tanzania has had extension since independence in the 1960s yet there is still no contact between smallholder farmers and extension workers, yet in a country with limited mass media availability, extension workers remain the primary source of innovative information for farmers. Extension contact is critical to adoption of innovations and therefore, lack of extension contact implies farmers’ inability to adopt modern farming methods. There is need to examine why the new extension policy is not working in Tanzania. There is a need to examine how the use of mass and social media can enhance extension impact.

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Resurrecting the Death of Agricultural Extension in the Philippines: Will Renationalization Revive It?

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Keywords: agricultural extension, decentralization, local governance, renationalization, agricultural extension workers (AEWs)

Introduction

The death of agricultural extension in the Philippines, literally and figuratively, is an expression of personal observation over the declining scholarship and practice of public agricultural extension in the Philippines for the past thirty years. The demise of efficient and effective agricultural extension service in the country – compared to its heydays in the 1960s and up to early 1980s – is brought by a complex and multi-dimensional factors entrenched at the national and local level of governance. The perennial top-down approach of managing extension programs and the subservient attitude exacerbated by the lack of strong political voice among the country’s frontline workers – the agricultural extension workers (AEWs), perpetuate a culture where dialogue for reforms and innovation is almost nil. The abolition of the Bureau of Agricultural Extension (BAEx) in January 1987 and the subsequent decentralization of agricultural extension through the Local Government Code of 1991, have further demeaned the extension service in the country.

Purpose and Objectives

The purpose of this paper was to review the existing impact assessment/evaluation literature pertaining to the decentralized agricultural extension in the Philippines. The literature is then compared with a case study that examined the performance and impacts of decentralized agricultural extension in the provinces of Eastern Samar and Leyte, Philippines. The comparison between studies conducted since 1994 and a case study conducted in Eastern Samar and Leyte in 2011, will determine whether over time, the perception of stakeholders remain supportive to decentralization or it withers in favor of renationalization.
Method
Fourteen studies conducted from 1994 to 2010 were reviewed to summarize the advantages, issues and challenges of a decentralized agricultural extension. The conclusions and recommendations of these studies were further reviewed to examine the trajectory of decentralized agricultural extension over the years. The review of literature was complemented by a survey comprised of 141 AEWs from the provinces of Eastern Samar and Leyte, Philippines. The survey sought the perception of AEWs on renationalization including the advantages and disadvantages of decentralized extension.

Results and Conclusions
The study suggests that from 1994 to 2010, the issues and challenges were similar which ranges from lack of funding to politicization, and from weak-extension research linkage to lack of capacity building for decentralized AEWs. The survey results, on the other hand, suggests that 88% of the AEWs (n=141) from both provinces agree for the renationalization of agricultural extension. The clamour of the majority of AEWs from both provinces to be renationalized reflects the various constraints they have identified under a decentralized system of agricultural extension – 1) insufficient funds of provincial and municipal governments to support agricultural extension programs and services, 2) massive partisan politics that hampers the objectivity of programs, and 3) demotion in rank and salary of AEWs. The 3 major advantages of decentralized agricultural extension identified by AEWs include 1) easier management of agricultural extension programs/projects, 2) localization of AEWs, and 3) timely release of salaries. The 3 major disadvantages on the other hand are: 1) political interference, 2) no salary increase/low salary, and 3) insufficient funds at the local government units. While decentralization concepts and principles have been adopted as guideposts in the delivery of extension service, there seems to be a vague understanding and interpretation of the Local Government Code of 1991 particularly from the local chief executives in the provinces, cities, and municipalities. The misunderstanding and misinterpretation of the Code by the governors and the mayors have brought deliberate and unintentional outcomes of decentralized extension resulting to mediocre services, politicized agricultural programs, demoralized AEWs, and negative impacts on the productivity, income and well-being of smallholder and marginalized farmers.

Recommendations and Educational Importance
The study recommends for a nationwide survey on the impact of decentralized agricultural extension to inquire on whether other AEWs in other provinces agree for the renationalization of agricultural extension. Other recommendations include creating a national organization of AEWs, complementation of fiscal resources from national and local governments, inter-local cooperation among provinces and municipalities to complement resources at the local level, pilot testing of an academe-based extension similar to US Cooperative Extension Service, and continued dialogue among stakeholders to enhance the impact of agricultural extension in improving the well-being and economic conditions of farmers and rural communities regardless of whether agricultural extension is decentralized or not.

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Introduction

Globalization has created an increasingly important need to understand leadership preferences in cross-cultural contexts (Kanter, 2010). Even though research has shown aspects of leadership vary from one culture to the next (Scandura & Dorfman, 2004) much of what we currently know about leadership pertains to Westernized contexts. It is imperative for those engaged in international development efforts understand the intricate nature of leadership in different countries and how one’s leadership style can help or hinder developmental efforts.

While there is a multitude of leadership theories to choose from when analyzing a population, Barbuto & Etling (2002) recommend international extension educators focus on current empirically investigated theories. Transformational leadership is one of those theories. A transformational leader is one who invests in their followers and transforms them into leaders (Avolio, 1999; Bass & Avolio, 1990; Bass & Bass, 2008). Authentic leadership is another theory international extension educators could utilize in development efforts. Authentic leadership states one must match espoused values with actions (George, 2003).

Purpose

Understanding the indigenous systems of an area, including its leadership structure, is key in the international development process (Alonge, 2002). This is often an issue for international development educators because they lack the necessary leadership education and development training to accurately assess the leadership needs of the selected population (Barbuto & Etling, 2002). The purpose of this case study was to determine the perceived leadership needs of a specific non-profit NGO. The Health, Education, and Literacy Program (H.E.L.P.) is a faith based, non-profit, non-governmental (NGO) organization founded in 2005. H.E.L.P. manages a primary school and Care Center (orphanage), while carrying out a variety of functions including digging water wells (helpwestafrica.org).

Methods

In accordance with the understanding of implicit and culturally endorsed implicit leadership theories, this case study holds to the constructivist paradigm of research. From this perspective, leadership phenomena are believed to only be understood in the context in which it occurs (Klenke, 2008; Patton, 2002). Operational construct and intensity sampling of H.E.L.P led to the
creation of a selection criteria which yielded 13 Nigerians staff or board members, from the Yorba ethnicity.

Interviews were semi-structured, open ended, and conducted in person to allow for rich data collection. The researcher recorded each interview with an audio digital recorder and took hand-written notes. To ensure internal validity and dependability, triangulation of the data included both methodological triangulation and data triangulation (Merriam, 2009). Raw data from transcripts and document collection yielded 261 units of data, which were openly coded. The data units were then inductively analyzed and grouped into general themes (Merriam, 2009).

Results and Conclusions

Data analysis showed the overarching leadership theme perceived to be effective by the Nigerian members of H.E.L.P. was love. There were several aspects of a loving leader divided into higher and lower order themes. The higher order leadership themes were: not being harsh with followers, being honest, taking followers on as their own children, mentoring, and having faith in God. The corresponding lower order themes were: offering encouragement, being humble, involving others in decision-making and through delegation, setting a good example, and serving followers.

It can be concluded that the Nigerian members of H.E.L.P want a leader who is relationship oriented and take an active role in their lives. This corresponds with two leadership theories: transformational leadership and authentic leadership. The specific themes of mentoring, humility, honest, good example, not harsh, encouraging, takes followers on as their own children, and involves others correlate to the four factors of transformational leadership (Avolio, 1999; Bass & Avolio, 1990). The overarching theme in the Nigerian leader profile of love is actualized in the heart component of George’s (2003) model of authentic leadership.

Recommendations

In order for international development leaders to be effective, it is essential for those agents to understand the indigenous leadership context (Alonge, 2002; Kanter, 2010; Muczyk & Holt, 2008). A mismatch of leadership style with follower acceptance of the style can have detrimental consequences in the transfer of competencies (Bass & Bass, 2008). This case study lays a framework for understanding perceived effective leadership in a specific context, a faith based, non-profit NGO in Nigeria. By analyzing the leadership context through a theoretical lens, curriculum design can be implemented to “optimize leaders’ experiences and learning opportunities” (Barbuto & Etling, 2002, p. 21). While this study cannot be generalized, it could be replicated by others in the field who are interested in matching leadership style to the leadership style wanted by the target population, thus being better able to educate those being served.

References


Bt Cotton Adoption in Shandong Province, China

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Introduction
Bt cotton adoption in China has been a successful example of genetically modified (GM) crop adoption (Ledermann & Novy, 2012, Smale et al, 2006). From 1997 to 2010, the Bt cotton planting areas grew from 2,000 hectares to 3.45 million hectares (James, 2010). Based on Rogers’s (2003) theory of diffusion, the innovation-decision process includes knowledge of an innovation, forming an attitude, decision of adoption or rejection, implementation of the innovation, and confirmation of the decision. The purpose of this study was to understand farmers’ decision-making process of adopting Bt cotton in Shandong Province, China; specifically the factors that motivated and obscured the innovation-decision process.

Methods
An analytical survey, using directly administered questionnaires with farmers who grew cotton in Shandong province was conducted. Both close- and open-ended questions
were asked. A three-stage random sampling procedure was applied. A total of 120 farmers were interviewed with 88 full responses (73%). The questionnaire included questions about farmers’ demographics, whether or not they were satisfied with Bt cotton performance and their concerns about Bt cotton. Quantitative data was analyzed using descriptive statistics. Open-ended responses, originally in Chinese, was translated into English. Open-ended responses were coded according to the number of times similar comments were mentioned. Similar comments were put into themes and reported.

**Results**

Farmers who grew Bt cotton were highly similar in terms of their education level, satisfaction with Bt cotton performance, concerns about Bt cotton and their seed/cotton purchasing behaviors. Overall, Bt cotton farmers had very little knowledge about Bt cotton, except that it was called “pest-resistant cotton.” Farmers adopted Bt cotton within one year of observing the performance of Bt cotton. At the time, a problem with bollworms was so severe that as soon as farmers saw how well Bt cotton performed against it, they made the decision to adopt. The percentage of farmers that rated Bt cotton as satisfactory (84.1%) was high, but adopters had complaints about Bt cotton. Some of the adopters mentioned discontinuing use of Bt cotton because cotton prices were too low; the “pest-resistant” Bt cotton did not resist pests; and pesticides were too expensive to afford.

This study also found farm insufficiency, soil quality limitation, and lack of knowledge caused farmers not to adopt. Not enough growers, age, and family issues were also reasons previous adopters discontinued their adoption. Farm size also turned out to be an important indicator of Bt cotton adoption. Farmers with larger farms tended to be Bt cotton adopters, and were more satisfied with Bt cotton performance.

**Conclusion**

Most of the farmers did not know that what they were growing was a GM crop. There is a risk that Bt cotton farmers who are unaware of the technology may not follow proper rules for its use. In general, farmers felt dissatisfaction about Bt cotton because the pest-resistant trait was weakening as a result of misuse, including reusing seeds and low quality seeds.

At this point in time farmers in Shandong Province, China are growing Bt cotton because it is the only thing available. Farmers can switch their land to wheat/corn but the soil may only grow cotton well, which leaves farmers without much choice. As such, the economic factors associated with growing Bt cotton heavily influenced the farmers’ decisions to adopt or reject Bt cotton.

**Recommendations**

The open-ended results indicated the farmers had very limited knowledge of Bt cotton as a GM crop. Future studies could document quantitatively how much knowledge of Bt cotton and GM crops farmers have. Extension services were not found in the area studied. Based on the results, farmers needed to know about Bt cotton beyond what it is called. The extension service could provide services to help farmers increase their Bt cotton knowledge. Future research could focus on how the extension service can assist farmers in better understanding Bt cotton and proper practices.

This study was designed to examine the individual level of diffusion. The influence of the underlying features of the social system such as government policies, market availability, or
cultural impact to farmers’ adoption deserves study. These factors may have more influence on decisions to adopt or reject GM crops than individual characteristics.

The average age of the farmers in the area studied was 48. Younger people adopt new innovations more quickly (Rogers, 2003) and may be more likely to adopt Bt cotton and use it correctly. Therefore, agricultural educators should consider engaging younger generations in Bt cotton use to ensure the future of the industry.

References
Determinants of Climate Change Adaptation Measures Used by Crop and Livestock Farmers in Southeast Nigeria

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ABSTRACT

The study identified socio-economic determinants of climate change adaptation measures used by crop and livestock farmers in Southeast Nigeria. Multi-stage sampling technique was used to select one hundred and sixty farmers from the five states that make up southeast Nigeria. Data was collected using structured interview schedule, structured questionnaire, focused group discussion and personal observation while analysis was done using descriptive statistics namely: mean, percentages and frequency count. Ordinary least square multiple regression analysis was used to identify the determinants of adaptation measures used by farmers in the study area. Result from the analysis showed that out of the 160 respondents that were interviewed in this study, 57% were male, 86.4 % were above 40 years of age, 95% were married and have family. It was also shown that 70% had at least secondary school education, 88.8% earned monthly income of less than N50, 000 while 84.4% had above ten years of farming experience. Majority (66.3%) of the farmers maintained an average household size of 6-10, 82.5% have farming as their major occupation with 70.6% having a farm size of less than 1 hectare and 71.2% practicing mixed farming. Both sales and consumption (68.8%) were their major aim of production. The major crops cultivated were cassava, yam, maize, vegetables and plantain/banana while the animals reared are poultry birds and goats. The Varimax rotated factor analysis identified eight major adaptation measures used by farmers in the area as improved livestock and crop management practices (factor 1), application of agricultural chemicals and irrigation facilities (factor 2), use of improved and resistant crop and animal species (factor 3), use of information from extension agent and improved land management practices (factor 4), planting of different varieties of crops and varying planting/harvesting dates (factor 5), soil fertility improvement measures (factor 6), use of available credit facilities and joining of cooperative societies (factor 7), portfolio diversification and mixed farming (factor 8). The ordinary least square regression analysis identified the seven socio-economic determinants of adaptation measures used by
farmers to be years of education, monthly income, marital status, farming experience, major occupation, farm size and major farming activity. Based on the results of the study, vital recommendations that will improve the adaptive capacity of the crop and livestock farmers were made.
Introduction

Agriculture remains a key component of the Nigerian economy, currently contributing about 40.0% of the GDP and employing about 70.0% of the active population, the sector has however, underperformed its potential in the past few decades (FGN, 2008). This has been clearly manifested in the high food prices prevailing nationwide arising from population driven increase in food demand. The greatest threat to sustaining agricultural productivity in Nigerian farming communities is the decline in soil fertility. It has been noted that yields of crops are higher on crop farms with conservation practice than farms without conservation practices in the same ecological zone (Salako and Tian, 2003). However, Aromolaran (1998) stated that land owners receive the benefits of soil conservation in the long term. Increased land-use intensity could lead to continuous depletion of soil fertility, decline in productivity, loss of soil structure, soil erosion and land degradation (Erbaugh 1999). Udoh (2000) noted that increasing sustainability while targeting the predominant small scale farmers in the Nigerian agricultural development policy and programmes directly or indirectly depends on the availability (quantity and quality) of land. Hence, giving adequate consideration to the condition of the resource base under different production system remains a crucial factor in the quest for agricultural growth. The aforementioned need to be taken which into consideration when packaging extension messages which requires understanding of the farmers’ prevailing environment.

Purpose and Objectives of the study

The main objective of the study was to examine soil conservation and management practices of farmers in Oyo and Kwara states, Nigeria.

The specific objectives of the study were to:
1. Describe the socio-economic and crop production practices of the farmers;
2. Identify soil fertility maintenance and conservation practices of the farmers;
3. Identify the production (land and soil) constraints encountered by farmers in the study area.

**Method or data sources**

The study was conducted in farming communities located in Ofiki, and Asa watersheds of Oyo and Kwara states respectively. Multi-stage sampling technique was used to select three hundred and forty four (344) farmers from one Local Government Area identified as the location of the watershed in each of the States. Data were collected using structured interview schedule, focus group discussion and personal observation. Data collected were analyzed using frequency distribution, percentages and means.

**Results and Conclusion**

The results show that 68.35% of the farmers were male; 51.45% were within the productive age of 41 and 60 years; 89.1% were married while 75.35% had farming as major occupation. More than half (59.5 %) had between 11 and 20 years of farming experience and 50.8% were members of cooperative associations. Mean years of education was 10.40 while mean household assisting in farming was 4.0. Majority of the farmers were owners of their farmland which they acquire prominently through inheritance (67.85%). 21.45% had their farmland under tenancy agreements through rent/leased. Average farm size cultivated was 4.72%. Food crops grown in order of importance include maize, cassava, yam, sorghum, tomato, pepper while mixed cropping is the dominant cropping system practices by farmers. Prominent crop combinations were cassava/maize and maize/cassava/yam. Fifty-two percent of the farmers used inorganic fertilizer while only 10.55% used organic fertilizer. Continuous cultivation was the major fallow rotation pattern in the area. Farmers’ perception of the trend in soil fertility condition reveal that 63.7% perceived their farmland as being very fertile at initial cultivation, 52.8% at now and 55% perceived a declining trend in crop yield over time. Farmers engaged in soil conservation practices through the use of mulching (52.0%), ridge and furrow (37.65%), diversion channels (29.9%) and opening up of dead furrow (23.75%) to allow free flow of water. Invasion of farms and water sources by cattle reared by the nomads, low soil fertility, termite infestation, weather variability, poor extension contact and poor yield were major production and soil related constraints identified by farmers. The study concluded on the need for researchers and extension agents to give adequate consideration to the limiting constraints of farmers in the study area.

**Recommendations**

There is need to create awareness on environmentally friendly and sustainable farming practices to mitigate the problem of declining soil fertility. Training of farmers on appropriate farm-level fertility enhancing and climate smart soil conservation practices to improve their knowledge on soil conservation techniques. There is need to explore the rehabilitation of existing cattle routes and create a community driven policy and legal framework for monitoring the activities of the nomads and consultation for conflict resolution.

**References**


Conflict Resistant Crops: Identifying Crops and Cropping Systems for Targeted Agricultural Development in North Kivu, Democratic Republic of the Congo

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Introduction
Conflict contributes to conditions of hunger, malnutrition, poverty and acts as the fulcrum where life-threatening conditions emerge from otherwise preventable circumstance. Prolonged conflicts are a daily reality for the people and communities around the world (Seddon & Adhikari, 2003). Armed forces in conflict zones are not immune from the hardships experienced by local populations involved in the conflict. A more complete understanding of the economic and social interactions between armed forces and local populations has the potential to increase the effectiveness of development policy and conflict interventions (Jacobsen, 2002).

The Democratic Republic of the Congo is engaged in the deadliest conflict since WWII and a majority of these deaths come from indirect consequences of conflict - 90% from war exacerbated disease and malnutrition (Human Security Report, 2010). The North Kivu province in the eastern region of the DRC is arguably the most conflict-ridden region in Africa. Our survey of North Kivu farming households found that 70 percent of respondents experienced hunger. Of these respondents, 54 percent cited displacement from their farms by conflict as a cause of their shortfall in food production, and 35 percent cited pillaging associated with conflict as the primary cause of their food insecurity. Other causes of food shortfall in households included crop failure and lack of agricultural inputs. Additionally, our research suggests that conflict in the region continues to adversely impact the extensive cultivation of cereal crops, and constrains food production to enterprises that are ‘conflict-resistant’ – a term that encompasses a range of crops which local populations in conflict areas are able to cultivate with some degree of success in spite of activity on the part of nearby armed groups.
Purpose

Our purpose is to set forth a framework for classifying crops that are inherently difficult to unlawfully consume, transport, and/or steal in rural conflict zones in order to develop resiliency strategies for rural agricultural communities. While a diverse set of crops could be considered ‘conflict-resistant’, we suggest that the unifying characteristic is the difficulty with which an armed group might profit from the crop, either by consuming or selling it. A ‘conflict resistant crop’ has a comparative advantage to farmers during conflict. Such crops demonstrate a tolerance to conflict by household production quantities falling at a slower rate than other crops or even household production rates increasing compared to other crops during periods of conflict. Such crops demonstrate a tolerance to conflict since their production is not as adversely affected during, or is even entirely affected by, periods of conflict.

Methods and Themes

The Texas A&M University Conflict and Development Laboratory’s farm household survey in North Kivu province provides insight about the production practices of communities amidst conditions of conflict. From these surveys, we were able to determine the attributes and specific types of crops that allow for food security and rural livelihoods in conflict-prone areas. Characteristics or categories of conflict resistant crops were found to be crops that:

8. require significant processing,
9. are hard to transport,
10. have flexible harvest times,
11. have short seasons,
12. don’t require much investment (of labor/money), and
13. are grown in close proximity to households/rural centers.

Conclusions

By understanding conflict resistant characteristics of crops, policymakers and development practitioners can more effectively equip rural communities during conflict (Ballentine & Nitzschke, 2005). There are complex relationships between armed forces and rural communities before, during, and after conflict that need to be understood and respected in order to promote food security. Communities may still operate even in the presence of armed forces and thus conflict resistant crops allow for production of food while minimizing food and economic loss due to conditions of conflict.

Implications and Application

As mentioned, understanding those crops that provide resiliency to rural communities amidst conflict is important to promote food security and livelihoods. Such conflict resistant crops need the support of policymakers and development practitioners. Targeted focus through conflict resistant crop extension programming will increase efficacy of technology innovation (breeding), transfer, and adoption. In addition, knowing cultivation practices would be valuable in predicting malnutrition and income loss in regions controlled by rebels. Other potentially useful implications include using cultivation practices to assess armed forces movement throughout a region and provide more balance to policy responses that are proactive (development) versus reactive (disaster response) in conflict mitigation and recovery efforts.
References
Encouraging Nigerian Farmers’ Utilization of Native Plants:  
A Case Study of Moringa oleifera

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Keywords: Nigeria, Agriculture, Extension, International, Diffusion

Introduction
The state of Ebonyi in southeastern Nigeria is primarily an agricultural producing region, with many subsistence farmers (National Bureau of Statistics, 2013). Moringa oleifera is a shrub-like tree that grows in tropical and sub-tropical environments, including southeastern Nigeria. It matures to flowering in six months, and after the leaves and fruit are harvested, regenerates in 50 to 60 days. The fruit, flowers, leaves, and sap of the Moringa tree possess great dietary and medicinal value for humans. Additionally, their properties can contribute to increased agricultural production. Given the known benefits, it is believed that propagation and utilization of this species may help Nigerian farmers begin to address existing nutrition and medical problems.

The potential benefits of the propagation and use of the Moringa tree among small-holder Nigerian farmers have been identified. An important first step in the diffusion process is knowledge (Rogers, 1983). Farmers must first be educated about the benefits and best growing practices of the Moringa oleifera in order to consider adopting the agricultural innovation.

Purpose and Objectives
The purpose of this research was to understand how agricultural innovations may be introduced into southeastern Nigeria. This case study focused on the experiences of an agricultural extension education student as she sought to better understand the process of adoption and diffusion of agricultural products by farmers in southeastern Nigeria. Specific research questions included:

1. What is the response of Nigerian farmers to the introduction of a new agricultural product?
2. What educational methods can be used to help guide Nigerian farmers through the knowledge phase of Roger’s (1983) diffusion of innovation model?

Methods

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In spring 2013, as a component of a religion-based mission trip, an undergraduate student participated in development work establishing an extension program to encourage cultivation and harvest of *Moringa oleifera* in southeastern Nigeria. The student was a participant observer under the direction of a Nigerian agricultural educator introducing the plant to farmers in Ebonyi, Nigeria.

Four agricultural educators conducted ten sessions over three days with 150 to 200 people attending each session. *Moringa* seeds were distributed to attendees after each education session. The student observed and interacted with the educators teaching about the *Moringa* tree and local farmers learning about the product. Field notes and reflections on observations were recorded daily and transcribed upon the student’s return to the United States. Results were analyzed using the constant comparative method to identify themes (Allen, Erlandson, Harris & Skipper, 1993).

**Results and Conclusions**

Two themes were identified through analysis of the data. The first theme was guarded interest and motivation of recipients. Local farmers seemed skeptical about utilizing the *Moringa* tree. However, they were eager to learn the potential uses and benefits of the tree after supporting research from the Nigerian agriculture professor was conveyed. At the end of each lesson, learners were eager to receive seed packets.

Theme two was constraints on educators. Educators’ encountered several constraints, including communication barriers, limited time with farmers, limited materials and resources, a lack of continuing support for farmers, and conflicting learner expectations.

The agricultural educators did not speak the native language, making translators necessary. Translators did not have an agricultural background, further hindering accurate communication. Agricultural sessions lasted only one hour, with 150-200 people attending each session, making it difficult to deliver instruction effectively. Educators also had very limited time to gather native plants for demonstrations and prepare on-site materials for the lessons. Packets of plant seeds were dispersed to learners; however, there were a limited number. Farmers that did not receive seeds were visibly upset and possibly offended. Additionally, educators had no instructional materials to distribute or means of communicating with farmers once they left the country. Finally, agricultural sessions were held in congregational “church” settings, as a component of a pre-planned evangelical effort. Educators had to improvise with teaching resources available, reducing their ability to vary teaching methods and include demonstration of planting techniques. Furthermore, learners were not mentally prepared for an agricultural lesson, rather they were expecting only a religious presentation.

**Implications and Recommendations**

Farmers in southeastern Nigeria were interested in incorporating the *Moringa oleifera* into their agricultural production. They were eager to learn once they understood the qualifications of the Nigerian agricultural professor. It is important to understand the learner, especially when crossing cultural boundaries and tailor instruction to meet their needs. The capability of farmers to implement desired agricultural practices must be assessed. Educators should provide adequate and necessary resources and support to the farmers. Finally, adoption of the innovation should be evaluated.

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Environmentally Sustainable Agricultural Practice Among Women Farmers in Oyo State Nigeria.

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ABSTRACT

The plague of food insecurity facing the developing countries with the ever increasing population growth has posed a lot of environmental threats. Through the use of different agricultural practices such as chemicals: insecticides, herbicides and pesticides have led to the increase of Greenhouse Gas (GHG) emissions which is detrimental to climatic condition hence a determining factor to agricultural production. The environmentally sustainable agricultural practice studied among women farmers would help them gain an economic advantage by reducing their costs while increasing their crop yields, productivity, and revenue. The study was carried out in Oyo State, Nigeria among rural women farmers. It investigated the level of use of environmentally sustainable agricultural practices prevalent in the study area. The purpose of the research work was to investigate the friendly environmental farming practices that would help the farmers reduce the uncertainty tied to climate change by using cost-effective strategies and helping farmers to improve profit margins and sustain opportunities for future generation on the farm. A random sample of 148 respondents were selected and interviewed from Surulere, Ibarapa North and Ibarapa central local governments respectively.

The result of the descriptive analysis indicated that most of the farmers sampled practiced majorly crop rotation (93.9%), bush-fallowing (89.9%), planting legumes (89.2%), mulching (88.5%) and selective bush burning (87.8%) while others were either neglected or sparsely practiced, probably due to unfavorable attitude towards the practices. Major factors determining the use of environmentally sustainable agricultural practice are financial status (79.7%), availability of work force (73.6%), issue of land ownership/non-ownership (73.0%) and size of farmland under cultivation (60.8%) among others. Correlation analysis revealed that a significant relationship exists between benefits derived such as protection and renewal of soil fertility (r=0.219***), prevention of pollution (r=0.211**), reduction in cost (r=0.217**), bio-diversity (r=0.195**), social equity (r= 0.210**), attracts more market value hence more income (r=0.182**) and the frequency of practicing environmentally sustainable agriculture. The result implied that these practices as revealed among the rural women who are a major stakeholder in the practice of agriculture sends a positive signal of hope in the agricultural business that future agricultural practice would reshape the elements of the environment, thereby improving agricultural production and hence food security. Women farmers who are noted to be poor without access to much land of their own should be focused and encouraged to practice these environmentally sustainable agriculture practices that have been found not expensive. Its practice would also retain and return native land ecosystems which would increase biodiversity, improve wildlife habitat and water quality of the soil. Farmers can also establish a competitive advantage in a volatile market while preparing their farms for sustained long-term productivity, setting up future generations for long-term success and producing additional environmental benefits. In
conclusion, agricultural practices determine the level of food production and to a great extent, the state of the environment. The detrimental environmental impacts of agricultural practices are costs that are typically unmeasured and often do not influence farmer’s or societal choices about production methods.

Therefore, sustainable agricultural practice means practices that would meet current and future societal needs for food, fiber, ecosystem services and for healthy lives, there by maximizing the net benefits of agriculture. To manage the preservation of the quality and quantity of ecosystems and improvement of crop yields, appropriate incentive is needed by providing adequate information on biological and agronomic knowledge that is specific to certain agro-ecosystems, soil types and slopes. It is recommended that funds be made available to conduct research continually on biological and agronomic knowledge on agricultural practices. Also, adequate number of well equipped extension agents must be made available at rural level to disseminate technological packages and encourage farmers to practice sustainable agriculture. To achieve this regular and continuous in - service trainings must be given to the extension workers. Financial assistance should be made available to women farmers with proper monitoring and evaluation to ensure it gets to the real rural women farmers. In the face of such high illiteracy among rural farmers, adult education should be revived and packaged in a way that will attract the interest of the respondents.

The implication of this internationally is that illiteracy, adequate technological information and financial barriers are major determinants that will limit the effectiveness of its adoption and practice of environmentally sustainable agricultural practice. Hence, translating agricultural innovations to indigenous languages and also making the required input for its implementation available to the rural women farmers will go a long way in encouraging massive adoption of such innovation.

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Factors Influencing Rural Livelihood Diversification among Women in Northern Region of Ghana

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Livelihood diversification is a common phenomenon among rural subsistent farmers in Sub-Saharan Africa, including Ghana (Ellis, 1998; Hilson & Garforth, 2012). Rural livelihood diversification is the process by which rural households who are largely peasant farmers engage in multiple sources of livelihoods in order to sustain their living (Ellis, 1998). Statistics have shown that non-farm income sources contribute 42% to total rural income in Africa, 32% in Asia and 40% in Latin America (Reardon, Crawford, & Kelly, 1994). In Ghana rural households who are largely small scale farmers engage in non-farm livelihood activities to sustain their living (Abujaja, 2013; Banchiriga & Hilson, 2006; Yaro, 2004). Women contribute tremendously to livelihood sustainability of rural households, but remain the poorest (Awumbila, 2006). Rural household resources are largely controlled by household heads who are mostly men except in female-headed households (Apusigah, 2009). Studies from Ghana have shown that women dominate in rural non-farm livelihood activities and tend to have some level of independence over income they generate from these non-farm livelihood sources (Abujaja, 2013). However, little is known about the factors which influence livelihood diversification among rural women in Northern region of Ghana. Such a study is important in contributing to policy strategies in meeting the millennium development goal three - “empower women and promote equality between women and men”. This study was therefore undertaken to determine the factors which influence rural livelihood diversification among women in Northern region of Ghana. Two districts (Savelegu-Nanton & West Gonja) in Northern region of Ghana were purposively selected for the study. The two districts were selected based on their popularity in non-farm livelihood activities. A multi-stage sampling technique was used to select 260 households for investigation. Data were collected by use of survey questionnaire, key informant interview and focus group discussion. The quantitative data was analysed using probit model with livelihood diversification being the dependent variable, while factors such as age, marital status, years in education, household size, social group participation, migration, participation in training, decision making and resource access were considered as independent variables. The qualitative data were used to enrich the survey questionnaire. To conceptualise livelihood diversification, respondents were classified according to their livelihood sources (farm, non-farm or mixed).
Those who were found to be drawing their livelihoods from mixed sources were considered to be diversifying their livelihoods. The findings show that rural women are diversifying their livelihoods as already reported by previous studies (Bryceson, 2002; Ellis, 1998) because the majority (75.3%) of the respondents combine both farm and non-farm livelihood activities. Some of the non-farm livelihood activities were location specific, while others cut across the two locations. Livelihood diversification plays an important role in minimising the suffering of rural women as proceeds from the non-farm activities are used to support household expenses such as food, children’s education, health care, clothing and ceremonies. The overall probit results gave a log-likelihood ratio (LR) of about 68 which is statistically significant at 1% suggesting that all the variables included in the model jointly influence livelihood diversification among rural women. The Pseudo R² of 0.23 shows that the model is able to explain about 23% of the variability in the probability of rural women diversifying their livelihoods. The overall probability of rural women diversifying their livelihoods given the factors modelled was predicted to be about 87%. The regression results showed that variables such as age, years in formal education, household size, group membership, vulnerability and resource access were significant at 5% and 10% confident levels. This implies that age, years in formal education, household size, social group membership, vulnerability and resource access are important parameters to look into for formulating rural policy on livelihood diversification. This study therefore recommends that rural poverty policy planning should work towards addressing these factors, especially in livelihood diversification activities. It is also important for agricultural extension programmes to integrate non-farm livelihood activities in extension programmes since it contributes greatly to the welfare of rural households.

References


Views of rural women of Adamawa State Nigeria on the consumption of insects as food complement

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Keywords: Insects, food security, nutritional advantage, challenges, processing & sustainability.

Introduction

In many developing countries around the world, insects are common sources of food protein, fat, minerals and vitamins (Durst and Shono, 2010). Some edible insects have nutritional value comparable to that from meat and fish, while others have higher proportion of proteins, fat and energy value (De Foliart, 1992). Many modern entomophagers contend that insects should be the food of the future because they are nutritionally superior to many other protein sources, such as beef and chicken. In addition, insects are abundant; constituting about 75% of known species of animals (Yoloye, 1988). With about 1500 identified edible species (Smith, 1999), some insects are eaten as larvae and others in their adult stage (Wikipedia, 2010). In desert or hot climatic environments and developing countries where food and water is scarce, and malnutrition is reported to be very high (Joosten and Hulst, 2011). In West and Central Africa for example, insects form part of normal diet throughout the year or during seasons of high insect occurrence (Banjo et al., 2006) and according to (Kho, 2002) insects do constitute important food stable source.

The northeast region of Nigeria is the second largest livestock producer in Nigeria (Majiayagbe and Lamorde, 1997), but very little has been done by way of documentation about the rich "microlivestock" population of this region and the high cost of animal protein, which is beyond the reach of the highly impoverished population has reawakened and encouraged entomophagy in this part of the country more than other parts. Some families especially in Nigeria, make fairly good living from gathering edible insects from farmlands, processing, eating or marketing them.
Purpose and objectives of the study

The main purpose of the study was to verify the views of rural women in Adamawa State Nigeria on the consumption of insects as feeding complement. Specifically, the paper examines the reasons for the consumption of insects and the types of insects consumed. It also looks at the collecting and processing methods as well as challenges facing insect availability and processing. Finally, the paper presents ways of making edible insects a more sustainable food source for the rural women and their families.

Sampling and data collection

Geographical profile: Adamawa State is one of the 36 states of Nigeria, is popularly known as the Land of Beauty due to the numerous mountains, natural parks and cultural monuments in the State. It has a total area of 39,742.12 square kilometres. The 2005 projected population of the State is 3,106,585 (Adamawa State Diary, 2005). The State lies between 8°00 N and 11°N and longitude 11.50 and 13.50 E; generally characterized by many rivers; the major one is the River Benue whose source is from the highlands of the Cameroon and flows southwards to join the River Niger. The State has a vast fertile land suitable for farming.

The major occupation of Adamawa people is farming. Cattle rearing is also a major occupation, while villages around the banks of Rivers Gongola and Benue and their tributaries in the State engage in fishing and farming. The State has 21 local Governments with various ethnic groups among which are the Fulanis, Verre, Chamba, Mumuye, Dabanci, Dangsa, Higgi and others. Its vegetation is primarily savannah. Cash crops grown in the state include cotton and groundnuts, while food crops include maize, yam, cassava, guinea corn, millet and rice. The communities living on the banks of the state’s rivers engage in fishing while the Fulani rear cattle.

The State experiences a typical tropical climate with two distinct seasons, the rainy season lasts from April to October with annual rainfall in the range of 150-180mm. The dry season begins in November and ends in March while mean monthly temperatures fluctuate between 23°C and 38°C in the year.

Questionnaire survey: A questionnaire with structured and unstructured items was administered in 5 out of the 21 LGAS of Adamawa State (Mubi, Michika, Yola, Numan and Lamurde) and from three ethnic groups. The selection of the LGAs from three ethnic groups was done based on the cultural variations that exist within groups. Stratified random sampling technique as suggested by Anonymous (2003) and Osuala (1986) was used to select the LGAs. The Questionnaire was pretested and revised before final administration. Two communities in each of the 5LGAS were chosen for the study. Questionnaire was administered on all the women members of insect selling groups in each community. The 10 groups in the 5 communities had 135 women members. Information validation was by personal observations, insect collection and identification. Data obtained were analysed using frequency counts, means, standard deviation, pie chart and bar chart.

Results

The rural women claimed that the consumption of insects is not prohibited in their culture (100%) and that insects are consumed not solely because of taste or nutritional value as they
complement their protein needs or ethnic preferences but also because insects are medicinal (92%) and serve as good sources of income (100%). Locust, flying termites, grasshopper and crickets are the main insects available and consumed in the communities. The women also claimed that these insects were freely available everywhere and costs of catching and processing insects are very low (92%) compared to that of livestock or crop. All the women (100%) claimed that catching insects is a very lively and highly cherished social activity that brings family members and village children together especially in the evenings when lanterns are lit all over the place. Harvesting is often done by women and their children. The harvesting technique depends on the behaviour of particular insects. For example, inactivity due to low temperature in the morning enables easy collection of locusts and grasshoppers. Night flying insects (termites, some grasshoppers) can be lured into traps by light. Some species (crickets) can be located by the sound they make. Tools such as glue, sticks, nets, brooms and baskets are used to catch the insects or by using chemicals, fire and direct hand picking. The insects are eaten by all the family members but largely consumed by children (91%). Processing is mainly by boiling, roasting or frying but because most of these insects are only seasonally available, preservation by drying is also practised by the women. The insects are sold in big sacks when fresh or by using various small measuring containers when fried and sold in the market.

Constraints and challenges in the business include: hazards associated with entering the bush in the night (79%); hazards from chemicals used in catching the insects (62%); illness from smoke inhalation during processing (59%); poor storage facilities (52%); lack of innovative means of catching the insects (56%); poor roads leading to where the insects are (100%); high cost of firewood for processing (61%) scarcity of the insects some times of the year (81%) as well as climate change which causes fluctuation in their availability (59%).

Conclusion and recommendation
To effectively harness and manage the benefits from insects in the interest of food security in Adamawa State, more attention should be given to environmentally sustainable harvesting methods for the women. The insects should be made more accessible throughout the year by developing improved conservation methods and by actually farming them. There is need for researchers to study the nutritional values and otherwise, of these insects as well as make available better, adaptable and affordable processing technologies, conservation, good storage, packaging and marketing possibilities, so as to make this natural source of nutrition more attractive to urban dwellers.

Educational Importance
Considering the economic, nutritional and ecological benefits of this natural food source, its promotion deserves more attention both from national government, the state government and the Agricultural extension arm of Adamawa State ate Agricultural development programmes, universities and research institutions in Nigeria.

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Introduction

Unemployment and underemployment are contributing factors for widespread poverty in India. To overcome the unemployment situation and enhance the livelihood of vulnerable people in rural areas, Government of India initiated the National Rural Employment Guarantee Act (NREGA) in 2005 that ensures at least 100 days of guaranteed employment to every rural household (Anonymous, 2013).

Researchers have studied the effect of woman beneficiaries’ profile on their attitudes towards various development programs (Jaffer, 2007; Garg & Yadav, 2010; Vanitha, 2010; Joshi et al., 2008; Roy 2012; Suresh, 1997; Sinha et al, 1984). Mass media contact, risk orientation, cosmopolitanism, achievement motivation, aspiration level, and deferred gratification were the specific characteristics of women that were found to be significantly related to the attitude of MGNREGA beneficiaries.

Lack of awareness among public regarding MGNREGA and improper child care facilities hindered the involvement of women in MGNREGA program (Jaffer, 2007). Roy (2012) argued that lack of medical facilities, inconsistencies in MGNREGA policy implementation, and irregularities in wage payments as constraints to effective implementation of MGNREGA. It has been eight years since the program was first introduced in Bangalore rural
district of Karnataka, but no research has been conducted to analyze the impact of the women beneficiaries’ profile and their attitude towards MGNREGA and to examine major constraints for effective implementation of MGNAREGA.

**Purpose and Objectives**

The overall purpose of the study was to determine relationships between woman beneficiaries’ profile and their attitude towards MGNREGA program. This study also examined the constraints limiting implementation of MGNREGA program. The following objectives guided the study.

1. Determine the relationship between the woman beneficiaries’ profile and their attitude towards MGNREGA program.
2. Determine the constraints and suggestions of women beneficiaries for effective implementation of MGNREGA program.

**Methods and Data Sources**

The study was conducted in Bangalore rural district of Karnataka state, during 2012-2013, and the district was purposively selected as MGNREGA was implemented in this district from the initial phase of program implementation. Three Taluks were randomly selected and 120 beneficiaries were selected from those three Taluks through snowball sampling technique. Ex-post facto research design was adopted for this study. Nine independent variables (see objective 1) that represent profile of woman beneficiaries were selected from literature and data related to those nine variables were collected using different scales, developed and validated by the researchers.

Ten constraints (see objective 2) reported in literature were used in the interview schedule. Responses were collected in yes or no type question format. Beneficiaries’ suggestions were documented using open ended questions. The collected data were analyzed using Minitab software. PPMR correlation was used to analyze the relationships.

**Results**

**Objective 1:**

Of the nine variables representing woman’s profile, four variables age ($r=-0.104^{NS}$), Cosmo politeness ($r=0.128^{NS}$), achievement motivation ($r=0.019^{NS}$) and risk orientation ($r=0.062^{NS}$) had no significant relationship, while the remaining five variables--caste ($r=0.213^*$), occupation ($r=0.542^{**}$), mass media contact ($r=0.624^{**}$), aspiration level ($r=0.469^{**}$) and deferred gratification ($r=0.524^{**}$) showed significant, positive, moderate to substantial relationship with the attitude of beneficiaries towards MGNREGA program.

**Objective 2:**

The most important constraints faced by the MGNREGA beneficiaries in the order of severity were: no person to look after their children at work place (76.67%), 100 days of employment not given (68.33%), and continuous work not provided (66.67%), delay in payment of wages (50.83 %), and low wage rate (48.33%). Other constraints included: same wage rate for all kinds of work and men and women, only local residents eligible to work, delay in issue of job cards, and lack of proper facilities at work place.

Major suggestions expressed by the women beneficiaries for overcoming the problems included “provision of facilities like drinking water, medical facilities, toilets at work places...”
(75.00%), engagement of person to look after children at work place (70.83%), and timely payment of wages (68.33%).

**Discussion and Recommendations**

The implementing agency of the MGNREGA needs to make necessary amendments to the program policies to overcome implementation problems, so that the laborers can work in the program with pride and prestige.

Concurrent monitoring and social auditing of MGNREGA work must be made compulsory throughout the project cycle to ensure the timely payment of wages and issuance of job cards to all households under MGNREGA. Gram Saba (village council) should be made more participatory through wide publicity. Third party evaluations should be completed once every three years for program accountability and transparency.

Government should make changes to the MGNREGA program by providing financial assistance and paid medical leave to women during maternity period. These additional steps will encourage women beneficiaries and also inspire other women beneficiaries to actively participate in the program.

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Gender Dynamics in the Adoption of Climate-Smart Agricultural Practices: A case study in Cauca, Colombia

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Abstract  
Agriculture is a climate-sensitive activity. There is a critical need for "climate-smart" agriculture (CSA) and mitigation practices to address growing vulnerability, particularly in the tropics. Although many poor farmers have developed methods and strategies to deal with climate variability, the extreme and unpredictable nature of global climate change threatens to undermine their livelihoods and welfare. Furthermore, despite a growing body of research about the adaptive capacity of households, there persists a lacuna of data about the role of women in agriculture as it relates to adaptation and mitigation strategies. This is crucial since women are often agents for change and adaptation within the household. Furthermore, the feasibility of CSA practices depends on an understanding of how information and innovation is diffused within and among communities.

Within the framework of the Climate Change, Agriculture and Food Security (CCAFS) project, this research explores the gender dynamics of small-scale agriculture in the Río Piedras watershed, located in the Colombian Massif, as related to decision-making, access to information, distribution of assets, division of labor, and perceptions towards new CSA practices. The region is characterized by a high level of institutional activity and numerous extension services; this project was made possible through the support of two such organizations: The Fundación Río Piedras, a non-profit that works towards land, food and water security in the region, and ASOCAMPO, the campesino farmers’ association.

Case study methodology was used and included a pilot questionnaire and participatory rural appraisal tools with approximately one-third of the regional peasant farming population
The research focused on the gender dynamics of the adoption of twenty-three, region-specific, climate-smart agricultural (CSA) practices. Additional data collection methods used included semi-structured interviews with key stakeholders, participant observation, and other participatory tools such as Historical Timelines, Seasonal Calendars, and Venn diagram activities.

The study concludes that the perceptions of men and women significantly differ on which agricultural practices are considered more beneficial. In addition, the study identifies 1) the roles and agricultural activities typically performed by men and women, 2) the wider gender gaps in terms of ownership of resources. Furthermore, social network analysis is used to examine the underlying inequalities in the method and degree of information made available to men and women.

The vast majorities of both male and female farmers seem familiar with the concept of climate change and had perceived the effects of which in the watershed. However, while most of the interviewed women stated that they had modified at least some of their activities due to these changes, less than half of the interviewed men had done so, suggesting that women may be more exposed or vulnerable to changes in climate, or alternatively, that their productive activities are more affected.

Men and women both expressed general knowledge of / familiarity with most CSA practices, and had similar levels of implementation of the different practices, with some distinctions among specific practices. However, when asked to identify the practices the farmers found most beneficial on their farm, men’s preferences were distributed across a much wider range of practices, while women tended to choose the same three. Furthermore, there was a range of decision-making strategies regarding the implementation of new CSA practices. The most common form was by men alone; however, in about a third of the households the couple made the decision jointly, and several households reported that the wife made the decision.

Men typically cited a much wider variety of sources of information in terms of learning about the practice and their decision to use it on their farms. Based on the questionnaires, and multiple informal conversations with the farmers, the high level of knowledge about and implementation of CSA practices was largely due to the extensive services provided by the La Fundación Río Piedras, ASOCAMPO and other development projects and extension services in the area. Therefore, the data suggests certain inequalities in the method and degree to which these services reach men and women in the region. Men are more likely to attend community meetings and workshops than women, and often are more vocal and active during discussions.

This pilot study identifies the strengths and weaknesses of the institutional activity and outreach in the Río Piedras region, and makes recommendations as these services can improve to reach both men and women equally. This research also contributes towards the development of a gender methodology to be used by CCAFS for future projects related to gender and climate change adaptation in Cauca and other regions throughout the world.

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