

Assessing the Effect of Green Training on Agricultural Cooperatives' Willingness to Adopt Green Practices

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Abstract

This study aims to examine the effect of green training on the decision of agricultural cooperatives to adopt green practices. A customized green training process was specifically designed for the study and applied to two selected agricultural cooperatives, namely *Green Beans Multipurpose Cooperative* (GBMPC) and *Calamba Vegetable Growers Marketing Cooperative* (CVGMC). Secondary and primary data were collected through cooperative visits and self-administered survey and analyzed using qualitative techniques. Key findings show improvements in the members' self-ratings in terms of 1) knowledge on green growth, 2) support on the promotion and practices of green growth, and (3) belief on the benefits of green growth. This study also assessed the change in the green scores or the level of commitment of these cooperatives to pursue green growth opportunities before and after the training. GBMPC manifested a 90% improvement while CVGMC recorded a 25% increase in its green scores. Overall, the study confirms that training process can positively impact the decision to adopt green. Recommendations for policy directions and institutional support and interventions are suggested.

Keywords: *green growth, green practice, training, agricultural cooperatives*

Introduction

Agriculture plays a substantial role and is one of the main drivers of the Philippine economy. It is also the main source of sustenance and employment for most Filipinos in the rural areas. This sector's share to the economy's aggregate output was 9% in 2016 while its role in employment was significantly bigger with 27% or 11.06 million of the national labor force coming from agriculture (PSA 2016). The rate of growth of this sector has strategic significance to the country's economic development, food security, environmental sustainability, and poverty alleviation (Balisacan 2003). It also has direct link to the rest of the economy as supplier of food and raw materials and buyer of non-agricultural inputs, consumer goods, and services.

However, agriculture is the most vulnerable sector to changes in weather conditions. The Global Climate Risk Index had listed the Philippines as one of the countries mostly affected by climate change (Kreft, Eckstein, Junghans, Kerestan and Hagen 2014). This is mainly attributable to its geographical location and lack of natural barriers that protect the archipelago from natural disasters. Compounded by devastating man-made activities like deforestation and pollution, the country is more exposed than ever to threats and devastating effects of climate change.

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The Philippines' high reliance on agriculture and its susceptibility to climate change require the need to adopt environmentally-sound practices in order to achieve sustainable development. The pursuit of this type of growth corresponds to the integration of three important development pillars: economic, social, and environmental. This means pursuing a growth strategy that simultaneously aims for economic prosperity and protects the planet's natural resources and people's well-being. It is striving for hefty earnings without sacrificing the interests of everyone while still being good stewards of the environment. This is green growth strategy – the kind of growth that is “efficient, clean, resilient, and inclusive.”³

Generally, green growth adoption may provide: 1) economic gains such as increased revenue, growth, diversification, and innovation; 2) environmental advantages like productivity and efficiency improvements of natural resource usage and adverse environmental reduction; and 3) social benefits such as livelihood opportunity enhancements, job creation, and social capital development (OECD 2011). Green growth strategies can be adopted by an economy, industry, organization, household or individual. In this study, green growth is viewed and applied at the organizational level.

One natural adopter of green growth is the cooperatives. The International Cooperative Alliance (ICA 1995), in its statement of cooperative identity, defines cooperatives as “autonomous associations of persons united voluntarily to meet their social economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise.” Not only do cooperatives undertake business activities for the financial stability of the members (referring to “economic development pillar”), they are also user-owned, user-controlled enterprises that ultimately aim for the improvement of the members' standard of living (referring to “social development pillar”). The 7th cooperative principle of “concern for the community”, on the other hand, reinforces the priority of cooperatives to give back to and protect the community (referring to “environmental development pillar”). This inherent ability of cooperatives to embrace a holistic approach to sustainable development, its cooperative identity which combines these distinct priorities, values and principles – is what makes cooperatives ideal vehicle for the adoption of green growth strategies.

However, actual adoption may prove difficult for agricultural cooperatives in the Philippines because of the following constraints: 1) individual members' lack of understanding on the benefits of greening strategies, 2) inadequate organizational commitment to implement green practices, 3) limited organizational support from within the cooperative (i.e., board of directors (BOD) and management team), and 4) low regulatory incentives to pursue environment-friendly activities. While there are already programs and projects from various national organizations like the green financing of Land Bank of the Philippines (LBP) and incentives provided by the Department of Trade and Industry (DTI) assisting cooperatives and other small-scale enterprises to expand their greening practices, there is still a need to mainstream and intensify these efforts for a wider reach. Compounded by the common business practice of “growing first and cleaning up later”, enterprises are motivated to pursue primarily profit over natural resource protection. These constraints in the national and business environment further dampen the green adoption in the country.

³ Definition of green growth from OECD, Global Green Growth Institute, and World Bank.

This paper speculates that these organizational and individual restrictions can be addressed through awareness promotion and capacity building on green growth strategies. In the study of Pabuayon, Pantoja, Vista, and Manila (2016), the lack of awareness and knowledge on green practices was identified as one of the key reasons for not greening their business activities. This finding was echoed by Jabour, Teixeira and Jabbour (2013) which considered environmental training as important in the development of ecologically-sound practices and the creation of an organizational culture sensitive to environmental needs. Renwick, Redman and Maguire (2008), on the other hand, found that well-trained employees on greening were able to determine and reduce waste in their operations. Furthermore, capacitating farmers helps bust the myths and misconceptions on going green (Hussey 2016), namely: 1) it is costly, 2) only big businesses and organizations do it, and 3) it means construction of big structures like solar powered machines and equipment. These studies show the significant role of training in the implementation of greening programs.

Garavan (1997) described training as “a planned and systematic effort to modify or develop knowledge, skills, and attitudes through learning experiences, to achieve effective performance in an activity or a range of activities.” Thus, there is a need to assess if increasing awareness and knowledge through training can help pave the way for green growth adoption among agricultural cooperatives.

This study is an attempt to validate the effectiveness of sharing knowledge, best practices, and experiences and learning from successes and failures of others in increasing the willingness of cooperatives to engage in green activities. It developed a green training process that is specifically designed for agricultural cooperatives, which was then pilot-tested on two selected local cooperatives.

Generally, this paper aims to examine the effect of a green training on the decision of agricultural cooperatives to adopt green practices. Specifically, it describes the characteristics of the two pilot agricultural cooperatives; determines the knowledge, attitude, and perception of cooperative members, officers, and managers towards green growth adoption before and after green training; assesses the change in the pilot cooperatives’ adoption or willingness to pursue green practices after undergoing the green training process; and recommends policy directions to institutionalize green growth adoption among agricultural cooperatives.

Conceptual Framework for Adopting Green Growth

The study hypothesized that adoption of green growth strategies is influenced by various factors from the internal and external environments of the cooperative (Figure 1). Internal factors include both organizational and individual considerations. The former involves competencies and commitment of the officers and BOD, financial management, green integration on the organization’s vision, mission, and goals (VMGs), organizational capability, and concern for the community. At the individual level, members’ know-how, attitude, and perception on engaging green are speculated to positively affect adoption. This research postulates that the internal factors at both the organizational and individual levels are affected by training and development. Particularly, a green training approach is identified as a key input to building a favorable internal environment that will result in a positive outcome of green growth adoption. Externally, there are also factors that could provide an enabling environment for the adoption of green practices. These external factors at the national

level consist of regulatory support, pro-environment business climate, public-private partnerships, and cooperation among cooperatives.



Figure 1. Green growth adoption framework for agricultural cooperatives

Methodology

Selection of Cooperative Participants

The pilot cooperatives are the Calamba Vegetable Growers Marketing Cooperative (CVGMC) and the Green Beans Multipurpose Cooperative (GBMPC). CVGMC and GBMPC were purposively selected based on the following criteria: 1) they must be agricultural-based cooperatives; 2) they must have limited knowledge on green growth; 3) they must have undertaken nil or minimal green practices in their business and farm operations; and 4) they must be willing to undergo the whole green training process and be assessed during and after the training. The cooperatives, which are both located in Calamba, Laguna were also selected due to proximity to the project implementers.

From the subject cooperatives, training participants included members of the BOD, managers, and non-officer members. These respondents were chosen on the premise that they hold considerable knowledge on the activities and performance of the cooperatives as well as possess authority and influence over other members making them ideal change agents in greening the cooperatives. The mix of participants ensured that all types of cooperative members are well-represented in the training process.

Data on participants' demographics, their knowledge, attitude, and perception (KAP) on green growth, and their willingness to adopt green practices were collected using self-administered survey and exercises during the training process. The profile of the two cooperatives were also gathered from the cooperative annual reports and interviews with the key informants of the cooperatives.

Green Training Process

Guided by the green growth adoption framework, the subject cooperatives went through a training process, which entailed a series of activities for adopting green (Figure 2).

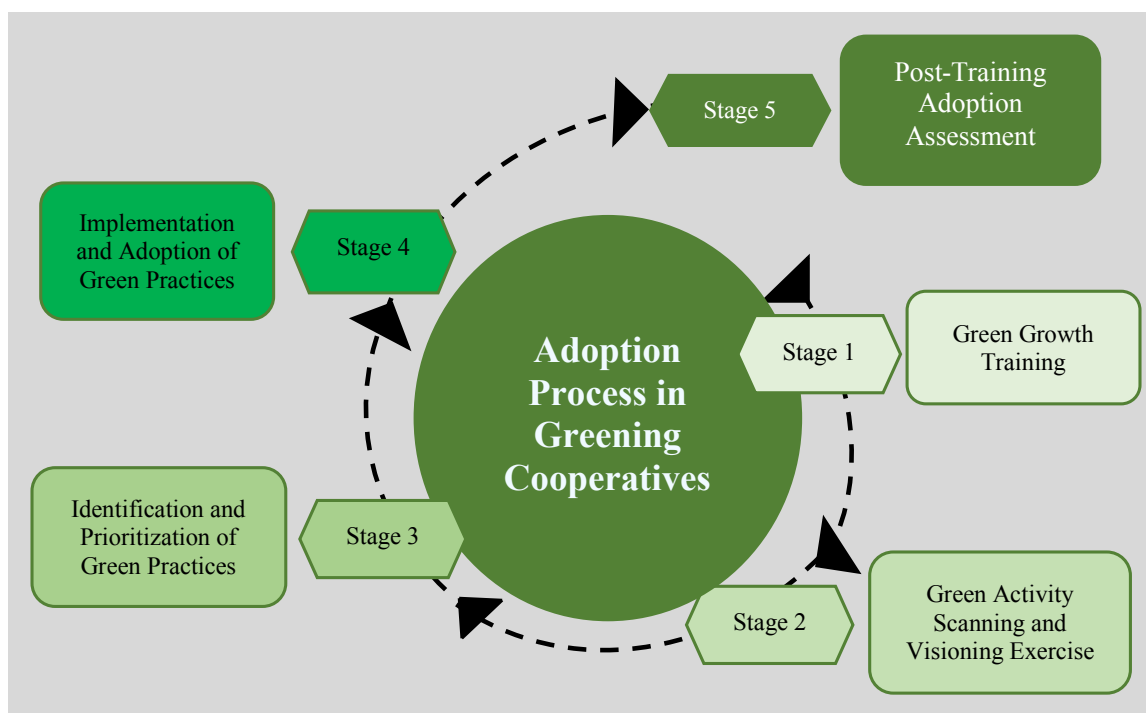


Figure 2. Green training process for agricultural cooperatives

Stage 1. A one-day green growth education training was undertaken to raise awareness and understanding of the concept, strategies, opportunities, and practices of doing green. Before the start of the training, participants were asked to self-rate their green growth KAP. Right after the training, they rated themselves again using the same set of KAP statements.

Stage 2. The second step, a half-day activity, involved a green scanning activity and visioning exercise. In this step, cooperatives were asked to review their cooperative growth strategies and the key activities for operationalizing such strategies and to draft green-inspired vision statements to ensure the inclusion and alignment of greening to the overall plans and activities of the organization.

Stage 3. In this step, which lasted for another half day, the cooperatives were made to identify and prioritize their green practices. A menu/list of green practices was presented to the participants to serve as their guide in determining whether their current growth strategies were “green” and in developing their own list of environment-friendly practices. The list was developed based on related literature and the recommendations of the experts from the sectors of the government, academe, research, and cooperatives during a consultation-workshop implemented prior to the green training-workshop. From the list, participants chose and prioritized the green practices that maximize the use of their scarce resources.

Prioritizing green practices is one of the important considerations in undertaking green growth activities. The process of prioritization identifies and ranks the most important and high-yielding green activities by grouping projects according to two considerations: 1) impact or what gives the biggest value-addition to the cooperative and 2) urgency or what requires immediate attention and action. Figure 3 presents this prioritization matrix.

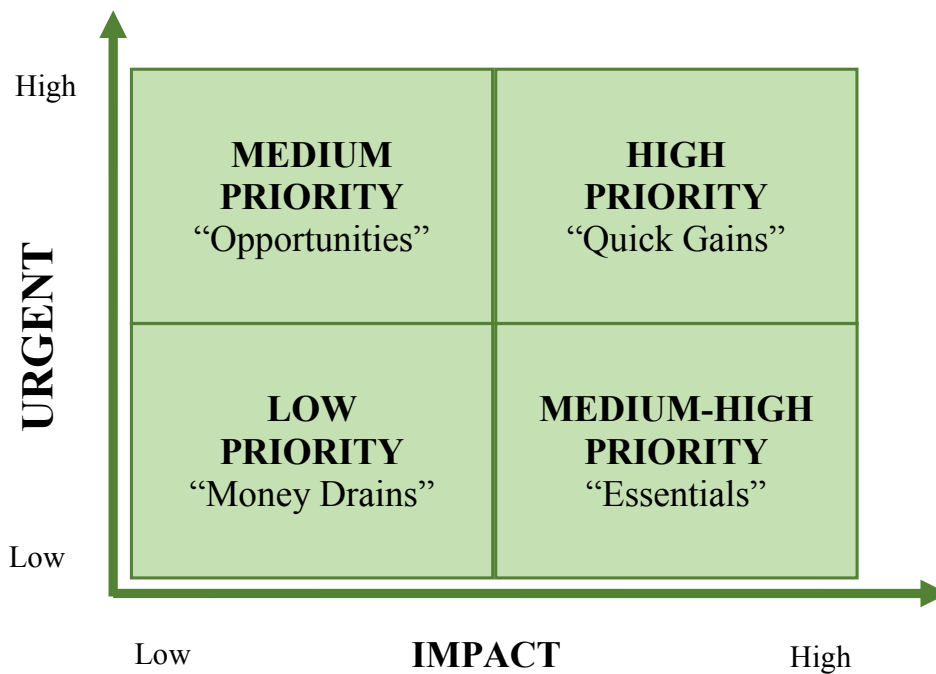


Figure 3. Prioritization matrix in analyzing high-impact and urgent green practices

Note: Adopted from the Eisenhower Matrix with modification

The prioritization matrix is an analytical tool that sorts out the activities into an order of importance and determines their relative ranking by assigning a numerical value for each practice based on a set of criteria that are deemed important by the cooperative. Figure 4 shows the prioritization process used in this study. In step 1, a five-point rating scale with a score of “5” as strictly adhering to the criterion and “1” as the least desirable practice for a particular criterion is used. The establishment of weight per criterion in Step 2 determines the comparative significance of each criterion. Step 3 is about the integration of the criteria, practices, and weights for evaluation by individuals and groups (step 4). Step 5 pertains to the dissemination and communication of the identified high-impact practices to the rest of the organization. The level of commitment of members and officers who will serve as change agents in greening the cooperatives is vital in the last step of the prioritization process. The cooperatives are asked to indicate their organization’s willingness to adopt green practices in their operations by giving a score for each green activity in the list.

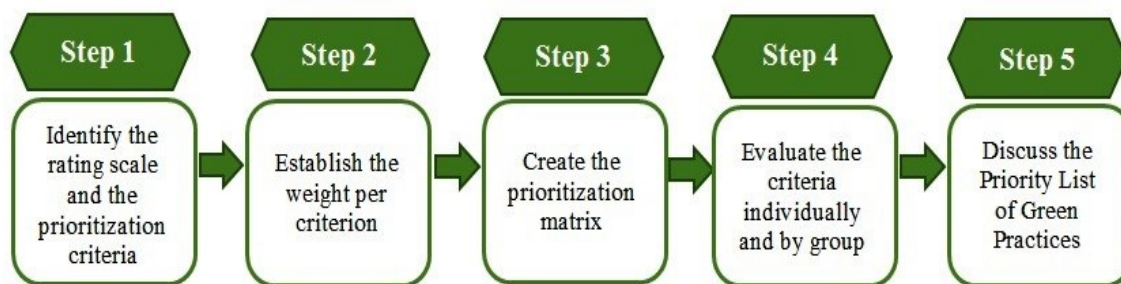


Figure 4. Prioritization process in ranking green practices

Source: Quilloy, K.P. and L.S. Cruz (2017)

Stage 4. After the prioritization exercise, the cooperatives were challenged to implement or adopt the prioritized green practices when they get back to their farms and business operations.

Stage 5. The last step of the training process was the assessment of the cooperatives' success in implementing the green practices that they had previously identified. In this study, the post assessment or second audit was conducted one month after the training proper. The number of adopted green practices was recorded and assessed vis-à-vis the list of practices that they had committed to adopt during the prioritization exercise. A comparison was also made on the green practices that they were previously implementing prior to the training.

For *Stages 4* and *5*, the duration of implementation and assessment period may vary depending on the extent of goal of the training process and the nature of green practices to be implemented. It can be as short as one month or can be completed in one year or so.

Limitation of the Study

This paper is an output of a short-term action research entitled "Leveraging Philippine Agricultural Cooperatives for Green Growth: A Pilot Study," implemented by the Institute of Cooperatives and Bio-Enterprise Development (ICOPED), CEM, UPLB in 2017. With limited time and budget, the project was designed to be implemented as a pilot study, covering only two preliminary agricultural cooperatives. The main intention was to test a methodological approach or training process design for encouraging cooperatives to adopt green practices. If results turn out positive, it can be replicated to or adopted by a bigger pool of agri-based cooperatives and related businesses and organizations with a longer time frame in the future. Monitoring and evaluation was also beyond the scope of the study due to time constraint.

Analytical Approaches

Descriptive analysis was used to describe the participants' profile, KAP, and the green scores or the level of commitment of the cooperatives and their members to adopt green practices during and after the training. For KAP, participants were asked to rate themselves on a scale of 1 (lowest) to 10 (highest) before and after the training on the criteria of 1) knowledge on green growth, 2) attitude towards supporting the promotion and practices of green growth, and 3) perception and belief on the benefits

of green growth. Scores were then categorized as follows: “low” if ratings fall from 1.00 to 4.00, “fair” if 4.01 to 7.00, and “high” for ratings between 7.01 and 10.00. KAP results before and after the training were compared to find any immediate change in their reception of green practices.

For measuring the willingness of the cooperatives to pursue and adopt green practices, a basic green audit was done. The green audit is a preliminary assessment of an organization in terms of environmental practices. It involves a systematic identification and quantification using green scores of the planned and adopted green practices of an organization. A checklist that contains a list of possible green practices that can be adopted by the cooperative were provided for this green audit. The participants used a three-point green scoring system to evaluate these green practices: three (3) points to indicate if there is a full adoption of the practice, one (1) point if partial adoption, and zero (0) if the practice is not yet being implemented but can potentially be included in future plans. The green scores were summated and the change in green scores during and after the training were compared with a positive change showing an increase in green adoption in the form of new greening methods or simply raising usage and frequency of existing green initiatives.

Results and Discussion

GBMPC was established on November 9, 2014 and primarily engages in production, processing, and marketing of coffee bean seedlings and green coffee beans. Its coffee nursery and plantation are located in Bataan and Batangas while its member-farms are scattered in the Laguna and Batangas provinces. It offers coffee production technology services and credit lending facilities to its members. With only PhP 1.7 million total assets (Table 1), GBMPC is still considered a micro cooperative with a recorded membership base of 43 in 2016.

CVGMC, on the other hand, was registered with Cooperative Development Authority (CDA) on April 4, 2013 as a marketing cooperative engaged in the production, processing, and marketing of vegetables like tomato, bottle gourd, and squash. It also provides machine rental of agricultural products to its members. All of its members are farmers with farms located mainly in Brgy. Looc, Calamba City, Laguna. Same with GBMPC, CVGMC is still under the category of micro cooperative with total assets of PhP 824,647 and 52 regular members in 2016.

Table 1. Financial profile of GBMPC and CVGMC, December 2016

Item	GBMPC	CVGMC
Total Assets (PhP)	1,754,472.84	824,647
Total Revenues (PhP)	235,432.41	102,400
Net Surplus (PhP)	92,255.91	10,906
Membership Base (no. of members)	43	52

Source: 2016 Annual Reports of GBMPC and CVGMC

Individual Level: Participants Profile

The participants of the green training are from the executive officers and members of GBMPC and CVGMC. There is a total of 17 participants who attended and completed the green training-workshop, 10 of which are from CVGMC while the rest are from GBMPC (Table 2). Age of participants ranges from 34 to 64 years old with mean age of 52. Albeit slightly lower than the 57 years old average age of Philippine farmers in 2013 (Elauria 2015), this implies that the two cooperatives are facing the same ageing problem of farmers as experienced by the entire agricultural sector.

Table 2. Participants' profile of the green training-workshop, May 2017

Item	No.	Percent
No. of participants		
GBMPC	7	59
CVGMC	10	41
Age		
Range (years)	36 to 64	
Average (years)	52	
Gender		
Male	9	53
Female	8	47
Educational attainment		
High school	7	41
College	6	35
Others	4	24
Work experience		
Farmer	9	53
Entrepreneur	3	18
Government employee	5	29
Position in the cooperative		
Member	6	35
Manager/management staff	5	30
Board of directors	6	35
Length of membership in cooperative (GBMPC, CVGMC)		
Range	0.08-5	
Average	3.19	

There are nine (9) male participants compared to the eight (8) female respondents. On educational attainment, 41% of them had graduated from high school while 35% completed college and/or post-graduate studies. In terms of work experience, majority of the participants are farmers (61%) while the rest are engaged in non-farm related occupation. This mixture of members' sources of livelihood provided diverse perspectives in identifying green practices applicable to both farm and non-farm operations of the cooperative.

In relation to positions in the cooperative, there is an equal number of non-officer members and BODs at 35% while only 30% of them are managers or staff. The average length in years as members of the cooperative is 3.19 and since the two pilot cooperatives are operating for just three to four years, the member-respondents are mostly founding members of these pilot cooperatives. This signifies the potential influence of the participants to cascade and communicate the benefits of green growth and the merits of engaging in green practices making them ideal change agents in greening the cooperatives.

Individual Level: Knowledge, Attitude, and Perception (KAP) on Green Growth

The number of participants who rated themselves to have high knowledge on green growth increased by 38% from 8 to 11 before and after the training (Figure 5). This increase in understanding of going green translated to 17% more individuals, from 12 to 14, expressing high willingness (increased attitude) to support, promote, and adopt green practices and a favorable shift of 21% more participants, from 14 to 17, who rated high on the perceived benefits of green growth.

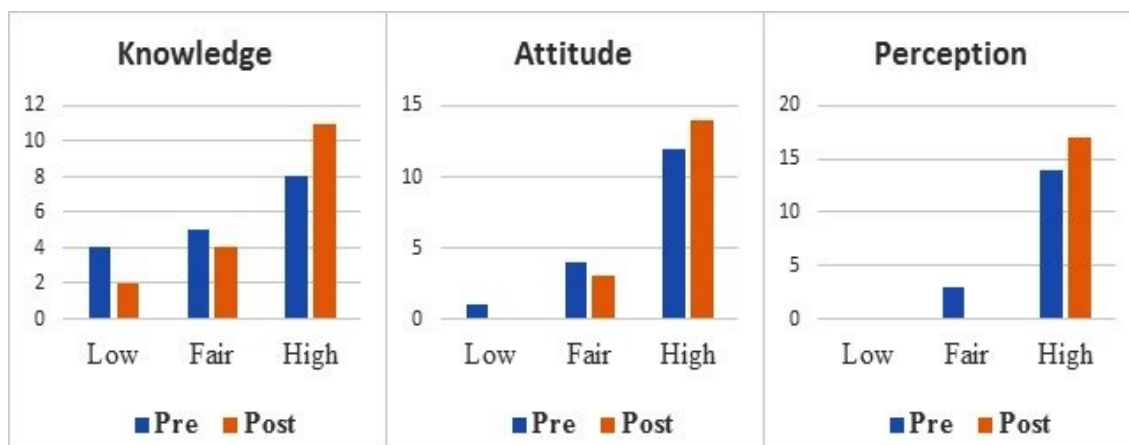


Figure 5. Number of participants and their ratings on KAP before and after the training

Member-respondents who rated high across their KAPs are from the older group (51 to 64 years old vis-à-vis 36 to 50 years old); with more male participants than female, mostly high school graduates whose usual occupation is farming, and have longer tenure as members (Table 3). The findings in this study add to the mixed results found in literature that compared greening behaviors and demographics such as age, education, and gender (Fisher, Bashyal and Bachman 2012) except on education, which consistently shows favorable adoption of those with higher level of education. Further examination reveals that change in ratings among high school graduates remains the same which means that six participants who initially rated high scores prior to the conduct of the training also rated high after. While all the six who finished college/ post graduate degrees initially recorded low-fair scores at the onset, two of them changed their scores favorably to high scores after the conduct of the training. This assessment is congruent to the findings in the study of Fisher, Bashyal, and Bachman (2012) on the positive acceptance of greening from those with higher level of education.

Table 3. Distribution of respondents by post-training KAP ratings and socio-demographic characteristics, 2017

Item	Total Participants	Knowledge				Attitude				Perception	
		Low to Fair		High		Low to Fair		High		High	
		No.	%	No.	%	No.	%	No.	%	No.	%
Age (years old)											
36-50	7	3	50	4	36	2	67	5	36	7	41
51-64	10	3	50	7	64	1	33	9	64	10	59
Total	17	6	100	11	100	3	100	14	100	17	100
Gender											
Male	10	4	57	6	60	2	50	8	62	10	59
Female	7	3	43	4	40	2	50	5	38	7	41
Total	17	7	100	10	100	4	100	13	100	17	100
Position											
BOD	6	2	33	4	36	1	33	5	36	6	35
Manager	5	1	17	4	36	1	33	4	29	5	29
Member	6	3	50	3	27	1	33	5	36	6	35
Total	17	6	100	11	100	3	100	14	100	17	100
Educational Level											
High school	7	1	17	6	55	1	33	6	43	7	41
College/post graduate	6	4	67	2	18	2	67	4	29	6	35
Others	4	1	17	3	27	0	0	4	29	4	24
Total	17	6	100	11	100	3	100	14	100	17	100

Table 3. (Continued) Distribution of respondents by post-training KAP ratings and socio-demographic characteristics, 2017

Item	Total Participants	Knowledge						Attitude						Perception	
		Low to Fair		High		Low to Fair		High		Low to Fair		High		High	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Length of membership (years)															
0-3	7	4	67	3	27	2	67	5	36	7	41				
More than 3	10	2	33	8	73	1	33	9	64	10	59				
Total	17	6	100	11	100	3	100	14	100	17	100				
Work Experience															
Farmer	9	1	17	8	73	0	0	9	64	9	53				
Entrepreneur	4	2	33	2	18	1	33	3	21	4	24				
Employee	4	3	50	1	9	2	67	2	14	4	24				
Total	17	6	100	11	100	3	100	14	100	17	100				

Organizational Level: Integration of Green Growth on Cooperatives' Vision Statements

Both CVGMC and GBMPC, have no well-defined vision and mission statements. In the visioning activity to incorporate green growth in their VMGs, the cooperatives drafted possible ideas of green-inspired vision statements as presented in Table 4. Given the time limitation of the study, the cooperatives have yet to present these newly-outlined green vision statements for the approval of the General Assembly before a change in its vision statement can take effect.

Table 4. Green-inspired vision statements of CVGMC and GBMPC, May 2017

Cooperative	Green-inspired Vision Statement
CVGMC	<ol style="list-style-type: none"> 1. To be known as producers of high-quality organic vegetables. 2. To be known as vegetable producers recycling by-products as compost. 3. To stand out as active player in organic farming
GBMPC	<ol style="list-style-type: none"> 1. The cooperative aims to uplift the welfare of the members and help the community by being responsible steward of the natural resources. 2. To be world-class quality coffee producers and responsible stewards of natural assets.

Organizational Level: Prioritization of Green Practices

GBMPC and CVGMC both identified “low cost to implement” as the most important criterion in prioritizing green practices, with a weight of 30% and 40% respectively, while the least important criteria vary from “faster or quick results” at 5% for CVGMC to “high savings potential” at 10% for GBMPC. Table 5 summarizes the prioritization criteria by CVGMC and GBMPC with assigned weight per criterion.

Table 5. Priority criteria and assigned weights set by GBMPC and CVGMC

CVGMC		GBMPC	
Priority Criteria	Weight (%)	Priority Criteria	Weight (%)
1. Low cost to implement	40	1. Low cost to implement	30
2. High savings potential	30	2. Maximizes readily available resources	25
3. High improvement on output / yield	15	3. High customer satisfaction potential	20
4. Ease of implementation	10	4. High improvement on output / yield	15
5. Quick results	5	5. High savings potential	10
Total	100	Total	100

Using individual and group assessments, CVGMC identified composting and waste segregation as top priority green practices while GBMPC favored waste segregation and waste reduction (Table 6).

Table 6. Priority green practices of GBMPC and CVGMC, May 2017

CVGMC	Total Score	GBMPC	Total Score
1. Make and use compost	3.39	1. Waste segregation	4.23
2. Waste segregation	3.25	2. Waste recycling & reduction	3.33
3. Record and collect energy data	2.80	3. Incorporate greening in VMGs	3.15
4. Check lighting and control	2.73	4. Save paper / electronic communication	2.58
5. Limit use of chemical fertilizer	2.64	5. Conduct training on greening	1.63

Note: The nearer the score to 5, the higher the perceived importance of the identified practice to the cooperative based on the prioritization criteria set by the participants.

Organizational Level: Green Scores or Willingness of Cooperatives to Adopt Green Practices

The result shows improvements in their green scores after the training for both cooperatives (Table 7). CVGMC raised its green scores by 25% which means it incorporated three additional green activities after the training, namely: the checking of 1) lighting and controls which was also a priority practice as identified in Table 6; 2) water usage and controls; and 3) water leaks from faucets, pipes, and toilets. It also added seven more green practices from the list in Table 7 for their future plans which includes one of the priority green practices, the recording and collection of energy data. The other three identified priority green practices of CVGMC in Table 6 are existing activities of the cooperative, namely, waste segregation, composting and limiting the use of chemical fertilizer.

GBMPC, on the other hand, manifested a 90% improvement in its green scores. The six new green practices that were newly implemented after the training are 1) checking of lighting and controls; 2) installation of LED lights; 3) checking of water usage and controls; 4) capturing and storing water; 5) checking of water leaks from faucets, pipes, and toilets; and 6) minimizing the use of paper in their transactions, which was a priority practice listed in Table 6. The other two identified priority practices of this cooperative, waste segregation and waste reduction & recycling, were done even before the training. The incorporation of greening in its VMGs as identified in its priority list was deferred pending the conduct of green training to other members of GBMPC and in light of the due process when amending a cooperative's VMGs.

Table 7. Green audit results of CVGMC and GBMPC, 2017

Green Practices	CVGMC		GBMPC	
	1 st Audit	2 nd Audit	1 st Audit	2 nd Audit
<u>Improve Environmental and Climate Awareness and Knowledge</u>				
Advertise “green credentials” in documents & communications		x		
Communicate green in packaging, website, office signage				
Conduct training to cooperative members on benefits of green and green practices				x
Give preference to suppliers that implement green practices		x		x
<u>Reduce Energy and Emissions</u>				
Check lighting and controls		3		3
Install energy efficiency lighting (i.e. LED, solar-powered)				3
Collect and record energy consumption information		x		
Check water usage and controls		3		3
Capture and store water		x		3
Check faucets, pipes and toilets for leaks		3		3
Install water-saving devices in business or farm operations	3	3		x
<u>Manage Resources and Wastes</u>				
Send information electronically to save paper				3
Do waste segregation and recycling	3	3	3	3
Implement efficient waste disposal systems	3	3		
Collect and record waste information	3	3		x
Reduce, reuse, recycle materials in business and farm operations		x	3	3
Check vehicle usage and reduce unnecessary trips/journeys		x		
Check and maintain vehicles regularly	3	3		
<u>Invest in Green and Climate Smart Technology</u>				
Make and use compost	3	3		x
Repair and improve drainage	3	3	3	3
Reduce cultivations	3	3		1
Target fertilizer applications to soil conditions, crop requirements and weather	3	3	3	3
Explore opportunities to build organic materials and use legumes to fix Nitrogen	3	3	3	3
Limit the use of chemical fertilizer	3	3	3	3
Use improved (e.g. climate-resistant) crop varieties	3	3	3	3
Total Green Scores	36	45	21	40
% Change in Green Scores	+25%		+90%	

Notes:

1. Score of “3” means the practiced is being fully implemented by the cooperatives, “1” if partially implemented and “x” indicates the green practices that were not yet implemented by the cooperatives but were identified to be promising and were added to their future plans.

2. The green practices listed above were compiled from existing literature, suggestions of other cooperatives, and technical recommendations of experts from the government and academe during a consultation workshop done by the authors (2017).

Conclusion and Recommendations

The study concludes that raising awareness and knowledge on green growth through training can positively affect the willingness of agricultural cooperatives to go green both at the organizational and individual levels. Addressing the lack of information on the benefits of green strategies can make a big difference in green adoption among cooperatives. At the individual level, the study records an increase in the number of respondents who rated themselves to have high knowledge, attitude, and perception on greening after the conduct of the training.

At the organizational level, enhancing the green competencies of the decision-makers of the cooperative – the BOD and management team, through training had increased the willingness of the cooperatives to adopt green practices as demonstrated by 25% and 90% improvements in the green scores of CVGMC and GBMPC, respectively, and the addition of new green practices by the cooperatives in their farm and business operations.

To institutionalize green growth adoption in the Philippines, the following are recommended:

1. Monitor and evaluate green adoption. Green audit must be part of the regular activities of the cooperatives to provide the feedback for continuous green adoption and improvement.
2. Encourage green initiative through the integration of green growth in the organization's vision, mission, and goals. A directive to align tactics and strategies to green-inspired vision for the incorporation of green strategy in the by-laws of cooperatives is recommended to inspire greening initiatives.
3. Rationalize government and private training programs to increase focus on green. Training service providers from the private and public sectors must include and promote green trainings in their existing program offerings.
4. Provide direct and indirect incentives to promote green. Establishing institutional support, especially assistance to secure access to finance and capital (green financing), shall boost adoption of green practices. Incentive system for green enterprises and public-private linkages and partnership on greening can also be explored.
5. Institutionalize the practice of greening. To complete the picture of mainstreaming green growth adoption among cooperatives, the external environment must be primed to support the thrust to engage in green. A review on the Philippine cooperative laws and policies is highly recommended. Inclusion of green growth in the Philippine Cooperative Code and mandate of Cooperative Development Authority can provide the climate of compliance for cooperatives to support and adopt ecologically-friendly initiatives much like the decree to set aside funds for community-based projects and members' education, training, and information.
6. Promote greening as a business and social issue. Oftentimes, doing green is set aside and pushed down the priority list because of pressures to meet stiff competition. Its advantages in improving quality, competitiveness, and compliance with climate change directive must be disseminated and

communicated. Beyond the organizational level, all stakeholders must see the necessity rather than the option to move toward greener practices.

7. Capitalize on the principle of “cooperation among cooperatives” by utilizing the big brother-small brother system. This system of brotherhood and sisterhood, anchored on the 6th cooperative principle, creates a culture of interdependency, mentoring and sharing of best practices that has the potential to empower the agricultural cooperatives of the country.

Since this research was only a pilot study on using the training approach to mainstream green growth strategy in Philippine agricultural cooperatives, several areas for further research can be undertaken to support and strengthen the findings of the study:

1. Replication of the study to other types and categories of cooperatives across different geographic areas is suggested. The pilot cooperatives were chosen based on close proximity to the researchers and only from the agricultural sector. Representations of cooperatives from other categories based on asset size can also be done. The two featured cooperatives in this study underrepresent the other micro cooperatives in the country. It would be relevant to examine the same issues and concerns from larger cooperatives, where financial resources are not an issue.
2. Gender issue on green adoption can be explored to determine if adoption rate varies by gender across different cooperative types.
3. Financial impact of green practices can also be assessed. It would be worthwhile to study the financial effect of engaging in green practices on the cooperatives’ bottom line and to validate if the improvement in economic value and/or yield can propel farmers to further engage in ecologically-sound activities.
4. Due to the size limitation of this study which provides mostly anecdotal information, it would be useful to undertake a similar study with a larger sample size of both participating cooperatives and individual member-respondents to allow appropriate statistical analysis.

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