

Sustaining Development Anchored on Women's Involvement in Adopting Location-Specific Technologies on Vegetable Production

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Abstract

This study assessed the contributions of women as adopters and promoters of the Location-Specific Technologies (LST) on vegetable production in Lagangilang, Abra, a municipality with serious nutritional problems among pre-school children.

A combination of quantitative and descriptive methods was used in this research. Complete enumeration of the 81 women participants in the three pilot barangays whose activities and progress in vegetable production were documented.

The participatory processes resulted to fast and high adoption of the LSTs on vegetables by the women partners. This was reflected by the increase in the number of women adopters within the pilot barangays, the expansion of the project to other barangays within the municipality and the involvement of elementary schools.

The areas grown with vegetables increased from 415m² before project intervention to 15,310m², two years after project implementation. It resulted to the municipality's improved vegetable sufficiency level from 3.8% in 2007 to 40% during the first half of 2012. The women were insistent in claiming that their constant monitoring and their patience in promoting the LSTs to recipients of the *Pantawid Pamilyang Pilipino Program* (4Ps) and the mothers of underweight children were significant contributory factors to the 34% decrease in the number of underweight children.

The LSTs on vegetables provided cash income as much as PhP26,000 per year to some women farmers, who before the project contributed not more than PhP4,000 imputed labor for her household farming activities in a year. Earning cash income of their own and providing vegetables on their household table, the women now feel their significant worth and consequently their self-esteem improved.

LGU Lagangilang institutionalized vegetable production following the LST in the entire municipality and integrated it with other projects such as *4Ps*, *Gulayan sa Paaralan* and *Gulayan sa Bakuran*, all projects complementing each other to help attain food security and reduce malnutrition.

Drawing on the findings of this study we propose that there should be an increased effort to engage more women in adoption and promotion of location-specific technologies. This will help farm households improve food security and nutrition. Socio-cultural implications of this initiative are interesting subjects for future research.

Keywords: TCP3, LST, GulayCheck, Women, WFI, WPF, TDF, FLF, AESA, IPM, LGU

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Introduction

Technology generation is indispensable for economic growth in the rural areas. Technologies developed benefit the poor, weak and less articulate sectors of society who have greater needs, fewer resources and little opportunity (Mangabat 2001).

From 2004 to 2008, the Technical Cooperation Project Phase 3 (TCP3) of PhilRice and JICA (Japan International Cooperation Agency) in collaboration with the Local Government Units of Currimao, Ilocos Norte, and Cabugao, Ilocos Sur developed and promoted Location-Specific Technologies (LSTs) for rice and vegetables. The TCP3 involved active participation of two groups of men and women farmers. The first group consisted of farmer partners (FPs) who were required to implement all the technologies in the technology demonstration farms (TDF), and the participating farmers (PFs) who had the option to choose and implement a combination of technologies in the farmer's learning fields (FLF). The project utilized the TDF, FLF, weekly farmer's field school, and technology cross visits. PhilRice spearheaded the implementation of the project for two years. Thereafter, the LGU expanded the project strategies in other barangays and took over the management in the original sites (Agres et al 2009).

Through the LSTs on vegetables, the farmers gained higher income, significantly decreased the frequency and volume of pesticide application, and became extension agents to farmers in the surrounding fields and the project's expansion sites of the technologies they learned from the project.

Three years after the end of the project, the impact evaluation indicated that the more successful beneficiaries were women (Catudan 2012). In Currimao, Ilocos Norte, a woman

farmer partner started farming with a 200m² farm and expanded her area to more than 3 ha. She eventually became a Magsasaka Siyentista, and currently the municipality's MAFC chair. Above all, she has become recognized by her peers as a leader, which shows that the ability of women in food production must never be underestimated. Despite the not so favorable agro-ecological condition of her farm, she was able to transform it into a productive one which serves as a model in increasing productivity of farms in adverse environments (Pablico 2007).

The four-year experiences with the TCP3 showed that more successful farms had the farmers' wives very much involved in production activities. This was evident with several of the women partners who are now successful entrepreneurs after venturing into off-season vegetable production. One of these is an enterprising woman farmer who was awarded *Sipag at Tiyaga* by Senator Manny Villar in 2009. Another is a former overseas contract worker who was awarded *Most Outstanding OCW* of Ilocos Norte in 2012. These women are regarded as champions by the farmers in their barangays. The above accounts are just several of the many success stories of women-farmer partners as adopters and promoters of LST.

Having proven that the strategies of TCP3 has been successful for women farmers in Ilocos, PhilRice Batac embarked on expanding it in Abra where it was identified by the government to have serious nutritional problems among pre-school children. Hence, this study aimed to assess the contributions of women as adopters of the LST on vegetables in Lagangilang, Abra. Specifically, it aimed to (1) identify the processes in adopting the LST on vegetables involving women in Lagangilang, Abra together with their inputs and outputs; (2) assess the adopted technologies based on the following indicators: social acceptability, technical feasibility, economic viability, environmental soundness, and, political acceptability; (3) identify the enablers and barriers surrounding the commercialization of the

technologies; and, (4) surface the lessons learned from the women's experiences and practices in adopting the LST on vegetables.

Conceptual Framework

Sustained development anchored on women's involvement is the end goal of promoting the developed LST on vegetables (Figure 1). The LST on vegetables, including the developed promotion strategies as inputs, were geared toward food security, increased income, improved nutrition and employment generation. The commitment of the LGU, change agents, and the active participation of women partners were important inputs to enhance adoption of the LST.

The municipality of Lagangilang was chosen as the partner agency because of its low sufficiency level (4%) of vegetables, high incidence of malnutrition, the availability of idle time of women, and the willingness of the LGU to support the project.

The processes in adopting and promoting the LST started with a strong partnership with the LGU that is in need of the technologies. The first component of the technology dissemination process was the introduction of the TCP3 technologies and hands-on training through the GulayCheck Field School. The training was conducted in 20 weekly meetings following the FFS approach. During the training, the science behind the technologies was discussed.

Simultaneous with the training, the women participants were given the chance to experience implementing the technologies. The women farmer innovators (WFI) established technology demonstration farms (TDFs) where they implemented all technology components, and the women participating farmers (WPF) chose a combination of technologies that they implemented in their farmer's learning fields (FLFs). Through the TDF and FLF, the women experienced implementing the technology, observed and discovered the effects, and learned

to make decisions based on their actual observations. Non-participating women and other farmers learned the technologies when they attended cross visits or the field days.

The project identified the problem-solving dynamics in the implementation of the processes. Likewise, the evolution and modifications of the technology transfer strategies were documented.

The adopted technologies were assessed based on the five criteria such as social acceptability, technical feasibility, economic feasibility, environmental soundness, and political acceptability. Finally, the lessons learned from the women’s experiences and practices in adapting the technologies were identified.

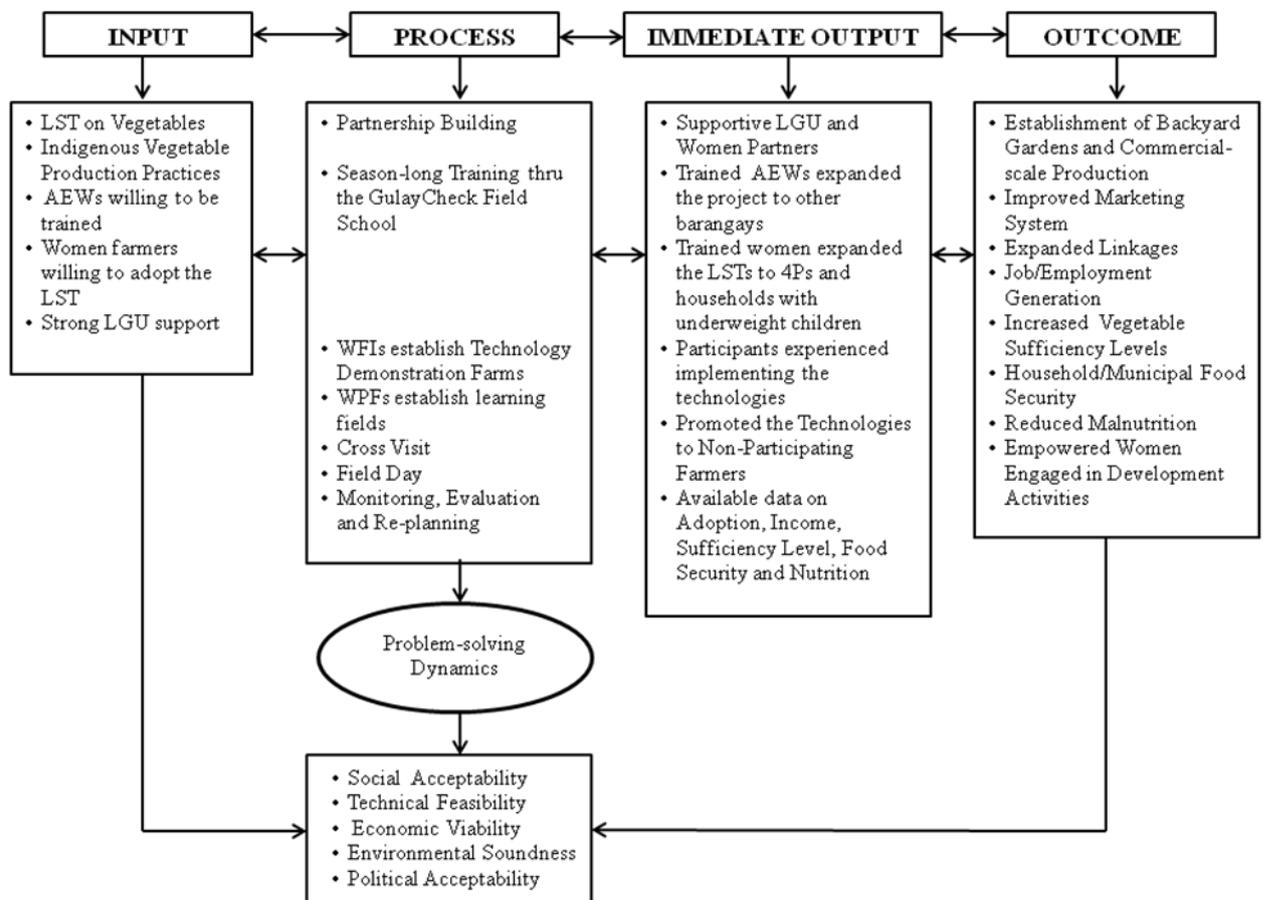


Figure1. The Conceptual Framework of Sustaining Development Anchored on Women’s Involvement in Adopting Location-Specific Technologies on Vegetable Production.

Methodology

This project was conducted in three barangays of Lagangilang, Abra namely: Dalaguisen, Pawa and Nagtupacan. Lagangilang is one of the most interior municipalities of Abra, has the 5th highest incidence of malnutrition in the province, and has no Agricultural Extension Worker trained on vegetable production. All three barangays practice rice-rice cropping system.

The project involved 81 women participants whose activities and progress in vegetable production were documented. Quantitative research methods were employed to answer the objectives. The instruments used to gather the needed information were a semi-structured questionnaire, observation guide, checklist of the technology components, and planting calendar.

The data were treated using descriptive and correlational analysis. Descriptive method was used to characterize the women's personal characteristics, knowledge level, attitudes, social and physical environment, change agents and other support services as well as the perceived and observed attributes of the technology components.

Results and Discussion

This chapter is presented in four parts. The first part describes the processes in adopting the LSTs on vegetable production, together with inputs and outputs involved. The second portion presents the assessment of the technologies adopted by the women based on social acceptability, technical feasibility, economic feasibility, environmental soundness, and political acceptability. The third part is the problem solving dynamics in the implementation of the processes, and the evolution and modifications of the technology transfer strategies. The last part shows the lessons learned from the women's experiences and practices in adopting the LST on vegetables.

I. Processes in Implementing the Project

Partnership Building. PhilRice started the partnership building with the LGU of Lagangilang through a courtesy call to the local executive. The activity secured the commitment of the LGU to the project. The local executive assigned AEWs to assist in all activities, and provided financial counterpart for field inputs, training and other activities.

In early April 2010, the project implementers paid courtesy calls to the Chairmen of Barangays Dalaguisen, Pawa and Nagtupacan to introduce the project and how it could help the community improve food security and nutrition. The next meeting involved the project briefing of prospective women partners. The wives of the Brgy. Chairmen were identified as the focal person in each site.

Baseline Characterization of the Site. A baseline survey was conducted to all women partners. A Focus Group Discussion (FGD) was likewise conducted in each barangay, participated by women project participants and non-participants. The following problems in the production chain that needed to be addressed were identified: (a) limited access to quality vegetable seeds, (b) lack of basis for fertilizer application, (c) limited access to off-season and in-season technologies, (d) limited knowledge to identify suitable areas for off-season vegetable production, (e) areas available for planting vegetables are stony and clayey, (f) limited knowledge on pests management, and, (g) no AEW trained on vegetable production.

The baseline survey included the socio-demographic and socio-economic characteristics of the women and their families, their activities and routine of work, and the amount and source of income of their household before the project implementation.

Together with the experts and the AEWs, the rural women who attended the FGD identified the technology interventions needed and how to implement them. The women were

made to understand of the root cause of their problems, and were given first-hand experience to plan interventions to solve their own problems.

Establishment of Demonstrations and Learning Fields. The primary strategies to transfer the LST on vegetable production were the establishment of TDF and FLF. The seeds, seedling trays, fertilizers and plastic mulch were given free to WFIs. Labor was the women's equity. On the other hand, the LGU provided a portion of the seeds and fertilizers for free to the WPFs.

Project Launching. The project was launched at the start of WS2010. Heads of provincial and municipal LGUs joined the local executive in the ceremonial transplanting of vegetables in the TDFs. The project was introduced to 204 women and men farmers from various barangays of Lagangilang, and to the representatives of local units and agencies.

Season-long Training through the GulayCheck Field School. To impart to the AEWs and women partners the technologies and the science behind the technologies, a season-long training course from seedling production to harvesting was conducted following the FFS approach. The sessions were conducted right at the farm, in the brgy hall, under a tree or inside a participant's house depending on the topic and the convenience of the women. During the first season (WS2010), 20 sessions were conducted every week but were reduced to 11 sessions every other week during the second season (DS2011). Topics discussed during the second season were reinforcement of the topics taken during the first season and dealt mainly with essential cultivation techniques for dry season.

The highlight of the training session was the conduct of the Agro-Ecosystems Analysis (AESA) and the processing of field observations. In every AESA session, each group of women was assigned a particular vegetable to observe. They measured plant height, population and degree of damage of insect pests and diseases. The identity of beneficial organisms, their hosts and their role in the farm, and the weather conditions were also

observed. Based on the observations, the decision-making skills of the women were enhanced. They recommended and employed immediately the appropriate cultural management, water and nutrient management, and, pests and diseases management. The first two hours of the training were devoted to the participatory discussion of observations and status of the TDFs and FLFs. Yield was also measured.

Special topics on vegetables included were those that the women felt they needed at the relevant growth stage of their standing crop, or a technique they needed to implement during that stage. The topics were delivered by experts coupled with a demonstration on how to do the technique.

Meanwhile, AEWs of the Municipal Agriculture Office attended a 3-day training program prior to the start of the women farmers' FFS to equip them with basic skills in vegetable production. In addition, they attended the season-long training in the sites together with the women farmers.

Cross Visit and Field Day. Cross visits were conducted during the vegetative and fruiting stages of the vegetables. The activity provided the women within the site and across sites a chance to exchange observations and experiences about the technologies adopted. Meanwhile, a field day in each site showcased the technologies to women and men farmers from other barangays who were prospective recipients of the project's expansion activities.

Organizing the Women. The participating women in each site were organized to strengthen their ties, systematize their concerted efforts and aspirations, link them with the LGU, and create a market niche for their produce. They were likewise organized to ease their access to support and consequently better ensure the sustainability of their vegetable production endeavor.

Enrollment to the PTC. Women participants who owned cellphones were encouraged to register at the PhilRice Text Center (PTC). The PTC provided S&T

information on vegetable and wholesaler's prices from a *bagsakan centers* in Metro Manila and Ilocos Norte.

IEC Materials. Information, education and communication materials such as bulletins, coursewares and flipcharts were produced for the project participants. Technologies of the different vegetables were compiled in bulletins in the Iluko dialect and served as a guide for the farmers on how to implement the technologies. Flipcharts, also in Iluko, served as a guide for the AEWs in their conduct of GulayCheck Field School. The coursewares (in English) guided the AEWs in the delivery of the different topics during the weekly or bi-weekly sessions with the women partners.

Monitoring, Evaluation and Re-planning. Monitoring and evaluation of the immediate impact of the project was done. To estimate the income of the adopters from vegetable production, the women participants were provided planting calendars to record their yield and sales on a daily basis, including the material and labor inputs they incurred.

Supplementary data such as changes that occurred within the women participants and their family and community were gathered through a structured questionnaire.

The project tied up with the Barangay Nutrition Scholars (BNS) and the Barangay Health Workers (BHW) in the sites who incidentally were likewise partners of the project. The weight of children (0-72 months) in the households of women adopters were measured every quarter. The actual weight of each child was compared with the desirable weight for a particular age. The number of families with at least one kind of vegetable in their backyard/farm was documented in the baseline. Two years after the project, the number of families with at least two kinds of vegetables and with at least 10 hills using the technologies advocated were monitored. Likewise, the LGU together with personnel from the Bureau of Agricultural Statistics in the province extracted from the record of the participants the data on

the total volume of vegetables produced by each household. A household that was able to produce at least 30 kg per capita for its members was considered self-sufficient in vegetables.

After each season, an end-season review and re-planning was conducted to identify the strengths and weaknesses of the strategies and the technologies, and to plan for the next season activities.

Linkage with Other Stakeholders. After one season of project implementation, the demand for the material inputs such as seeds, seedling trays, plastic mulch and fertilizers escalated. To address the problem, the project implementers established linkage with several input providers assuring the availability of these inputs in the locality. Likewise, additional training programs on *Enterprise Development* and *Value-adding of Vegetables and Other Farm Products* were conducted to provide the women the skills to start their vegetable production and processing as a small business.

Processes in the Adoption and Adaptation of the Technologies

The women partners adopted majority of the technologies advocated but adaptation was made on materials used and some techniques. The women used materials which are locally available, cheap and sometimes free. They resorted to recycling used papers, plastics, old basins, coconut shells and bamboo for the technology on the use of seedling tray. Plastic mulching was modified by using the transparent plastics inside sacks of commercial fertilizers or livestock feeds, rice straw and kakawate leaves. The use of rice straw compost as a component of the seedling media was substituted by using garden soil collected under big trees and under bamboos. The women partners brought out their ingenuity, creativity and innovativeness in adapting and modifying the technologies introduced. Likewise, the implementers assisted the women who cannot buy the material inputs to identify recyclable materials.

Processes in the Expansion of the Project

The technologies and the extension strategies of the project were replicated by the LGU in 9 barangays and 10 elementary schools in Lagangilang. The LGU provided all the inputs for the TDFs. PhilRice extended technical assistance but conducted a bi-monthly meeting this time with the AEWS to monitor the processes in the implementation of the project expansion. Problems in the management of the expansion sites and in the adoption of the LSTs were discussed and given immediate solutions. The group visited the demonstration plots and learning fields with problems after the reporting.

The women leaders from the original project sites outscaled the project on their own within their barangays. They extended the technologies to the recipients of the “Pantawid Familyang Pilipino Program” (4Ps), who were also the same families with underweight children.

II. Assessment of Technologies Adopted

Technologies that were highly adopted by the women participants were those that required labor only and minimal material inputs (Table 1). Those that required material inputs were less adopted.

The social acceptability of the LST on vegetables can be best reflected by the increase in the number of women adopters and expansion barangays, and the involvement of elementary schools. The baseline survey indicated that 29% (162 of the 560 families in the project sites) had at least one kind of vegetable raised in their fence or backyard (Table 2). After two years of the project, 45% (252 families) have established their vegetable gardens with at least two kinds of vegetables and at least 10 hills each kind.

Table 1. Adoption (%) of technology components according to type of inputs required. Abra 2012.

Technology Component	% Adopting	Input Category
Planting in raised beds and high ridges	100	Labor
Appropriate distance of plating	100	Labor
Practice of IPM	99	Labor
Construction of simple nursery	99	Labor
Construction of trellis	98	Labor
Raising seedlings in cell trays	94	Labor
Use of recommended seedling media	89	Labor
Off-Season cultivation	73	Labor
CRH making	73	Labor
Composting	61	Combination
Use of high quality seeds	41	Material
Basal fertilization	35	Material
Plastic mulching	8	Material

Table 2. Change in the number of households growing vegetables before and after project implementation. Lagangilang, Abra 2012.

Site	Total No. of Households	No. of WFPs	No. of Households with Vegetable Garden		% Increase from Baseline	No. of Farmers Tutored by Each WFP
			Baseline (May 2010 ^a)	2012 ^b		
Dalaguisen	189	34	59	85	44	1.5
Pawa	100	34	50	90	80	1.0
Nagtupacan	271	25	53	77	45	1.0
All Sites	560	93	162	252	56	1.0

a – at least 1 kind of vegetable even without technology

b – at least 2 kinds of vegetables, followed at least a combination of the LSTs

The LGU upscaled the LST on vegetables in 7 barangays after one season of project implementation, and to 2 more brgys after 2 years (Table 3) involving about 225 women participants. The expansion of the technologies was based on the requests submitted by the barangay council and women farmers to the office of the Municipal Agriculture Office. Likewise, 10 elementary schools requested for training on the LSTs and assistance in the establishment of demonstration plots for their *Gulayan sa Paaralan*. Members of the Parent-

Teachers' Association of the schools joined the pupils establish and maintain the *Gulayan sa Paaralan*. Grade V and Grade VI pupils brought home vegetable seedlings for planting in their homes.

Based on promising adoption and promotion results, the LGU launched its *Gulayan sa Bakuran* in July 18, 2012. The LGU's program on *Gulayan sa Bakuran* aims to involve all households in producing their own fresh vegetables for food security and improved nutrition.

Table 3. Starting year of involvement of project sites in Lagangilang, Abra.

Sites	2010	2011	2012
Barangay	Dalaguisen Pawa Nagtupacan	Balais San Isidro Laguiben Lagben Nagtipulan Tagodtod Presentar	Bacooc Cayapa
Elementary Schools		Dalaguisen Elem Sch Metodio Elem Sch Lagangilang Elem Sch San Isidro Elem Sch Nagtipulan Elem Sch Tagodtod Elem Sch Presentar Elem Sch Cayapa Elem Sch Caridad Azares Elem Sch Holy Cross Sch Taping Primary Sch* Gaddani Primary Sch*	

* Teachers in the primary schools stopped the activity because their pupils are very young and have very limited time for the activity.

The women partners produced vegetable seedlings inside simple nurseries using local materials which they constructed themselves or with help from household members. The nurseries of various sizes and durability (Figs 2, 3, 4, 5) show how the women took good care of their vegetable seedlings. One WPF used the old mosquito net of her granddaughter to protect the seedlings from insect pests or stray animals.



Figure 2. Simple vegetable nurseries built by women partners of brgy. Pawa.



Figure 3. Simple nurseries constructed by women partners in brgy. Dalaguisen.



Figure 4. Simple nursery constructed through hired labor



Figure 5. Temporary simple nursery of a 74-year old WFP

Likewise, the innovative women in Brgy. Nagtupacan who did not have enough space to plant vegetables decided to build a communal nursery. These same women established a communal vegetable garden in a wide area owned by one of the members (Fig 6). Their decision to pool their resources resulted to more varieties of crops planted and more number of hills per crop. Producing more than what their families needed, the women sold their surplus to neighbors and employees of the municipal hall.



Figure 6. The women in Nagtupacan planted 40 hills of bottlegourd, 40 hills of ampalaya, 80 hills of tomato, and 200 hills of eggplant. WS2011.

Likewise, the women who did not have the suitable space for planting converted or convinced their husbands to convert previously unproductive areas such as stony, submerged-prone and garbage areas into very productive vegetable gardens (Fig 7). The patience and hard work of the women to produce a lot of compost and CRH helped in improving the quality of the soil and made it fit for vegetable growing.



Figure 7. WFI successfully planted up in a stony area. WS 2010.



Figure 8. WPF established her ampalaya and eggplant at their rooftop. WS2010.

The number of technologies adopted by the women was not correlated with their age. A 74-year old widow established her tomato, eggplant, pepper and ampalaya in plastic sacks and plastic containers and maintained them at the rooftop of her house (Fig 8). Lately, she relocated her simple nursery at the rooftop. Likewise, another WPF established her bottlegourd with trellis and her eggplant at the rooftop of their house.

The women recycled plastic cups, old basins, tetra packs, coconut shells and bamboo, cut into halves to raise seedlings in lieu of plastic cell trays (Fig 9). This way they helped their community recycle plastic.



Figure 9. Recycled materials used by women in raising seedlings of vegetables. Lagangilang, Abra.

Likewise, they used the transparent plastic inside fertilizer sacks, kakawate leaves and rice straw for mulching their crops. The women who are heads of families practiced early planting of vegetables in the wide silted areas they call “laplapog”. These areas are far from their houses, so majority planted vegetables such as eggplant, squash, upo and even ampalaya which required less attention. One WFI was able to sell her ampalaya at PhP90.00/kg and her eggplant at PhP50.00/kg.

The total area planted to vegetables by all project participants increased tremendously from 415 m² in the baseline to 15,310 m² on the first year and 26,830 m² on the second year (Table 4).

Table 4. Total area planted to vegetables by project participants from 2010 to 2012 at the project sites. Lagangilang, Abra.

Site	Area (m ²)		
	2010 (Baseline)	2011	2012
Dalaguisen	135	7,100	12,400
Pawa	160	4,625	9,100
Nagtupacan	120	3,585	5,330
All Sites	415	15,310	26,830

During the baseline survey, the women were hesitant to tell that they were not earning any cash income of their own. While they did not consider their labor contributions as a form of non-cash income, their imputed monetary values were estimated. Before the project intervention, not one woman participant contributed more than PhP4,000 imputed labor to her household farming activities in a year (Table 5).

After producing vegetables for the household and the market and revolving their cash sales to other farm activities such as rice and livestock production, some of the women earned as much as PhP26,000 per year.

Table 5. Increase in income (PhP) of the women partners in the sites. Lagangilang, Abra. 2011

Site	Income (PhP)	
	Baseline	2011
Dalaguisen	<1000 – 2,745	3,200 – 26,000
Pawa	<1000 – 3,840	2,500 – 18,000
Nagtupacan	<1000 – 2,716	3,000 – 9,500

The project likewise provided employment for women who did not have suitable area for growing vegetables. One of them is an amputee and a young mother with 3 children who became indirectly involved in the project by selling the produce of the women participants.



WPF Adela collects and sells vegetables

In addition, the women participants devised a marketing scheme when their production significantly increased. When the volume of their produce was still minimal, they disposed them only to LGU employees, retailers and wholesalers within Lagangilang. To get the price differential enjoyed by middlemen, many of the women participants eventually brought their produce to the market and directly sold them to consumers. Originally, the municipal market operated only during Thursdays and Sundays. With the increased supply of vegetables from the project participants, Tuesday was added. Further, two women partners became assemblers and have been bringing the vegetables to neighboring municipalities such as Dolores, San Juan and Bangued.

Earning cash income of their own and providing vegetables in their household table, the women now feel their significant worth. Their self-esteem improved consequently landing some women official posts in their barangays and in civic organizations, and others became very active in helping other women in their community.

The increase in areas grown with vegetables in the original and expansion sites, and the adoption of the technologies resulted to improved vegetable sufficiency level in the municipality. Table 6 shows that its 3.8% sufficiency level in 2007 rose to 20% during the first year of the project, 28% after one year, and 40% during the first half of 2012. With the trend in the increase of the sufficiency level, the municipality projects an 80% sufficiency level by 2016.

Table 6. Vegetable sufficiency level (%) of Lagangilang, Abra. 2007-2012.

Year	Population	Production (MT)	Demand (MT)	Deficit (MT)	Sufficiency Level (%)
2007	13,552	19,989	528,528	508,539	3.8
2010	14,072	109,256	548,808	439,552	19.9
2011	14,246	156,068	555,594	399,526	28.1
2012	14,427	224,130	562,653	338,520	39.8

Source of basic data is from the municipality's profile

Table 7. Decrease in the number of underweight children (0-72 months old) in the sites. Lagangilang, Abra. 2012.

Site	Underweight (no.)		Change (%)
	Baseline	2012	
Dalaguisen	77	37	52
Pawa	50	50	0
Nagtupacan	22	11	50
Total	149	98	34

By 2011, the number of underweight children (0-72 months old) decreased by 34% (Table 7).

The women partners were insistent in claiming that their constant monitoring, and their patience in

promoting the technologies to the *4Ps* were significant contributory factors to the above impacts of the project. The WFIs continued to produce seedlings of vegetables and distributed them to mothers of underweight children.

LGU Lagangilang through its Municipal Agriculture Office recognized that the LST on vegetables would pave the way to increasing sufficiency level of vegetables and reducing malnutrition in the municipality. Hence, the LGU institutionalized vegetable production following the LST in the entire municipality.

In all expansion barangays, the LGU allocated budget for seeds and other material inputs. In the elementary schools, the LGU provided plastic nets for the simple nurseries and starter seeds and other inputs like plastic mulch and fertilizers.

Most importantly, the LGU mobilized all the AEWs and assigned the management of the activities in the original and expansion barangays and the elementary schools to them (Table 8). The project became a priority and was integrated with other projects of the municipality such as the *Pantawid Pamilyang Pilipino Program* (4Ps), *Gulayan sa Paaralan*, and *Gulayan sa Bakuran*. All projects complement each other to help attain food security and reduce malnutrition in the municipality.

Table 8. Project site assignments of AEWs in Lagangilang, Abra*.

AEW	2010	2011	2012
Aveno, Julito A.	Pawa	Nagtipulan + 2 schools	
Ballacilla, Soledad A.	Nagtupacan	Balais, Lagben + 1 school	
Borge, Veronica T.		San Isidro + 2 schools	
Buenafe, Absolon Jr.		5 schools	
Castaneda, Adelina B.	Dalaguisen	Tagodtod, Presentar + 1 school	
Paa, Amelita		Laguiben + 1 school	
De Guzman, Digna	Supervisor	Supervisor	Bacooc, Cayapa

* Site assignments of AEWs were maintained until the present.

For two years since the start of the project in 2010, the municipality has launched the *Pinaka* on vegetables (biggest size of different vegetables), and searched for different recipes of vegetables during their town fiesta. And for the first time, Lagangilang was chosen as one of the three municipalities of Abra which participated in the display of off-season vegetables during the *Provincial Nutrition Month* celebration in July 2012.

The local executive during the launching program and field day in 2010, challenged the women to produce as much vegetables as they can and the LGU will support them by constructing a new market. The new market was inaugurated in late 2011. The LGU also constructed new farm-to-market roads in the different barangays.

On July 18, 2012, the LGU Lagangilang launched the *Gulayan sa Bakuran* participated by all barangays. Evaluation and awarding of top performers is to be done every quarter of the year within two years.

III. Enablers and Barriers for the Commercialization of the Technologies

Dissatisfaction with the present situation. LGU Lagangilang had low vegetable sufficiency level of 3.8% before the implementation of the project while it was identified to have serious nutritional problems among pre-school children. No AEW in the municipality was trained on off-season vegetable production. LGU Lagangilang recognized that the LST on vegetables would pave the way to increasing sufficiency level and reducing malnutrition in the municipality.

Knowledge and Skills Exist. Majority (30%) of the women participants have finished high school, 16% graduated in college and another 16% reached college level. This finding implies that the women understand and can comprehend the LSTs on vegetables. The participatory processes which involved the conduct of the GulayCheck Field School, the establishment of demonstrations and learning fields, and the conduct of cross visits and field days where the women actively participated honed their knowledge and skills.

Availability of Resources. The LST on vegetables was made accessible to the AEWs and the women partners through a season-long training, demonstrations and hands-on exercises. PhilRice and the LGU provided material inputs for the demonstration farms and learning fields. These inputs were made available in the locality and the women partners recycled and used locally-available and cheaper material inputs. Women who did not have the suitable areas for production produced enough compost and CRH to improve the soil and also converted previously unproductive areas into productive vegetables areas.

Availability of time. The women in the project sites identified their available idle time and they provided quality time for adopting the LSTs on vegetables. The women who had small children were assisted by the women leaders in producing vegetables by providing them transplantable seedlings. Absence to a particular session did not constrain the women from adopting the technology component discussed as they eventually sought assistance from those who attended. This was attributed to the *tutor your neighbor* scheme which was implemented to help the women who, sometimes absent themselves from the sessions because of equally important domestic responsibilities.

Participation. The recipients of the project were involved since conceptualization up to implementation and monitoring of the project. The participatory processes resulted to the success of the project implementation.

Commitment. The commitment of the project implementers in working with the recipients and other stakeholders resulted to fast adoption. The project became a priority project of the LGU and was institutionalized in the entire municipality by integrating the LST on vegetables with other projects, all of which help attain food security and reduce malnutrition in the municipality.

IV. Lessons Learned

The role of the LGU, the women partners and those of the other stakeholders were identified and explained clearly during conceptualization. The recipients and the stakeholders felt that they own the project, hence they provided their full support.

The project sites which really needed the innovation and the recipients of the technologies or the training program were identified based on set criteria, hence both implementers and recipients took advantage of the program with their own vested interests.

The women underwent the GulayCheck Field School and became farmer partners who experienced implementing the technologies by establishing demonstrations and learning fields, hence adoption and adaptation of the LST on vegetable production was fast and high. Their learnings were enhanced by the discussion of the science of the technologies followed by hands-on exercises.

The knowledge and skills of the AEWs on the LST on vegetable production was enhanced by undergoing a 3-day training of the basic skills on vegetable production and attended the season-long training with the women farmers. Likewise, local women leaders regarded as *champions* within the community were tapped and even volunteered to promote the technologies. The self-confidence of the AEWs and the women leaders in upscaling the technologies to other barangays and within their barangays was enhanced by providing them IEC materials such as flipcharts and bulletins in the local dialect.

Conclusion and Recommendations

This paper has shown that involving women in adopting location-specific technologies on vegetable production contributed significantly in increasing the number of adopters thus increasing the area grown with vegetables. Likewise, their active participation in disseminating the advocated technologies to other women within their barangays resulted to improved vegetable sufficiency level in the municipality. Their constant monitoring and patience in promoting the LSTs on vegetables to mothers of underweight children and recipients of the 4Ps apparently contributed to the decrease in the number of underweight children.

The women after earning cash income of their own and providing vegetables and other foods on their household table, now feel their significant worth and their self-esteem improved.

Local women leaders and successful women farmers within the community are important change agents who can be tapped to assist in disseminating the technologies and research information to farmers. The country must invest in devising an extension system or training programs which suits the needs of women farmers as participants. As pointed by Manalo and de Fliert 2012, the existing pool of agricultural technologists is never adequate to service the more than 2 million Filipino farmers. The capabilities of women farmers as food producers and technology promoters is needed especially that the country envisions becoming food self-sufficient.

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