

Department of Agriculture

Department of Agrarian Reform

## Summary Report

Republic of the Philippines

Pilot Survey for Disseminating  
Japanese SME's Technologies  
for

Introduction of IT for Agricultural Products  
Distribution

May 2015

Japan International Cooperation Agency

E-SUPPORTLINK, LTD.

## 1. BACKGROUND

In the Philippines, many agricultural development projects have been implemented in the fields of agricultural development, rural development, and irrigation, which aim not only for the improvement of livelihood but also poverty eradication. However, poverty still remains in rural areas. Due to inefficient agricultural product distribution systems, farmers cannot sell high value-added products and are forced to sell their products at lower prices. In addition, they cannot cut back production in response to fluctuations in the market price.

In the Philippines, increased benefits for farmers, distributors, and consumers should be achieved by ensuring the stability of prices, quality, and food safety. These can be done with the development of appropriate facilities for controlling supply and demand such as distribution systems or wholesale markets.

E-supportlink, Ltd. (ESL) has conducted "The Study for Introduction of Information Technology (IT) for Agricultural Product Distribution" through the "Project Formulation Survey" under the Governmental Commission on the Projects for Official Development Assistance (ODA) Overseas Economic Cooperation in FY2012 (December 2012-March 2013) and confirmed the need for the improvement of distribution through the introduction of IT for agricultural product management and agricultural product distribution for which it proposes a concrete pilot survey.

## 2. OUTLINE OF THE PILOT SURVEY FOR DISSEMINATING SMALL MEDIUM ENTERPRISE'S (SME) TECHNOLOGIES

### (1) Purpose

To verify the propriety of agricultural products distribution system operations and the effect on agricultural product distribution caused by utilizing the technologies developed by ESL particularly the farm management system known as Farm Story and the sales management system known as ESL system.

### (2) Activities

#### (A) Introduction of Farm Story and ESL System

##### 1) Basic survey

Baseline survey was conducted in order to fix the requirement definition (basically, this was needed only for ESL system). The main survey items are as follows:

- (a) Operation flow of the driver, marketer, cashier, and accounting officer;
- (b) Transaction volume;
- (c) Current problems about the trading center's operation; and
- (d) Facility environment.

##### 2) Data collection (products, farmers, etc.)

Investigators gathered information for master data which is necessary for the initial use of the systems.

- 3) Software localization and customization  
Language used in the systems was translated into English and the system was modified to suit to the pilot sites' operation.
- 4) Hardware installation  
Hardware was installed to the two pilot sites. After installation, the Survey Team confirmed that the system worked properly with demo data.
- 5) System operation design  
The project team made an operations design and usage manual.
- 6) Operations test  
The Survey Team confirmed the system worked properly with actual data according to the operations design.
- 7) Training for users  
The Survey Team members conducted trainings for users, operators, enumerators, encoders and managers of each association.
- 8) System maintenance during the undertaking  
During the trial period, the Survey Team supported operations and maintenance of the pilot site.
- 9) Monitoring and evaluation of the effectiveness  
The Survey Team had been monitoring if the pilot sites could use the system continuously and appropriately by observing the sites periodically.  
The team also analyzed the effectiveness for the pilot sites to use the system.

(B) Dissemination of Farm Story and ESL System

- 1) The Survey Team proposed the system to other stakeholders such as other farmers' associations, buyers, and local government units (LGUs) through individual presentations and workshops.

(3) Information on Product/Technology to be Provided

E-supportlink, Ltd. is proposing the introduction of the following two kinds of systems in the Philippines.

The Farm Story is a system that manages information about farmers and their products. By registering necessary production information into Farm Story, it gives out a producer's ledger and a harvest schedule. By utilizing the output data, farmers can improve their cultivation method and plan proper cropping patterns.

The flow of Farm Story is shown below.

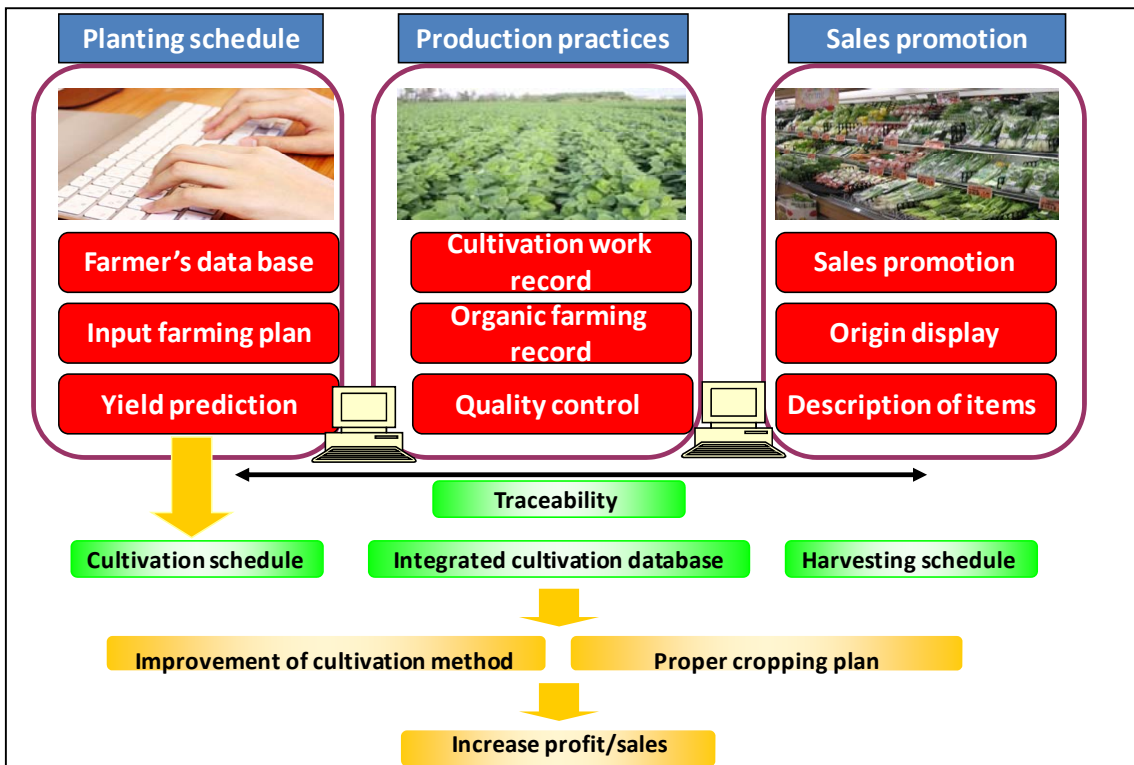


Figure 1 Farm Story

The ESL system enables necessary data transactions among the producers, producer's organizations, and distributors. Each step has the following functions:

- Arrival of products  
The farmer who ships the products is identified through the farmer's identification (ID). Shipping data, kind of items, amount, price, date, time, etc., are gathered in the database.
  - Selling of products  
The buyer's ID and kind of items, amount, price, date, time, etc., are gathered in the database.
  - Payment to farmers  
Farmers can visit the market and get the payment for their products based on the transaction database. The farmer can get the amount one day after the transaction because the database is immediately constructed.
  - Reference of the output  
The system can provide many kinds of useful data for operations, analyzing sales tendency, etc., by sorting and summarizing the data from various points of view.
- The flow of ESL system is shown below.

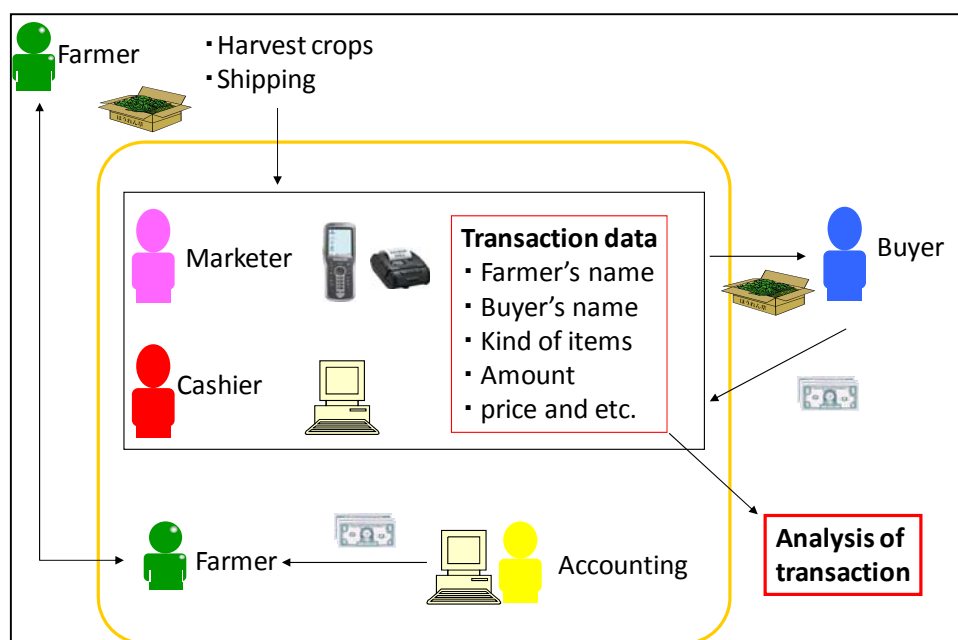


Figure 2 ESL System

(4) Counterpart Organizations

Department of Agriculture (DA)

*Sentrong Pamilihan ng Produktong Agrikultura (Sentrong Pamilihan)*

Department of Agrarian Reform (DAR)

Federation of Patriotic Farmers Cooperative of Nueva Ecija (FPFCNE)

(5) Target Areas and Beneficiaries

(A) Target Areas

*Sentrong Pamilihan ng Produktong Agrikultura*: Sariaya, Province of Quezon

FPFCNE: Talavera, Province of Nueva Ecija

(B) Beneficiaries

*Sentrong Pamilihan ng Produktong Agrikultura*: Cooperative members of *Sentrong Pamilihan ng Produktong Agrikultura*

FPFCNE: Cooperative members of Kawanggawa PMPC, Bantug Agricultural Multi-Purpose Cooperative, Valle Primary Multi-Purpose Cooperative, Barangay Aquino Development Cooperative and Bagong Buhay ng Mabini Multi-Purpose Cooperative

(6) Duration

From September 2013 to May 2015

### (7) Progress Schedule

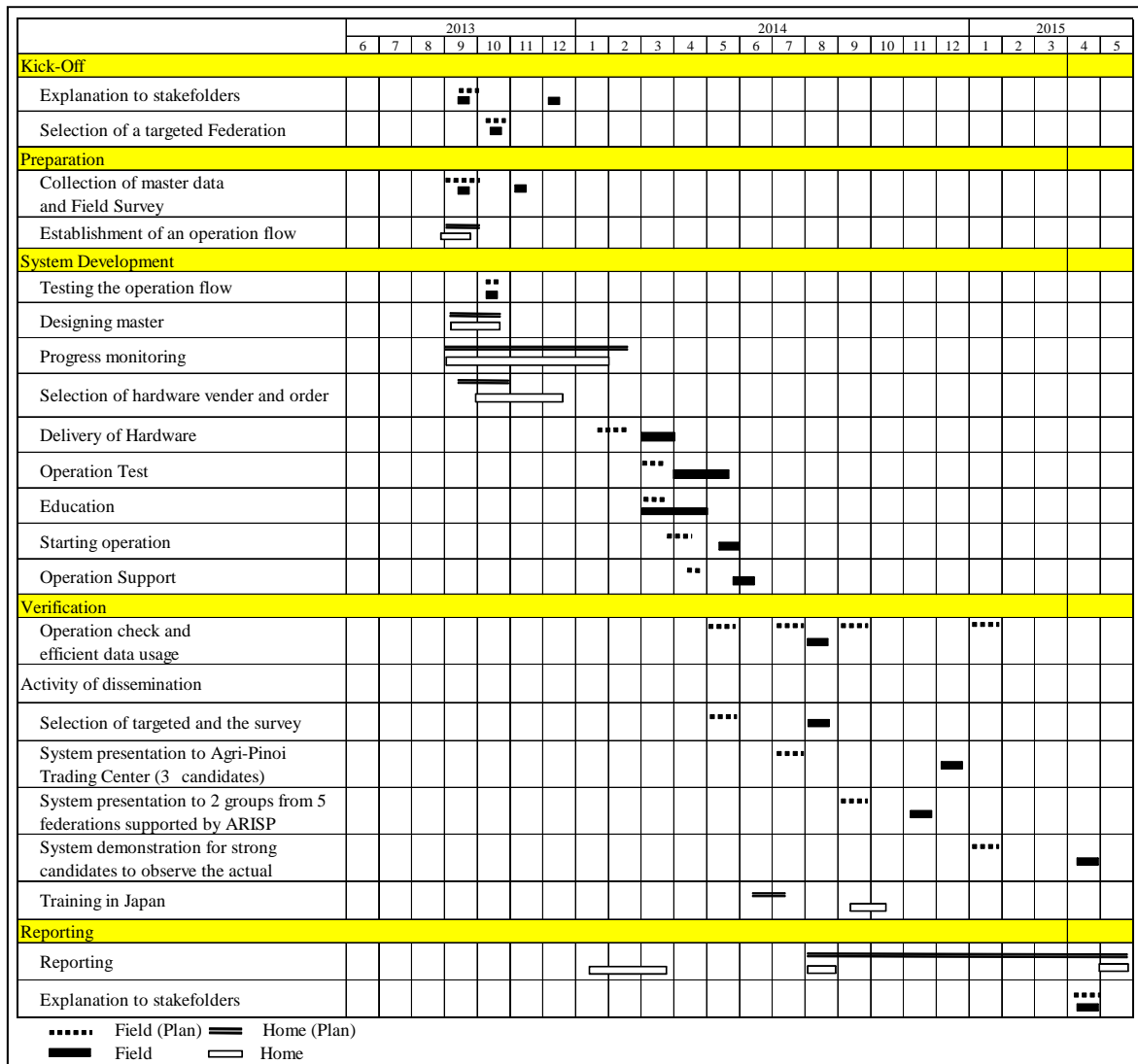


Figure 3 Progress Schedule

### (8) Manning Schedule

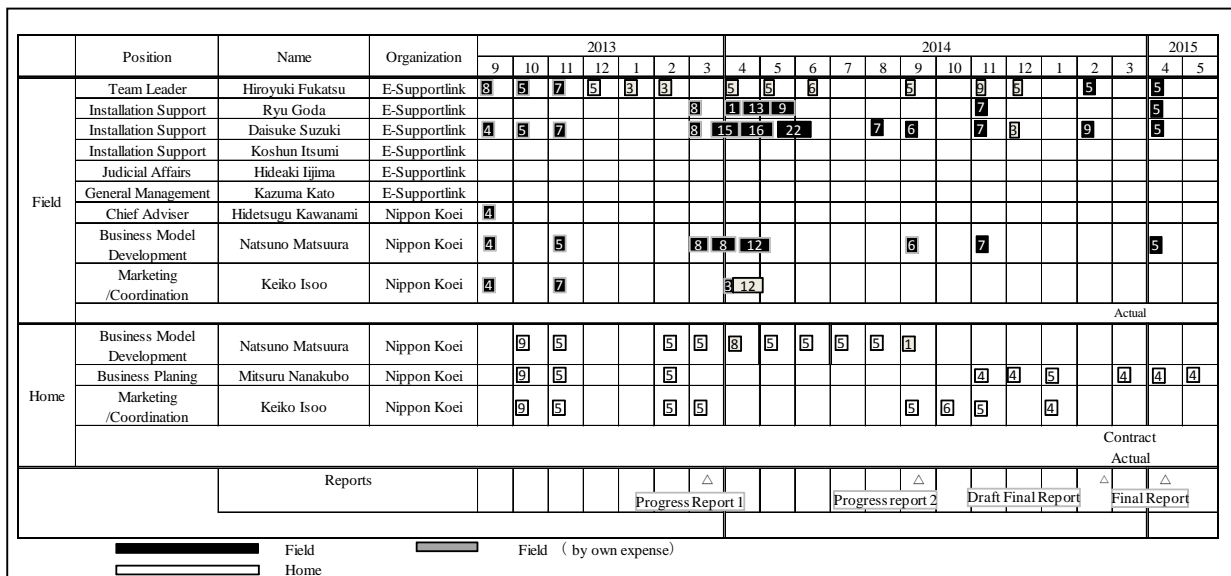


Figure 4 Manning Schedule

(9) Implementation System

The implementation system is illustrated below. The Technical Working Group (TWG) was set-up during the starting period and has specific groups for the *Sentrong Pamulihan* and FPFCNE. The TWG meeting is spearheaded by ESL, and attendees are representatives from the Japan International Cooperation Agency (JICA), the Department of Agriculture (DA), the Department of Agrarian Reform (DAR), the *Sentrong Pamulihan*, FPFCNE, and ESL. The meeting is held once every three months. An emergency meeting can be called upon if necessary. Target issues are identified as follows:

- 1 Progress report of the project;
- 2 Sharing of new information;
- 3 Confirming the challenges and discussing countermeasures; and
- 4 Evaluation of the project.

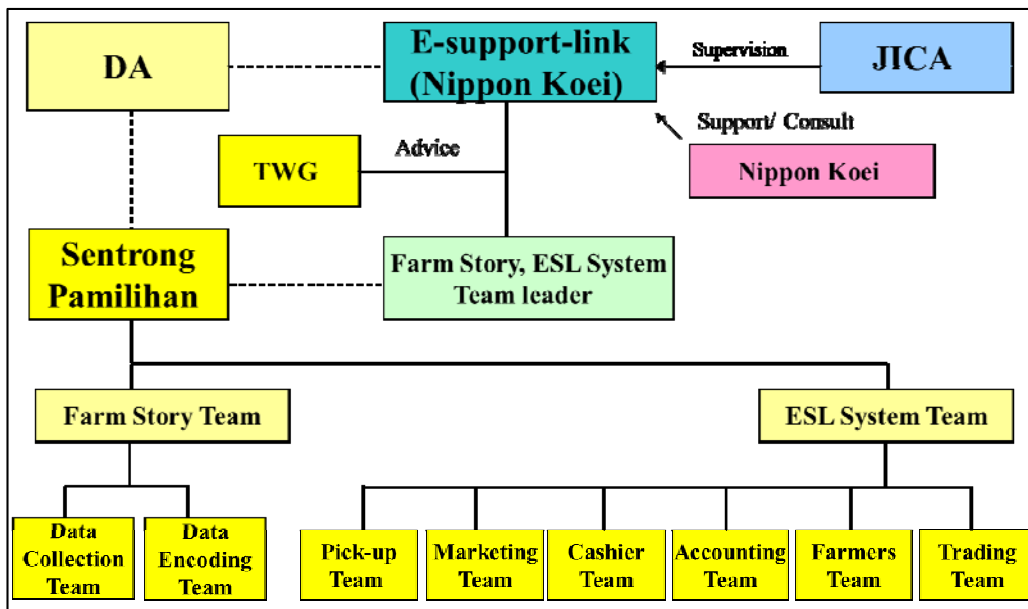


Figure 5 Implementation System of the *Sentrong Pamulihan*

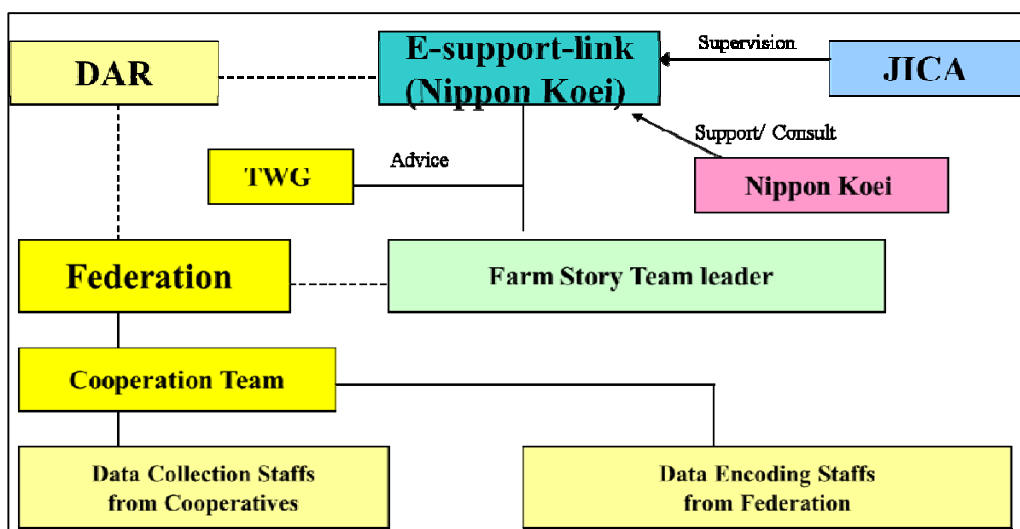


Figure 6 Implementation System of FPFCNE

### 3. ACHIEVEMENTS OF THE SURVEY

#### (1) Results of Each Activity

##### (A) Kick-off

###### 1) Kick-off Meeting

The kick-off meeting was held on September 26, 2013 with related agencies including DA; the *Sentrong Pamilihan* and JICA were also invited. During the meeting, the purpose and outline of the project were shared. Also, the Memorandum of Agreement (MOA) among DA, the *Sentrong Pamilihan*, and ESL was discussed and demarcation of each task was decided. For the DAR side, the target cooperative was not determined during this period. Another kick-off meeting was held in November 2013 as a workshop in order to choose the target cooperative.

##### (B) Preparation

###### •First TWG Meeting (DA)

On November 13, 2013, the first TWG meeting was held. The progress of the project in the last two months was shared and demarcation of each agency and the action plan were discussed and agreed among the TWG members.

###### •Workshop on the Collection of Target Cooperatives (DAR)

From November 11 to 12, 2013, the workshop for FPFCNE and cooperatives belonging to FPFCNE was held. On the first day of the workshop, the purpose of the project was accepted by FPFCNE and the cooperatives belonging to FPFCNE. The target cooperatives were selected under the following conditions:

**Table 1 Target Cooperatives and Target Products**

Name of Cooperative	Location	Target Number of Farmers for Each Product			
		Total	Rice	Onion	Pinakbet
1. BAMC	Talavera	100	100	30	30
2. BBM MPC	Sto. Domingo	200	200	0	0
3. VALLE MPC	Talavera	50	50	50	50
4. KAWANGAWA MPC	Bongabon	100	100	100	30
5. BADECO	Licab	50	50	0	0
Total		500	500	180	110

On the second day of the workshop, the members of the selected cooperatives decided the action plan in preparation for system installation; and discussed the operation of the system, the producer registration sheet, and the form for cultivation record. The implementation system was decided as mentioned earlier.



·Site Visit and Workshop (FPFCNE)

The site visits for survey for system installations were conducted; and workshop was held on March 6, 2014. The purpose of the workshop was to prepare the training for the FPFCNE board members and five target cooperatives.

·MOA Signing Ceremony (for DA and DAR)

The MOA signing ceremony was held on November 11, 2013 for the DAR side (FPFCNE, DAR, and ESL); and December 10, 2013 for the DA side (DA, *Sentrong Pamilihan*, and ESL). The signatories of the MOAs are shown below:

**Table 2 Signatories of the MOA**

	Name of Signatory	Title, Agency
DAR side	Warlito D. Rupac	Chariman, FPFCNE
	Arnel S. Dizon	Regional Director , DAR
	Fukatsu Hiroyuki	General Manager , E-support link
DA side	Proceso J. Alcala	Secretary, DA
	Sofronio F. Pagkaliwagan	Vice Chairman <i>Sentrong Pamilihan</i>
	Horiuchi Shinsuke	President, E-support link



**MOA signing ceremony (DA side)**



**MOA signing ceremony (DAR side)**

**(C) System Modification and Introduction**

**1) Establishment of the Flow of Operation ~ System Modification**

Based on the survey conducted before the beginning of the contract, the schedule of the actual operation was confirmed and other necessary information to be considered for the system structure was gathered.

Based on that information, detailed requirements for hardware and software were confirmed at the end of September 2013. The system modification commenced in October 2013.

The product code of the system was defined based on the actual operation and the code owned by the Philippine Statistics Authority (PSA). Some basic information such as the computation of the farmer's average yield, average production, quantity, etc., was prepared by the counterparts.

2) Purchase and Delivery of Hardware

The supplier was selected in December 2013. In selection of a supplier, the following conditions were considered: cost/price, time of delivery, and maintenance service. The hardware was supplied in January and February 2014, and the system was installed in March 2014.

Development of the Operations Manual

The Survey Team prepared the operations manuals of the two systems based on the results of the survey and workshop conducted in March 2014.

3) Organization of Maintenance System

The Fresh Remix Asia Software Corporation (FRASC) was in charge of the maintenance after system installation. ESL assigned the role of FRASC during the maintenance phase, and FRASC confirmed it.

4) Set-up and Starting of Real Operation at the Site

The set-up and training preparation were made by the FRASC at the site in March 2014.

5) Second TWG meeting (for the DA side)

The second TWG meeting (for the DA side) was held on April 4, 2014, and discussed the following topics; explanation of the schedule from the training phase to the actual operation phase, demonstration of the ESL system, and the Farm Story.

6) Trainings

Training for the *Sentrong Pamilihan*

The training was conducted by ESL on April 6, 2014 at the *Sentrong Pamilihan*. The contents are as follows: 1) detailed confirmation of the rules, 2) on-the-job training during the actual operation, and 3) support of the maintenance after the actual operation.

Training for the FPPCNE and the First TWG Meeting for DAR

The first TWG meeting was held on April 28, 2014 in Nueva Ecija and the following topics were discussed: a) demonstration of the Farm Story and b) explanation of the training schedule. The training was conducted from April 29 to 30, 2014 and the target attendees of the training were encoders and enumerators of the FPPCNE.

The actual operation started after the trainings.

(D) Verifications

The application of the results of the systems following customer potential was recognized after thorough discussions.

1) Monitoring the Operations and Application of the Data

After the start of the actual operation, ESL ultimately gathered the data through e-mail from the sites and visited them in order to check the operation conditions and discussed the application of the data in August, September, and November 2014.

2) Third TWG Meeting (For DA side)

The third TWG meeting was held on November 28, 2014 at the DA Head Office. The discussion topics are as follows: sharing the progress of the project, lessons learned from the operations of the system, and analysis/results of the data of the system.

(E) Dissemination activities:

1) Results of the Survey on Targets for Dissemination

The results of the survey on targets for dissemination are as follows:

- Domestic Food Suppliers of Vegetables

It was realized that it was very practical for the domestic food suppliers such as vegetable processing company, to use the ESL system and the Farm Story because they could get information about the stable purchase and supply of vegetables through these systems.

- Exporting Agricultural Products

In the Philippines, there are companies that export agricultural products like okra, mango, corn, etc. These companies have agreements and contracts with specific farmers. It was realized that the Farm Story was very useful for these companies because they could confirm the state of production on a timely manner through the system.

- Loan For Farmers (Micro Credit)

The cooperatives have to submit the conditions of the farmers whenever they need to apply for a loan from the bank. At that time, data result of the Farm Story was very useful.

- Industries Around Agriculture Cultivation

A fertilizer company was very interested in the Farm Story. They realized that the data of cultivation history was very useful in an effective dissemination of fertilizer. They are now thinking if there is a potential for partnership.

2) Dissemination of Activities in Japan

Dissemination of activities was conducted from September 29, 2014 to October 5, 2014. The purposes of these activities were: a) to visit the sites where the ESL system and Farm Story are installed and implemented and b) to understand the merits of using the system. The names of the trainees are as follows:

**Table 3 List of Trainees**

Name of Trainees	Agency, Title
Mr. Leandro H. Gazmin	Assistant Secretary, DA (AMAS)
Mr. Edmar Fujutagana	DA (AMAS)
Mr. Carlo S. Cena	Director, <i>Sentrong Pamilihan</i>
Mr. Sherwin Mark de Oro	Person-in-charge of the system, <i>Sentrong Pamilihan</i>
Mr. Wablito D. Rupac	Chairman, DAR(FPFCNE)
Mr. Christopher Villasenor	Person-in-charge of the system, DAR(FPFCNE)
Ms. Jocely O. Ramones	PARO, DAR Nueva Ecija Provincial Office
Ms. Lalaine D. Blanca	DAR Nueva Ecija Provincial Office

The targets of the training are as follows:

**Table 4 Training Targets in Japan**

		
<p><b>E-support link Software Developer</b></p> <ul style="list-style-type: none"> <li>Introduction to the IT system in Japan</li> <li>E-support link achievement in Japan</li> </ul>	<p><b>DOLE Japan Trading Company</b></p> <ul style="list-style-type: none"> <li>Business of DOLE</li> <li>Introduction of the system provided by E-support link</li> </ul>	<p><b>Fresh System Kawasaki Center Delivery Center</b></p> <ul style="list-style-type: none"> <li>Explanation of the function of the center</li> <li>Site visit at the ‘after ripening equipment’</li> <li>Study the trade flow in Japan</li> <li>Study the system of delivery to keep the freshness of the products</li> </ul>
(Picture taking is not allowed)		
<p><b>KI Fresh Access Kawasaki Center Delivery center</b></p> <ul style="list-style-type: none"> <li>Explanation of the function of the center</li> <li>Site visit in the sorting activity</li> </ul>	<p><b>KI Fresh Access Kawagoe Center Delivery center</b></p> <ul style="list-style-type: none"> <li>Explanation of the function of the center</li> <li>Site visit in the food processing factory</li> </ul>	<p><b>Shizutetsu Store Super Market</b></p> <ul style="list-style-type: none"> <li>Study the case of a good relationship between farmers and supermarket owners using the Farm Story</li> <li>Study the operation of direct marketing</li> <li>Visit the two farmers using the Farm Story</li> </ul>
		
<p><b>Shizuoka Sentral Market</b></p> <ul style="list-style-type: none"> <li>Visit the market</li> <li>Explanation of functions of the market</li> </ul>	<p><b>Suruga Minori Market</b></p> <ul style="list-style-type: none"> <li>Introduction to direct market</li> <li>Introduction to a good sample of local production for local consumption</li> <li>Visit the market</li> </ul>	<p><b>Ogata Akita Komachi Producers Cooperative</b></p> <ul style="list-style-type: none"> <li>Introduction to production, processing, and marketing collaboration</li> </ul>

### 3) Workshop (for the DAR side)

The workshop for promotion was held on November 26 and 27, 2014. The target attendees were relative agricultural companies and cooperatives. On the first day of the workshop, the participants discussed the usefulness and merits of the Farm Story. On the second day, they discussed the case study of the system.

## (2) Results of the Introduction of the Systems

The results of the validation of efficiency of the system and the system dissemination activity were shown as follows:

### (A) ESL System

#### 1) Work Efficiency

- The market staff can disburse money to farmers quickly.
- The accounting data can be accessed and downloaded easily.

#### 2) Fair Trade and Improvement of Trading Quality by Visualizing the Transaction

- By encoding all transactions (buying and selling), errors can easily be detected and market operation becomes more precise.
- Market staff responsibility was clarified; discipline is reinforced to prevent unfair transactions.
- Not only the market staff but also the farmers can check any evidence of selling or other transactions; also they can confirm if the trade was fair.

#### 3) Simplification and Diversification of Data Analysis

- A monthly transaction report to the government such as selling quantity, amount, and average price, can be made easily and immediately. (*Sentrong Pamilihan* had submitted a handwritten monthly transaction report to DA. Although it took much time to make an accounting slip sheet, they can simply printout and submit the data after the introduction of the system.)
- The system can provide various kinds of data for analysis aside from the items mentioned above.

#### 4) Understanding the System Output

- Minimizing losses such as missing crops, trading errors, and bad debts.
- By knowing the latest transaction trend, the market manager can adjust the supply-demand control that can lead to reduction of losses due to product disposal and increase the ability to sell at a good price.
- The simplification of data collection and analysis will be useful in strategic production, harvesting, and sales. Examples of effective use of output data are shown in the attached tables below).

a) Transaction Trend (Sales Quantity, Sales Amount, and Average Unit Price)

The data can be used by the market staff not only to understand the transaction trend but also to show DA the evidence of actual sales in the *Sentrong Pamilihan*. Detailed information is shown in Table 5 and shows the monthly (October 2014) transaction trend of sales quantity, sales amount, and average unit price of the five major products. The market staff will be able to adjust the demand and supply by analyzing the trend. At the same time, understanding of the trend of sales quantity, sales amount will bring expectation of sales through seeing the recent sales data, leading to adjustment of shipment quantity from farmers and promotion of sales to buyers. Also, understanding of average unit price will lead to selection of products with the highest unit price and market staff could encourage farmers to ship more of their products. On the other hand, the staff would try to promote sales to buyers for products with low unit price.

**Table 5 Transaction Trend (Sales Quantity, Sales Amount, and Average Unit Price)**

(Sales quantity)

Unit : kg

Crop Day	BottleGourd/Upo	HotPepper/SiliPanigang	Loofah/Patola	StringBeans/Sitao	Tomato/Kamatis
1	2,154	2,010	2,360	4,405	3,173
2	1,533	1,744	2,777	5,697	4,654
3	2,826	2,272	2,700	3,940	3,357
4	1,820	1,712	3,248	4,099	3,604
5	1,485	437	2,787	2,040	4,168
6	1,533	1,277	3,867	2,661	3,549
7	2,286	2,593	2,370	3,235	3,245
8	1,415	937	3,687	3,480	3,906
9	2,063	2,940	4,035	3,277	2,288
10	1,319	1,589	3,366	2,944	2,639
11	1,346	1,645	3,906	1,855	2,638
• • •	• • •	• • •	• • •	• • •	• • •

(Selling Amount)

Unit : Peso

Crop Day	BottleGourd/Upo	HotPepper/SiliPanigang	Loofah/Patola	StringBeans/Sitao	Tomato/Kamatis
1	10,134	37,099	12,108	23,250	61,881
2	6,295	32,374	13,854	25,848	89,535
3	11,768	39,814	13,131	15,047	63,724
4	7,295	35,779	15,795	16,308	63,245
5	5,599	9,205	11,106	10,393	80,822
6	5,562	32,058	16,395	25,345	61,680
7	6,898	61,145	7,175	25,184	63,117
8	4,630	19,577	10,416	38,946	77,897
9	5,835	45,612	6,997	23,977	46,648
10	3,556	24,838	7,404	20,840	57,547
11	3,852	30,379	8,370	16,226	54,359
• • •	• • •	• • •	• • •	• • •	• • •

(Average Unit Price)

Unit : Peso/kg

Crop Day	BottleGourd/Upo	HotPepper/SiliPanigang	Loofah/Patola	StringBeans/Sitao	Tomato/Kamatis
1	4.7	18.5	5.1	5.3	19.5
2	4.1	18.6	5.0	4.5	19.2
3	4.2	17.5	4.9	3.8	19.0
4	4.0	20.9	4.9	4.0	17.5
5	3.8	21.1	4.0	5.1	19.4
6	3.6	25.1	4.2	9.5	17.4
7	3.0	23.6	3.0	7.8	19.5
8	3.3	20.9	2.8	11.2	19.9
9	2.8	15.5	1.7	7.3	20.4
10	2.7	15.6	2.2	7.1	21.8
11	2.9	18.5	2.1	8.7	20.6
12	3.4	19.9	2.5	7.9	21.7
...	...	...	...	...	...

b) Transaction Trend Graph

In visualizing the previous graph (Figure 6), medium- to long-term trend becomes obvious. The data will be used in formulating a strategy for farmer's steady profits. Also, comparing with other areas will lead to an understanding of seasonal changes in market prices.

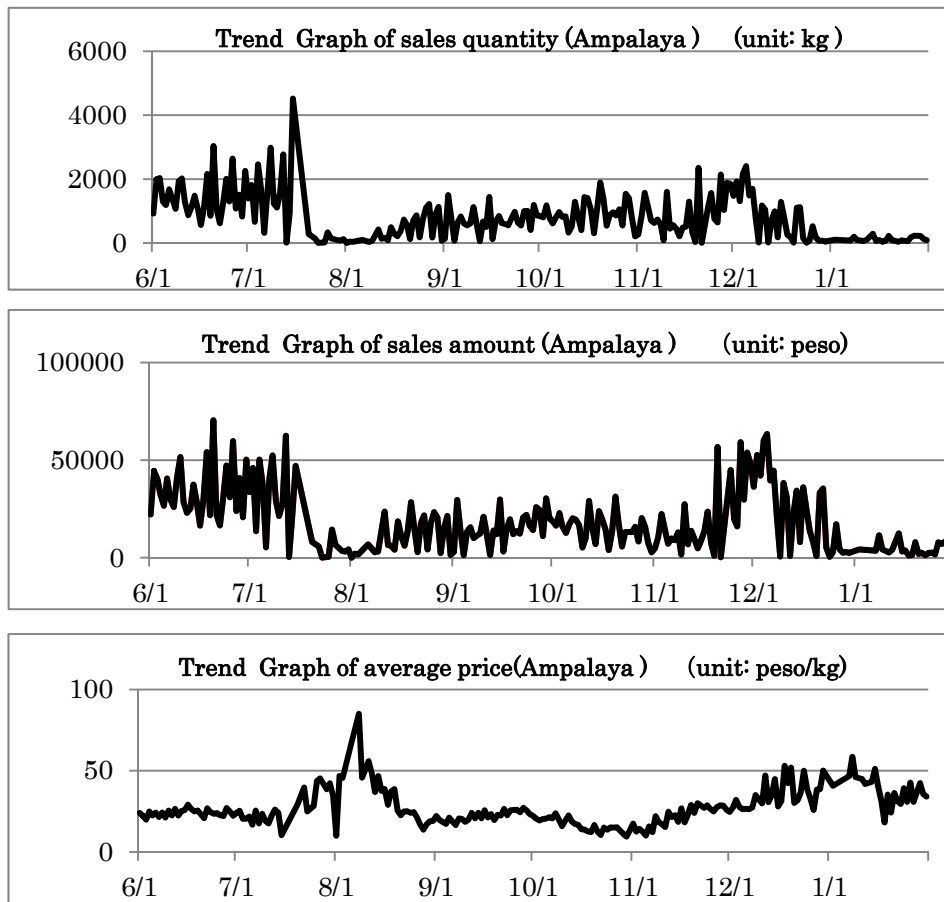
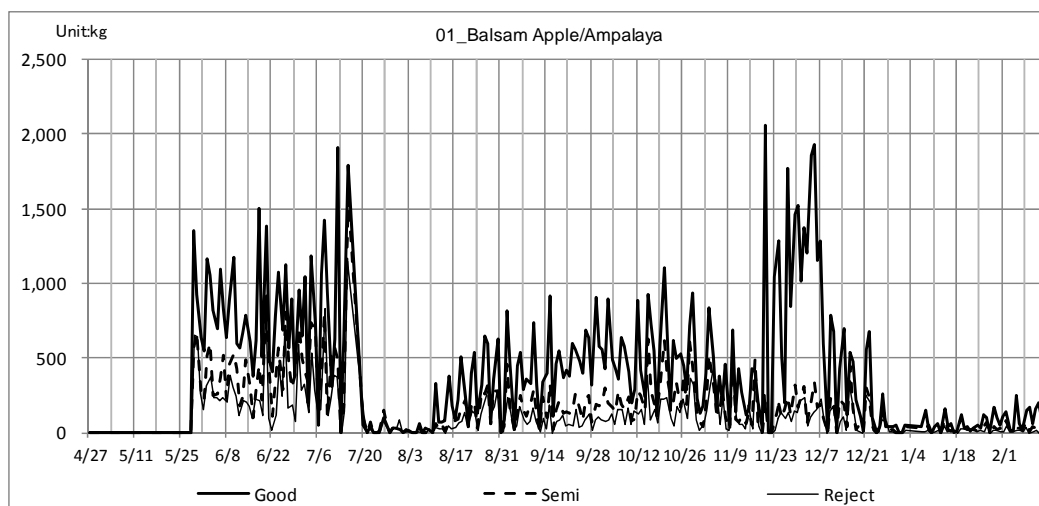


Figure 6 Transaction Trend Graph

c) Daily Arrival of Products by Quality

The data can be used for understanding the quantity of excess or deficiency, leading to finding a beneficial agricultural product in a certain area. Detailed information is shown in Figure 7 and it shows the percentage of each grade (Good, Semi, Reject) *Ampalaya* based on quality.



**Figure 7 Daily Arrival of Products by Quality**

d) Monthly Quantity of Disposed Products

The data can be used for finding out the disposal quantity and the loss quantity by product. Detailed information is shown in Table 6, and it shows the quantity of disposed products for October 2014. The reason why the quantity was very high during that time was a typhoon in July 2014. Farmers had concentrated on cultivating the same products every year in July and a massive surplus always appears in the market.

**Table 6 Monthly Quantity of Disposed Products**

Unit : /kg

Crop \ Month	Month								
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Total
<b>Loofah/Patola</b>	59	34	304	474	5,106	751			6,728
<b>HotPepper/SiliPanigang</b>	82	91	86	514	1,148	1,254	1,841	90	5,106
<b>Squash/Kalabasa</b>					5	1,544	658	3	2,210
<b>Ampalaya</b>		1,478	10	21	230	11			1,750
<b>Radish/Labanos</b>		410	662	340	30		90	184	1,724
<b>Pechay</b>		390	350		7	240	120	450	1,657
<b>Tomato/Kamatis</b>	50		11	135	60	584	564		1,460
<b>BottleGourd/Upo</b>	11			106	740	147		15	1,019
<b>Okra</b>	10	1	549	30	203	57	19		869
<b>StringBeans/Sitao</b>	4	20	4	204	107	215	85		639
. . .									. . .
<b>Total</b>	360	2,483	2,393	2,447	7,706	5,033	3,528	804	24,918



e) Quantity of Shipment by Farmers and Quality of Products

The data can be used for selection of the Best Practice Farmer based on the productivity and quality. By considering the trend of the products, quality, unit price, and loss, the farmer's cooperatives can improve their agricultural techniques. Detailed information is shown in Table 7. At present, Best Practice Farmers are commended based only on their sales amount in the *Sentrong Pamilihan*. The data can also be used for raising farmer's motivation as an addition to the evaluation points like mentioned above.

**Table 7 Quantity of Shipment by Farmer and Quality of Products (2014.6-2015.1 Total)**

Unit : /kg

Farmer Code	Quality						Total
	Good		Semi		Reject		
2	138,248	81.4%	26,319	15.5%	5,329	3.1%	169,896
7	107,651	77.0%	30,480	21.8%	1,605	1.1%	139,735
8	70,256	70.5%	23,696	23.8%	5,693	5.7%	99,644
22	57,084	59.9%	27,917	29.3%	10,291	10.8%	95,292
23	67,567	76.4%	17,369	19.6%	3,530	4.0%	88,466
24	39,864	63.7%	17,537	28.0%	5,225	8.3%	62,626
28	42,057	70.1%	12,858	21.4%	5,066	8.4%	59,981
30	38,577	68.6%	13,790	24.5%	3,880	6.9%	56,246
..	..	..	..	..	..	..	..
1761	4	66.7%	2	33.3%	0	0.0%	6
	2,105,484	75.1%	576,565	20.6%	120,578	4.3%	2,802,627

f) Selling Quantity by Buyer and Quality

The data can be used as a marketing tool by conducting an analysis of the buying trend, leading to finding a proper distribution for steady production and sales. Detailed information is shown in table 8. It was revealed that the top 13% of buyers in terms of transaction quantity in *Sentrong Pamilihan* account for 80% of the whole sales quantity. Also, market could improve products by finding the reason why buyers purchased those products.

**Table 8 Sales Quantity by Buyer and Quality (2014.6-2015.1 Total)**

No.	Buyer Code	Quality (kg)			Total	Rate (%)	Cumulative Rate (%)
		Good	Semi	Reject			
1	9187	243,492	32,049	3,608	279,149	14.0	14.0
2	9205	161,764	23,320	2,510	187,593	9.4	23.5
3	9111	122,540	18,071	266	140,876	7.1	30.6
4	9202	89,263	12,716	1,146	103,124	5.2	35.8
5	9236	71,668	4,040	79	75,787	3.8	39.6
6	9019	60,314	7,401	232	67,947	3.4	43.0
7	9221	64,569	3,000	338	67,906	3.4	46.4
...	...	...	...	...	...		
273	9167	3	0	0	3	0.0	100.0
		<b>1,590,800</b>	<b>335,245</b>	<b>61,196</b>	<b>1,987,240</b>		<b>100</b>

As results of the dissemination activities of ESL system, the system was demonstrated in Benguet Trading Center and to other markets. Also, market staff around the Philippines such as those from Cebu and Mindanao, which are candidate sites of Agri-Pinoy Trading Center, have visited the *Sentrong Pamilihan*; and the system efficiency has been recognized.

(B) Farm Story

The yield of rice per barangay (smallest administrative division in the Philippines) in Nueva Ecija is shown in Table 9. The table shows clearly that rice productivity is different in each barangay. According to farmers, this is because of the differences in soil and cultivation method, but this is not a sure reason. However, what seems sure is that Farm Story can be used for understanding the current situation of cultivation.

**Table 9 Rice Yield per Barangay in Nueva Ecija**

Barangay	No of Sample	Average Yield (kg/ha)
PUDIOT	6	6,333
Collado	6	6,281
BACAL 1	7	6,135
LENNEC	8	5,997
BETES	6	5,796
Mabuhay	4	5,769
MAMANDIL	3	5,696
SAN CARLOS	9	5,673
BANTUG	31	5,660
Valle	20	5,623
MALAYANTOC	4	5,591
MABINI	18	5,569
Villa Isla	5	5,547
ANIAS	14	5,209
SN. CARLOS	5	5,194
AQUINO	5	5,111
CASULUCAN	3	4,939
AVERAGE		5,650

Cultivation history is good for the improvement of productivity of farmers. Farmers will know cultivation methods, fertilizer application, chemical usage, and transplanting date. They can share good practice information among themselves. This system function is intended to predict the timing and crop yields of agricultural products.

This survey was used to compare the productivity of farmers in selected barangays. Table 10 shows the seeding volume and time of fertilizer application and Table 11 shows the cost of fertilizer application in Valle barangay.

Although the variety of products and the timing of seeding and transplanting in the barangay were almost the same, the timing of fertilizer application is different for each farmer. Also, it is found that the yield is not always proportional to the cost of fertilizer.

Since some farmers buy fertilizers at above average cost, adequate fertilizer planning and

usage should be promoted by collaborating with farmer's cooperatives and agricultural engineers.

**Table 10 Seeding and Fertilizer Application of each Farmer by Barangay**

Farmer ID	crop-variety	Seeding (kg)/ha	Seeding date	Trans-planting date	Fertilizer date from seeding				
					1	2	3	4	5
270	rice222	120	20140603	20140625	4	37	61		
248	rice222	60	20140604	20140627	69	96			
244	rice222	80	20140603	20140627	9	45	62		
263	rice222	80	20140602	20140626	8	47	62		
237	rice222	80	20140603	20140629	10	37	85		
265	rice222	80	20140603	20140629	5	37	61		
239	rice222	67	20140527	20140623	11	36	84	94	
263	rice222	69	20140606	20140630	7	42	62		
263	rice222	80	20140603	20140627	7	45	63		
266	rice222	80	20140604	20140629	11	36	48	111	
274	rice222	80	20140604	20140629	9	65	78		
256	rice222	80	20140609	20140630	5	44	49	57	
275	rice222	80	20140608	20140630	10	42	57		
283	No Data	108	20140605	20140701	10	34	54	84	
279	rice222	80	20140602	20140627	9	33	57	87	
250	rice222	80	20140606	20140627	8	31	70	82	
275	rice222	80	20140605	20140629	7	45	64		
252	rice222	80	20140605	20140628	6	42	66		
253	rice222	80	20140605	20140627	10	41	66		
275	rice222	80	20140602	20140627	8	46	62		

**Table 11 Cost of Fertilizer Application by Barangay**

Farmer ID	Crop-Variety	Volume of fertilizer by name					Cost	
		14-14-14	16-20-0	46-0-0	0-0-50	15-15-15	Pesos	Pesos/ha
270	rice222	250		275			10,150	10,150
248	rice222	50		50			1,940	3,880
244	rice222	200		120			6,320	12,640
263	rice222	200		111			6,158	12,316
237	rice222	150	250	400			14,870	7,435
265	rice222	200		210			7,940	15,880
239	rice222	150		165			6,090	10,150
263	rice222	300		300			11,640	3,326
263	rice222	200		110			6,140	12,280
266	rice222	250		240			9,520	6,347
274	rice222	200		75			5,510	5,510
256	rice222	350		375			14,030	4,009
275	rice222	200	50	225			9,120	4,560
283	No Data	250	100	325			12,870	9,900
279	rice222	300	150	250	25		14,130	14,130
250	rice222	400		350	50		15,940	15,940
275	rice222	200		220			8,120	8,120
252	rice222	200		220			8,120	8,120
253	rice222	200	100	180			9,220	6,147
275	rice222	300	100	250			12,560	4,187

a) **Direct Purchase of Products (from the viewpoint of retailers)**

Some supermarkets, for example Metro Gaisano, hope to directly purchase products from farmers for differentiation of products. However, there is a risk that supermarkets may not be able to get enough products from farmers due to weather and farmers' low agricultural output techniques. If supermarkets adopt the system and see a cultivation schedule, it could expect a steady amount of supply in advance and directly purchase products.

b) **Fertilizer suppliers**

Fertilizer suppliers usually provide technical assistance for farmers. The Farm Story can be used for customer service and corporate social responsibility (CSR) activity.

c) **Organization for Farmers**

Babas Foundation in Mindanao, which provides technical assistance and micro finance to farmers, evaluates the efficiency of output data from the Farm Story in terms of the findings of cultivation schedule and expectation of the amount of yield. Babas Foundation considers that the data would be used as support documents for the micro finance.

The data analyzed by the Farm Story were shown in a workshop for FPFCNE. The cooperative seemed to be aware of the necessity of improvement of productivity and that the Farm Story would be an effective tool for it.

(3) Self-reliant and Continual Activities to be Conducted by Counterpart Organizations

(A) *Sentrong Pamilihan*

*Sentrong Pamilihan* states the continued use of the systems after this survey. ESL and *Sentrong Pamilihan* have been negotiating about the fee for using the systems. As described below, they have solved issues of operation without any assistance from ESL. Therefore, it is expected to act continually with self-reliance.

- 1) Counterpart organizations have already solved various operational problems such as power outages due to typhoons. In other words, counterpart organizations can deal with the various problems by themselves with self-reliant activities.
- 2) It becomes clear that extra costs of consumable products such as printer paper and cost of electricity would not be high, according to market staff's investigation.
- 3) The hardware is managed by a market manager. For example, market staff has to write down his/her name and time on a sheet when he/she takes out or returns handy-terminal and handy-printer.
- 4) *Sentrong Pamilihan* made an operations manual about hardware management, flow of operation, and troubleshooting. Therefore, the standardized operation will allow them to act continually with self-reliance.

(B) FPFCE

It would be difficult for farmer's cooperatives to analyze the output data and improve their operation by themselves. Therefore, ESL will solve the issue with Universal Harvester (fertilizer supplier) during continuous survey for FPFCE.

4. FUTURE PROSPECTS

(1) Impact and Effect on the Concerned Development Issues through Business Development of the Product/ Technology in the Surveyed Country

- 1) Farm Story introduced in the farmer's cooperative can reduce the loss due to overshipment by estimation of shipment in advance. As a result, farmer's cooperatives will be able to keep sales steady with the scheduled production and sales.
- 2) After validation of efficiency of the system, ESL will consider how to collect the fee and maintenance cost for system usage from the retailer.
- 3) The efficiency of the system has been recognized by DA, suppliers, agricultural products export council, supermarkets, and LGUs. ESL will continually consider a more effective use of the system and select actual users.
- 4) DA and market staff around the Philippines have visited the *Sentrong Pamilihan*. A successful introduction of the system into *Sentrong Pamilihan* will lead to further development of Agri-Pinoy Trading Center Project.

(2) Lessons Learned and Recommendation through the Survey

1) Effective Use of the Data by Customer

The system has numerous benefits such as strategic cultivation and sales planning. ESL has to consider a more effective use of the output data; and train system users for practical use in order to improve the operations by themselves.

2) Communication with System Users and Information Literacy

The bottleneck during the Survey was communication gaps between system users and ESL. Although it was necessary to train local staff and follow up the operation after introduction of the system, it was considered that communication and involvement of local people would lead to more acceptance of the system. During this pilot project, users seemed to accept the use of the system without any rejection and have a strong desire for self-improvement with regard to new things. These could be considered as good difference.

ATTACHMENT: OUTLINE OF THE SURVEY

THE PILOT SURVEY FOR DISSEMINATING SME'S TECHNOLOGIES FOR INTRODUCTION OF IT FOR AGRICULTURAL PRODUCTS DISTRIBUTION E-Supportlink, Ltd.

Development Needs in the Philippines

- Improvement of farmer's income by strategic cultivation and shipping based on the data
- Loss reduction of post-harvest by efficient logistics
- Stable price and supply of agricultural products

Implemented Activities in the Survey

- Test operation of the systems to a farmer's cooperatives and a fruit and vegetable market
- Database construction by the systems such as farmer, input cost, cultivation record (fertilizer, pesticide), harvesting time and yield
- Database construction of transaction in the market

Products/Technologies

A Farm Story

Farmer's Database

Outcomes in the Philippines

- Stable supply of agricultural products by the scheduled cultivation
- Improvement of value of the products by providing the traceable products to retailer and consumer
- Enhancement efficiency of transaction by the system
- Realization of getting fair price by management of income summary of each kind of products

Farm Story

ESL System

Outcomes by Japanese company side

- Current Situation**
- Starting negotiation with Department of Agriculture about introduction of ESL System into Agri-Pinoy Trading Center.
  - Implementing verification activity with a fertilizer company which recognized efficiency of Farm Story
- Future**
- Building partnership and disseminating activity for expanding the system