

# A Study of Shareholders Interest Factor and Interaction Activity of Community Supported Agriculture Farms in Northern Taiwan

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**Abstract:** Taiwan has 116 CSA (Community supported agriculture) farms until 2017. This research aims to analysis comprehensive Taiwan's CSA customer's feedback on the northern Taiwan. What kind of values of landscape or interaction factor make customers choosing CSA farm as their daily food supply. This research using questionnaire survey towards 4 CSA farm's customers to find out the value and feature in each farm. Through a series of customer's survey we could understand the CSA farms located in downtown area could reduce the transportation expense and food mileage. Furthermore, comparing with U.S. CSA farm, Taiwan's CSA farm daily food supply distance is shorter. According to this survey, we could also find out Taiwan CSA farms main financial support coming from the customers living in the downtown area.

**Keywords:** Taiwan, Community supported agriculture (CSA), Participatory guarantee system, Food mileage

## 1. Introduction

In Taiwan, due to the ageing problem of agricultural producer has been progressing lately, Taiwan's agricultural producers are trying to make more communication opportunities and farming interaction activities for their consumers. Because of this background, Community Supported Agricultural (CSA) farming way which could provide various exchange Activities for customer and make more connection with local community has become more attractive and popular on Taiwan in recent years.

According to the CSA definition from Cynthia [1], Community supported agriculture (CSA) is a growing social movement that endeavors to make direct connections between the producers of food and those who consume it. In its simplest form, CSA is a contractual agreement between a farm and a group of consumers variously described as "shareholder". Members purchase a "share" at the beginning of the season, allowing the farmers to plan production for a guaranteed market and providing capital up front to purchase inputs. Thus, shareholders pay the real costs of production and in this way contribute to the support of local, small scale growers. Risks are shared if there is a poor harvest, everyone gets less, not just the farmers. The cost of a share, decided in advance, takes into account estimated costs of inputs and labor and the standard of living of the farmers.

CSA is been said as a new solution of producer and consumer cooperate with each other through prepayment to support regional agriculture. Taiwan's CSA has the feature on consumer could participate in farm producing activities such as rice transplanting and harvesting work. And the greatest feature is both producer and consumer share the risk of production based on trust between each other. Recently, CSA is being paid more attention as an ideal agricultural model that could bring diverse effects to the region, such as reforming community and promoting revenue of agricultural producer.

About previous CSA's studies, numerous reports [2], [3], [4], concern about the safe food production and regional CSA farm operation strategy. Cynthia [1] points out the evaluation of CSA development for the urban residents, "The value of the CSA system is to connect with safety food materials for urban residents and stable revenue for CSA farms."

Regarding a previous study on CSA in the United States by Cheryl [2], it is said that the transport distance is the most important factor when customer defining CSA and about half of customers in the United States define the maximum distance of local foodstuff supply radius is within 160.9 km (about 100 miles), and 37% CSA consumers in U.S. point out that local foodstuffs are considered agricultural products coming from the local state.

Antoinette [3] conducts a study about doing questionnaire survey towards 565 CSA consumers in New York State on 2012. Survey's result shows most of New York's consumers joined CSA farm because of the freshness of foodstuff, local community production, seasonal crops and organic production way. And a few of consumers joined CSA for connection with community, interaction with others customers, sharing production risk with producer. As a conclusion, comparing with interaction opportunity, CSA consumers in New York care more about the quality of foodstuffs.

Since 2004, CSA farms have been establishing in various parts of Taiwan, contributing to the revitalization of agricultural production areas by increasing the numerous number of long-term CSA contract consumers. Via popularization of CSA's "Participatory Guarantee Systems" (PGS), Taiwan's CSA farm number has been increasing to 116 on Aug. 2017.

According to the Antoinette's New York research, find out the Taiwan's CSA customer's actual status, CSA contract joining factors, CSA farm selecting factors, characteristic of Taiwan's food mileage and interaction frequency between producer and customer becoming the main research purpose.

## 2. Material and Methods

### 2.1 Study area

(Figure 1) shows the number of CSA farm in each county on Taiwan in Oct. 2017. Regarding the distribution density of CSA farms throughout Taiwan, the northern part CSA farm number tends to be larger than the southern part, the eastern part CSA farm number tends to be larger than the western part. From a nationwide perspective, it can be said that CSA farms are developing in the northern part of Taiwan Island. In order to clarify the actual CSA farm development situation on the Taiwan's most developed area, the target area of this research was selected northern part of Taiwan. About the situation of the CSA farm in Northern Taiwan, this research conducted a hearing survey on 33 farms, which are all CSA farms in northern Taiwan around Dec. 2015. (Table 1) shows the basic attributes of 33 farms as of Dec. 2015.

Based on the survey results in (Table 1), the each CSA farm's annual income ratio from CSA contract and the distance from the major consumer's residence to the farm are shown in (Figure 2), and the ratio of CSA consumers come from downtown area on each CSA farm and the distance from the major consumer's residence to the farm are shown in (Figure 3).

According to the (Figure 2,3), there are shown high density CSA farms mass in the range of distances 40 km to 50 km for both the revenue rate 85% to 100% section from the CSA contract in (Figure 2) and the urban district consumer rate section 60% to 95% section in (Figure 3). The location of this intensive CSA farms mass was all come from Yilan County. From this, it is inferred that the group of CSA farms in Yilan County is representative of northern Taiwan's CSA farm. In this research, we selected 2 CSA farms in the concentrated section of (Figure 2,3) as our research subject, and also decided to select 2 farms out of the concentrated section of (Figure 2,3) as the comparison target.

Next, according to the results in (Table 1), in order to examine the relationship between the income ratio and the proportion of CSA consumers residing in downtown areas, the Pearson product moment correlation coefficient (PPMCC) was analyzed for the survey results of 33 CSA farms.

First, a positive correlation was obtained with  $r = 0.417$  ( $p < 0.05$ ) as a correlation coefficient between the annual income ratio under the CSA contract and the proportion of major CSA consumers living in the downtown area. This is presumed to be due to the fact that CSA farms with high revenue ratio in CSA contract tend to have a high consumer ratio from downtown areas. And while on the other hand there is the oppositely, CSA farms with low revenue ratio in CSA contract tend to have a low major consumer ratio from downtown areas.

With regard to the research's subjects CSA farms, we separated whole CSA farms into two categories, the downtown type CSA farms and rural type CSA farms are shown in (Figures 2, 3) for the following reasons. Downtown type farms were taken from downtown district within 10 kilometers radius to all consumers. Rural type farms were taken by major consumers from outside the farm's located county.

In addition, this study aims to elucidate the cause of formation on northern Taiwan's CSA farm colony. This study decided to select the founded earliest CSA farms in the downtown area and rural areas.

One of the downtown type farms which was selected by



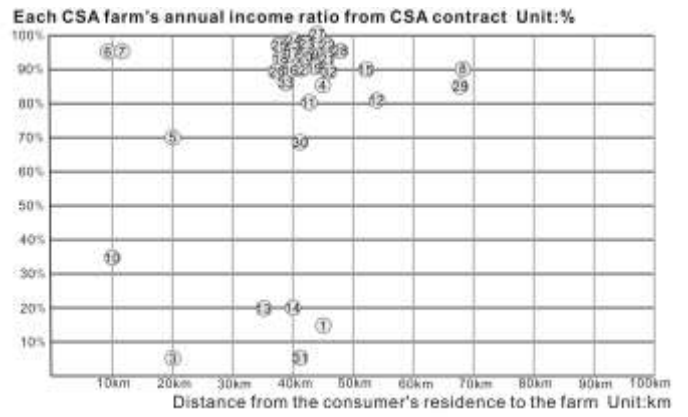
**Figure 1:** number of CSA farm in each county on Taiwan

this study were designated as Hui-Yao CSA Farm which has been receiving stable financial assistance from a law office in Taipei city. Another downtown type farm that is called Qian-Jia CSA farm locating on Hsinchu County Which has been receiving stable financial assistance from government research organization employees. And then one of the rural type farm is the Yilan County's Gu-Dong club, which is said to be the founder farm of Taiwan CSA agriculture, introducing Japan's Teikei system into Taiwan. About another rural type farm, this study selected the Roger CSA Farm which is one of the Shan-Gou village CSA farm cooperative members. Shan-Gou village CSA farm cooperative is the Taiwan's first and biggest CSA farm cooperative with the largest annual crop production and is recognized as CSA agriculture teaching center in Taiwan. The position of these four research objects which is shown on (Figure 4).

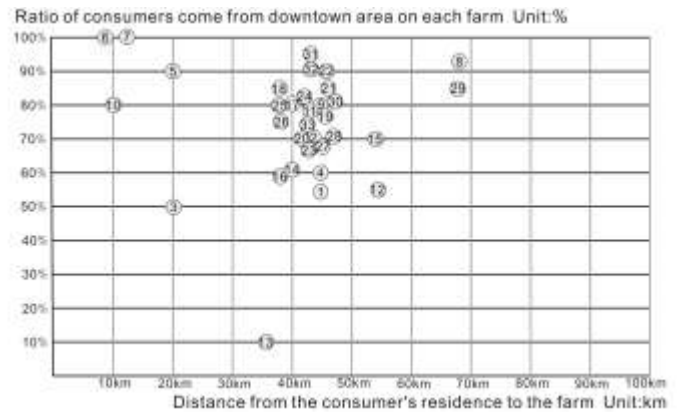
About these 4 CSA farms to be selected as research objects, all with high technological capabilities represented their locating region. Besides, these 4 CSA farms also can provide the

**Table 1:** Taiwan northern 33 CSA Farms basic attributes

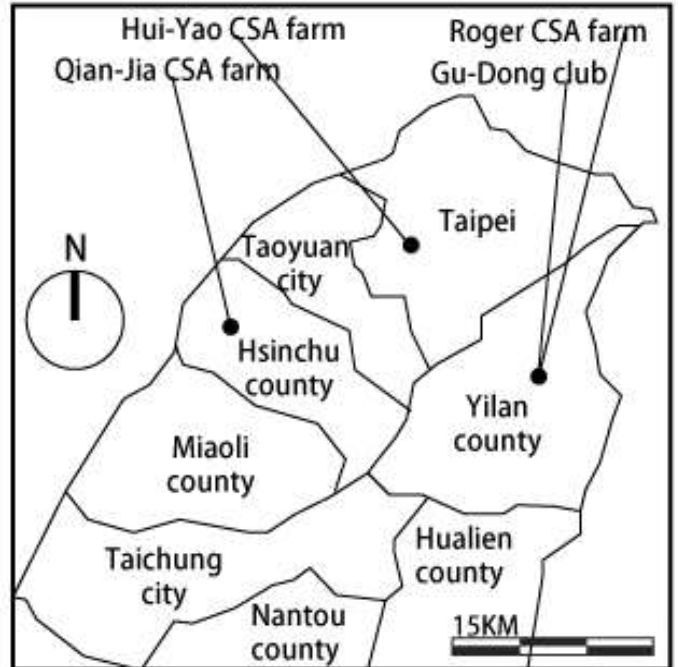
Corporate name of CSA farm	Revenue rate from CSA contract (%)	Downtown District Consumer Rate (%)	Farmland area (ha)	Number of customer (people)	Farm location
1.Power garden	15	55	0.7	105	Hsinchu City
2.Gu-Dong club	95	70	5	410	Yilan County
3.Happines Farm	5	50	2.0	10	New Taipei city
4.Island farm	85	60	4.0	70	Yilan County
5.Jack farm	70	90	0.1	30	New Taipei city
6.Qian-Jia CSA farm	95	100	0.8	35	Hsinchu City
7.Hui-Yao CSA Farm	95	100	1.3	50	New Taipei city
8.Natural Field farm	90	92	12.0	60	Yilan County
9.Xingjian Village	95	80	19.3	85	Yilan County
10.Yangming farm	35	80	1.0	170	Taipei city
11.Nanao farm	95	80	3.7	55	Yilan County
12.Youten farm	80	55	3.0	350	Yilan County
13.Raw farm	20	10	0.8	25	Hsinchu City
14.Raccoon farm	20	61	5.0	183	New Taipei city
15. 52ha farm	90	70	2.0	32	Yilan County
16. 200ha farm	90	60	20.8	120	Yilan County
17.Birds farm	95	80	0.9	100	Yilan County
18.Le farm	95	85	0.8	85	Yilan County
19.Friendly Rice	95	80	1.6	40	Yilan County
20.Heart farm	95	70	1.8	45	Yilan County
21.Meeting rice	95	85	0.9	38	Yilan County
22.Muji rice	95	90	1.0	48	Yilan County
23.Abba's Rice	95	70	3.0	120	Yilan County
24.Turk farm	95	80	1.6	155	Yilan County
25.Xin Tian farm	95	80	0.8	50	Yilan County
26.Beginning farm	90	75	1.0	60	Yilan County
27.Children garden	90	70	1.4	70	Yilan County
28.Chicken rice	95	70	4.7	470	Yilan County
29.Pastor rice	45	85	40.0	60	Yilan County
30.Roger CSA Farm	60	80	1.6	50	Yilan County
31.Pugu farm	5	95	0.8	5	Yilan County
32.Fuhou farm	90	90	2.0	35	Yilan County
33.Peak Farm	90	75	3.8	60	Yilan County



**Figure 2:** Relationship between annual CSA income ratio and major customer location city distance



**Figure 3:** Relationship between downtown customer ratio and major customer location city distance



**Figure 4:** Location of research target of CSA farms

consumer's address information for questionnaire survey and allow us joining their agricultural production interaction activities towards their customers.

(Table 2) shows the basic attributes of these 4 CSA farms. Regarding the characteristics of each area where the 4 CSA farms is located, according to the statistical data from Taiwan



**Table 2: Farm basic information**

Name of farm (CSA farm type)	area (ha)	Major crops	Location	Major consumer's residence and ratio within whole customers	Crop delivery way (frequency of crops delivering)
Gu-Dong club (rural type)	5.0	Rice	Yilan County	Taipei (70%)	(Once a year) 1. home delivery service: 89% 2. pickup crops by yourself: 11%
Roger CSA Farm (rural type)	3.0	Rice	Yilan County	Taipei (65%)	(Once a year) 1. home delivery service: 95% 2. pickup crops by yourself: 5%
Hui-Yao CSA Farm (downtown type)	1.3	Vegetable and fruit	Taipei	Taipei (100%)	(Once a week) 1. pickup crops by yourself: 48% 2. producer deliver crops to the pickup point: 52%
Qian-Jia CSA farm (downtown type)	0.8	Vegetable and fruit	Hsinchu County	Hsinchu County (100%)	(Once a week) 1. pickup crops by yourself: 43% 2. producer deliver crops to the pickup point: 57%

government [5], the location of the Gu-Dong club and Roger CSA farm are located at Taiwan countryside region on Yilan County. The average monthly income of the prefectural people of Yilan County is 113,000 ¥ (JPY), the average population density is 213 (people/km<sup>2</sup>), and it is said to be the prefecture of organic agriculture and nature tourism with 19th population density in 22 prefecture cities of Taiwan. Taipei is the location of the Hui-Yao CSA farm of the downtown type CSA farm, and the average monthly income of the Taipei's citizen is 161,000 ¥ (JPY). Taipei has an average population density of 9,904 (people/km<sup>2</sup>), and also is the capital of Taiwan with largest population density. Another downtown type CSA farm called Qian-Jia CSA farm is located on Hsinchu city, and the average monthly income of citizen in Hsinchu city is 19,900 ¥ (JPY). Hsinchu city has an average population density of 4,210 (people/km<sup>2</sup>) which has third high population density and highest average monthly income within whole Taiwan cities and counties.

Finally, about the crop transportation methods are showed in (Table 2). Because of CSA rural type farms Gu-Dong club and Roger CSA farm deliver their crops only once per year, most of their customers have chosen using home delivery Service. Only a few of their customers choose pickup crop by yourself, because of the distance to farm is too far and inconvenient. About the pickup by yourself ratio, Gu-Dong club is 11% and Roger CSA farm is 5%. Besides, customers choose pickup crop by

themselves all live in the Yilan County as same as these two rural type CSA farms location.

About the downtown type CSA farms, both of Hui-Yao CSA farm and Qian-Jia CSA farm need delivering vegetables and fruits once per week, and the proportion of consumer pickup crops by themselves in these two farms is 48% for Hui-Yao CSA farm and 43% for Qian-Jia CSA farm. Then, the ratio of producer deliver crops to the customer group pickup point is 52% of Hui-Yao CSA farms and 57% of Qian-Jia CSA farm. Downtown type CSA farms near densely populated areas were seen having more Willingness pickup crops by themselves from their homes than rural type CSA farm customers.

Comparing downtown type farm with rural type farm, the downtown type farm's consumers all live within 10 km distance from CSA farm, and could save crops home delivery service expense because of their homes are close to CSA farm. On the other hand, according to the proportion of transportation vehicle options in (Table 4), the motorcycle usage rate of downtown type farm consumer is 44.5% for Hui-Yao CSA Farm and 24.1% for Qian-Jia CSA farm, so if CSA customer could reach farm by motorcycle, it can be said that customers can save the costs of crop home delivery service. Simultaneously, all CSA consumers of rural type farms using the car to their farm, it can be said that distance to farm has become great influence for pickup crop by themselves, and pickup by customers themselves maximum distance roughly equal to distance which could ride motorcycle as transportation vehicle.

## 2.2 Questionnaire survey content and analysis methodology

Implementation of the questionnaire survey has two types, the first one is distributing the questionnaire survey sheets to the Gu-Dong club, Hui-Yao CSA Farm and Qian-Jia CSA farm consumers who participate in interaction activities on each CSA farm, and collected their opinions and did the oral interview at the same time. Secondly, because of Roger CSA farm didn't have any interaction activity during research survey period, we sent questionnaire survey sheets to Roger CSA farm's customers by postal mail. For some of the consumers who did not participate in interaction activities on others three CSA farms we also sent questionnaire survey sheets by postal mail. About this research's questionnaire survey period, was carried out between February 28<sup>th</sup>-April 19<sup>th</sup> and July 1<sup>st</sup>-October 2<sup>nd</sup> on 2016.

Survey items of the questionnaire are shown in Table 3. Questionnaire items were separated into four major parts. The first part consisted of questions related to food mileage, the sources of daily foodstuffs, and frequency of visiting, and all questions were selected as a multiple choice question type. The second part was about the relationship with local landscape and community. The third part is about the CSA comparison research between northern Taiwan CSA and Antoinette's study [3]. Through this comparison research, we could figure out the CSA regional feature between U.S. New York and Taiwan. The fourth part is the customer personal information.

For the analytical method, we analyzed each question by correlation coefficients (PPMCC) and the  $\chi^2$  test (Chi-squared test).

About the questionnaire survey recovery ratio, 48 replies were collected from the Gu-Dong club 70 customers, with a collection rate of 68.5%. And 40 replies were collected from the Roger CSA farm 60 customers, with a collection rate of 66.6%. And 36 replies were collected from the Hui-Yao CSA Farm 50 customers, with a collection rate of 72.0%. And 29 replies were collected from the Qian-Jia CSA farm 35 customers, with a collection rate of 82.8%.

**Table 3: Questionnaire survey content**

I. Customer's feedback on CSA farm selecting reason
1) Selected CSA farm because of food mileage
2) Selected CSA farm because of caring about food daily supply
3) Frequency of visiting this farm
II. Customer's feedback on regional landscape feature
1) Attractive landscape around the farm
2) Attractive facility and environment of the farm
3) The reason coming to this farm for recreation
4) About places you often visit on weekends
5) About interaction activities in farm that you want to participate
III. CSA Comparison research between New York and northern Taiwan
1) Reason for joining CSA farm
2) Concerning CSA importance about agricultural conservation
IV. Customers basic personal information
1) gender, 2) marital status, 3) age, 4) occupation, 5) city where they live, 6) transportation vehicle to the farm, 7) year of participation of CSA's contract

### 3. Results

#### 3.1 About basic attributes in the questionnaire survey

(Table 4) shows basic attributes of consumers obtained by questionnaire survey. Firstly, about the gender, age and occupation, more than half of the responders on the four farms were female, and these farm's marriage rate of responders were all over 90%. Regarding the age of responders, the ages of the responders at the four farms are all under 60's. Firstly, the responders in the Gu-Dong club and Roger CSA farm both concentrate on 40's. Secondly, the responders in the Hui-Yao CSA Farm and Qian-Jia CSA farm both concentrate on 30's. According to age survey, there was a tendency that working generation has become the major group of CSA customers both on downtown type farm and rural type farm.

Next, as for the occupation of responders in each farm, housewives are the most frequent in Gu-Dong club (37%) and Roger CSA Farm (40%). A group CSA contract from lawyer firm located in Taipei composes 47% of the total customers in the Hui-Yao CSA Farm. And a group CSA contract from National Institute of Industrial Science and Technology employees composes 69% of the total customers in the Qian-Jia CSA farm. When comparing downtown type farm and rural type farm, it seems that rural type farm's major salary comes from individual CSA contract and downtown type farm's major salary comes from group or firm's CSA contract.

Regarding the residential area of responders, the majority of responders which come from Taipei in Gu-Dong club is 35 individuals (73%) and Roger CSA Farm is 36 individuals (90%). Those two rural farm's customers all rely on car as vehicle, because of the long distance between Taipei and Yilan County is nearly 41km. About the downtown type farm situation, because of Hui-Yao CSA Farm customers all live in Taipei, car using ratio is 55.5% and motorcycle using ratio is 44.5%. About the Qian-Jia CSA farm located in Hsinchu County, because of customers all live in Hsinchu County, car using ratio is 75.9% and motorcycle using ratio is 24.1%. Based on the above results, rural type farm's major salary aren't coming from local residents. The major salary of rural type farm are coming from downtown customers lived in Taipei far from the farm. About the downtown type farm's, their major salary all come from local city's residents.

**Table 4: Questionnaire survey of basic information**

Name (location)	Gu-Dong club (Yilan County)	Roger CSA Farm (Yilan County)	Hui-Yao CSA Farm (Taipei)	Qian-Jia CSA farm (Hsinchu County)
Sending number	70	60	50	35
Recovered	48	40	36	29
Recovery rate	68.5%	66.6%	72.0%	82.8%
Gender proportion	Male:45.8% Female:54.2%	Male:40.0% Female:60.0%	Male:36.1% Female:63.9%	Male:41.3% Female:58.7%
Marital status	Married:48 Unmarried:0	Married:39 Unmarried:1	Married:36 Unmarried:0	Married:29 Unmarried:0
Age group :	People (Ratio)	People (Ratio)	People (Ratio)	People (Ratio)
20's	0(0%)	0(0%)	1(3%)	1(3%)
30's	16(33%)	12(30%)	19(53%)	15(52%)
40's	28(58%)	23(57%)	15(41%)	13(45%)
50's	4(9%)	5(13%)	1(3%)	0(0%)
60's	0(0%)	0(0%)	0(0%)	0(0%)
occupation:	people (ratio)			
	Housewives			
	18(37%)	16(40%)	1(3%)	4(14%)
	Public servant			
	7(14%)	11(28%)	2(5%)	1(3%)
	Teacher			
	10(22%)	5(12%)	15(42%)	2(7%)
	Private enterprise			
	13(27%)	8(20%)	1(3%)	2(7%)
	Group CSA contract from lawyer firm located in Taipei			
	0(0%)	0(0%)	17(47%)	0(0%)
	Group CSA contract from National Institute of Industrial Science and Technology employees			
	0(0%)	0(0%)	0(0%)	20(69%)
Residence city: people, [people ratio], (distance to farm)	Yilan: 6[13%] (10km) Taipei: 35 [73%] (41km) Taoyuan: 4[ 8%] (51km) Kaohsiung: 3[ 6%] (300km)	Yilan: 2[ 6%] (10km) Taipei: 36[90%] (41km) Taoyuan: 1[ 2%] (51km) Kaohsiung: 1[ 2%] (300km)	Taipei: 36[100%] (10km)	Hsinchu: 29[100%] (10km)
Vehicle to farm: ratio	car: 100%	car: 100%	car: 55.5% motorcycle: 44.5%	car: 75.9% motorcycle :24.1%

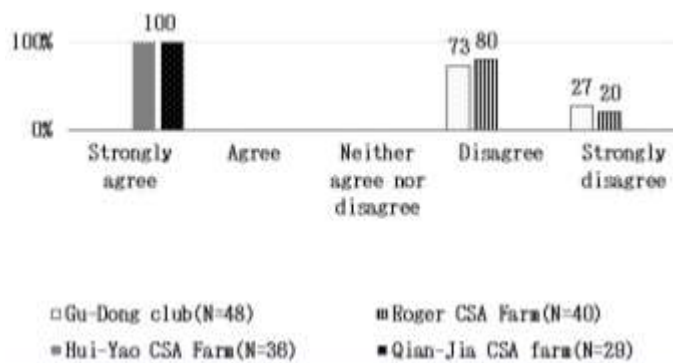
Finally, total year of consumers participate on each farms is shown in (Table 5). Gu-Dong club has 46% customers which have been joining from 6 years ago, and this is presumed to be due to the founder position of CSA in Taiwan. The highest ratio of the other three farms was the 3 year, Roger CSA Farm (53%), Hui-Yao CSA Farm (47%), Qian-Jia CSA farm (45%).

#### 3.2 About interaction between consumer and farm in the questionnaire survey

Question about selecting CSA farm due to food mileage reason are shown in (Figure 5). Regarding the result of downtown type farms, 100% customers both in Hui-Yao CSA Farm and Qian-Jia CSA farm chose the strongly agree. For the rural type farms, Gu-Dong club responders have (73% disagree) and (27% strongly disagree) and Roger CSA Farm responders have (80% disagree) and (20% strongly disagree). According to the

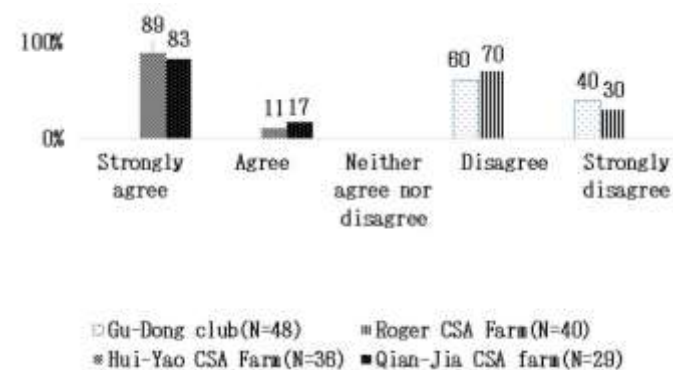
**Table 5:** Questionnaire survey of customer's joining period

CSA farm and year of establishment	Year of participation	1 year	2 years	3 years	4 years	5 years	6 years	7 years
Gu-Dong club 2004 (Respondent number=48)	people	0	0	2	0	10	22	14
	%	0	0	4	0	21	46	29
Roger CSA Farm 2009 (Respondent number=40)	people	0	1	21	6	12	0	0
	%	0	2	53	15	30	0	0
Hui-Yao CSA Farm 2007(Respondent number=36)	people	0	1	17	6	12	0	0
	%	0	3	47	17	33	0	0
Qian-Jia CSA farm 2010(Respondent number=29)	people	0	2	13	5	8	1	0
	%	0	7	45	17	28	3	0



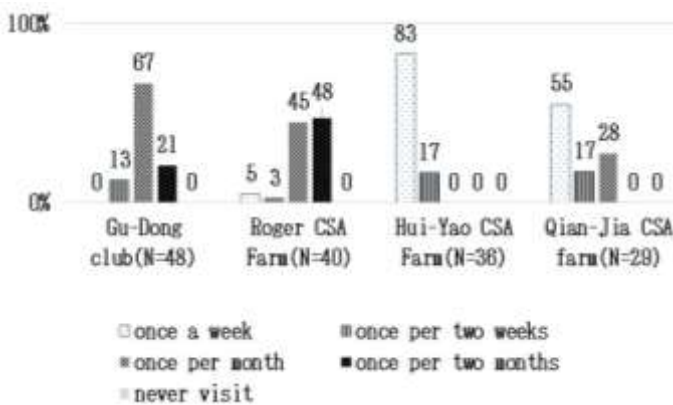
Unit: %  $\phi=6$   $p=0.05$   $\chi^2=154.048$  significant difference  $\rho=0$

**Figure 5:** selecting CSA farm due to food mileage reason



Unit: %  $\phi=9$   $p=0.05$   $\chi^2=155.718$  significant difference  $\rho=0$

**Figure 6:** whether CSA's agricultural foodstuffs have become main daily food supply or not



Unit: %  $\phi=9$   $p=0.05$   $\chi^2=119.630$  significant difference  $\rho=0$

**Figure 7:** the frequency of customers visiting farm

survey above, we know the food mileage becomes the strong motivation for downtown type CSA farm's customers joining CSA.

Next, (Figure 6) shows whether CSA's agricultural foodstuffs have become main daily food supply for each responder or not.

For the downtown type farm's responders, Hui-Yao CSA Farm has (89% strongly agree) and Qian-Jia CSA farm has (83% strongly agree). On the other hand, regarding the rural type farm's responders, the CSA foodstuffs couldn't become the main daily food supply getting the highest ratio. Gu-Dong club responder ratio is (60% disagree), and Roger CSA Farm is (70% disagree). Based on the above results, downtown type CSA farms are able to provide function as a source of main daily foodstuffs relative to the rural type CSA farms which are far away from the city.

Next, the frequency of customers visiting farm is shown in (Figure 7). About the downtown type farm, both customers in the Hui-Yao CSA Farm and Qian-Jia CSA farm have highest ratio on group of (once a week), Hui-Yao CSA Farm is 83% and Qian-Jia CSA farm is 55%. About the rural type farm, Gu-Dong club's responders have 67% choosing (once per month) and 20% choosing (once per two months). Roger CSA farm's responders have 45% choosing (once per month) and 48% choosing (once per two months). Looking at these result above, we could find out the phenomenon that comparing with rural type farm customers, downtown type farm customers have more motivation and chances on visiting farm because of convenient on the traffic and short distance to farm.

Next, in order to examine the interaction relationship between consumer and each farm, the responses of three questions mentioning above, such as questions of "selecting CSA farm for food mileage reason" (Figure 5), "whether CSA's agricultural foodstuffs have become main daily food supply for each responder or not" (Figure 6), "the frequency of customers visiting farm" (Figure 7), will be used a method of calculating the sum in an investigation called cross tabulation analysis in this part.

(Table 6) shows the cross tabulation result of the correlation coefficients (PPMCC) of "selecting CSA farm for food mileage reason" and "whether CSA's agricultural foodstuffs have become main daily food supply for each responder or not". As a result, a strong positive correlation was obtained at  $r = 0.948$  ( $p < 0.05$ ). This is because most of CSA consumers who focus on food mileage are also request CSA farms could become their main source of daily food. While on the other hand it was possible to grasp that there is the opposite consumer group.

Next, (Table 7) shows the cross tabulation result of the correlation coefficients (PPMCC) of "whether CSA's agricultural foodstuffs have become main daily food supply for each responder or not" and "the frequency of customers visiting farm". As a result,  $r = 0.752$  ( $p < 0.05$ ), as a strong positive correlation was obtained. From this result, it can be said that consumers who use CSA agricultural products as the main source of daily food tend to visit the farm more frequently.

(Table 8) shows the cross tabulation result of the correlation coefficients (PPMCC) between "selecting CSA farm for food mileage reason" and "the frequency of customers visiting farm". As a result,  $r = 0.777$  ( $p < 0.05$ ), as a strong positive correlation could be grasped. From the result above, it was possible to grasp that there is a possibility that the food



**Table 6:** cross tabulation result of "selecting CSA farm for food mileage "and" CSA's agricultural foodstuffs become main daily food supply"

Food mileage	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	total	Average rating value
Main daily food supply							
Strongly agree	56					56	5
Agree	9					9	5
Neither agree nor disagree						0	0
Disagree				44	13	57	1.77
Strongly disagree				23	8	31	1.74
total	65	0	0	67	21	153	3.13
Item with a higher grade average than the whole	correlation coefficients: $r=0.948$ $p=0.05$						

**Table 7:** cross tabulation result of "CSA's agricultural foodstuffs become main daily food supply "and" the frequency of visiting farm"

Main daily food supply	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	total	Average rating value
Visit frequency							
Once a week	41	5		1	1	48	4.75
Once per two weeks	9	2		2	5	18	3.44
Once per month	6	2		33	17	58	2.08
Once per two months				21	8	29	1.72
Never visit						0	0
total	56	9	0	57	31	153	3.01
Item with a higher grade average than the whole	correlation coefficients: $r=0.752$ $p=0.05$						

**Table 8:** cross tabulation result of "selecting CSA farm for food mileage "and" the frequency of visiting farm"

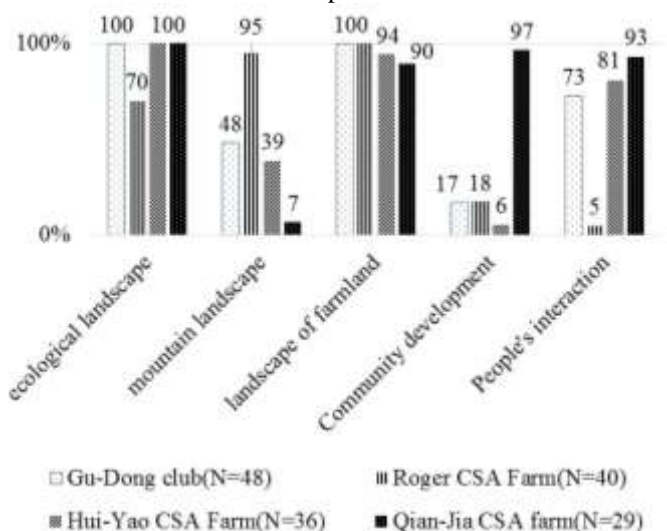
Visit frequency	Once a week	Once per two weeks	Once per month	Once per two months	Never visit	total	Average rating value
Food mileage							
Strongly agree	46	11	8			65	4.58
Agree						0	0
Neither agree nor disagree						0	0
Disagree	2	6	36	23		67	2.80
Strongly disagree		1	14	6		21	2.76
total	48	18	58	29	0	153	3.55
Item with a higher grade average than the whole	correlation coefficients: $r=0.777$ $p=0.05$						

mileage will be related to the frequency of visiting the farm. In other words, it can be said that consumers who emphasize food mileage tend to visit the CSA farm more frequently.

### 3.3 About the landscape around the farm in the questionnaire survey

Next, we will examine the selection factors of consumers from the viewpoint of rural landscape and charm. (Figure 8) shows the percentage inquired by the multiple selection method. More than 90% of contractors at all CSA farms replied "landscape of farmland", followed by "ecological landscape" was over 70%. Besides, in the Qian-Jia CSA farm, "Community development" reached 97%. This farm provides work related to CSA agricultural production for regional Taiwanese indigenous people, and provides various interaction activities and

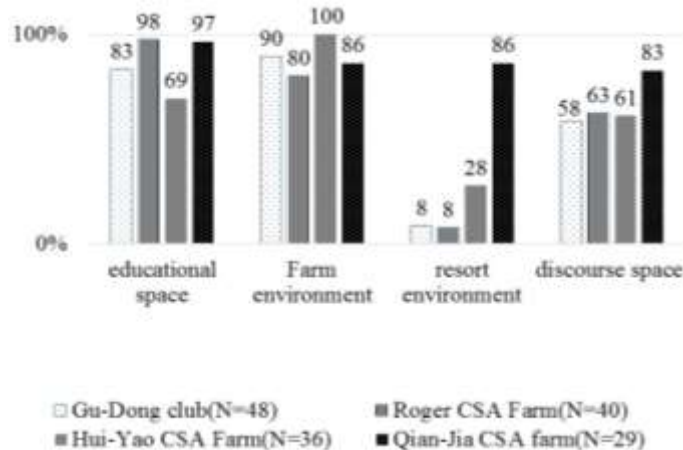
**Figure 8:** selection factors of consumers from the viewpoint of rural landscape and charm



Number of pointers	ecological landscape	mountain landscape	landscape of farmland	Community development	People's interaction	total
CSA farm						
Gu-Dong club(N=48)	48	23	48	8	35	48
Roger CSA Farm(N=40)	28	38	40	7	2	40
Hui-Yao CSA Farm(N=36)	36	14	34	2	29	36
Qian-Jia CSA farm(N=29)	29	2	26	28	27	29
$\chi^2$	36.7	55.8	8.1	79.3	73.7	153

Unit: people  $\phi=3$   $p=0.05$   $\chi^2=107.9$  Significant difference  $p=0$

**Figure 9:** farms' attractive facilities



Number of pointers	educational space	Farm environment	resort environment	discourse space	total
CSA farm					
Gu-Dong club(N=48)	40	43	4	28	48
Roger CSA Farm(N=40)	39	32	3	25	40
Hui-Yao CSA Farm(N=36)	25	36	10	22	36
Qian-Jia CSA farm(N=29)	28	25	25	24	29
$\chi^2$	15.8	7.9	67.0	5.2	153

Unit: people  $\phi=3$   $p=0.05$   $\chi^2=37.6$  Significant difference  $p=0$

educational classes for local students, teachers and NGO groups in the local universities. And the replied on "People's interaction" also showed the highest tendency of 93% at the Qian-Jia CSA farm.

Next, (Figure 9) shows the ratio of farms' attractive facilities asked by the multiple selection method. "Farm environment" was over 80% on all farms, followed by "educational space" also over 69%. About the results of the downtown type farm, Qian-Jia CSA farm has the highest tendency in "resort environment 86%" and "discourse space 83%". This was supposed to have church in this community and community hall as accessory facility of Qian-Jia CSA farm, so local residents and customers have various space for holding interaction and educational activities. Furthermore, as a result of performing the  $\chi^2$  test on the tabulation of four selection items in (Figure 9), a significant difference was found in the "resort environment". This could be grasped as a difference between downtown farms and rural farms.

Next, (Figure 10) shows the ratio of farm visiting reason with the multiple selection method. The option about "Local landscape" was 94% or more in all farms, and then "Observation of natural change" showed a trend overall higher than 60%. For the option about "Observing birds and animals" is 81% for Hui-Yao CSA Farm and 69% for Qian-Jia CSA farm, due to these two farms feed poultry and domestic animals to self-sufficient organic fertilizer by themselves. For the situation about rural type farm, Gu-Dong club is the most popular on "volunteer activity" at 90%. Gu-Dong club holds various volunteer activities and CSA farmers' schools throughout almost the year, and it also is the first CSA farm in Taiwan.

In addition, (Figure 11) shows the ratio of frequently visited places on weekends by the multiple selection method. About the option for "CSA Farm", Hui-Yao CSA Farm is 97%, Qian-Jia CSA farm is 90%, Gu-Dong club is 21% and Roger CSA farm is 8%. It was confirmed that the CSA farm near the house was used as a resort place to visit on weekends. Furthermore, the  $\chi^2$  test was performed on the tabulation of the seven selection items in (Figure 11). A significant difference was found in "CSA Farm". It can be said that there is a difference between weekend usage of downtown type farm and rural type farm.

Next, (Figure 12) shows the ratio of interaction activities that customers would like to participate in using the multiple selection method. The highest ratio was "Child agriculture classes" all over 90% in 4 farms. It can be said that consumers at CSA farms consider it very important for their children's natural education. And "Agricultural course" was more than 88% on all farms. It can be said that consumers of CSA are interested in farming methods. On the other hand, the lowest ratio was "safety education for CSA products", which was less than 6% on all farms. This is because CSA farm consumers believe that CSA's foodstuffs are safe and assumed that CSA food education for consumers is not interested. Furthermore, the  $\chi^2$  test was performed on the tabulation of the eight items in (Figure 12). A significant difference was found in "cooking classroom". This was thought to be because Roger CSA Farm had no cooking space compared to the other three farms.

### 3.4 About the comparison study with CSA questionnaire survey in New York State, USA

Antoinette [3] conducted a questionnaire survey for a total of 565 CSA consumers in the state of New York in the United States, pointed out the "reason of participation CSA" and "empathy on the importance of farmland conservation through CSA farm". In this study, we conducted the same questionnaire

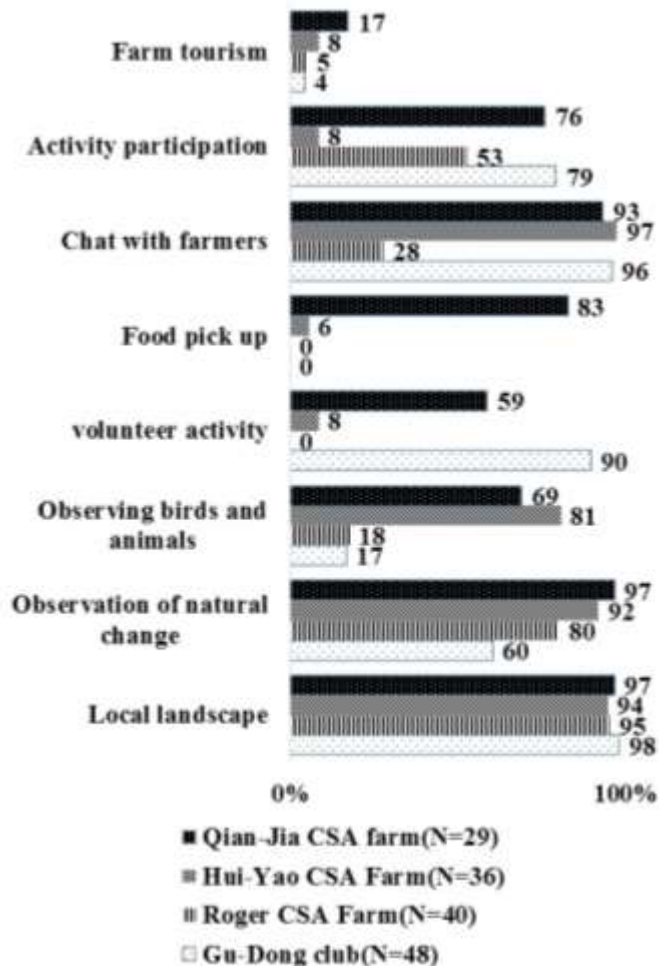


Figure 10: farm visiting reason

survey, and (Table 9) shows the percentage of New York state consumers compared with Taiwanese consumers.

According to the questionnaire survey results about the reason of participation CSA towards consumers in New York State, most of New York consumers are emphasis on "freshness", "local production", "seasonal foodstuff" and "organic production", and these four options ratio are from 68% to 81%. By contrast, only a small number of New York CSA consumers chosen "connection with local community", "interacting with others customers", "sharing production risk with producers", and these three options ratio are from 8% to 31%. Based on this, CSA consumers in northern Taiwan compared with CSA consumers in New York state in the US, option "connection with local community" is (Taiwan's farms all from 60% to 97%), and option "interacting with others



customers” is (Taiwan’s farms all from 65% to 93%), It can be said that Taiwan’s CSA

preservation was very important for research type consumer groups with high education level. Furthermore, Roger CSA farm

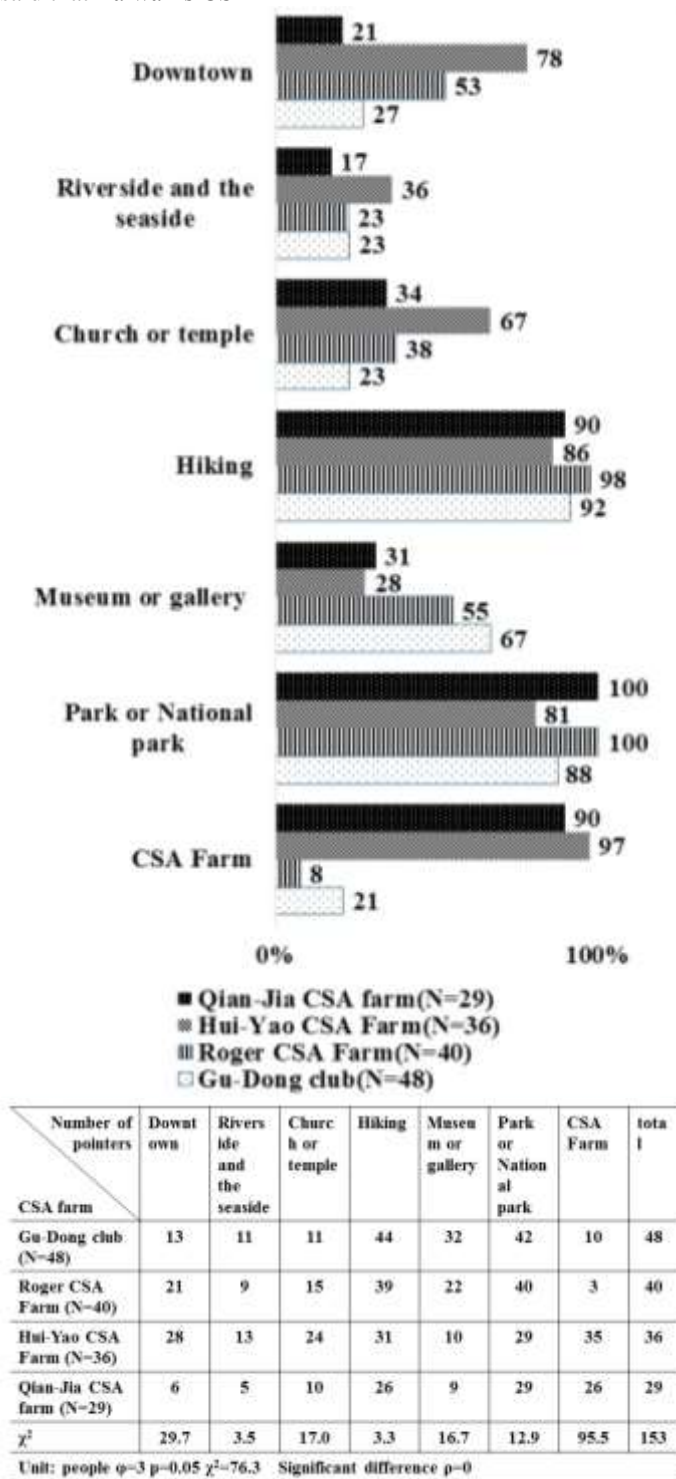


Figure 11: frequently visited places on weekends

customers is a tendency to emphasizing the interaction relationship with local community.

Next, concerning the sharing of production risk with producers, all New York states in the United States and all four Taiwan farm consumers were less than 34%. CSA consumers in Taiwan and New York State both are less interested in sharing production risk. About the result on “empathy on the importance of farmland conservation through CSA farm” got 90% agree on customers in Qian-Jia CSA farm. This is because that composition of the respondents at Qian-Jia CSA farm has 69% coming from national institute of technology research institute employees. It can be said that pursuit of ideal of farmland

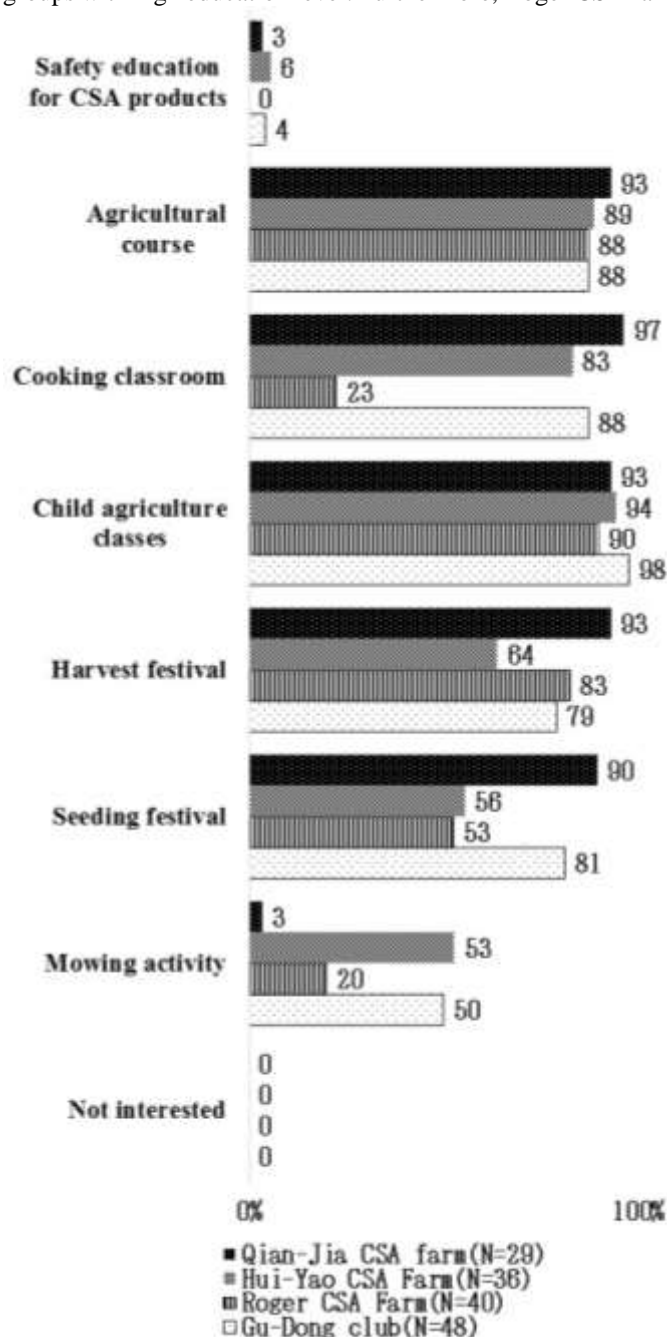


Figure 12: interaction activities that customers would like to participate in

and Hui-Yao CSA Farm are also 83% and 86%, and these two farms hold various interaction activities and agricultural educational classrooms throughout the year, this result can be **Table 9**: “Reason of participation CSA” and “Empathy on the importance of farmland conservation through CSA farm” comparison study with CSA questionnaire survey in New York State, USA

Survey target (Number of persons engaged)	Gu-Dong club (N=48)	Roger CSA Farm (N=40)	Hui-Yao CSA Farm (N=36)	Qian-Jia CSA farm (N=29)	New-York CSA (N=565)	$\chi^2$ (Significant difference-p)
<b>A. Reason of participation CSA</b>						
1. freshness	46 (96%)	38 (95%)	36 (100%)	28 (97%)	455 (81%)	23.8 (0.000)
2. local production	32 (67%)	32 (80%)	36 (100%)	28 (97%)	441 (78%)	19.8 (0.001)
3. seasonal foodstuff	33 (69%)	35 (88%)	35 (97%)	25 (86%)	398 (70%)	19.9 (0.001)
4. organic production	38 (79%)	32 (80%)	36 (100%)	27 (93%)	389 (68%)	25.9 (0.000)
5. connection with local community	32 (67%)	24 (60%)	33 (92%)	28 (97%)	176 (31%)	117.0 (0.000)
6. interacting with others customers	37 (77%)	26 (65%)	24 (67%)	27 (93%)	45 (8%)	318.6 (0.000)
7. sharing production risk with producers	4 (8%)	8 (20%)	5 (14%)	10 (34%)	118 (21%)	8.9 (0.063)
<b>B. Empathy on the importance of farmland conservation through CSA farm</b>						
	21 (44%)	33 (83%)	31 (86%)	26 (90%)	213 (38%)	82.8 (0.000)

Unit: %  $\phi=4$   $p=0.05$   $\chi^2=216.1$  Significant difference  $p=0$

assumed as main reason why these two farms have high ratio on “empathy on the importance of farmland conservation”.

#### 4. Conclusion

As described above, this paper considers the recent developments of CSA farms in Taiwan. Based on the consumers feedback in the four CSA farms in Northern Taiwan, we could clarify the actual situation of interaction activities in each farms based on field surveys and consumer questionnaire surveys , Clarified the following points. First, the participation factors will be described. First, about the trend of 33 CSA farms in northern Taiwan:

- Distribution of Taiwan northern CSA farms tended to concentrate in Yilan County with 40 ~ 50 km from Taipei Metropolitan Area.
- CSA farms with high percentage of consumers residing in downtown areas tended to have higher revenues from CSA contracts among total income.

Based on the above results, in this study, we selected two downtown type farms (the distance to all CSA contractor is within 10 km) and two rural type farms (40 ~ 50 km distance to main CSA contractor) for clarifying the point of view.

- In the case of downtown type farms, the all consumers are located in Taipei and Hsinchu downtown area, while rural type farms (located in the Yilan County) have about 70-80% customers from Taipei downtown area.

- For the main products, downtown type farm main crops are vegetables, fruits, and rural type farms produce rice as main crop.
- Downtown type farms with a transport distance of less than 10 km were able to provide main daily foodstuff for customers, but rural farms with 40 to 50 km tended not to be so. The transport distance of agricultural crops, which are considered to be local production, in US CSA consumers is defined as being within 100 miles (160.9 km), and the situation in northern Taiwan compared with the United States is shorter. Due to the human’s transportation habit and idiomatical vehicle are different.
- The means of transportation to the farm of CSA contractor is motorcycle (from 24.1% to 44.5%) and car (from 55.5% to 75.9%) in downtown type farms, whereas 100% rural type farm’s CSA consumers chose cars. The frequency of consumer visiting farms is consumers who are conscious of CSA foodstuffs as main daily food supply will be visit every week to every two weeks, and consumers who haven’t conscious of CSA foodstuffs as main daily food supply will be visit every two months to once a month. These result seemed to be influenced by the distance between each CSA farm and the customers.
- Compared with New York state consumers, Taipei consumers tend to be sympathized with the importance of farmland conservation. So the value of Taiwan CSA farms are not only the production and provision of safe crops but also the various interaction and educational activities in each CSA farm.

Finally, CSA farms in Taiwan have used Participatory Guarantee Systems (PGS) principle to hold various agricultural interaction, educational activities and build relationship of trust with consumers. According to the mentioned above, the various agricultural production events and interaction activities for customers such as making network with local community, teaching organic farming way were considered to be a feature of Taiwan's CSA farm.

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