CHAPTER 4
RESULTS

This study is Farmers' Participation in Sustainable Agricultural Development in the Highland Area of the Royal Project in Chiang Mai province.

From this study, the results of data analysis were divided into fives part as follows:

Part 1: General, economic and social information of farmers

Part 2: The farmers' participation in sustainable agricultural development in the highland area to cultivate plants which help the soil and water conservation in the highland area of the Royal Project in Chiang Mai province.

Part 3: The factors that affect the farmers' participation in sustainable agricultural development in the highland area of the Royal Project in Chiang Mai province.

Part 4: The problems and suggestions regarding the farmers' participation in sustainable agricultural development in the highland area of the Royal Project in Chiang Mai province.

Part 5: The steps to study the farmers' participation in sustainable agricultural development in the highland area to cultivate plants which help the soil and water conservation in the highland area of the Royal Project in Chiang Mai province.

Part 1: Economic and social characteristics of farmers

1. Farmer's Ethnic

It was found that the sample group was 80 Local lanna who represented 20.10 percent, followed by the Karen tribe people, representing 66 people as 16.50%, Lesu was 66 people representing 16.50%, Lahu 66 people, representing 16.50 %, Aka was 62 people representing 62 %. 15.50 %, Hmong tribe was 47 people representing 11.80%, and other tribes, such as Lua, Kachin, Taiyai were 12 people representing 3.00%, as revealed in Table 2.

Table 2 Number and percentage of farmers by tribes

Tribes	Number (person)	percent
Local lanna	80	20.10
Karen	66	16.50
Lesu	66	16.50
Lahu	66	16.50
Aka	62	15.50
Hmong	47	11.80
Others (Lua,Kachin, Taiyai)	12	3.00
Total	**399**	**100.00**

2. Gender

From the data analysis, it was found that most of the farmers were 285 males, representing 71.40%, 114 were females, representing 28.60 % according to Table 3.

Table 3 Number and percentage of farmers by gender

Gender	Number (person)	Percent
Male	285	71.40
Female	114	28.60
Total	**399**	**100.00**

3. Age

The averaged age to the farmers were between 41-50 years accounted for 30.00 %, followed by the age between 31-40 years accounted for 24.80 %, was the age which less than 30 years, representing 23.70 %. The age between 51 and 60 years represented 14.90 %. The farmers who were 61 years old or more were found as the least number accounted for 7.50 %. The farmers who provided a minimum age were 17 years, as well as provided the oldest was 80 years 41 years. The averaged age was 41 according to the table 4.

It was found that at the present, in the highland having older group than the younger and the younger become being in the city to receive an education or being the city worker, therefore, the development authority should promote the new highland agriculturist by using the older agriculturist as a learning source

Table 4 Number and percentage of farmers by age

Age (years)	Number (person)	per cent
Less than 30 years	95	23.70
30-40 years	99	24.80
41-50 years	120	30.00
50-60 years	59	14.90
61 and more	26	7.50
Total	**399**	**100.00**

Minimum age 17 years, Mean age 41 years

Maximum age 80 years, Standard deviation 0.63

4. Education Level

From the data analysis, it was found that the uneducated farmers were of 190 people, representing 47.70%, followed by primary education were 141 people, representing 35.40%, three years of high school were 40 people, representing 9.80%, six years high school were 21 people, representing 5.30%, diplomas were 4 people, representing 1.00%, and the least graduation of farmers was Bachelor's degree which provided 3 people, representing 0.80 % according to Table 5.

Table 5 Education level of farmer

Education level	Number(person)	Percent
Educated through formal system	209	47.70
- Primary school	141	35.40
- Three year high school	40	9.80
- Six year high school	21	5.30
- Diploma	4	1.00
- Bachelor's degree	3	0.80
Non formal Education	190	52.30
Total	**399**	**100.00**

5. Number of household members

Analysis of data in Table 6 showed that most farmers have four household members, representing 23.80%, followed by five of household members, representing 22.10%. Six of household members represented 20.30%. Three household members represented 15.30 %. Eight or more members accounted for 8.30%. Seven members represented 7.50%. Two members represented 1.80%. The least number of farmer's household member was 1 person, represented 1.00%. The total number of farmers was 399 with five members as the averaged number of household member.

It can be said that the population in the area of the Royal Project foundation's responsibility continued their occupation in agriculture. However, city has influenced on the nature of families, due to economic conditions which made trends change from a large number of family to the fewer members.

Table 6 Number of household members

Number of household members	Number (family)	percent
1	4	1.00
2	7	1.80
3	61	15.30
4	95	23.80
5	88	22.10
6	81	20.30
7	30	7.50
8 or more	33	8.30
Total	**399**	**100.00**

Minimum number of households members 1 person.
Maximum number of households members 22 persons.
The average number of household members 5 persons
The value of standard deviation 2.50.

6. Number of school' age household members

Analysis of data in Table 7 sowed that most the farmer's families contained one person who was in school age, which represented 28.00%, followed by the two school age household members in the family, which represented 26.80%, no member of school age in the household represented 18.90%. Eleven school age household members 3 represented 17.30%. Four of school age household members represent 5.60%, and five or more household members accounted for 3.50%. The total number of farmers was 399 with two members as the averaged number of school age members. It is said that educational expenses of the family member is at the high cost so agriculturist tend to not give much of education for the family member.

Table 7 Number and Percentage of school' age household member

Number of school age member	Number(Person)	Percent
None	75	18.90
1	112	28.00
2	107	26.80
3	69	17.20
4	22	5.60
More than 5	14	3.50
Total	**399**	**100.00**

The lowest number of school age member 1 Person
The highest number of school age member 11 Persons
The average number of school age member 2 Persons
The value standard deviation 1.40

7. Number of working age household members

From the analysis in Table 8, it was found that most of the working age member in the household was 2, representing 36.10%, followed by three working members represented 24.50%. Four working age members represented 20.20%. Five members accounted for 8.60%. Six or more members represented 6.60%. The least number of working age members was one person, representing 4.00%. The total number of households of farmers was 399. The average number of working age member was three people. It was found that the working ages in both male and female are in equal.

Table 8 Number and Percentage of working age household member

Number working age member	Number(people)	Percent
1	16	4.00
2	144	36.10
3	98	24.50
4	81	20.20
5	34	8.60
6	26	6.60
Total	**399**	**100.00**

Minimum number of working age members 1 Person
Maximum number of working age members 17 Persons
The average number of working age members 3 Persons
The value standard deviation 1.80

8. The income of household

From the analysis of the income of the sample group resulted in Table 8 showed that most of the farmers had their income between 20,001and 40,000 baht per year, representing 31.60%, followed by the income of the household between 40001and 60,000 baht per year, representing 25.80%. The household income of more than 100,001 baht per year represented 19.80%. The farmers who had less than 20,000 baht per year represented 10.50%. The income of 80,001-100,000 baht per year represented 6.50%. The least was the number of farmers who had income between 60,001-80,000 baht per year, represented 5.80%. The total number of farmers was 399. The averaged income was 72,990 baht per year, according to Table 9.

Table 9 Number and Percentage of farm households by income

Income (baht per year)	Number (person)	Percent
Less than 20,000	42	10.50
20,001-40,000	125	31.60
40,001-60,000	102	25.80
60,001-80,000	23	5.80
80,001-100,000	26	6.50
More than 100,000	78	19.80
Total	**399**	**100.00**

Minimum income 4,000 baht per year
Maximum income 600,000 baht per year
Average income 72,990 baht per year
Standard deviation 78,152

9. Area holding of the household

Fruit growing areas revealed that most farmers with 37.60% had fruit farm about one to five rais. Less number of farmers had no fruit farm represented 35.4 %. There was 4.00% of farmers who had fruit area of 16-20 rai as the least number. The average fruit area of the farmers was 6.30 rai.

The area of vegetable, it was found that most of the farmer with 50.30% had no vegetable area, followed by 35.40% of farmers had the vegetable area with 1-5 rais. Also, the 0.60% of farmers had the vegetable area with 16-20 rai. The least number of the farmers who had the vegetable area was more than 20 rais. The average vegetable area was 2.30 rais.

Corps planting area, it was found that most of the farmer with 54.30% had no crops planted area, followed by 26.80% of farmers had the area of 1-5 rais for corps planting. 1.00% of the farmers had the corps planting area more than 20 rais as the least. The household had an average area of crops cultivation as 2.80 rais.

Flowering plant area, it was found that most of the farmers with 54.30% had no flowering plant area. Following by 0.80% of farmers had 1-5 rai of flowering

plant area. The average number of farmer household which had the flowering plant area was 2.80 rais.

Area of integrated plant, it was found that most farmers with 91.20% had no hybrid plant area, following with 4.80% had hybrid plant area with 1-5 rais. Moreover, 1.20% had hybrid plant area with 16-20 rai as the least. The average area of hybrid plant area was 0.78 rai.

Animal husbandry areas, it was found that most of the farmers with 97.70% had no animal husbandry areas. Followed by 2.30% had the animal husbandry areas with 1-5 rais. The average of animal husbandry areas of farmers was 0.03 rais.

Area of residence, it was found that most of the farmers with 99.70% had the resident area about 1-5 rais. In addition, the 0.30% of farmers had no resident area. The average resident area of farmers was 0.70 rais.

Other benefit areas, it was found that 96.00% of farmers had no other benefit areas. Followed by with 2.70% of farmers who had other benefit area with 1-5 rais. The 0.30% of farmers had the other benefit area with 11-15 rai as the least. The average other benefit area of farmers was 0.44 rais.

Area holdings of households found that most of the farm households with 24.80% hold 6-10 rais. Followed by 23.70% of farmers had 1-5 rai. The15.20% of farmer had 16-20 rais as the least. The average number of farmers who had their own area was 13.50 according to Table 10.

It was found that the highland people hold smaller of the land than before because the number of population are increasing. In addition their farms area and residential area are smaller than before.

Table 10 Number and percentage of total household land area

Area holding	Number (percent)						$\bar{X}$	S.D.
	None	1-5 Rais	6-10 Rais	11-15 Rais	16-20 rais	More than 20 rais		
Fruit	141 (35.40)	150 (37.60)	49 (12.10)	23 (5.80)	16 (4.00)	20 (5.10)	6.30	16.60
Vegetable	200 (50.30)	148 (37.10)	39 (9.60)	8 (3.00)	2 (0.60)	2 (0.60)	2.30	4.40
Corp	216 (54.30)	107 (26.80)	57 (12.10)	9 (2.30)	6 (1.50)	4 (1.00)	2.80	4.80
Flower	395 (99.20)	4 (0.80)	-	-	-	-	0.01	0.12
Integrated Plant	362 (91.20)	20 (4.80)	11 (3.50)	2 (0.60)	4 (1.20)	-	0.78	3.90
Animal husbandry	389 (97.70)	10 (2.30)	-	-	-	-	0.03	0.20
Resident Area	2 (0.30)	397 (99.70)	-	-	-	-	0.70	0.53
Other benefit	381 (96.00)	12 (2.70)	-	1 (0.30)	-	5 (1.00)	0.44	3.50
Total area of holding	-	95 (23.70)	99 (24.80)	80 (19.90)	58 (15.20)	67 (16.40)	13.50	0.45

Minimum area of fruit planting none Maximum area of fruit planting 247 rais
Minimum area of vegetable planting none Maximum area of vegetable planting 49 rais
Minimum area of crop planting none Maximum area of crop planting 40 rais
Minimum area of flowering planting none Maximum area of flowering planting 2 rais
Minimum area of integrated planting none Maximum area of integrated planting 45 rai
Minimum area of animal husbandry none Maximum area of animal husbandry 2 rais
Minimum area of residential none Maximum area of residential 3 rais
Minimum area of other benefit none Maximum area of other benefit 49 rais.
Minimum of holding area 0.25 rais Maximum holding area 13.50 rais
Maximum of holding area 251 rai Standard deviation values 0.45

10. Channel of agricultural information access

10.1 radios

It was found that most farmers about 73.70% had never received information about agriculture from radio, secondary, 18.20% had received news about agricultural development from the radio 1-3 times per year. Respectively, 4.30% had been received news about agriculture from the radio more than10 times per year, 3.30% of

farmers had received information about agriculture from the radio 4-6 times per year, and the least, 0.50% of farmers had received information about agriculture from radio 7-9 times per year.

10.2 Televisions

From the analysis, it was found that most of the farmers about 28.60% had received agricultural news from television 1-3 times per year, followed by 27.80% had never received news about agriculture from television. Respectively, 22.70% had received information of agriculture from television more than 10 times per year, 14.60% farmers had received information about agriculture from television 4-6 times per year, and the least, and 4.10% farmers had received information about agriculture from television 7-9 times per year.

10.3 Newspapers

It was found that most of the farmers about 89.10% had never received information about agriculture from newspapers, followed by 8.30% had received news from newspapers 1-3 times per year. Respectively, 1.80% had received information about agriculture from newspapers more than 10 times per year, 0.50% farmers had received information about agricultural newspapers and 4-6 times per year, the least 0.30% of farmers had received information about the agricultural from newspaper 7-9 times a year.

10.4 Published

It was found that most of the farmers about 83.60% had never received information about agriculture from documents, followed by 13.90% had received information about agriculture from documents 1-3 times per year. Respectively, 2.00% had received information about agriculture from documents 4-6 times per year, and the least 0.50% of the farmers received the information of agriculture by more than 10 documents per year, according to Table 11.

Table 11 Number and Percentage news receiving of the farmer from media.

Channel of information (Per year)	Number of people (Percent)			
	Radio	**Television**	**Newspaper**	**Publication**
Never	293 (73.7)	111 (27.80)	354 (89.10)	332 (83.60)
1-3 times	73 (18.20)	123 (58.60)	34 (8.30)	56 (13.90)
4-6 times	13 (3.30)	58 (14.60)	2 (0.50)	9 (2.00)
7-9 times	2 (0.50)	16 (4.10)	1 (0.30)	0 (0.00)
More than 10 times	18 (4.30)	91 (22.70)	8 (1.80)	2 (0.50)

10.1 radio (N = 399)

Minimum Never Maximum 365 per year.

Mean 2 times a year Standard deviation value 19.50

10.2 Television (N = 399)

Minimum Never Maximum 365 per year.

Mean 8 times a year Standard deviation value 28

10.3 Newspapers (N = 399)

Minimum Never Maximum 90 per year.

Mean 1 time a year Standard deviation value 5.30

10.4 Publication (N = 399).

Minimum Never Maximum 100 per year.

Mean 44 times a year Standard deviation value 6.60

11. Contact with extension staff and government officials in a year

From the analysis, it was found that most of the farmers about 42.60% had contacted with extension staff and government officials more than 9 times per year, followed by 21.10% had contacted extension staff and government officials to 1-3 times per year. Respectively, 18.60% had never contacted with extension staff and government officials, 15.50% farmers had contacted with extension staff and government officials 4-6 times per year, and the least, 2.30% had contacted with

extension staff and government officials 7-9 times per year. The average time of contact between farmers and extension staff and government officials' was11 times per year. It can be said that vegetable farmers receives more communication from the development authority than the other group, According to Table 12.

Table 12 Contact between farmers and extension staff and government officials

Number of contact (Per year)	Number (people)	Percent
Never	74	18.60
1-3	84	21.10
4-6	62	15.50
7-9	9	2.30
More than 9	170	42.60
Total	**399**	**100.00**

Minimum of contact with extension staff and government officials Never.
Maximum of contact with extension staff and government officials 300 per year
The average time of contact to extension staff and government officials 11 per year
Standard deviation 27.00

12. The participation of Community Activities

From the analysis, it was found that most of the farmers about 58.20% had participated in community activities 1-3 times per year, followed by 25.30% had participated the community activities 4-6 times per year. Respectively, 12.00% had participated community activities more than 9 times per year, 3.00% had participated in community activities 7-9 times per year, and the least, 2.50% of the farmers had never participated in community activities. The average participation of community activities was 4 times per year. It can be said that mostly form of farmers participation can found in the year festival and in the type of hill tribe ritual. According to Table 13.

Table 13 Farmers' participation in local activities

Participation in local activities (Per year)	Number (Person)	Percent
Never	10	2.50
1-3	232	58.20
4-6	101	25.30
7-9	12	3.00
More than 9	44	12.00
Total	**399**	**100.00**

Minimum participation in local activities Never
Maximum participation in local activities 100 per year.
The average participation in local activities 4 per year.
Standard deviation 4.30.

13. Farmers' Participation in agricultural development

From the analysis, it was found that most of the farmers about 62.20% had participated in agricultural development 1-3 times per year, followed by 20.50% had never participated in agricultural development. Respectively, 8.50% had participated in the agricultural development 4-6 times per year, 5.70% had participated on the agricultural development, and the least and 3.10% had participated in agricultural development. The average time of farmers' participation in agricultural development was 7-9 times per year. It was found that training term of the highland farmers is only at 1 time a year and sometime site visiting is set. According to Table 14.

Table 14 Farmers' participation in agricultural activities

Participation in agricultural development (Per year)	Number (Person)	Percent
Never	82	20.50
1-3	247	62.20
4-6	35	8.50
7-9	12	3.10
More than 9	23	5.70
Total	**399**	**100.00**

Minimum participation in agricultural development activities Never
Maximum participation in agricultural development activities 16 per year
Average participation in agricultural development activities 3 per year
Standard deviation 3.10

14. Farmers' Participation in training and study tour of agriculture

From data analysis, it was found that most of the farmers about 49.40% had never participated in training and study tour of agriculture, followed by 46.00% had participated in the training and study tour of agriculture 1-3 times per year. Respectively, 3.50% had participated in training and study tour of agriculture 4-6 times per year, 1.00% of farmers had participated in the training and study tour of agriculture more than 9 times per year, and the least, 0.30% of farmers had participated in the training and study tour of agriculture 7-9 times per year. The average time of farmers' participation in the training and study tour of agriculture was 1 per year, according to Table 15.

Table 15 Farmers' participation in training and study tour of agriculture

Training and study tour of agriculture (Per year)	Number (Person)	Percent
Never	197	49.40
1-3	183	46.00
4-6	14	3.50
7-9	1	0.30
More than 9	4	1.00
Total	**399**	**100.00**

Minimum training and study tour of agriculture Never
Maximum training and study tour of agriculture 29 per year
The average of training and study tour of agriculture 1 per year
Standard deviation 2.07

15. Duration of resident

From the analysis, it was found that most of the farmers about 29.00% had set up homes in the area for 21-30 years, followed by 27.10% had set up more than 40 years. Respectively, 19.60% had set up in the area for11-20 years, 18.60% had set up homes for 31-40 years, and the least, 5.80% had set up for 1-10 years. The average duration of the resident in the area was 36.2 years, It can be said that the setting term of the highland community is about 36.2 years and in the same age of the Royal Project. In addition, the highland community is permanent. According to Table 16.

Table 16 Number and Percentage of duration of the resident

Duration of resident (years)	Number (Person)	Percent
1-10	23	5.80
11-20	78	19.60
21-30	116	29.00
31-40	74	18.70
More than 40	108	27.10
Total	**399**	**100.00**
Minimum duration of resident	1 year	
Maximum duration of resident	99 years	
Average duration of resident	36.2 years	
Standard deviation	4.52	

16. The benefits of sustainable agriculture in the highland area as follows:

16.1 A source of food for consumption From the analysis, it was found that most of the farmers about 60.60% have been the most benefit. Followed by 38.10% had been moderate benefit and 1.30% had been the least benefit.

16.2 Convenient transportation From the analysis, it was found that most of the farmers about 64.60% have been the most benefit. Followed by 34.60% had been moderately benefit, and 8.00% had been the least benefit.

16.3 A source of water for agriculture in the area From the analysis, it was found that most of the farmers about 64.60% had been the most benefit. Respectively, 46.20% had been moderately benefited, and 4.30% had been the least benefit.

16.4 Income from various agricultural products purchasing From the analysis, it was found that most of the farmers about 53.00% had been moderately benefited. Followed by 43.70% has been the most benefited, and 3.30% had been the least benefited.

16.5 Attractions of Eco-agriculture tourism From the analysis, it was found that most of the farmers about 47.70% had been moderately benefited. Followed by 44.70% has been the most benefited, and 7.60% had been the least benefited.

16.6 Grouping, community economic home, production process From the analysis, it was found that most of the farmers about 65.20% had been the highly benefit. Followed by 32.10% had been moderately benefit, and 11.90% had been less benefit.

16.7 Farmer had knowledge of conservative planting From the analysis, it was found that most of the farmers about 65.90% had been highly benefit. Followed by 30.80% had been moderately benefit, and 3.30% had been less benefit.

16.8 Reducing the drug planting and increasingly strong communities From the analysis, it was found that most of the farmers about 65.20% had been highly benefited. Followed by 32.10% had been moderately benefit, and 2.80% had been less benefited.

16.9 Expansion of agricultural product market communities From the analysis, it was found that most of the farmers about 61.80% had been highly benefited. Followed by 35.90% had been moderately benefited and 2.30% had been less benefited.

16:10 Increasing the agriculture of soil and water conservation From the analysis, it was found that most of the farmers about 66.90% had been highly benefited. Followed by 31.60% had been moderately benefited and 1.50% had been less benefited.

16.11 Reducing unemployed in the area From the analysis, it was found that most of the farmers about 69.70% had been moderately benefited. Followed by 29.50% had been highly benefited, and 0.80% had been less benefited, respectively, according to Table 17.

Table 17 Number and Percentage of the benefits of sustainable agriculture in the highland area

Benefit	High		Moderate		Low	
	Person	Percent	Person	Percent	Person	Percent
1.Resources for consumption	241	60.60	152	38.10	6	1.30
2. Better transportation	257	64.60	138	34.60	4	8.00
3. More water resources for agriculture	197	49.50	184	46.20	18	4.30
4. Income from various agricultural products	174	43.70	211	53.00	14	3.30
5. Eco-tourism attractions	178	44.70	190	47.70	31	7.60
6. Groups of community and economic home	259	65.20	128	32.10	48	11.90
7. More knowledge in conservative agriculture	262	65.90	123	30.80	14	3.30
8. Reduce of drug and strengthen community	259	65.20	128	32.10	12	2.80
9. Expand agricultural market	246	61.80	143	35.90	10	2.30
10. More conservative agriculture conducted	257	66.90	126	31.60	7	1.50
11. reduce the unemployed in the area	118	29.50	277	69.70	4	0.80

17. Information about the Knowledge of farmers about sustainable agricultural development in the highland area

The study of farmer knowledge about sustainable agricultural development in the highland area provided details are as follows.

1. The development of agriculture is to increase the agricultural production for higher value to investors. From the analysis, it was found that most of the farmers about 96.50% made the right answer, while 3.50% made the wrong answer.

2. The acknowledgement of agricultural people is another key to agricultural development. From the analysis, it was found that most of the farmers about 98.50% made the right answer, while 1.50% made the wrong answer.

3. Avoid dropping the wasted chemicals, hazardous substances into water is another key to sustainable agricultural development. From the analysis, it was found

that most of the farmers about 85.70% made the right answer, while 14.30% made the wrong answer.

4. To reclaim forest in the prone area for economic planting is considered as a sustainable agricultural development. From the analysis, it was found that most of the farmers about 73.30% made the right answer, while 26.70% made the wrong answer.

5. The plants grown in cultivated plant conservation is a demonstration. It is not able to give the real benefits. From the analysis, it was found that most of the farmers about 82.60% made the right answer, while 17.40% made the wrong answer.

6. The hybrid cultivate approach enables the development of sustainable agriculture. From the analysis, it was found that most of the farmers about 93.50% made the right answer, while 6.50% made the wrong answer.

7. In sustainable agriculture, it should be cultivated crops and farm animals simultaneously. From the analysis, it was found that most of the farmers about 11.90% made the right answer, while 88.10% made the wrong answer.

8. The soil and water conservation under highland areas is the responsibility of farmers and developing organization. From the analysis, it was found that most of the farmers about 77.60% made the right answer, while 22.40% made the wrong answer.

9. The sustainable agriculture under highland area will not use chemical fertilizers. From the analysis, it was found that most of the farmers about 54.50% made the right answer, while 45.50% made the wrong answer.

10. On the high areas in steep vertical, vetiver should be planted to prevent soil collapse. From the analysis, it was found that most of the farmers about 95.30% made the right answer, while 4.70% made the wrong answer.

11. The development of sustainable agriculture or the activities of plants grown in soil and water conservation is to ensure balance of human and environment. From the analysis, it was found that most of the farmers about 97.50% made the right answer, while 2.50% made the wrong answer.

12. The development of sustainable agriculture under highland area of plant grown in soil and water conservation should be planted along the staircase, as well as there should be very planted in the same area. From the analysis, it was found that most of the farmers about 97.30% made the right answer, while 2.70% made the wrong answer.

13. Areas of high steep; it should be planted trees rather than crops, such as vegetables and other biennial crops. From the analysis, it was found that most of the farmers about 88.40% made the right answer, while 11.60% made the wrong answer.

14. Water wall should be built used to store water resources. It can be prevented the water shortage in the highland area. From the analysis, it was found that most of the farmers about 96.00% made the right answer, while 4.00% made the wrong answer.

15. Farmers were able to sustainable farming without the assistant of government or royal projects. From the analysis, it was found that most of the farmers about 57.90% made the right answer, while 6.80% made the wrong answer.

16. The group of agricultural productivity was the value adding of agricultural productivity and the sustainable activity in plants grown in soil and water conservation in the highland area. From the analysis, it was found that most of the farmers about 93.20% made the right answer, while 6.80% made the wrong answer.

17. The weed elimination of crops in the conversion system on soil and water conservation in the highland area by using chemical is the best way. From the analysis, it was found that most of the farmers about 67.00% made the wrong answer, while 33.00% made the right answer.

18. The development of sustainable agriculture projects in planting crops in soil and water conservation in the highland area will help reduce the problem of chemical contamination in agricultural products. From the analysis, it was found that most of the farmers about 72.80% made the right answer, while 27.20% made the wrong answer.

19. Organic farming is one way to develop sustainable agriculture. From the analysis, it was found that most of the farmers about 97.80% made the right answer, while 2.20% made the wrong answer.

20. The sustainable agriculture is one of the soil and water. From the analysis, it was found that most of the farmers about 98.30% made the right answer, while 1.70% made the wrong answer, according to Table 18.

Table 18 Number and percentage of farmer's knowledge about sustainable agricultural development in the highland area.

Statement	Farmer's Opinion			
	Incorrect		Correct	
	Person	Percent	Person	Percent
1. Agricultural Development is to increase agricultural value to be higher for investment	14	3.50	385	96.50
2. Acknowledging agricultural people is another agricultural development	6	1.50	393	98.50
3. Avoid dropping chemicals, hazardous substances into water sources is a natural approach to sustainable agricultural development	57	14.30	342	85.70
4. To reclaim forest in the prone area for economic planting is considered as a sustainable agricultural development	293	73.30	106	26.70
5. Plants cultivated in demonstrate area are not benefit in reality	330	82.60	69	17.40
6. The hybrid cultivate approach enables the development of sustainable agriculture	26	6.50	373	93.50
7. The sustainable agriculture development should provide animal husbandry at the same time	48	12.10	351	87.90
8. Soil and water conservation is the responsible of farmers and development authorities	89	22.40	310	77.60
9. Sustainable agriculture in the highland area will not use chemical fertilizers at all	253	54.50	182	45.50
10. In the highland areas in steep vertical, vetiver grass should be planted to prevent soil collapse	19	4.70	381	95.30
11. The development of sustainable agriculture activities of plants grown in soil and water conservation is to ensure balance of human and environment	10	2.50	389	97.50

Table 18 (Cont.)

Statement	Farmer's Opinion Incorrect		Correct	
	Person	**Percent**	**Person**	**Percent**
12. The development of sustainable agriculture in the highland area of plant grown in soil and water conservation should be planted along the staircase, as well as there should be vary planted in the same area.	11	2.70	388	97.30
13. Areas of high steep; it should be planted trees rather than crops, such as vegetables and other biennial crops	46	11.60	352	88.40
14. Water wall should be built used to store water resources. It can be prevented the water shortage in the highland area	16	4.00	382	96.
15. Farmers were able to sustainable farming without the assistant of government or Royal Projects	167	42.10	232	57.90
16. The group of agricultural productivity was the value adding of agricultural productivity and the sustainable activity in plants grown in soil and water conservation in the highland area	27	6.80	372	93.20
17. The weed elimination of crops in the conversion system on soil and water conservation in the highland area by using chemical is the best way	268	67.00	131	33.00
18. The development of sustainable agriculture projects in planting crops in soil and water conservation in the highland area will help reduce the problem of chemical contamination in agricultural products	108	27.20	291	72.80
19. Organic farming is one way to develop sustainable agriculture	9	2.20	390	97.80
20. The sustainable agriculture is one of the soil and water	7	1.70	392	98.30

Part 2: Farmers' participation in sustainable agricultural development on growing plants project in soil and water conservation in the highland area.

1. The participation in consultations on the sustainable agricultural development project in soil and water conservation in the highland area of the Royal project

The result of the analysis of activity participation in consultation on sustainable agricultural development projects in growing plants in soil and water conservation in the highland area of the Royal Project. The level of participation in the sustainable agriculture development is considered in the issue of the consultation. It was found that farmer participation levels were moderate with an average 1.57. The criteria of participation level were given as follows.

1.1 Consultation with the director, head of the center and extension staff of Royal Project development center to plan the cultivation of plants in soil and water conservation under highland before operation. It was found that most of the farmers about 52.80% had moderately participated. Followed by, 22.70% had less participation. Respectively, 15.70% had no participation, 8.80% had much participation. The average level of farmers' participation was 1.55. It is revealed that farmers' participation was at the moderate level.

1.2 Suggestion in the meeting and seminar which held by the project staff. The meeting or seminar is about the grouping of crops planter in soil and water conservation in the highland area. It was found that most of the farmers about 47.20% participated moderately. Followed by 33.10% participated at low level. Respectively, 10.10% participated at much level, and the least, 9.60% never participated in the suggestion. The average number of farmer who participated in the suggestion was 1.58% at moderate levels of participation.

1.3 Participation in consultations with the Royal Project staff or government official before, during, or after operation of the agricultural activities in crop cultivation projects in soil and water conservation in the highland area. It was found that most of the farmers about 48.20% had moderately participated. Followed by, 31.30% had participated at low level. Respectively, 12.90% had highly participated,

7.60% had never participated. The average farmer of the participation was 1.70, which was at moderate levels of participation.

1.4 Participation in agricultural project planning of the activities in crop cultivation system on soil and water conservation in the highland area which was the responsibility of the Royal Project area, as well as the nearby area. It was found that most of the farmers about 46.50% had moderately participated. Followed by, 32.60% had participated at low level. Respectively, 12.60% had highly participated, 8.30 had never participated. The average farmer of the participation was 1.64 which was at moderate levels of participation.

1.5 Participation in consultation with project staff and government officials in the acknowledgement of farmers and interested people about the sustainable agricultural development projects in growing crops on soil and water conservation in the highland area. It was found that most of the farmers about 48.00% had moderately participated. Followed by, 32.80% had participated at low level. Respectively, 13.10 had highly participated, 6.10 had never participated. The average farmer of the participation was 1.80 which was at moderate levels of participation, according Table 19.

Table 19 Farmers' participating in consultation on sustainable agricultural development projects in the plants growing on soil and water conservation of the Royal Project in the highland area

Participation in consultations	Level of participation (Percent)						
	High	Moderate	Low	None	$\bar{X}$	S.D.	Meaning
1. Consultation with the director, head of the center and extension staff of Royal Project Development Center to plan the cultivation of plants in soil and water conservation in the highland before operation.	35 (8.80)	210 (52.80)	91 (22.70)	63 (15.70)	1.55	0.85	Moderate
2. .Suggestion in the meeting and seminar which held by the project staff. The meeting or seminar is about the grouping of crops planter in soil and water conservation in the highland area.	41 (10.10)	188 (47.20)	132 (3(3.10)	39 (9.60)	1.58	0.80	Moderate
3. Participation in consultations with the Royal Project staff or government official before, during, or after operation of the agricultural activities in crop cultivation projects in soil and water conservation in the highland area.	52 (12.90)	192 (48.20)	125 (31.30)	30 (7.60)	1.70	0.80	Moderate
4. Participation in agricultural project planning of the activities in crop cultivation system on soil and water conservation in the highland area which was the responsibility of the Royal Project area, as well as the nearby area.	51 (12.60)	185 (46.50)	130 (32.60)	33 (8.30)	1.64	0.80	Moderate
5. Participation in consultation with project staff and government officials in the acknowledgement of farmers and interested people about the sustainable agricultural development projects in growing crops on soil and water conservation in the highland area	51 (13.10)	191 (48.00)	131 (32.80)	24 (6.10)	1.80	0.77	Moderate
The average level of participation in the issue of consultation					**1.65**	**0.80**	Moderate

2. The participation of suggestion propose and decision making in sustainable agriculture development program in plants grown on soil and water conservation of the Royal Project in the highland area.

From the analysis of the activities of participation of suggestion propose and decision making in sustainable agriculture development program in plants grown on soil and water conservation of the Royal Project in the highland area, It is considered the level of sustainable agriculture development of suggestion propose and decision making. It is found that, farmers participated at the less level which was 1.49%. The participation criteria were given as the following.

2.1 Participation in the project of crop production proposal or activities in the soil and water conservation of Royal Projects and Royal Project development center with the head of center and staff. It was found that most of the farmers about 44.20% had moderately participated. Followed by, 36.10% had less participated. Respectively, 11.60% had never participated, 8.10% had mostly participated. The average farmer of the participation was 1.48 which was at low level of participation.

2.2 Participation in the suggestion of production factor management activity of soil and water conservation in sustainable agricultural systems in the center conference which is held by the government organization in the area. It was found that most of the farmers about 43.90% had moderately participated. Followed by, 34.80% had less participated. Respectively, 12.60% had never participated, 8.60% had mostly participated. The average farmer of the participation was 1.48 which was at low level of participation.

2.3 Participation in project and activity planning in plants cultivation on soil and water conservation on highland of Royal Project. It was found that most of the farmers about 43.40% had moderately participated. Followed by, 34.30% had less participated. Respectively, 12.60% had never participated, 9.60% had mostly participated. The average farmer of the participation was 1.50 which was at moderate level of participation.

2.4 Participation in regulations setting in production and manufacturing of economic plants, such as fruit, vegetable, flower, and crops in Royal Project with the relationship between conditions of manufacture which relates to market situation and conditions of the good manufacturing system of each corps. It was found that most of

the farmers about 40.90% had moderately participated. Followed by, 37.90% had less participated. Respectively, 12.40% had never participated, 8.80% had mostly participated. The average farmer of the participation was 1.46 which was at moderate level of participation.

2.5 Participation in the proposal of sustainable agriculture operation in plants cultivation on soil and water conservation in the highland of Royal Project and other nearby areas. It was found that most of the farmers about 48.70% had moderately participated. Followed by, 31.60% had less participated. Respectively, 11.10% had never participated, 8.60% had mostly participated. The average farmer of the participation was 1.54 which was at moderate level of participation, according to Table 20.

Table 20 Farmers' participating in proposing the solution and decision making in sustainable agricultural development projects in the plants growing on soil and water conservation of the Royal project in the highland area

Participation in finding solution and decision making	**Level of participation (percent)**						
	High	**Moderate**	**Low**	**None**	$\bar{X}$	**S.D.**	**Meaning**
1. Participate in propose the project of soil and water conservation of the Royal Project in the meeting with the staff and the chief officer	32 (8.10)	176 (44.20)	144 (36.10)	47 (11.60)	1.48	0.80	Low
2. Participate in propose the management of production factors in the project of soil and water conservation in sustainable development at the meeting of the center and other organizations	34 (8.60)	175 (43.90)	139 (34.80)	51 (12.60)	1.48	0.80	Low
3. Participate in planning the project of soil and water conservation in the highland area of the Royal Project	38 (9.60)	173 (43.40)	137 (34.30)	51 (12.60)	1.50	0.83	Moderate
4. Participate in setting regulations of production of vegetable, fruits, flowers, and corps of the Royal Project which meet the conditions of market and production of each types of plant	35 (8.80)	163 (40.90)	151 (37.90)	50 (12.40)	1.46	0.82	Low
5. Participate in propose the project of sustainable agricultural development in the highland area in soil and water conservation system of the Royal Project and other area	34 (8.60)	194 (48.70)	126 (31.60)	45 (11.10)	1.54	0.80	Moderate
Average level of finding solution and decision making					**1.49**	**0.81**	**Low**

3. The participation of cooperation in sustainable agriculture development program in plants grown on soil and water conservation of the Royal Project in the highland area.

From the analysis in the participation of cooperation in sustainable agriculture development program in plants grown on soil and water conservation of the Royal Project in the highland area, it is considered the point of cooperation that farmer participation was at the moderate level with 1.61% according the level of participation criteria as follows:

3.1 Participation in the cooperation between the Royal Project staff and farmer to generate activity groups of plants grown on soil and water conservation both in small and large groups. It was found that most of the farmers about 59.60% had moderately participated. Followed by, 23.70% had less participated. Respectively, 8.80% had mostly participated, 7.80% had never participated. The average farmer of the participation was 1.70 which was at moderate level of participation.

3.2 Participation in the cooperation between the Royal Project supporting staff and other government officials, farmers, local people, and private agencies in sustainable agriculture development program in plants grown on soil and water conservation of the Royal Project in the highland area. It was found that most of the farmers about 53.30% had moderately participated. Followed by, 28.80% had less participated. Respectively, 10.40% had mostly participated, 7.60% had never participated. The average farmer of the participation was 1.67 which was at moderate level of participation.

3.3 Participation in the cooperation between the Royal Project foundation, together with other government and development organizations to acknowledge and learn about the program in plants grown on soil and water conservation of the Royal Project in the highland area to farmers and interested people. It was found that most of the farmers about 48.70% had moderately participated. Followed by, 34.10% had less participated. Respectively, 8.80% had mostly participated, 8.30% had never participated. The average farmer of the participation was 1.57 which was at moderate level of participation.

3.4 Participation in the cooperation between the Royal Project, government agricultural agencies and private organizations to support and promote of the

instructors of the project and other activities related to plant cultivation in Royal Project. It was found that most of the farmers about 42.70% had moderately participated. Followed by, 32.10% had less participated. Respectively, 13.10% had never participated, 7.60% had mostly participated. The average farmer of the participation was 1.50 which was at moderate level of participation.

3.5 Participation in the cooperation between the Royal Project, government agricultural agencies and private organizations in the proposing budget and finance for agricultural activities in the plants cultivation in soil and water conservation in the highland area. It was found that most of the farmers about 48.20% had moderately participated. Followed by, 24.50% had less participated. Respectively, 19.70% had never participated, 7.60% had mostly participated. The average farmer of the participation was 1.40 which was at low level of participation, according to Table 21.

Table 21 Farmers' participating in the cooperation of sustainable agricultural development projects in the plants grown in soil and water conservation of the Royal Project in the highland area

Participation in coordination	Level of participation (percent)						
	High	Moderate	Low	None	$\bar{X}$	S.D.	Meaning
1. Participation in coordination Between the Royal Project officers and farmers to create groups of activities on soil and water conservation both in small and large groups	36 (8.80)	237 (59.60)	95 (23.70)	31 (7.80)	1.70	0.70	Moderate
2. Participation in coordination between the Royal Project officers and other organization, local people, and private sections in activities in soil and water conservation in the highland area.	42 (10.40)	222 (53.30)	115 (28.80)	30 (7.60)	1.67	0.76	Moderate
3. Participation in coordination between the Royal Project officers and other organization in promotion of the project information in activities in soil and water conservation in the highland area and acknowledge other people in the area.	33 (8.30)	194 (48.70)	136 (34.10)	36 (8.80)	1.57	0.77	Moderate
4. Participation in coordination between the Royal Project officers and other organization, local people, and private sections to support and be the instructors of the project	30 (7.60)	188 (47.20)	128 (32.10)	53 (13.10)	1.50	0.82	Moderate
5. Participation in coordination between the Royal Project officers and other organization, local people, and private sections in proposing the budget and loan for activities on soil and water conservation in the highland area	30 (7.60)	192 (48.20)	98 (24.50)	78 (19.70)	1.40	0.90	Low
Average level of coordination					**1.61**	**0.79**	**Moderate**

4. Participation in the implementation of sustainable agriculture development program in plants grown in soil and water conservation of the Royal Project in the highland area

From the analysis in the participation in the implementation of sustainable agriculture development program in plants grown in soil and water conservation of the Royal Project in the highland area, it is considered the point of implementation found that farmers' participation was at the moderate level with 1.66% according the level of participation criteria as follows:

4.1 Participation in manufacture planning with the Royal Project officers of economic plant cultivation, such as land preparation, care practices according to the manufacturing instructions strictly throughout the production season. It was found that most of the farmers about 56.60% had moderately participated. Followed by, 25.30% had less participated. Respectively, 11.90% had mostly participated, 6.30% had never participated. The average farmer of the participation was 1.74 which was at moderate level of participation.

4.2 Participation in the regulatory compliance of planting crops that obligates in marketing of the Royal Projects foundation in pre-market system on environmental production and safety chemicals usage in agriculture for manufacturers and consumers. It was found that most of the farmers about 47.50% had moderately participated. Followed by, 33.80% had less participated. Respectively, 12.60% had mostly participated, 6.10% had never participated. The average farmer of the participation was 1.67 which was at low level of participation.

4.3 Participation in regulation compliance of the Ministry of Agriculture and Royal Project regulations about agricultural production factors utilization, such as fertilizers, agricultural chemicals in crop planting project in the best farming areas on highland area, emphasis on the use of organic fertilizer and reduce the use of chemical to prevent and eliminate disease and insect pests, how to drop toxic cans and materials. It was found that most of the farmers about 47.20% had moderately participated. Followed by, 32.80% had less participated. Respectively, 14.40% had mostly participated, 5.60% had never participated. The average farmer of the participation was 1.67 which was at low level of participation.

4.4 Participation in the planting activity of vetiver in of crops cultivation on soil and water conservation in the highland area and cultivation to replace the destroyed forests. It was found that most of the farmers about 51.30% had moderately participated. Followed by, 29.80% had less participated. Respectively, 13.60% had mostly participated, 5.30% had mostly participated. The average farmer of the participation was 1.73 which was at moderate level of participation.

4.5 Participation in funding, labor and production factor support to be used in the activity of crops planted on soil and water conservation in the highland area. It was found that most of the farmers about 46.50% had moderately participated. Followed by, 27.00% had less participated. Respectively, 17.90% had never participated, 8.60% had mostly participated. The average farmer of the participation was 1.45 which was at low level of participation, according to Table 22.

Table 22 Farmers' participating in the practice of sustainable agricultural development projects in the plants cultivation in soil and water conservation of the Royal Project in the highland area

Participation in operation	Level of participation (percent)						
	High	Moderate	Low	None	$\bar{X}$	S.D.	Meaning
1. Participation in production planning with the Royal Project officer in planting economic plant, such as preparing area of planting, caring according to the suggestion in all season	48 (11.90)	225 (56.60)	101 (25.30)	25 (6.30)	1.74	0.75	Moderate
2. Participation in operation according to regulations about marketing of the projection environment conservation and good for consumers.	51 (12.60)	189 (47.50)	135 (33.80)	24 (6.10)	1.67	0.78	Moderate
3. Participation in operation according to regulations of the Ministry of Agriculture and cooperative and the Royal Project agricultural production factors utilization, such as fertilizers, agricultural chemicals in crop planting project in the best farming areas in the highland area, emphasis on the use of organic fertilizer and reduce the use of chemical to prevent and eliminate disease and insect pests, how to drop toxic cans and material	58 (14.40)	188 (47.20)	131 (32.80)	22 (5.60)	1.70	0.79	Moderate
4. Participation in the planting activity of vetiver in of crops cultivation on soil and water conservation in the highland area and cultivation to replace the destroyed forest	55 (13.60)	204 (51.30)	119 (29.80)	21 (5.30)	1.73	0.75	Moderate
5. Participation in funding, labor and production factor support to be used in the activity of crops planted on soil and water conservation in the highland area	34 (8.60)	185 (46.50)	108 (27.00)	71 (17.90)	1.45	0.89	Low
Average level of operation					**1.66**	**0.79**	**Moderate**

5. Participation in caring of sustainable agriculture development program in plants grown in soil and water conservation of the Royal Project in the highland area

From the analysis in the maintenance in the implementation of sustainable agriculture development program in plants grown in soil and water conservation of the Royal Project in the highland area, it is considered the point of implementation found that farmers' participation was at the moderate level with 1.55% according the level of participation criteria as follows:

5.1 Participation in grouping of farmers, who join the cultivation program the Royal Project, to conserve the basis structure, packaging plant, construction, road, manufacturing factors, agricultural equipments from the Royal Project Foundation and the Department of Land Development. It was found that most of the farmers about 54.50% had moderately participated. Followed by, 26.80% had less participated. Respectively, 10.10% had never participated, 8.60% had mostly participated. The average farmer of the participation was 1.60 which was at moderate level of participation.

5.2 Participation in submitting soil samples to determine soil quality, food elements in soil and water quality which used for agriculture, by submitting the sample of soils, water, and products to be tested, as well as to prevent environmental damage of the Royal Project. It was found that most of the farmers about 44.70% had moderately participated. Followed by, 39.40% had less participated. Respectively, 9.60% had never participated, 6.30% had mostly participated. The average farmer of the participation was 1.47 which was at low level of participation.

5.3 Participation in activities to conserve soil and water in the highland areas, forest cultivation, vetiver cultivation, promote to farmers in order to recognize and maintenance the agricultural resources in the area. It was found that most of the farmers about 52.80% had moderately participated. Followed by, 33.80% had less participated. Respectively, 8.30% had mostly participated, 5.10% had never participated. The average farmer of the participation was 1.45 which was at low level of participation.

5.4 Participation in public relations and campaign to encourage farmers in the area support the Royal Project foundation, by not to deforest to cultivate crops, especially the areas with high steep. It is found that most of the farmers about 48.70% had moderately participated. Followed by, 36.10% had less participated. Respectively, 7.80% had mostly participated, 7.30% had never participated. The average farmer of the participation was 1.57 which was at moderate level of participation.

5.5 Participation in the presentation of rules and regulations on agricultural production selling with staff of the Development Center, including the use of space and natural resources in the highland areas which is considered as being the risk of unsustainable agriculture. It was found that most of the farmers about 45.20% had

moderately participated. Followed by, 36.10% had less participated. Respectively, 11.60% had never participated, 7.10% had mostly participated. The average farmer of the participation was1.47 which was at low level of participation, according to Table 23.

Table 23 Farmers' participating in caring the sustainable agricultural development projects in the plants cultivation in soil and water conservation of the Royal Project in the highland area

Participation in caring	Level of participation (percent)						
	high	Moderate	Low	None	$\bar{X}$	S.D.	Meaning
1. Participation in grouping of farmers, who join the cultivation program the Royal Project, to conserve the basis structure, packaging plant, construction, road, manufacturing factors, agricultural equipments from the Royal Project Foundation and the Department of Land Development	34 (8.60)	217 (54.50)	107 (26.80)	41 (10.10)	1.60	0.78	Moderate
2. Participation in submitting soil samples to determine soil quality, food elements in soil and water quality which used for agriculture, by submitting the sample of soils, water, and products to be tested, as well as to prevent environmental damage of the Royal Project.	25 (6.30)	178 (44.70)	157 (39.40)	39 (9.60)	1.47	0.75	Low
3. Participation in activities to conserve soil and water in the highland areas, forest cultivation, vetiver cultivation, promote to farmers in order to recognize and maintenance the agricultural resources in the area.	34 (8.30)	210 (52.80)	135 (33.80)	20 (5.10)	1.64	0.70	Moderate
4. Participation in public relations and campaign to encourage farmers in the area support the Royal Project foundation, by not to deforest to cultivate crops, especially the areas with high steep.	32 (7.80)	194 (48.70)	144 (36.10)	29 (7.30)	1.57	0.74	Moderate
5. Participation in the presentation of rules and regulations on agricultural production selling with staff of the Development Center, including the use of space and natural resources in the highland areas which is considered as being the risk of unsustainable agriculture.	28 (7.10)	180 (45.20)	144 (36.10)	47 (11.60)	1.47	0.79	Low
Average level of participation in caring					**1.55**	**0.75**	**Moderate**

6. Participation in benefit of sustainable agriculture development program in plants cultivation in soil and water conservation of the Royal Project in the highland area

From the analysis in the benefit in the implementation of sustainable agriculture development program in plants grown on soil and water conservation of the Royal Project in the highland area, it is considered the point of implementation found that farmers' participation was at the moderate level with 1.67% according the level of participation criteria as follows:

6.1 Participation in the plants cultivation on soil and water conservation of the Royal Project in the highland area brings more income and improvement of economic conditions to the household. It was found that most of the farmers about 50.50% had moderately participated. Followed by, 33.10% had less participated. Respectively, 12.40% had mostly participated, 7.10% had never participated. The average farmer of the participation was 1.68 which was at moderate level of participation.

6.2 Participation in the plants cultivation in soil and water conservation of the Royal Project in the highland area provided the wider market for agricultural products. It was found that most of the farmers about 50.80% had moderately participated. Followed by, 22.20% had less participated. Respectively, 15.90% had never participated, 11.10% had mostly participated. The average farmer of the participation was 1.57 which was at moderate level of participation.

6.3 The development of sustainable agriculture in the highland areas provided the natural resources and environment with no destruction to community. It was found that most of the farmers about 57.80% had moderately participated. Followed by, 22.50% had less participated. Respectively, 12.90% had mostly participated, 6.80% had never participated. The average farmer of the participation was 1.76 which was at moderate level of participation.

6.4 Sustainable agriculture, especially, plants cultivation on soil and water conservation of the Royal Project in the highland area generates the farmer groups for agricultural production, bargain power in the market and risk reduction. It was found that most of the farmers about 55.50% had moderately participated. Followed by, 29.50% had less participated. Respectively, 10.10% had mostly participated, 9.80%

had never participated. The average farmer of the participation was 1.60 which was at moderate level of participation.

6.5 Participation in the plants cultivation in soil and water conservation of the Royal Project in the highland area acknowledged farmers about production, maintenance and harvest. It was found that most of the farmers about 59.60% had moderately participated. Followed by, 20.20% had less participated. Respectively, 12.90% had mostly participated, 7.30% had never participated. The average farmer of the participation was 1.78 which was at moderate level of participation, according to Table 24.

Table 24 Farmers' participating in the benefits of plants cultivation on soil and water conservation of the Royal Project in the highland area

Participation in caring	Level of participation (percent)						
	High	Moderate	Low	None	$\bar{X}$	S.D.	Meaning
1. Participation in the plants cultivation on soil and water conservation of the Royal Project in the highland area brings more income and improvement of economic Conditions to the household.	50 (12.4)	201 (50.50)	120 (30.10)	28 (7.10)	1.68	0.77	Moderate
2. Participation in the plants cultivation in soil and water conservation of the Royal Project in the highland area provided the wider market for agricultural products	45 (11.10)	202 (50.80)	88 (22.20)	63 (15.90)	1.57	0.88	Moderate
3. The development of sustainable agriculture in the highland areas provided the natural resources and environment with no destruction to community	52 (12.90)	230 (57.80)	90 (22.50)	27 (6.80)	1.76	0.75	Moderate
4. Sustainable agriculture, especially, plants cultivation in soil and water conservation of the Royal Project in the highland area generates the farmer groups for agricultural production, bargain power in the market and risk Reduction	41 (10.10)	201 (50.50)	118 (29.50)	39 (9.80)	1.60	0.80	Moderate
5. Participation in the plants cultivation in soil and water conservation of the Royal Project in the highland area acknowledged farmers about Production, maintenance and harvest	52 (12.90)	237 (59.60)	81 (20.20)	29 (7.30)	1.78	0.76	Moderate
Average level of participation in benefit					**1.67**	**0.79**	**Moderate**

7. Participation in project monitoring and evaluation of plants cultivation in soil and water conservation of the Royal Project in the highland area

From the analysis in the monitoring and evaluation of sustainable agriculture development program in plants cultivation in soil and water conservation of the Royal Project in the highland area, it is considered the point of implementation found that farmers' participation was at the moderate level with 1.67% according the level of participation criteria as follows:

7.1 Participation in the monitoring and evaluation of the plants cultivation in soil and water conservation project in the highland area, such as production problems, toxic, as well as marketing information, with the Royal Project staff, farmers, and promoting staff of the Royal Project Foundations. It was found that most of the farmers about 35.40% had less participated. Followed by, 33.10% had moderate participated. Respectively, 26.80% had never participated, 4.80% had mostly participated. The average farmer of the participation was 1.55 which was at low level of participation.

7.2 Participation in the monitoring the officials or farmers of the plants cultivation project, or other people, about regulations offenses under the promotion of the Royal Projects Foundation. It was found that most of the farmers about 38.90% had less participated. Followed by, 28.80% had moderate participated. Respectively, 27.50% had never participated, 4.80% had mostly participated. The average farmer of the participation was 1.10 which was at low level of participation.

7.3 Participation in the monitoring and evaluation of training program about plants cultivation in soil and water conservation project in the highland area with the Royal Project staff and other people. It was found that most of the farmers about 39.10% had less participated. Followed by, 31.10% had moderate participated. Respectively, 24.70% had never participated, 5.10% had mostly participated. The average farmer of the participation was 1.17 which was at low level of participation.

7.4 Participation in the monitoring and evaluation of soil and water quality, such as deliver and receive information, meeting to review the analysis in the area of promoting Royal Project Foundation that resulted from the use of factors of production for farming on areas with high officials found that most farmers have a 42.20 percent participation. Few. 29.30 percent, followed by a moderate level of

participation. Later percent respectively. No part 24.00 and 4.50 per cent level is greater participation. The average is equal to 1.14 level, farmers have less participation.

7.5 Participation in monitoring and evaluation of agricultural projects and natural resource conservation and environmental activities in the highland area about the success and failure of the project operation. It was found that most of the farmers about 41.40% had less participated. Followed by, 29.50% had moderately participated. Respectively, 25.50% had never participated, 4.00% had mostly participated. The average farmer of the participation was 1.14, which was at low levels of participation, according Table 25.

Table 25 Farmers' participating in the monitoring in sustainable agricultural development projects in the plants cultivation in soil and water conservation of the Royal Project in the highland area

Participation in monitoring and evaluation	Level of participation (percent)						
	High	Moderate	Low	None	$\bar{X}$	S.D	Meaning
1. Participation in the monitoring and evaluation of the plants cultivation on soil and water conservation project in the highland area, such as production problems, toxic, as well as marketing information, with the Royal Project staff, farmers, and promoting staff of the Royal Project Foundations	19 (4.80)	132 (33.10)	141 (35.40)	107 (26.80)	1.15	0.87	Low
2. Participation in the monitoring the officials or farmers of the plants cultivation project, or other people, about regulations offenses under the promotion of the Royal Projects Foundation	19 (4.80)	115 (28.80)	1 55 (38.90)	110 (27.50)	1.10	0.86	Low
3. Participation in the monitoring and evaluation of training program about plants cultivation in soil and water conservation project in the highland area with the Royal Project staff and other people.	20 (5.10)	124 (31.10)	156 (39.10)	99 (24.70)	1.17	0.85	Low
4. Participation in the monitoring and evaluation of soil and water quality, such as deliver and receive information, meeting to review the analysis in the area of promoting Royal Project Foundation that resulted from the use of factors of production for farming on areas with high officials	18 (4.50)	117 (29.30)	168 (42.2)	96 (24.0)	1.14	0.83	Low
5. Participation in monitoring and evaluation of agricultural projects and natural resource conservation and environmental activities in the highland area about the success and failure of the project operation	16 (4.00)	118 (29.50)	165 (41.40)	100 (25.5)	1.12	0.83	Low
Average level of participation in monitoring and evaluation					**1.13**	**0.85**	**Low**
Average level of 7 points					**1.54**	**0.78**	**Moderate**

From the study about Farmers' Participation in Sustainable Agricultural Development in the Highland Area of the Royal Project in Chiang Mai province. It was found that the participation level of farmers for the consultant or discussion, coordination, action, care taking, and benefit, the participation of farmers was

moderately. In contrast, to find the solution, decision, and monitoring and evaluation, the participation of farmers was low. In addition, the overall of the farmers' participation was moderately.

Part 3: Factors that affect the participation of farmers in sustainable agricultural development project on growing plants in soil and water conservation in the highland area

Analysis of the relationship between independent variables and dependent variables

The study of Farmers' Participation in Sustainable Agricultural Development in the Highland Area of the Royal Project in Chiang Mai province was analyzed by using Statistical of the Social Science SPSS / PC+ program, such as Stepwise Multiple Regression Analysis with an important characteristic. Analysis of the independent variables such as the steps individually. In the first step to find one independent variable that can explain the variability of the variables. (Or is associated with the variables) to analyze the most suitable regression equations to create the first. In the second step will find that two variables. When used as variables in the first step is to find the other independent variables that come into the remaining equations beyond. Respectively, of the ability to explain the variability of variables as possible. The Multiple regression analysis, a step intended to see whether any variables in the independent variables that can explain the variation as possible and increase the natural independent variables step up. To what variables are variables. Can be explained much more and are statistically significant or not (Surat, 1995:36).

Table 26 shows the relationship between variables as independent variables showed that the variables correlated with the benefit of sustainable farming on an area of high (X_{14}) than other variables. Holdings in the area of household (X_7) is associated with variations in the number of secondary variables X_{12} X_2 X_{11} X_{15} X_9 X_8 X_{10} X_5 X_1 X_{13} and X_4 is associated with variations in the ratings, respectively, followed by the

variable X_{12} X_{11}. X_{15} X_9 X_8 X_{10} X_5 X_1 and X_4 is a positive relationship with the variables by the variables X_2 and X_{13} has a negative relationship with the variables.

Table 26 values take week's New Property correlation between independent variables with the variables.

	Y = Participation of Sustainable Agricultural Development
X_1 = Age	0.062
X_2 = Level of education	-0.136*
X_3 = Number of household members	0.007
X_4 = Number of school age household members	0.005
X_5 = Number of working age member	0.024
X_6 = Total household income	0.072
X_7 = Area holdings in household	0.160*
X_8 = Source of agricultural information	0.062
X_9 = Contact with the Extension staff and government officers	0.108*
X_{10} = Participation in local activities	0.035
X_{11} = Participation in agricultural development	0.129
X_{12} = Participation in agricultural training and study tour	0.159*
X_{13} = Duration of resident	-0.052
X_{14} = Benefit of the sustainable agriculture	0.237**
X_{15} = Knowledge of sustainable agricultural development	0.113*

Table 27 Multiple Regression Analysis: Stepwise

DEPENT VARIABLE ……..Y
VARIABLE (S) ENTERED ON STEP NUMBER…… X_{14}

MULTIPLE R		.237		
R SQUARE		.056		
ADJUSTED R SQUARE		.054		
STANDARD ERROR		1.85545		
ANALYSIS of VARIANCE	DF	SUM OF SQUARE	MEAN SQUARE	
REGRESSION	1	11233.371	11233.371	
RESIDUAL	398	188198.232	477.660	

F = 23.517 Significant F = .000

VARIABLES IN THE EQUATION

VARIABLE	**B**	**SE B**	**BETA**	**T**	**Sig. T**
X_{14}	1.214	.250	.237	4.849	.000
(CONSTANT)	36.232	4.291		8.444	.000

VARIABLES NOT IN THE EQUATION

VARIABLE	**Beta In**	**Partial**	**Tolerance**	**T**	**Sig. T**
X_1	.012	.012	.957	.236	.814
X_2	-.110	-.112	.987	-2.239	.026
X_3	.013	.013	.999	.265	.791
X_4	.014	.014	.999	.283	.777
X_5	.012	.013	.998	.253	.801
X_6	.080	.082	.999	1.640	.102
X_7	.155	.159	.999	3.198	.001
X_8	.065	.067	1.000	1.337	.182
X_9	.104	.107	1.000	2.138	.033
X_{10}	.054	.055	.994	1.096	.274
X_{11}	.149	.153	.994	3.069	.002
X_{12}	.144	.148	.996	2.966	.003
X_{13}	-.107	-.107	.956	-2.139	.033
X_{15}	.102	105	.998	2.089	.037

Table 28 Multiple Regression Analysis: Stepwise

DEPENT VARIABLE ……..Y

VARIABLE (S) ENTERED ON STEP NUMBER……..……..X_7

MULTIPLE R		.283R	
SQUARE		.080	
ADJUSTED R SQUARE		.076	
STANDARD ERROR		1.60391	
ANALYSIS of VARIANCE	DF	SUM OF SQUARE	MEAN SQUARE
REGRESSION	2	16007.056	8003.528
RESIDUAL	397	183424.547	466.729

F = 17.148 Significant F = .000

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	Sig. T
X_{14}	1.196	.248	.234	4.831	.000
X_7	.191	.060	.155	3.198	.001
(CONSTANT)	33.949	4.301		7.894	.000

VARIABLES NOT IN THE EQUATION

VARIABLE	Beta In	Partial	Min Toler	T	Sig. T
X_1	.018	.018	.955	.358	.721
X_2	-.115	-.119	.985	-2.380	.018
X_3	-.017	-.017	.964	-.339	.735
X_4	-.002	-.003	.987	-.051	.959
X_5	-.016	-.016	.966	-.320	.749
X_6	.045	.046	.940	.904	.367
X_8	.064	.066	.999	1.316	.189
X_9	.099	.103	.998	2.045	.042
X_{10}	.061	.063	.992	1.248	.213
X_{11}	.130	.134	.975	2.680	.008
X_{12}	.108	.107	.909	2.129	.034
X_{13}	-.099	-.101	.954	-2.002	.046
X_{15}	.108	.112	.996	2.238	.026

Table 29 Multiple Regression Analysis: Stepwise

DEPENT VARIABLE……..Y

VARIABLE (S) ENTERED ON STEP NUMBER……..….X_{11}

MULTIPLE R	.311		
R SQUARE	.097		
ADJUSTED R SQUAR	.090		
STANDARD ERROR	1.43593		
ANALYSIS of VARIANCE	DF	SUM OF SQUARE	MEAN SQUARE
REGRESSION	3	19307.951	6435.984
RESIDUAL	396	180123.652	459.499

F = 14.007 Significant F = .000

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	Sig. T
X_{14}	1.252	.246	.244	5.074	.000
X_7	.169	.060	.137	2.826	.005
X_{11}	.935	.349	.130	2.680	.008
(CONSTANT)	30.883	4.418		6.990	.000

VARIABLES NOT IN THE EQUATION

VARIABLE	Beta In	Partial	Min Toler	T	Sig. T
X_1	.010	.010	.947	.205	.837
X_2	-.102	-.106	.963	-2.103	.036
X_3	-.006	-.007	.943	-.129	.898
X_4	.003	.003	.969	.066	.948
X_5	-.006	-.006	.946	-.120	.905
X_6	.052	.053	.920	1.058	.291
X_8	.032	.033	.910	.653	.514
X_9	.072	.074	.921	1.463	.144
X_{10}	.046	.048	.962	.948	.343
X_{12}	.093	.092	.895	1.830	.068
X_{13}	-.094	-.097	.950	-1.920	.056
X_{15}	.091	.095	.955	1.882	.061

Table 30 Multiple Regression Analysis: Stepwise

DEPENT VARIABLE ……..Y

VARIABLE (S) ENTERED ON STEP NUMBER …….X_2

MULTIPLE R .327

R SQUARE .107

ADJUSTED R SQUARE .098

STANDARD ERROR 1.3429

ANALYSIS of VARIANCE	DF	SUM OF SQUARE	MEAN SQUARE
REGRESSION	4	21321.944	5330.486
RESIDUAL	395	178109.660	455.523

F = 11.702 Significant F = .000

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	Sig. T
X_{14}	1.185	.247	.232	4.790	.000
X_7	.176	.060	.142	2.940	.003
X_{11}	.851	.350	.119	2.435	.015
X_2	-2.340	1.113	-.102	-2.103	.036
(CONSTANT)	33.948	4.634		7.326	.000

VARIABLES NOT IN THE EQUATION

VARIABLE	Beta In	Partial	Min Toler	T	Sig. T
X_1	-.028	-.027	.843	-.535	.593
X_3	-.019	-.020	.937	-.388	.698
X_4	-.007	-.007	.960	-.145	.884
X_5	-.015	-.016	.942	-.308	.759
X_6	.052	.054	.918	1.059	.290
X_8	.043	.044	.893	.860	.390
X_9	.075	.077	.908	1.534	.126
X_{10}	.048	.050	.949	.998	.319
X_{12}	.093	.094	.895	1.856	.064
X_{13}	-.094	-.097	.935	-1.921	.055
X_{15}	.081	.084	.946	1.659	.098

Results from the analysis in Step 1, it is revealed that the benefits of sustainable agriculture cultivation (X_{14}) is the first variable chosen because it was able to explain the variability of farmer participation in sustainable agricultural development under highland area more than any other independent variables (see the R and R^2 values, which was 0.23 and 0.05, respectively). Moreover, it related to the dependent variables with significant. (See the F value for Step 1 F = 23.51) when compared the F value in Table which provided the independent rate and 398.

If bring out the regression analysis to estimate the value of the expected equations of participation in the sustainable agriculture development in the highland areas. The regression equations were as follow.

$Y = 36.232 + 0.00121 (X_{14})$..... (1)

$R = 0.23$, $R^2 = 0.05$, SSE = 1.85, F = 23.51.

Among the remaining variables that were not brought into the equation (see back of Part 3 in step 1), the partial regression coefficient of X_7 was more that the partial regression coefficient of others variables. The X_7 had the statistical significant, so it was brought to be included in the next step.

Results from the analysis in Step 2, it is revealed that when X_7 combined with X_{14} to describe the variability of the changes involved in the development of sustainable agriculture in the highland areas. Can explain the variability of the more variable (see the value $R^2 = 0.08$) and regression equations that include independent variables. 2 and has a statistically significant (F is equal to 17.14) compared the value of F. Rates in Table 2 and 397 independent.

To imply the result of regression analysis in the equation estimation of participation in the sustainable agriculture development in the highland areas, the equation derived from the analysis of variability of dependent variable explanation, including X_{14}(the benefit of sustainable agriculture) and X_7 (area holding in household), which it can be seen that the regression equations derived from the analysis in Step 2 was better than that from step 1 because it was able to explain more variance, which can be seen from the increasing value of R^2 from 0.05 to 0.08. It can be summarized as follows:

$Y = 33.949 + 1.196 (X_{14}) + 0.191 (X_7)$..... ..... (2)

$R = 0.28$, $R^2 = 0.08$, R^2adj2 0.07, SSE 1.60, F = 17.14.

Some of variables that had not been brought into the partial correlation coefficient of X_{11} was more than some of partial correlation coefficient of other variables of X_{11} was to be included in the next step.

Results from the analysis in Step 3, it is revealed that when the X_{14} combined with X_{11} and X_7 to explain changes of participation in the sustainable agriculture development in the highland areas was be able to explain the variability of the dependent variable more. (See the R^2 value = 0.09). Moreover, the regression equations containing these three independent variables were statistically significant (F = 14.00). The shown equation was good from the analysis of the variability of the dependent variable explanation, including variables X_{14} (the benefit of sustainable agriculture) X_7 (area holding in household) X_{11} (participation on agricultural development).

It is seen that the regression equations derived from the analysis in Step 3 was better than that from Step 2 because it was able to explain the variability of dependent variable more, which from seeing the R^2 value from 0.05 to 0.09, it can be summarized as regression equations.

$Y = 30.883 + 1.252 (X_{14}) + 0.169 (X_7). + 0.935 (X_{11})$..... (3)

$R = 031$, $R^2 = 0.09$, R^2adj2 0.090, SSE 1.43, F = 14.00.

Among the remaining variables that were not bring into the partial correlation coefficient X_2 was more than some of partial correlation coefficient of other variables of X_2 was to be included in the next step.

Results from the analysis in Step 4, it is revealed that when the X_2 combined with X_{14}, X_7 and X_{11} to explain changes of participation in the sustainable agriculture development in the highland areas was be able to explain the variability of the dependent variable more. (See the R^2 value = 0.10) Moreover, the regression equations containing these four independent variables were statistically significant (F = 11.70) the shown equation was good from the analysis of the variability of the

dependent variable explanation, including variables X_{14} (the benefit of sustainable agriculture) X_7 (own area) X_{11} (participation on agricultural development) and X_2 (education level).

It is seen that the regression equations derived from the analysis in Step 4 was better than that from Step 3 because it was able to explain the variability of dependent variable more, which from seeing the R^2 value from 0.05 to 0.10, it can be summarized as regression equations.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + b_{14}X_{14} + b_{15}X_{15}.$$

When Y = farmers' participation in sustainable agricultural development in the highland area.

a = constant value

b_1 ... $._{15}$ = correlation coefficient value between independent variables and dependent variable.

X_1 = age of farmers.

X_2 = educational level of farmers.

X_3 = number of household members.

X_4 = number of household members age child.

X_5 = number of working age members.

X_6 = total household income.

X_7 = area holdings in household

X_8 = channel of agricultural development information receiving.

X_9 = contact to extension staff and officers and government officers.

X_{10} = participation in activities of the village or community.

X_{11} = participation on agricultural development.

X_{12} = participation on agricultural training and workshop.

X_{13} = duration of settlement in the area.

X_{14} = benefits to the Farmers of sustainable agricultural development in the highland.

X_{15}= knowledge of farmers about sustainable agricultural development in the highland area.

$$Y = 33.94 + 1.185 (X_{14}) + 0.176 (X_7) + 0.851 (X_{11}) - 2.340 (X_2) \quad (4).$$

R = 0.327, R^2 = 0.107, R^2adj2 0.098, SSE 1.34, F = 11.70.

When Y = farmers' participation in sustainable agricultural development in the highland area.

a = constant value

$b_{1 \ldots 15}$ = correlation coefficient value between independent variables and dependent variable the after value of independent variables were controlled to be constant.

X_{14} = the benefits of sustainable agriculture.

X_7 = area holdings in household

X_{11} = participation on agricultural development.

X_2 = education level.

For the remaining variables based on standardized regression coefficient value (beta), it was revealed that each of the remaining variables had no statistically significant. It can be said that regression coefficient was 0 or not different from 0 with statistically significant. Therefore, the value of y used the only 4 variables, which were X_{14} X_7 X_{11} and X_2. As mentioned above, the appropriate regression equation is equation (4). The statistics regression analysis steps were summarized as follows.

Table 31 The summarized statistics of Stepwise Multiple Regression Analysis

Variables	R	R^2	R change	B	Beta	F	Sig F
X_{14}	0.237	0.056	0.056	1.214	0.237	23.51	.000
X_7	0.283	0.080	0.024	0.191	0.155	17.14	.000
X_{11}	0.311	0.097	0.041	0.935	0.130	14.00	.000
X_2	0.327	0.107	0.051	-2.340	-0.102	11.70	.000

From the table, it can be explained that the benefit of the sustainable agriculture of farmers explained the variability of the dependent variables with statistically significant at 5.6%. In the consideration of own area, it was 8.0%. For the participation in agricultural development activity, it considered as 9.7%. For the education level, it considered as10.0%. It can be seen that X_{14} is the benefit of the sustainable agriculture. It influenced on farmer's participation in sustainable agricultural development in the highland area positively. That was, farmers who benefit from the sustainable agriculture in the highland area were highly participated

in the sustainable agriculture development in the highland area than farmers who had low or never benefit from the sustainable agriculture in the highland area. The variable X_7 was the area holding in household. It explained the variability of participation in sustainable agricultural development in the highland area positively. That was, farmers who own much area were highly participated in the sustainable agriculture development in the highland area than farmers who had less area. The variable X_{11} was about the participation agricultural development activity. It explained the variability of participation in sustainable agricultural development in the highland area positively. That was, farmers who had much of participation were highly participated in the sustainable agriculture development in the highland area than farmers who had less participation. The variable X_2 was about the education level of farmers. It explained the variability of participation in sustainable agricultural development in the highland area positively. That was, farmers who had low education were highly participated in the sustainable agriculture development in the highland area than farmers who had high education. The farmers may be higher because a low level, or school will not have confidence in staff development and promotion agencies or developers who hope to bring things to their community, or so it is another reason allow farmers to cooperate in activities also can influence easily than farmers with higher education feel that when things do that will benefit themselves. Families and communities, so access is part of the activities or thoughts that will not participate if the results could endanger themselves and their families will not receive assistance from agencies such development.

Part 4: Problems and suggestions regarding farmers' participation in sustainable agricultural development in the highland area.

4.1 Problems of farmers' participation

From the analysis results in the table, it was found that 399 farmers, who were the sample group of the study, and provided problems of farmers' participation as follows.

From the study, it was found that most of the farmers about 183 farmers faced the problem of inadequate time for participation in activities, representing 46.20%, followed by 171 farmers experienced a lack of understanding about the benefits of

participation, therefore, they would not like to participate in activities. Moreover, the lack of public relations and single plant cultivation generates faster economic results sustainable agriculture cultivation. As a result, farmers did not participate in such activities as the second problem; representing 43.20%. Respectively at the third, 158 farmers experienced the lack of grouping. Therefore, they had no bargaining power with government authorities. The top-down approach was used. Thus, the lack of grouping of farmers represented 39.90%. Respectively in the fourth, 154 farmers experienced that farmers and community did not receive assistance from government and private authorities in sustainable agricultural development under highland area, represented 38.90%. Respectively at the fifth, 131 farmers experienced the problems that farmers could not participate in agricultural activities which were held by government authorities, represented 33.10%. Respectively in the sixth, 128 farmers experienced the problems of agencies both government and private section refused to allow them to participate, including agricultural development project, represented 32.30%. Respectively in the seventh, 127 farmers faced the over budget problems for the promotion of participation is low, represented 32.10%. Also, the last one, 93 farmers experienced that farmers and communities did not receive assistance from government and private sections in sustainable agricultural development under highland. Moreover, most farmers in the project were lacked of knowledge and understanding on sustainable agriculture and natural resource conservation under highland area, represented 23.50%. All mentioned above were the problems of farmers' participation about the participation with development agencies as Table 32.

Table 32 Number and Percentage of farmers separated by a problem with participation of farmers

Order	Issues	Number (person)	Percent
5	1. Farmers were not able to participate in the activities that held by the project.	131	33.10
1	2. Farmers had no time to participate due to their workload.	183	46.20
2	3. Farmers lacked of knowledge of the benefit of participation. Therefore, they would not participate in such activity, as well as the public relations about SAD was not enough.	171	43.20
3	4. Farmers did not form in to groups, so they lacked of bargaining power with government sections. There was top-down management in the project.	158	39.90
7	5. Small amount of budget	127	32.10
6	6. Farmers were not allowed to participate and arrange any agricultural projects.	128	32.30
8	7. Farmers are refused to help in sustainable agricultural development in the highland area promoted by government and private sections.	93	23.50
4	8. Farmers and agricultural community are refused to help in sustainable agricultural development in the highland area by government and private sections.	154	38.90
2	9. Single crop brings faster products than sustainable agriculture. Thus, farmers did not interested in participate in the project.	171	43.20
8	10. Most of the farmers lacked of comprehension about sustainable agricultural development and natural resource conservation in the highland area.	93	23.50

Note: Each farmer can choose more than one choice.

4.2 The expectation of farmers' participation in development project of development authorities in community.

The sample group of 399 farmers identified the expectation of participation in development project as follows:

4.2.1 Current farmers also lack of follow-up evaluation programs continued. And lack of evaluation after the completion of the project to find ways of improvement in operations.

4.2.2 In the future projects in development agencies should provide farmers involved in various projects at all stages of operations.

4.2.3 Training should provide knowledge about participation and community leaders should be involved with the development of more units.

4.3 The expectation of farmers' participation in development project of development authorities in community.

The sample group of 399 farmers identified the expectation of participation in development project as follows:

4.3.1 Expect to receive development projects information before participation.

4.3.2 Expect to participate in every development activities.

4.3.3 Expect the officials to focus more on the people in the community.

4.3.4 Expect to have community leaders to get involve in planning with development agencies in the area more than present.

4.3.5 Expect to begin the development project from local people in the conference with the assistance of government.

4.2.6 Expect to have a budget to support the activities of people participation in the community.

4.2.7 Expect to participate in local development.

4.2.8 Expect to create a network to reduce the barriers that affect trade in agricultural products by creating collaborative in production technology by the participation of farmers in the area.

4.2.9 Expect to manage water efficiently, especially in the area of public land, the problem of water scarcity for consumption during dry season with the relevant

authorities by building a dam and reservoir, water extraction by drilling bowels with community participation.

4.2.10 expect to increase productivity efficiency in the area of physical fitness, infrastructure, economic and social by using the convincing approach, not to control and focused on bio-diversity under highland area.

4.4 The expectation for government to the Royal Project to help farmers or community.

The sample group of 399 farmers identified the expectation for government to the Royal Project to help farmers or community by government and the Royal Project as follows:

4.3.1 To develop basic infrastructure, such as roads, water supply, electricity services in some areas.

4.3.2 To support the education of youth, scholarships for higher education.

4.3.3 To provide assistance in public health, health reconstruction.

4.3.4 To promote the production of various crops to increase income for farmers and introduce new production technology.

4.3.5 To provide an expanded market for agricultural products both inside and outside the region, and to increase knowledge of marketing to the farmers.

4.3.6 To provide assistance to improve agricultural tourism in order to attract tourists to visit highland area more.

4.3.7 The government or the Royal Projects help find the budget, low interest loan for agricultural activities.

4.3.8 To provide assistance of water for agriculture under highland area.

4.3.9 To support the marketing of agricultural products that are not standard to focus on optimizing the process to increase the value of output.

4.3.10 To modify the structure of manufacturing production from lower prices or income to higher production revenue, such as fishery and animal husbandry and processing, as well as, from one type of product to another product in the same type, such as fruits, trees, vegetable, tea, coffee, organic agriculture, flower and so on.

The results of this study can be summarized as follows:

Characteristics of local people, economic, and society of farmers' effect to farmers' participation in sustainable agricultural development in the highland area of the Royal Project; Education level, Holdings area, Participation in agricultural development activity and The benefits of sustainable agriculture in the highland area

The study of farmers' perception on participation in sustainable agricultural development in the highland area of the Royal Project in Chiang Mai province found that the sample group was moderately participated. Farmers were involved in the consultation, coordination, action, maintenance and benefits in medium level, whereas proposed solution**,** decision-making process and evaluation were less level.

The problems, the traits, and the suggestion related to the Farmers' Participation in Sustainable Agricultural Development under Highland of the Royal Project Area are as follow:

- Not enough time for participation in activities due to plenty of works.
- The lack of understanding of the benefits of participation, so, farmers did not interest in the participation.
- The lack of good public relations, as well as cultivation of single-plant provided faster economic results than sustainable agriculture. Therefore, farmers did not inter in participation.
- Lack of grouping, so there were no bargaining powers with governments in developing programs. The command was top-down process. There was participation of farmers in the process.

The suggestions of farmers about the development participation were that farmers were not participated in the project monitoring and evaluation continuously. Also, they lack of evaluation after the project in order to find ways of improvement in operating of the next projects. Therefore, the organizations should let farmers to participate in coming project in every step. Moreover, the training courses of participation should be arranged. The leaders of communities should participate more with the development authority.

The factors contribute to farmers' participation in Sustainable Agricultural Development in the Highland of the Royal Project

- Education level
- Holdings area
- Participation in agricultural development activity
- The benefits of sustainable agriculture in the highland area

Figure 4 Quantitative Research Result Frame

Part 5: To identify a participatory process of farmers in sustainable agricultural development project in the highland area in plant cultivation project in soil and water conservation in the facilitation of 6 Royal Project Development centers

5.1 farmers' participation processes on the economical planting in the highland area of the Royal Project

Participation of farmers in the promotion of cultivation of Royal Project Development Center is both similar and different because there were varieties of tribes in the area of Royal Project Development Center. Each tribe has a way of life and different careers that were passed on to the ancestral practice. In this research how the center's extension staff facilitate the participation of farmers in the Royal Project Development Center by various tribal farmers in planting project, plant types and factors of succession, collecting data by asking officials of the centers and farmers for individual and group meetings in the area of Pa Miang Royal Project Development Center (Local Lanna), Nong Hoi Royal Project Development Center (Hmong), Mok Cham Royal Project Development Center (Akha), Nong Khieo Royal Development Center (Muser), Huai Som Poi Royal Development Center (Lahu) and Mae Poon Luang Royal Project Development Center (Lisu).

Criteria for farmer's selection in this process

1. Selecting farmers by the tribe
2. Is not considered
3. Having land ownership
4. Receiving income and benefits from farming under the promotion of the Royal Project Development Center
5. Participated in agricultural activities under the promotion of the Royal Project Development Center
6. Willingness to participate in the meetings during this process

Framework of research including:

1. Status of the participation of farmers in cropping systems in support of the Royal Project Development Center
2. Problems and suggestions of farmers' participation in cropping systems in support of the Royal Project Development Center

3. Participation of farmers in different crops under the promotion of the Royal Project Development Center

4. Factors success and the reasons of farmer participation in the crop with the Royal Project Development Center

The results of this study can be summarized as follows:

5.1.1 Pa Miang Royal Project Development Center

Farmers who attended the focus group discussion could told the history of the Pa Miang Royal Project Development Center very well, that is it established in the year 1980. The objective of this project was to solve poverty and communist problems during that time. At first, in the year 1981, The King Phumipon and the Queen Sirikit visited Pa Miang Village and donated fund to be planted mushroom and Arabica coffee at the area of Moo1, Thepsadet Subdistrict, Doi Saket Distric, Chiang Mai Province. After that, agriculture and livestock development along with the promotion of socio-economic, culture and environmental conservation have continuously implemented in the name of Pa Miang Royal Project Development Center which covering the area of 75,506.25 rais. At present, this Royal Project area is divided into 2 areas of 10 villages with 2,249 population (509 rais) and farm area (4,237 rais)

Figure 5 Focus group discussion of Pa Miang Royal Project Development Center

The results of meeting and staging by staffs and farmers in Pa Miang Royal Project Development Center consisted of 19 persons: Mr.Boonchouy Keawprom, Mrs. Vilai Jitnan, Mrs. Duang Poungsen, Mrs.Buachan Kamrin, Mr.Prasert Puangsen, Mr.Praert Wannarit, Mrs,Bualiam Yaitha, Mrs.Supathra Maneethip, Mrs.Chantip Wannarit, Mr.Kam Pimpa, Mr.Sangthon Kaedongdang, Mr.Sunthon Kamrin, Mr.Monthein Kamsaiyai, Mr.Narongsak Wannarit, Mr.Pornthep Norin, Mr.Abhisith Aunpinit, Mr.Rangsun Kruekum, Mr.Pawat Pimpa, and Assoc.Prof.Dr.Avorn Opatpatanakit.

5.1.1.1 Status of participation of farmers in growing coffee in the Promotion of Pa Miang Royal Project Development Center

Farmers consisted that they were highly participated in the consultation, the proposed solution and decision making, the coordination, implementation, benefits, maintenance and monitoring and evaluation activities of coffee.

5.1.1.2 Problems and recommendations concerning the participation of agriculture crops in the Promotion of Pa Miang Royal Project Development Center

The issue of farmers regarding participation found to be: 1) there were a lot of works by farmers, so there is no time to participate in any activities by Royal project 2) officer did not inform the details that related to participation, so farmers did not enjoy attend the activity 3) the schedule of appointment was unavailable to farmers, so farmers less participated in some time. Then, the suggestions about the participation of farmers were identified: 1) the Royal Project should select the easily activities to make farmers participate extensively. 2) staffs should inform farmers to know the benefit of participation 3) staffs should make appointment in good time etc.

5.1.1.3 Participation of farmers in the Promotion of coffee by Pa Miang Royal Project Development Center

The participation of farmers under the promotion of coffee on various issues, can be summarized as follow:

1) The results of participation in the consultation showed that coffee farmers had consultations with the Center's staff including planting and maintenance coffee, coffee group formation, improving productivity and quality management, marketing and selling of products which were discussed in the meeting and private counseling with staffs.

2) The participation in the proposed solution and decision revealed that coffee farmers were involved in the proposed management of input factors, plan to send products as an estimate of each farmer, and set the regulation of dealing coffee with chief and staffs by using forum meeting both center and farmer groups.

3) The participation in the coordination showed that coffee farmers cooperated with the center and farmers including production and marketing of coffee, dissemination and application of knowledge as well as providing source of credit and inputs by direct contact and telephone.

4) The participation in practice found that coffee farmer had production planning with supported staffs, a practice maintained from planting to harvest coffee production with staff guidance continued participate in training and visit in coffee production and compliance followed the rules of center.

5) The participation in maintenance found that coffee farmers had leagued for helping the fundamentals factors, factors of production, persuading farmers stop forest deterioration the for planting coffee by private meeting and conferences.

6) The participation of benefits showed that coffee farmer earned from sales of products, knowledge of coffee and setting a group to negotiate marketing, conservation of natural resources and environment.

7) The participation in the evaluation showed that coffee farmers' participated in the monitoring problems of coffee production and marketing cooperated with staffs for transmission of soil and water samples to check quality.

5.1.1.4 Factors of success and the reasons of farmers' participated in the Highland coffee planting with the Pa Miang Royal Project Development Center as follow:

Factors Contribute to the successful

1) The area is suitable for growth and good yield

2) Source of capital cost and inputs

3) The production planning and good marketing

4) Good cooperation between the Central of Market Development, Marketing, staffs and farmers who grow coffee

5) Meeting, discussion and exchanging ideas on the production and marketing between farmers and representative of the Center

6) Policy development and promotion of coffee production that is clearly central to the purchase price of output including production planning and high quality of product

7) The policy to manage the production and marketing of coffee and head director of the Center of assignment to staff clearly and systematically

8) The strength of the coffee farmers and support of the local cooperatives

9) The integrity of the coffee farmers and Pa Miang Royal Project Development Center

10) To encourage farmers to integration activities related to coffee production and processing of data based on the possibility of processing coffee by studying the lessons of Colombia

11) Use of cooperative mechanism to control the output quality

Factors contribute to the participate of farmer in the coffee plantation

1) Income and knowledge of production and marketing of coffee
Meeting for discussion in the coffee growing both inside and outside areas

2) Financial support for the production of coffee farmers

3) Relationship between center and staff like children and relatives

4) The Royal Project is a project of His Majesty the King

1.1.2 Nong Hoi Royal Project Development Center

Farmers who attended the focus group discussion could told the history of the Nong Hoi Royal Project Development Center very well, that is established by Department of Public Welfare in the year 1984. After that, Co-operation between the vegetable promotion team of the Royal Project and Kasetsart University have exercised their attempt to research and develop uphill vegetable until this present. This Royal Project Residing at Ban Maeki and Ban Panghai with 2,607 population of Hill tribes (Hmong and Lisu) and local Lanna

Figure 6 Focus group discussion of Nong Hoi Royal Project Development Center

The results of meeting and staging by staffs and farmers in Nong Hoi Royal Project Development Center consisted of 10 persons: Mr.Chatree Techalertpana, Mr.Wanchai Techalertpana, Mr.Chawa Techalertpana, Mr.Sujitr, Mr.Sanit Nirapath, Mr. Tong Nateepaivan, Mr. Sanit Nirapat,Mr. Jamrat Sirinipat, Mr.Sorasak Nathip and Mr.Rungsun Kruekum.

5.1.2.1 Status of participation of farmers in clean vegetable in the Promotion of Nong Hoi Royal Project Development Center

Farmers consisted that they were moderate level participated in the consultation, the proposed solution and decision making, the coordination, implementation, benefits, maintenance and monitoring and evaluation activities of clean vegetables.

5.1.2.2 Problems and recommendations concerning the participation of agriculture crops in the Promotion of Nong Hoi Royal Project Development Center

The issue of farmers regarding participation found to be: 1) there were various types of vegetable that needed to grow by farmers, so there is no time to participate in any activities by Royal project 2) most development agencies ordered from top to bottom, so the lack of participation of farmers 3) planting a single type of vegetable easy to manage, so farmers less participated in the mixed intercropping.. Then, the suggestions about the participation of farmers were identified: 1) the Royal Project

and farmers should select the potential crop for farmers 2) before the operation should have representatives in consultation with farmers and staffs 3) in each cropping system should be growed vetiver grass in soil and water conservations in the Highland.

5.1.2.3 Participation of farmers in growing clean vegetable in the annual production season 2008/2009 by Nong Hoi Royal Project Development Center

The participation of farmers under The promotion growing clean vegetable on various issues, can be summarized as follow:

1) The results of participation in the consultation showed that farmers who grow vegetables, had consultations with the Center's staff in the planning of vegetables, the allocation of quota of vegetables each species, control disease from insect and the use chemical safety including sales of vegetable production. There was a discussion meeting and following the plantation of staffs

2) The participation in the proposed solution and decision found that farmers who grow vegetables were participated in the proposed plan of each vegetable, shipping the product, a plan of action in the field and plans for visiting outside including set the regulation of dealing products with staffs by using forum meeting and private counseling with staffs.

3) The participation in the coordination showed that farmers who grow vegetables cooperated with the center and farmers for production and marketing of vegetables, including activities related to growing vegetables throughout the season as well as providing source of credit and inputs by direct contact and telephone.

4) The participation in practice found that farmers who grow vegetables are planning to produce vegetables with staff support, the allocation of quotas for planting, a practice maintained throughout the season of production, the use of chemicals correctly, participate in training and study visits in vegetable production and compliance with the rules of the center in the production and distribution strictly

5) The results of participation in maintenance found that the farmers who grow vegetables supervision fundamentals of the centers such as roads, plant selection container, raw materials using the method and procedures themselves and the inclusion of farmer groups for activities together.

6) The participation of benefits showed that farmers who grow vegetables earned from sales of products, knowledge of the vegetable and using chemicals properly and safely.

7) The participation in the evaluation showed that farmers who grow vegetables participated in the monitoring problems of production and marketing, cooperated with staffs for transmission of soil, water, and vegetable samples to check quality including ongoing monitoring of market vegetables continuously.

5.1.2.4 Factors affecting the promotion of clean vegetable successful and reason of farmers participated in the clean vegetable project with Nong Hoi Royal Project Development Center

According the queries from staffs and farmers who grow clean vegetable of Nong Hoi Royal Project Development Center in the factors that promote successful operation and reason of farmers' participated in the clean vegetable project in the annual production season 2008/2009 with Nong Hoi Royal Project Development Center; the results were summarized as follow:

Factors Contribute to the successful

1) Clearly plan of production

2) The participation of farmers to participate in meetings a consultation in the production and marketing. If there were any problem, it can be solved shortly.

3) The promotion of officers and farmer's knowledge in clean vegetable

4) Plant container screening was standard

5) Coordination among center, production and marketing closely

6) All parties comply with the regulations especially farmers and center of agricultural chemical

7) The superior officer opens the opportunity to the staff for operation

8) It should have the room for analysis to preliminary check quality of vegetable

Factors Contribute to the participate of farmers in the clean vegetable

1) Making farmer's income to improve quality of life

2) Improve the community's infrastructure

3) Get the knowledge, skills and experience in growing vegetable

4) The Royal Project is a project of His Majesty the King that help all farmers

5) Providing recommend by staff

5.1.3 Mok Cham Royal Project Development Center

Farmers who attended the focus group discussion could told the history of the Mok Cham Royal Project Development Center very well, that is it established in the year 1983 to develop fruit and vegetable as well as to promote socio-economic, culture and environment conservation. At present, it covers the area of 10,528 rais, 15 villages with 302 households.

Figure 7 Focus group discussion of Mok Cham Royal Project Development Center

The results of meeting and staging by staffs and farmers in Mok Cham Royal Project Development Center consisted of 17 persons: Mr.Anant Pooming, Mr.Thawatchai Taper, MrsBuakam Taper, Mr.Ar-yo Taper, Mrs.Mheeser Ar-yee, Mr.Mheeyor Ar-jor, Mr.Ar-gor Ar-jor, Mr.Kam Tapiang, Mr.Lina Ar-Por, Mr.Ittipaht Sanmhee, Mrs.Yupin Sae-Liu, Mr.Utain Japue, Mrs.Ratchatigarn Manjee, Mrs.Kanya Nama, Mr.Seenoun Mheunnamnhor, Mr Aunnop peramatteinm, and Mr.Rungsun Kruekum.

5.1.3.1 Status of participation of farmers in growing mango under Good Agriculture Practice (GAP) in the Promoting of Mok Cham Royal Project Development Center

Farmers consisted that they were moderate level participated in the consultation, the proposed solution and decision making, the coordination, implementation, benefits, maintenance and monitoring and evaluation activities of mango growing.

5.1.3.2 Problems and recommendations concerning the participation of agriculture crops in the Promotion of Mok Cham Royal Project Development Center

The issue of farmers regarding participation found to be: 1) farmer lack the knowledge and understanding of the benefits of participation 2) farmers have so much work, so they didn't have more time to participate 3) development agency lacked of good public relations. Then, the suggestions about the participation of farmers were identified: 1) staffs should train and educate farmers in the benefit of participation 2) farmers should have been allocated time in order of importance of activities 3) staff should inform to farmer thoroughly.

5.1.3.3 Participation of farmers in the promotion of mango production under Good Agriculture Practice (GAP) in the annual production season 2008/2009 by Mok Cham Royal Project Development Center

The participation of farmers under the promotion growing mango on various issues, summarized as follow:

1) The results of participation in the consultation showed that farmers who grow mango had consultations with the Center's staff in planting and maintenance mango, mango production under GAP such as the record of farmers, certification system by auditor of Royal Project and Department of Agriculture, establishing of mango grower assigned grade level, marketing management and sale of mango production which was discussed in the meetings between farmers and staffs.

2) The participation in the proposed solution and decision found that farmers who grow mango were participated in the ways to expand the planting area, a plan of changing yield, a campaign plan of pruning mango, estimate of product distribution, and set the regulation of trading products with staffs by using forum meeting and private counseling with staffs.

3) The participation in the coordination showed that farmers who grow mango cooperated with the center and farmers for production, improve output quality, system management under GAP and marketing management of mango, educate farmers and other interested persons and get knowledge from stakeholder by direct contact and telephone.

4) The participation in practice found that farmers who grow mango are planning to expand the planting area with staff support, the allocation of quotas for planting, maintenance of practice, changing varieties, pruning, pest management, harvesting and grading prior to sale by staff of the center for instructions closely. However, farmers also participated and visited on mango practice caring both inside and outside of Royal Project.

5) The participation in maintenance found that the farmers who grow mango supervision fundamentals of the centers such as plant selection container, fruits container, factor of production such as fertilizer, chemical, and planting vetiver grass in soil and water conservations of fruit by farmers' practice and grouping.

6) The participation of benefits showed that farmers who grow mango earned from sales of products, knowledge of growing mango under GAP and setting a group to negotiate marketing, conservation of natural resources and environment.

7) The participation in the evaluation showed that farmers who grow mango participated in the monitoring problems of production and marketing, cooperated with staffs for transmission of soil and water samples to check quality by cooperated with staffs. Nevertheless, farmers also evaluated of staffs in training by tracking utilization of farmers with group of farmers in order to guide the development of mango production in the future.

5.1.3.4 Factors affecting the success and reason of farmers' participated in mango production under GAP in the annual production season 2008/2009 with Mok Cham Royal Project Development Center as follow:

Factors Contribute to the successful

1) The support of the highest commander of the center

2) Project due to the need of farmers because orange growers, in the past, found problems with the use of chemicals and marketing

3) The production planning and problem solving related to production with farmers

4) Knowledge of staffs and farmers in the cultivation of mango and GAP of fruit in the Royal Project

5) Project garden samples with the good management of the farm as a source of farmer's learning both inside and outside of the area

6) Closely monitoring and consistency of staffs

7) A liaison among staffs, central and farmers

8) Lesson from the failure of the growing orange, in the past, with many chemicals

Participate of farmers in growing mango under GAP

1) Royal Project has definitely supported the market

2) A new technology supported to farmers continuously

3) There were staffs that advised in growing mangoes and other crops

4) Planting fruit trees for future when they are older

5) There was center that cheering on factors all the seasonal

6) Royal Project has been developed in quality standard as well as private sectors

5.1.4 Nong Khiew Royal Project Development Center

Farmers who attended the focus group discussion could told the history of the Nong Khiew Royal Project Development Center very well, that is it established in the year 1980. At first, This Project was to develop flower, fruit, vegetable and livestock. Later on, the promotion of socio-economic, culture and environmental conservation were also set. At present, it covers the area of 22,065 rais, 760 households with 716 populations.

Figure 8 Focus group discussion of Nong Khiew Royal Project Development Center

The results of meeting and staging by staffs and farmers in Nong Khiew Royal Project Development Center consisted of 13 persons: Mr.Nira Khamsan, Mr.Yushae Afu, Mr.Banteng Jafu, Mr.Samkoud Korao, Mr.Jahae Ja-eu, Mr.Yusae Jawa, Mr.Jaha Jator, Mr.Jamnong Sujaridkarn, Mr.Jakor Jafu, Mr.Worrawith Chaiwanpimon, Mr.Lorza Jayor, Mr.Pira Khamsan, Mr.Jara Jafa, Mr.Prasert Chomduang, and Mr.Rangsan Kruekum.

5.1.4.1 Status of participation of farmers in growing avocado under GAP in the Promoting of Nong Khiew Royal Project Development Center

Farmers consisted that they were low level participated in the consultation, the proposed solution and decision making, the coordination, implementation, benefits, maintenance and monitoring and evaluation activities of avocado growing under GAP.

5.1.4.2 Problems and recommendations concerning the participation of farmers in growing avocado under GAP in the Promoting of Nong Khiew Royal Project Development Project

The issue of farmers regarding participation found to be: 1) most of farmers focused on their tribal activities rather than other 2) lack of meeting for information to farmers before setting activity 3) activities often caused waste time. Then, the

suggestions about the participation of farmers were identified: 1) activities of Royal Project should not meet the tribal tradition 2) staffs should train and educate farmers in the benefit of participation. Farmers should have been allocated time in order of importance of activities 3) staff should develop programs that farmer can participate thoroughly the activities.

5.1.4.3 Participation of farmers in the promotion of avocado growing under GAP in the annual production season 2008/2009 by Nong Khiew Royal Project Development Center

The participation of farmers under the promotion growing avocado on various issues can be summarized as follow:

1) The results of participation in the consultation showed that farmers who grow avocado had consultations with the Center's staff in planning an extended growing area, plan to change breeding, plan of training program and campaigns pruning including improve product and marketing management which was discussed in the meetings under center's area.

2) The participation in the proposed solution and decision found that farmers who grow avocado were participated in the proposed guidelines in choosing a new planting area, training and planning of production delivery following the estimation of farmers with staffs by meeting between center and farmer groups.

3) The participation in the coordination showed that farmers who grow avocado cooperated with the center and farmers in the transfer of knowledge about changing species and getting knowledge about disease and insect control including coordination with the supply factor by contact directly with center and staffs go to the field or home.

4) The participation in practice found that farmers who grow avocado are planning to expand the planting area with staff, maintained a practice since grown avocado to harvest with staff of center for instruction including participation in training and educational tour on how to improve product quality by changing varieties and pruning etc.

5) The participation in maintenance found that the farmers who grow avocado supervision fundamentals of the centers such as plant selection container, fruits

container, factor of production, and planting vetiver grass in soil and water conservations of fruit by farmers' practice and grouping.

6) The participation of benefits showed that farmers who grow avocado earned from sales of products, knowledge of growing avocado under GAP and setting a group for exchange their opinions, conservation of natural resources and environment.

7) The participation in the evaluation showed that farmers who grow avocado participated in the monitoring problems of production and marketing depending on the staffs for consultation such as sending soil and water samples to check quality by cooperated with staffs and farmer leader who motivated the practice.

5.1.4.4 Factors affecting the success and reason of farmers' participated in avocado cultivation under GAP with Nong Khiew Royal Project Development Center as follow:

Factors Contribute to the successful

1) The policy of the director of the Center focused on the promotion of fruit for replacement of destroyed forest's area to generate income in Nong Khiew Royal Project Development Center

2) Knowledge of staffs and farmers in the cultivation of avocado and GAP of fruit in the Royal Project

3) Prepare conversion test and demonstration garden of avocado that having good management of garden for case study of farmer especially leader.

4) The activities of training and study visit both inside and outside of the area for farmers and promoting staffs

5) The senior officer opens the opportunity to the staff for planning, production and maintenance with support staffs closely

6) Closely monitoring and consistency of staffs

Factors Contribute to the participate of farmers in growing avocado GAP

1) Making farmer's income

2) Fruits is a plant that longevity can be inherited to offspring

3) There were staffs, who advised or suggested, the center was near their village

4) Royal Project have new knowledge for transferring to farmers

5) To join the Royal project because there were definitely market

6) There were pre-sale product support, and then refund later

5.1.5 Huai Som Poi Royal Project Development Center

Farmers who attended the focus group discussion could told the history of the Huai Som Poi Royal Project Development Center very well, that is it established in the year 2001. At first, This Project was to develop agriculture and later on the promotion of socio-economic, culture and environmental conservation were also set. At present, it covers the area of 26.1 sq.kms, 412 households with 1,863 populations.

Figure 9 Focus group discussion of Huai Som Poi Royal Project Development Center

The results of meeting and staging by staffs and farmers in Huai Som Poi Royal Project Development Center consisted of 18 persons: Mr.Panong Pirojsatitchat, Mr.Boonchouy Sampansinchan, Mr.Sri Chareonpiroj, Mr.Boonlert Srisado, Mr.Kaow Malakeelee, Mr.Luersun Anurattanasakultai, Mr.Kaw Mongkolchareoncheun, Mr.Taweesak Mahannopnateepai, Mr.Nutee Choktanapol, Mr.Thongdang Prueksapriantid, Mr.Jorhae Duangjaipraiwan, Mr.Mont Thadasantipong, Mr.Chaiwat

Praiwankeeree, Mrs.Montha Niyompraipaonant, Mrs.Sributh Pitakkhantaseema, Mr.Sakaraj Noraj, Mr.Somchai Kraitou, and Mr.Rungsun Kruekum.

5.1.5.1 Status of participation of farmers in growing vegetable under GAP in the Highland area in the Promoting of Huai Som Poi Royal Project Development Center

Farmers consisted that they were moderate level participated in the consultation, the proposed solution and decision making, the coordination, implementation, benefits, maintenance and monitoring and evaluation activities of vegetable growing under GAP.

5.1.5.2 Problems and recommendations concerning in growing vegetable under GAP in the Highland area in the Promoting of Huai Som Poi Royal Project Development Center

The issue of farmers regarding participation found to be: 1) farmers had less household labor, so they have no time to participate every time 2) farmers lacked knowledge in participation 3) meeting or activities were not suitable for farmer, so they didn't have more time to participate Then, the suggestions about the participation of farmers were identified: 1) farmers should participate as possible 2) staffs should train and educate farmers in the benefit of participation. 3) staff should develop schedule of programs that farmer can participate thoroughly the activities.

5.1.5.3 Participation of farmers in the promotion of growing vegetable under GAP in the Highland area in the annual production season 2008/2009 by Huai Som Poi Royal Project Development Center

The participation of farmers under the promotion of growing vegetable on various issues can be summarized as follow:

1) The results of participation in the consultation showed that farmers who grow vegetable had consultations with the Center's staff in planning of production, plan to change breeding, planting vegetables and perform maintenance, setting a group of farmers in activities, disease and insect control, and sales of vegetable production which discussed by using forum meeting and private counseling with staffs.

2) The participation in the proposed solution and decision found that farmers who grow vegetables were participated in the proposed guidelines in choosing a new

planting area, production management, training and planning of production and quality grading for delivery following the estimation of farmers with staffs by forum meeting with center and contact directly with staffs.

3) The participation in the coordination showed that farmers who grow vegetables cooperated with the center in planting and maintenance each vegetable, getting knowledge about planting and marketing in the season including coordination with the supply of credit and inputs by contact directly with staffs.

4) The participation in practice found that farmers who grow vegetables participated in maintained a practice since grown vegetable to harvest with staff of center for instruction including participation in training and educational tour on how to improve product quality by changing varieties and pruning etc.

5) The participation in maintenance found that the farmers who grow vegetable had supervision fundamentals of the centers, factors of production, container by farmers' practice and grouping.

6) The participation of benefits showed that farmers who grow vegetables earned from sales of products, getting knowledge of growing vegetable under GAP and setting a group for discussion and conservation of natural resources and environment.

7) The results of participation in the evaluation showed that farmers who grow vegetable participated in the monitoring problems of production and marketing, sending soil and water samples to check quality by cooperated with staffs and farmers.

5.1.5.4 Factors affecting the success and reason of farmers participated in growing vegetable under GAP in the Highland area with Huai Som Poi Royal Project Development Center as follow:

Factors Contribute to the successful

1) Clearly plan of production from director of the Center of Development and Vegetable Center

2) Farmers' participated in the planning of production and quality selection

3) Farmer selection by planting area

4) Knowledge of farmers and staffs in different types of vegetable

5) Closely monitoring and consistency of staffs

6) Liaison between staffs, center, and farmers

7) Linking the integral target among the Center, Central Vegetable Department and related agencies such as Land Development and Royal Irrigation Department

Factors Contribute to the participate of farmers in growing vegetable GAP

1) Making farmer's income

2) Getting knowledge, skills and experience in various crops with the Royal Project

3) There were pre-sale product support and there were definitely market

4) There were staffs, who advised or suggested, the center was near their village

5) There were various types of vegetable following the potential of the area

5.1.6 Mae Poon Luang Royal Project Development Center

Farmers who attended the focus group discussion could told the history of the Mae Poon Luang Royal Project Development Center very well, that is it established in the year 1980 to develop flower, fruit, vegetable and Chinese tea along with the promotion of socio-economic, culture and environmental conservation were also set. At present, it covers the area of 53,381.64 rais, 6 villages with 2,996 populations.

Figure 10 Focus group discussion of Mae Poon Luang Royal Project Development Center

The results of meeting and staging by staffs and farmers in Mae Poon Luang Royal Project Development Center consisted of 14 persons: Mr.Preecha Tanmarom, Mr. Anupong Tanmarom, Mr.Chawan Sansi, Mrs.Sutree Saija, Mr.Veerachai Taihiranyuk, Mr.Yaipat Jirametheekul, Mr.Kabin Sanyang, Mrs.Suntree Khampun, Mr.Charee Sansi, Mr.Pananchai Chaochana, Mr.Peerapan Anantapong, Act.2nd Lt.Tanakarn Chumpoung, Mr.Sanit Nirapart and Mr.Rangsan Kruekum.

5.1.6.1 Status of participation of farmers in growing vegetable in the Highland area in the Promoting of Mae Poon Luang Royal Project Development Center

Farmers consisted that they were moderate level participated in the consultation, the proposed solution and decision making, the coordination, implementation, benefits, maintenance and monitoring and evaluation activities of growing vegetable under the Highland area.

5.1.6.2 Problems and recommendations concerning in growing vegetable in the Highland area in the Promoting of of Mae Poon Luang Royal Project Development Center

The issue of farmers regarding participation found to be: 1) they had a lot of work and there were various types of vegetable that needed to grow by farmers, so there is no time to participate in any activities by Royal project 2) development agencies didn't allow farmers to participate in the preparation of development project in early stage project 3) lack of financial support for promoting activities in the farmer's participation process Then, the suggestions about the participation of farmers were identified: 1) farmers should select the activities that can be done throughout the project 2) staffs should have meeting for discuss in activities. 3) the project should have the financial support for promoting the farmer's participation.

5.1.6.3 Participation of farmers in the promotion of growing vegetable in the Highland area in the annual production season 2008/2009 by Mae Poon Luang Royal Project Development Center

The participation of farmers under the promotion of growing vegetable on various issues can be summarized as follow:

1) The results of participation in the consultation showed that farmers who grow vegetable had consultations in planning of production, planning of vegetables,

the allocation of quota of vegetables each farmer, production under GAP in the Royal Project, planting vegetables and perform maintenance, production management and sale the products by using meeting and private counseling with staffs.

2) The participation in the proposed solution and decision found that farmers who grow vegetables were participated in the ways to expand the planting area, production management, training and planning of production and quality grading for delivery following the estimation of farmers with staffs by forum meeting with center and contact directly with staffs.

3) The participation in the coordination showed that farmers who grow vegetables cooperated with the center in production and marketing, training and visit, the supply of credit and inputs by contact directly with staffs.

4) The participation in practice found that farmers who grow vegetables participated in planning of production with promoting staffs, participate in training and study visits in vegetable production and compliance with the rules of the center in the production.

5) The participation in maintenance found that the farmers who grow vegetable had supervision fundamentals of the centers such as plant selection container, road, container, factor of fertilizer production, chemical production, persuading farmers have no deforestation for planting vegetable and self-preparation activities.

6) The participation of benefits showed that farmers who grow vegetables earned from sales of products, getting knowledge of growing vegetable and setting a group for exchanging opinion and conservation of natural resources and environment.

7) The participation in the evaluation showed that farmers who grow vegetable participated in the monitoring problems of production, sending soil and water samples to check quality by cooperated with staffs and farmers.

5.1.6.4 Factors affecting the success and reason of farmers' participated in growing vegetable in the Highland area with Mae Poon Luang Royal Project Development Center as follow:

Factors Contribute to the successful

1) Pulling a good leader or a potential person in the early stage of the promoting project

2) Clearly plan of production and marketing

3) Starting with a few farmers who interested the project

4) Setting the rule in promoting and production quota fairly

5) Topography and climate were suitable for various crops

6) Meeting for discuss in the planning of production that must have farmers or representing of farmer joined in the activities

7) Clearly policies of the Department Vegetable Center

8) A good cooperation among Production Department, Center, Screening Center, and Marketing Department

9) Grade standards with flexible

10) Coordination and exchanging of ideas with staffs consistency

11) Loyalty of staffs and farmers

12) Knowledge and technology in the production that corresponding to the potential area

Factors Contribute to the participate of farmers in growing vegetable

1) The Royal Project as good leaning source

2) Making farmer's income

3) Farmers can make the integration of various activities

4) Getting knowledge in planting vegetables

5) Reduce the market due to certain marketing support

6) Staffs always advised continuously and consistency

According the results, it can be concluded from the participation of farmers in economic plant cultivation with the Royal Project Development Center as following:

1. Choosing the area in the promotion of crops for each type that corresponding to the potential of the area and needed of farmers

2. A group meeting of farmers and staffs of the Center for farmers selected in each crop, clarified the objective and guideline for the promoting crops in the season

3. Small group meeting of farmers in order to analyzed the problems with related the production and marketing in each crop

4. Small group meeting of farmers in a participatory action plan to promote the planting in each crop

5. Training and study visited both inside and outside of the Royal Project Development Center in planting and maintenance in each group

6. Monitoring of the action plan followed the promoting plan and farmer in each crop

7. Monitoring and evaluating performance by promoting staffs and farmers who cooperated the planting with the Royal Project Development Center in order to identify the problems and ways to solve it up to date

5.2 Study and development of farmers' participation processes on the economical planting in the highland area of the Tin-Tok Royal Project area

The operation to study the farmers' participation process of sustainable agricultural development in the highland area in plant cultivation project in soil and water conservation to get the process model of farmers' participation in the area can be concluded that the following processes.

5.2.1 The researchers studied data of centers to select the Royal Project Development Center

For the research by studying the basic information from the development department of the Royal Project. The selected area was to be a part of the area of quantitative research to study the conditions of farmers' participation and the trend of center staff and farmers to conduct research continuously until the research was completed. The Tin Tok Royal Project Development Center was selected for the research from the following reasons.

1) The center is the scope of quantitative research to study participants and conditions.

2) Head of the center staff and farmers volunteered to participate in this research project.

3) The ways to promote the center will focus on sustainable agricultural development and natural resource conservation and the environment.

4) Most of the farmers were local people, which make communication easier.

5) The study of the secondary data found that the center has the potential to create well grouping.

5.2.2 The Researchers and the Tin Tok Royal Project Development Center chose a village 15 farmers from quantitative research studied the conditions of farmer in sustainable agricultural development program in plants(fruit, vegetable, coffee) grown in soil and water conservation in the highland area in early stage, which targeted group do agricultural activities with the Tin Tok Royal Project Development Center. All of the farmers who participated were living in Baan Pok village area, which was the responsibility of the Tin Tok Royal Project Development Center, Maeaon district, Chiang Mai province. The study was based on principles of voluntary participation to create the process to participation.

5.2.3 The researchers presented the research plans and objectives. It aimed to create a process of farmers' participation in the development of sustainable agriculture in the highland area to the head of the Tin Tok Royal Project development Center, the officials and personnel who were expected to co-operate in this research. In this presentation, it is aimed for the collaboration and cooperation from people who ready to participate in the research. The reasons were if the research result is able to create a process of farmers' participation in the project, it will be used as a model for promoting the interests of farmers and professional development of both the Tin Tok Royal Project Development Center and other areas. The head of this center, Mr. Thairat Sithipanich was assigned to Mr. Satit Rangrat, the official of fruit extension staff, to be the coordinator with the researcher in this project. There were meetings to plan for the first meeting and forum to find the farmers who would like to participate voluntarily, as well as to present the objectives and operations of the research.

5.2.4 The first meeting and forum. It aimed to clarify objectives and operations of the research. The extension staffs met with farmers on the Buddhism holiday and by coincidence, as well as inform the community through the community leader, which all farmers are the target group of the quantitative research and the farmer's participated in plant cultivation with the Tin Tok Royal Project Development Center. The 10 of 19 farmers voluntarily participated in the study from the meetings. Some families had only 2 persons, husband and wife, joined the program. When combined with the officers and researchers who participate in research, there were

totally 15 people. The reasons of the volunteer were they would like to have experience in the research project. They would like to gain the knowledge of crop production and marketing. They would like to be a part in activities with the staff and researchers. They would like to learn the process of participation on development between community and the Royal Project. After forming the co-operation team, the meeting and forum used the tools of the activity which were to create a partnership relationship including the researchers, assistant researchers, and head of the center, extension staff, leader farmers and co-operation farmers. The activities are conducted. Researchers explain about the purpose of research. The operations were that the researchers explained the objectives, plan, the methodology and analysis of the study to understand the problems, the recruitment of related persons, the introduction and suggestion openly and an exchange of addresses and phone numbers of each other. The most importance of this meeting was the researchers, the extension staff, head of the center, and farmers to understand their role in operations of the research in order to create sustainable agricultural development project under highland area in plant cultivation project in soil and water conservation, such as consultation, operational planning, farmer activity, agricultural activities, coordinating and contact with each other, as well as evaluation. In addition, after the meeting and the first forum researchers and assistants also studied the third information for the research which was offered in Appendix. The meeting of the relevant authorities unofficially was to make the team understood more about the problem in the area.

Figure 11 The first meeting and forum

Results of the first meting and forum

1. The participants in the first meeting and forum were 4 staff and 19 farmers, 15 people who aimed to participate in the research under this project, including 10 people who are farmers and 5 officials and researchers of the center. The process of recruitment was that after the objectives and operation explanation the participants who were farmers and staff gave the mentioned reason. Everyone agreed that the project would benefit to themselves and others.

2. There were 15 people to participate. Each person had known each other and exchanged the idea between them, as well as they exchange the address and phone number to communicate during the research.

3. The research team was acknowledged about the history and purpose of research, operation of the research, as well as the benefit of the research, which was explained by the researchers. The researchers also provided the answers for the questions of participants about the benefits of the research and the possibility to expand in other areas.

4. Time to conduct research would be selected when the majority of participants were free. The appointments were made by the Royal Project Development Center staff of the Tin Tok Royal Project Development Center. Most of the budget spent with snacks. The lunch would be shared responsibility between researchers, the center and farmer, which would be informed time to time.

5. The participants in the research.

Table 33 Farmers of case study in Tin Tok Royal Project Development Center

No	Name	Age(years)	Kind of plant Cultivation
1	Mr. Wichit Inchan	49 years	fruit and coffee
2	Mr. Prasit Mata	59 years	fruit, coffee and forest
3	Mr. Wiroj Nochai	59 years	persimmon and coffee
4	Mrs. Mali Inthanon	43 years	fruit, vegetable and mushroom
5	Mr. Sawat Khankheaw	57 years	fruit, vegetable and coffee farmer
6	Mr. Thaworn Inchan	46 years	fruit, vegetable, forest and coffee
7	Mr. Sompong Prompeng	49 years	persimmon, vegetable and coffee
8	Mr. Inwhan Yoinchai	49 years	fruit , vegetable and coffee
9	Mr. Khampun Lukelam	49 years	fruit and coffee
10	Mr. Khankaew Pachontit	49 years	fruit and coffee

For officers are 5 people:

1. Mr. Songwut Roopsung The Vegetable Extension Officer at Tin Tok Royal Project Development Center.

2. Mr. Thairat Sitthipanich The Head of Tin Tok Royal Project Development Center.

3. Mr. Sathit Rangrat The Fruit and Coffee Extension Officer at Tin Tok Royal Project Development Center.

4. Mr. Pawat Pimpa The Assistant Researcher who have experienced to join with the planters in the area of Royal Project Development Center

5. Mr. Rungsun Kruekum The Researcher under the Development Division, Royal Project Foundation.

Principle of participant recruitment

Basic features of the participants were voluntarily participation, being the official of the Royal Project, being farmers who cultivated coffee, fruit, vegetables, etc. in the Tin Tok Royal Project Development Center, and had well cultivation system. It can be seen that most of the participant were male. Because of most of the farmers who registered in the activities of plants grown with Royal Project

Development Centers were males. However, in other activities, such as the cooperative banking, and housewife, were mostly females. For officers, the people served each position would be all male. All of participants in this research were voluntarily participated and ready to cooperate in activities according to the research plan, except when they had the important missions.

5.2.5 The second meeting and forum to create a process of farmers' participating in problem analysis by session to analyze problems and causes of the problems, data collection and usage which was the tool to create a process of farmers' participating in the sustainable agricultural development in the highland areas. There were small groups of crop cultivation, such as vegetables and fruit. Each group analyzed problems and causes of agricultural operations in growing plants in soil and water conservation projects and other agricultural projects in the past. Most of the farmers found that the quality of products was low. There was a problem with product selling. The Solution analysis between the research team by using session, problems and causes analysis, data collection and usage provided the problems and solution.

Figure 12 The second meeting and forum

Results of the second meting and forum

Results from the study of the creation of the farmers' participation process in sustainable agricultural development in the highland area in the second meeting and forum, the research team studied the study the basic agricultural information of the farmers. The operation of farmer leaders, head of the center, extension staff, assistant

researcher, and researcher encouraged the farmer confidence to express their potential by making comments about farming and problems found in cultivation. This was a part of the creation of the farmers' participation process in sustainable agricultural development in the highland area. The second meeting and forum was to analyze problems and causes occurred in the past, which was the result of the development from government, private authorities and the Royal Project by using co-analysis of data on agricultural activities related to sustainable agriculture in the highland area.

In the research, it was analyzed the problem of economic plant cultivation in the highland area, including vegetables, coffee, fruit (persimmon), as well as the natural resources and environment conservation in the highland area during the production season in 2008-2009. After then analysis, the farmers and related people ranked the priority of problems as can be seen as follows.

1. The problems of vegetable cultivation were farmers lacked of knowledge of complex planting and maintaining and lacked of investment factors. The staff lacked of follow-up continuously. Also, there was no areas and cultivate project vegetable because the majority of land used as forest conservation areas.

2. The coffee cultivation session found that the problems were lacked of water resources, farmers did not maintain carefully. Therefore, the products were low quality and faced the marketing problems.

3. The coffee cultivation session found the problem of low quality products, farmers lacked of good maintenance practices, lacked of knowledge in complex maintaining.

4. The natural resources and environmental conservation tourism found that they lacked of budget, lacked of good management, and good tourism database management.

In brainstorming process, individual asked to present the problem they have encountered in the past. It was a free presentation. The farmers who presented problems were asked to present the solutions of each problem.

After prioritize the problems that everyone presented issues that raised from the past, the issues would be brought out from the problem. Then, the right person who interested in each group would be selected to collect the basis data of each type of agriculture. Also, they had to be the group representative to find someone who

would responsible for operations in the group by group and prepared an action plan consistent with other 4 groups.

Table 34 Problems found in planting vegetables.

No.	Problems
1	Lack of planting area due to most land belongs to Tin Tok Royal Project Development Center and Forestry Conservation Authority.
2	Lack of knowledge to plant many kind of vegetables.
3	Lack of fund investment such as fertilizer and chemical pesticide.
4	Having no follow - up officers to develop this activity.

Table 35 Problems found in planting coffee

No.	Problems
1	Lack of the water resources so caused of low production per planting area.
2	The planters lack of skills to plant quality coffee and having no labors and time
3	Problems of marketing and pricing.

Table 36 Problems found in planting fruits.

No.	Problems
1	Low quality products and not meet the fruit standard which caused of low sale.
2	The planters lack of skills to plant and having no labors and time.
3	The planters lack of know ledges and skills to plant and harvest quality fruits.

Table 37 Problems found in term of the natural environmental conservation and tourism.

No.	Problems
1	Lack of fund to support the natural environmental conservation and tourism activity.
2	Having no good managing to set the exact authority to conserve the natural environmental and to promote tourism.
3	Having no the data study about the natural environmental conservation and tourism.

In the early stage of unofficial meeting, the extension staff and researchers or assistant researchers had to observe to encourage and advise farmers. Therefore, people who played a critical role and indispensable was extension staff of Royal

Project Development Center who responsible for supporting crop production in different types and believed in the creation of farmers' participation process in sustainable agricultural development in the highland area.

5.2.6 The third meeting and forum to create the participation of farmers in Participatory Planning PPA by the operating groups. Each group analyzed the problems and solutions with staff concretely. It was about bringing complex causes of the problems connected through the analysis of the research team. Then, they illustrated a clear structure of problem. Consequently, they found the concrete and practical solutions. In this step, the research team would participate in the intensive meeting and brought the concrete solution to the concrete action. Moreover, they had to deal with obstacles and conditions. Then, the research team had to determine a plan. As a result, the plan of the agricultural projects and coordinate external obligation of the group were to operate jointly in the activities of plant cultivation in soil and water conservation under the condition of marketing. This action provided the representatives of each group from the second meeting to report the results of data collection in agricultural projects during one month. The groups were the fruit cultivation, the coffee cultivation, and the natural resources and environment conservation. The content of the report consisted of the information of members of each group, cultivation areas and potential areas suitable for different types of plants, activities conducted in various phases, problems encountered by the past operations, details about the productivity and quality by peer review. The collected data would be checked with the head of the center, the extension staff and farmers who participate in each project, they worked on action plan to operate in the crop cultivation in soil and water conservation in the highland area. In this operational step, the agricultural development plan was conducted. The head of the center, extension staff and farmers worked together, including, the representative of farmers in each group with primary responsibility for group members include (1) Mr. Inwhan Yoinchai represented vegetable cultivation (2) Mr. Sawat Khankheaw represented fruit cultivation(3) Mr. Wichit Inchan represented coffee cultivation (4) . Mr. Thaworn Inchan represented natural resources and environment conservation. The conducted plan would consistent with the policy of the Royal Project foundation. Also, it should be consistent with development plans of other development agencies, such as the Local Administrative

Organization. The plan was relevant to budget support from those agencies as well as the coordination to maximize efficiency in terms of the development of several integration in the same topic. Thus, the plan was consistent with the policies of development agencies because of the participation of the officers in this planning step.

Figure 13 The third meeting and forum

Result of the third meeting and forum

The third meeting and forum on March 10, 2009. The Tin Tok Royal Project Development Center. The members of each group made the agricultural development plan, arranged the session, as well as assigned to head the group to recruit the farmers who do the same plant cultivation. Then they conducted the action plan with extension staff. Most farmers who participate in this research planted various crops in the Royal Project. That was the reason why they had to separate each activity to analysis and prepared the operational plan, problems analysis, such as lacking of knowledge about cultivation and practice care, lack of factors of production, lacking farming area, and lacking of follow-up work continuously of staff. Members brought information to design the agricultural development plan and presented the plan to the development center which responsible for promoting and marketing management to approve before implementation.

1. The cultivation of vegetables.

Vegetable cultivation farmers in the Tin Tok Royal Project Development Centers were 17 people within 10 rais. However, there were 3 farmers participated in the research project. The types of vegetable, including cucumber , Hong Kong Canga, Royal Project Canga, Saudi Broccoli. The plan making step was as follows.

1.1 Area of vegetable cultivation was rais. The farmers who participated as the research team cultivated the Japanese cucumber, and the Royal Project canga. The group participated in operation planning by focusing on planting vegetables in the green house system according to the development system of the center. Because of the space was limited and there were only 3 members, they requested the assistance in building the house in the area of local farmers, with good operation of cultivation system.

1.2 For knowledge of vegetable cultivation, group planned to resolve the issue about the lack of knowledge on cultivation practices of vegetables by designing the training plan with slide explanation, as well as training or workshop with the support staff of the Royal Project Development Center.

1.3 Investment Budget. The group planned to resolve the issue regarding the lack of budget to invest in the purchase of production factors in agriculture by the contact sources for investment. At the initial step they borrowed the production factor from the Royal Project Foundation. It was consistent with the policy to promote the Foundation's programs by providing support of production factors. After the products were sold, farmers had to pay back later.

1.4 The monitoring of extension staff. The group participated in operation plan to resolve problems of the monitoring of the extension staff. Due to, most of the staff had lots of works to do. They did not be able to monitoring thoroughly. Thus, members had to give some advises to each other in the production and collaboration of some procedures, such as housing. When serious problems found, they had to coordinate with the staff. The staff had to supervise to monitor the vegetables least 4 times per month, or when necessary, or according to one round of vegetable season, approximately 2-3 months. From the supervision, it is found that that staff monitored for 6 times per month. It depended on problems encountered by growing each plant.

Table 38 The Operation Plan of Vegetable Cultivation

No	Issue	Causes	Objectives	Activity/Operation	Responsibility
1	Lack of planting area	Lack of area for vegetable, mostly are forest	Growing vegetable in house	Growing vegetable in a house with low budget, but high income	farmer
2	Lack of knowledge of growing	No experiences	Acknowledge of growing vegetable	Training course of vegetable growing	farmer
3	vegetable Lack of budget	Low income and unstable	Ask the Royal Project to pay for the production factors first, the pay back.	Coordinate with the Royal Project to pay for the production factors in advance.	farmer
4	Monitoring of staff	Loaded works of staff	Staff should come to the village at least 3 times per week	Continuously contact with staff. If there is a problem, there should be 2 ways to reach the staff.	farmers and staff

2. The cultivation of coffee

The coffee cultivation group in the Tin Tok Royal Project Development Center, 23 farmers had sent fresh products to the markets of. 10 persons in the research teams cultivated Arabica under the large tree shade. The plan of the group was as follows.

2.1 Water resources management. The group designed the operation plan to resolve the issue regarding the lack of water for agriculture by providing planning information to the village leader, The Royal Project Foundation, and Local Administration to prepare budget for providing water sources for agricultural activities. The result of the plan was at the stage of budget consideration for the fiscal year 2010 by the Royal Project Foundation and Local Administration.

2.2 The improper of practice to take care of plant made the product low quality. The group planned to solve the problems by taking care of the coffee plant in every step according to the publications of the foundation that distributed to farmers. The farmers planned to do monthly take care and planned for working management.

2.3 Coffee Market. The group planned to solve the problem of the instable prices of coffee. They planned to guarantee the cost of purchase of the Royal Project. Also, they coordinated with private merchants about purchasing. The representative staff of the Royal Project participated in the operation.

Table 39 The Operation Plan of Coffee Cultivation

No.	Issue	Causes	Objectives	Activity/Operation	Responsibility
1	Lack of water resources for coffee	No water resource available foe the whole year	Find more Water resource	Present the problem to the administrative organization for budget	farmer
2	Low-quality product	Farmers lack of Caring	Produce qualified coffee to market	Manage, operate, and caring according to the suggestions	farmer
3	Coffee market	Unstable of the Prize	Prize assurance before harvesting	Coordinate with the Royal Project for prize assurance before harvesting	farmers and staff

3. The cultivation of fruit

The group of farmers who cultivated fruits in the Tin Tok Royal Project Development Center contained 7 farmers with the area of 10 rai of cultivated fruit. The type of fruit was persimmon and passion fruit. The plan of the group was as follows.

3.1 Low quality products. The group planned to resolve the problem low quality product by planning to improve the quality of production by manure, the trim branches and pest protection regularly. Moreover, they planned of training, especially for persimmon trees cultivation, which were the economic fruit widely planted in the Tin Tok Royal Project Development Center.

3.2 Farmer lack of good maintenance practices. The group planned to solve the problem with fruit care by setting the monthly and annual fruit care, as well as providing workers to take care of the fruit. They helped each other in the group.

3.3 Knowledge of fruit care. The group planned to solve the problem of the lack of knowledge on fruit care by designing the plan of training and observation in fruit growing and care with the staff, as well as inviting guest speakers to educate the training practical-oriented continuously.

Different research from the usual operation in fruit extension of the Royal Project Development Center was the plan making. Staff and central instructors were responsible for the operation. The farmers did not participate in brainstorming and planning both the annual plan and monthly plan. Yet, they had the opportunity to participate with staff in the production plan meeting for the approximately one time per year.

Table 40 The Operational Plan of Fruit Cultivation

No.	Issue	Causes	Objectives	Activity/Operation	Responsibility
1	Low-quality	- Lack of knowledge	Produce qualified Fruits	Plan of product improvement	farmer
2	Farmers lacked of caring	-Lack of caring person Farmers had too many works. They do not have time to take care of fruits	Pay more caring to the fruit to reach the standard quality of market	- Plan schedule of caring, prevent insect, harvesting, and quality selection -Operation follow the staffs' suggestions	farmers
3	Knowledge of fruit caring	Farmers lack of knowledge of fruit caring	Acknowledging about fruit caring	- Training course of fruit caring - Field trip about fruit caring	Farmers and staff

4. The conservation of natural resources and environment and tourism

Farmers in this group were all 10 farmers who participated in planning because they saw that the natural resources and environment conservation and tourism are important. The plan of the group was as follows.

4.1 Lack of budget. The group planned to resolve problems related to lack of budget for the management of the natural resources and environment conservation under highland area and community tourism management by planning the coordination the budget support from the Local Administration Organization, forestry agencies of the Royal Project Foundation. They also participated in the operation planning of natural resources and environment conservation and community tourism sharing the responsibility in the occurrence of forest fire management and tourism management in the different seasons. In budget support from the Local Administration Organization, the forestry agencies of the Royal Project Foundation, the agencies would be notified that the budget would be included in the next fiscal year 2010.

4.2 Lack of good management. The group planned to resolve the issue regarding the lack of good natural resources and environment and tourism management. The group planned to contact with the tourism staff of the foundation and Hoi Kaew Administration Organization to support the information about tourism management, as well as the complex information to the farmers in order to bring benefit to the operation. The results show that they supported documentation about tourism to support operations.

4.3 Lack of a good database creation. The group planned to resolve the issue regarding the lack of database of community tourism. They planned of the personnel management to be responsible for making the appropriate community tourism database. The group assigned Mr. Wichit Inchan and Mr.Khampan Lukelam because they were well acknowledged about local attractions and had good relationships with support staff of the tourism project. Moreover, they coordinated about the training and workshop in the area of Ban Mae Kam Pong, which was nearby. The farmer worked with the project staff. They started with introducing the close person to travel to the area. They publicized through media and public relations of the project.

Table 41 Operational plans of natural resources and environmental conservation and tourism in 2010

No.	Issue	Causes	Objectives	Activity/Operation	Responsibility
1	Budget	Lack of budget	Find a resource and make a plan to solve the problem urgently.	-Propose the budget from local administrative organization, forest section of the Royal Project	farmer
2	Management	- Lack of good management - Lack of comprehension of management	Acknowledge about the management	-Share responsibility when forest fire occurred, contact to the officers of the Royal Project, Huay Kaew Administrative organization to support and acknowledge about management of natural resource conservation and tourism.	farmer
3	Lack of qualified data based	Lack of knowledge in developing data base	Farmers understand how to create the data base	-Share responsibility -Field trip at Mae Pong village, where success in tourism	Farmers and staff

Results of the research in this step found that the operational planning process of the research, even if they followed steps and process that have been agreed, some problems in implementing were occurred. The plan also be incomplete content in details. It was not complete to be implementation. For example, the training plans to fix problems of lacking of knowledge to improve product quality of fruit. Farmers had not enough time for preparation because it had to do fruit cultivation at the same time of training. Also, it is necessary to arrange the training at the same time of coffee cultivation. Therefore, it is considered as the urgent event. Date and time of meetings was not suitable for farmers. They were not ready to participate in the action plan

preparation which could not be postponed. This might be one reason that farmers can not express the idea to the meeting. Also, there were some responsibilities assigned for only a few people because farmers have less choice and one person has more activity and more than one activity is the same person, especially a leader. It may be that the farmer group meetings to accept only certain people who may influence others. The experience showed that staff also be promoting some insight into the project plan. They were not being able to be consultants to farmers. Or they did not see importance of providing the operational plans. Also, it may be due to a very load of job, so the staff was lacked of the ability to write a good project. Thus, they were not being able to transfer their knowledge to farmers. Moreover, most of the action plans were short-term plans. The process of the plan had less time to analyze and consider the problems. To solve the problem, researchers and staff would closely advise the sample group and participate in operation.

Therefore, in the planning step, the extension staff, farmer leaders, and farmers should be acknowledged to understand and had the skill of planning. Farmers should focus on the details of the action plan to prepare it in concrete concepts. Especially, in selecting the participant of planning there should provide a leadership process. The training plan should be set in the proper time according to community context. Moreover, there should be focused on the actual participation. Time should flexible according to planning step. It is possible to have several times set to suit in every step of planning, such as the training in the step of basic information analysis, the step of problem definition, problem and need ranking, and monitoring and evaluation. The plan had to focus on community participation, as well as to provide opportunities for public participation in various forms. The action plan should be prepared to cover the frame in both the short term, medium term and long term. Moreover, it should be set the monitor and evaluation plan clearly to the end.

After agricultural development plan setting, the step was plan implementation into the research team meeting. Then the extension staff who responsible for the project with the teams and experts in vegetables, fruit and coffee cultivation participated in consideration before plans implementation. In addition, the training plan workshop and agricultural plans should be closely monitor and evaluation and

reported to the representative of extension staff and head of the Tin Tok Royal Project Development Center.

5.2.7 Training and Study Tour

The trainings in this research have been set in 2 programs, which were extension staff training and farmers and leaders training. The activities could be summarized as follows.

1. Staff training

1.1 The extension staff, Mr. Satit Rangrat participated in improving the quality of fruit production and cultivation in the soil and water conservation on highland area, which organized by the Department of Land Development and the Royal Project Foundation on March 3, 2009

1.2 The field trip observation of the extension staff and a field trip of plant cultivation in soil and water conservation under highland area at the agricultural station of Ang-Kang and Nong Kiao Royal Project Development Center, Chiang Dao district, Chiang Mai province on July 29-30, 2009

Training methods include lectures, discussion, practical and field trip observation of the Royal Project Foundation program. The details were as follows. Mango, Avocado and Papaya Cultivation and Agricultural System in the Highland

Figure 14 Study tour in Nong Kiaw, Chiang Dao district, Chiang Mai

1.3 The training results showed the changes of Extension staff by the observation of the researchers, which were they had more knowledge, responsibility of agricultural development, awareness of participation making in sustainable agricultural development process in the highland areas. Because they were more enthusiasm in collaborating with researchers, were able to make the operational and promotional plans, were able to make comments in conferences, and were able to encourage farmers to practice of fruit care. The participation of staff training may be a part of self-development or may be improved by them.

2. Farmers and leaders training

For the matter of agricultural development plan, it was selected to be connected to the sustainable agriculture because it was accepted at the local stage, group meeting. Then the trainings were provided, such as fruit, vegetables, coffee practice. In the training, the experts in agriculture were invited to be the educators.

Figure 15 Training of farmers in Tin Tok Royal Project Development Center

The operation of training by acknowledging the farmers in production support begin with surveying of the need of training. The sample group was 10 farmers who participated as the research team members. The approach of acknowledgement was variety suitable for each activity, such as inviting guest speakers to provide knowledge to farmers, study tour of the Royal Projects, the meetings to exchange ideas, academic lectures and practical training in the actual areas. The Royal Project Foundation and outside were invited as the instructors. The farmers had to learn from

a variety resources. At the end of training or work, farmers would have to conclude what brought to be implemented in the area to monitor the staff responsibility continuously. From the conference found that farmers would like to train on plant or fruit care, as well as vegetables, coffee, and mushroom cultivation under highland area. The training of such matters was held on April 7, 2009 at Bann Poke Multipurpose Building, the area of Tin Tok Royal Project Development Center, Hoi Kaew sub-district, Maeaon district, Chiang Mai province, with the participation of 20 farmers who participated as a research team of 10 people.

Figure 16 The study tour of fruit cultivation at Nong Kiew Development Center

5.2.8 The operational monitoring according to the action plan. Tools of the step were action and PAE (Participatory Action + Evaluation). The operation followed the project plan and coordination plan that the research team participated in obstacle management, using experience and exchange knowledge about the vegetables, coffee and fruit cultivation of the research team. The method of the step was operational planning and monitoring according to the set plan. Staff and researchers, were managers to advise and participate in operation. In monitoring, the extension staff and researchers would focus on farmers who were the participants of the research in growing fruit and vegetables and coffee in the soil and water conservation under highland area. Under the good circumstances, after the meeting and plan making as mentioned above, farmers would be connected with the staff

directly. In the meantime, the connection between the extension staff with a group of farmers, the leader arranged the appointment of the meetings to consult in agricultural issues. On the topic of cultivation, the staff and farmers who were the research team had to monitor production of fruit, vegetables and coffee. The staff had to meet all of farmers until the end of each harvest and market management, which details of plant cultivation of Tin Tok Royal Project Development Center area were described as follows.

1. The production plan. During the research time, the production planning of each plant provided the staff of the Royal Project Development Center, which was the staff of Tin Tok Royal Project Development Center, and the staff of Central Royal Project, development and agriculture extension staff to present the plans of each center and considered. After the plan presentation, the information would be presented to the head of the center. After that, the production plan would be presented to the development and production of the central center of the Royal Project. For vegetables, in this research, it would be produced in short-term production plan according to the season of vegetables, of which average 1-2 months. However, the overall plan would be set by 8-month. Before delivering the product, the extension staff would inform the Central Development and support in advance for preparing the marketing plans. The plan should be considered the basic factors and other production factors. In this research, farmers' participated in the meeting before plans are received from the Center.

2. The production of specific plants and vegetables, coffee and fruit, the extension staff of the Tin Tok Royal Project Development Center helped advice the farmer about cultivation practices, as well as plant care and supported factors of production, such as fertilizer, chemicals to use. For chemical usage, there should be the regulation under the responsible of the extension staff. In the mean time, there were the scholars from central unit help monitoring and giving advices regularly every month. In addition, in the process of cultivation, the project monitored the officials of the Department of Agriculture continuously. Moreover, before harvest, there should be the sampling analysis of production to find toxic followed the defined standard. In this research, the research team with farmers and staff participated in

monitoring the agricultural production, such as fruit cultivation group had participated in grades persimmon.

Figure 17 Visiting by extension staff of Royal Project Development Center

3. The estimation of product. During the study, before harvesting, the individual farmers estimated the fruit and vegetable products, such as persimmon to send to the Marketing Department of the Royal Project Foundation. The extension staff of the Tin Tok Royal Project Development Center, farmers, who were the research team, which cultivated fruit and vegetables sold in research duration. The estimated vegetables and fruits product were delivered three times, such as monthly, weekly and daily.

4. The product delivery to the packaging and marketing management. During the research, vegetables and fruit cultivation which harvested in the area of the center by collecting the product from individual farmers would be quality controlled packaging and residues checking from the center. Then, grade specification by the staff of the center and research team responsible for this step. At present, center has provides the selection for packaging plant before deliver the products to Chiang Mai. Then, the packaging plant of Chiang Mai would select the qualified products to quality checking before deliver to Chiang Mai and Bangkok market. There were some unqualified products would be delivered to the private traders who came to buy some products in areas. The farmers would be able to sell the products in the center area.

Figure 18 Grading and packing product before send to market

5. The production process. In the research duration, the unqualified products would be processed for consumption in households. It the products were left from household consumption, the farmer would deliver to private factories that contacted with the center. Some of the unqualified product would be sent to the farmers for procession, such as dried and fried persimmon.

6. Marketing. During the research time, farmers of the center sold the products by two ways as follows.

6.1 Through the Royal Project market.

6.2 Through private market outside the center by contacting with the center, direct trading and distribution center for tourists.

Figure 19 Coffee product of farmer in Tin Tok Royal Project Development Center

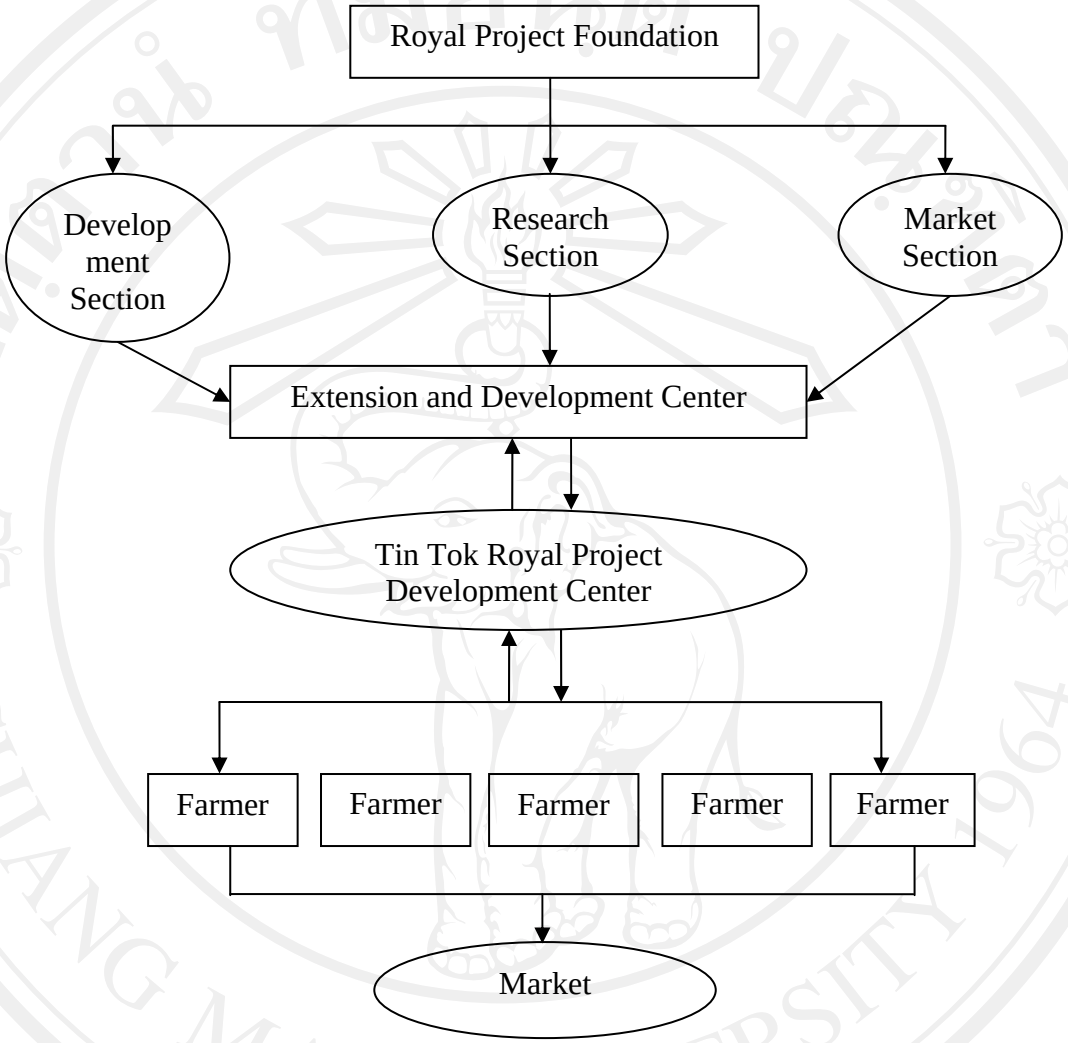

Figure 20 The extension structure of Tin Tok Royal Project Development Center in research duration

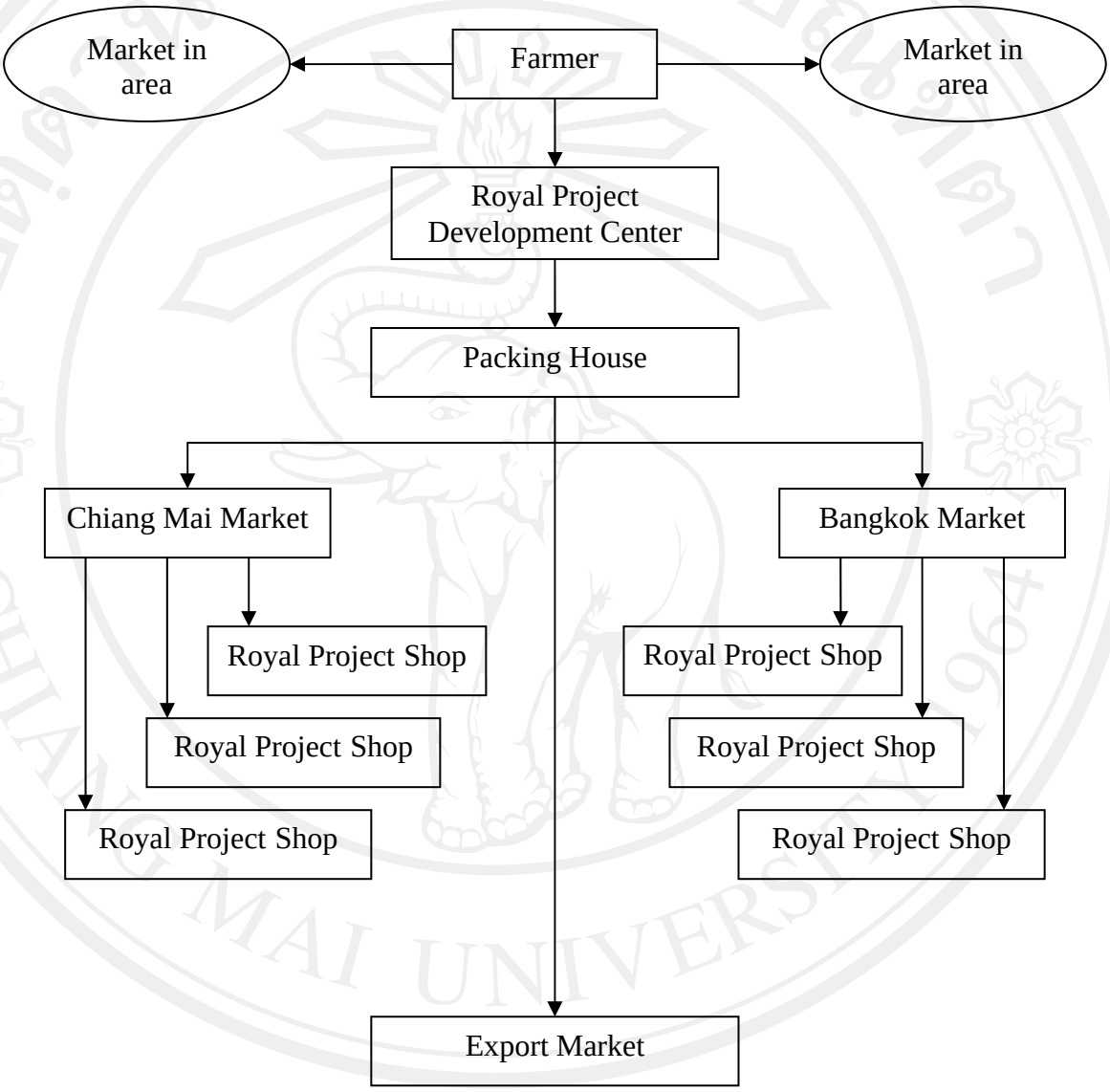

Figure 21 The production and marketing of agricultural products during the research project.

5.2.9 Monitoring and evaluation. To make the participation process in sustainable agricultural development in the highland area, the operations in this step, the research team of ten people comprised of extension staff, researcher, assistant researcher, farmers, monitored the results of the plant cultivation in soil and water

conservation in the highland area. The monitoring divided into the vegetable cultivation. The evaluation was about vegetable cultivation system, vegetable care, disease and insect protection, plants cultivation proper system, especially, chemical usage, soils analysis and vegetable analysis for residues before harvesting. It was found that there was a good operation according to the advices of staff. In monitoring and evaluation of grow persimmon fruit in the area of the Tin Tok Royal Project Development Center, in the time of productivity, the monitoring of using fermentation, removal of insects and pests, including diseases that mite and fruit fly, The monitoring and evaluation of plant field care, grade control before sending to market, etc., farmers had well operated. For coffee, there was a monitoring and evaluation of general care. The researchers, extension staff and farmers participated in this step to determine the obstacles and ways to resolve the issue in time. On the other hand, it was training for farmers to know the simple monitoring and evaluation the result of any programs.

The issues included.

1. The problem of time limited of farmers. They hardly went to the field regularly.
2. The problems with the disease during the rainy season, such as root rot
3. The chemical storage was not done as the principle.
4. Lack of workers for harvesting.
5. Persimmon grade qualification did not meet required standards.

Problem solving during the study

1. The farmers plan to spend times by prioritize.
2. Officials gave the chemicals to prevent root rot disease to farmers followed the instructions of the central plant protection.
3. Academics demonstrated the correct storage of chemicals to farmers.
4. Research team worked together when there were lots of products.
5. Coordination with central packaging staff to demonstrate the persimmon grade selection before sending to the market.

In this step found that members of the group that participated in planning assigned some members to responsible for monitoring and evaluating the results before, during, and after operation. The leaders of the groups were responsible for monitoring with farmers who were members of the group because each farmer grew different crops. In the system of cultivation of the Royal Project Foundation, which promotes the cultivation of crops in soil and water conservation projects, provided steps to improve the efficiency of monitoring and evaluation and assisted community members to resolve of the problems of each activity.

The process of farmer's participation came from the processing of steps of participation. Begin with farmers' participated in the consultation, basic data analysis in agriculture by the farmers themselves provided more benefit than official information, proposed solution and decision. For example, in the past planning supported by extension staff, while local farmers had to practice only. This process was switched to the local farmers indicated problems then brought them to action plans, participated in operation, and coordinated with relevant authority. Moreover, in the past project planning did not focused on acknowledgement, which was essential for developing skills of participation. Therefore, in every step of the process had to provide farmer participation from consultation through monitoring and evaluation, which was a part of the operational plan.

From research to create the farmers' participation process found that see that before the start of development projects community participation in planning was necessary. Employing basic information of community was the main tool of community stage. From the observation found that the leaders influenced the groups in encouraging the collaboration between community and Royal Project Development Centers. The head of the center or the officers both of government and private section supported and encouraged farmers to confident in development. Also, communities confident in showing their attitudes and express their thought with respects of other farmers in order to reach the development goals. Data analysis problems to be fixed in the implementation plan to develop the project as a key step in building the participation of communities in the development of demand in developed areas must come from the needs of the community and need and receive community participation in decision making, as well as operation by using the power of community as a key to

development. The people in community should be aware of the benefits of participation in development with development organization. They should create the skill of planning, operation, and evaluation continuously. Therefore, the starting point of development is to create relationships with the community, data analysis of issues associated with the projects. Community provided information for planning. Then extension staff or developers provided general supports and co-operation, as well as stimulate and coordinate the process to be occurred in the community. People who area able to deliver information and concept of the project to community should be the leader. Therefore, staffs should explain the details of this process to the leaders to recruiting people with the same idea or similar agricultural activities to participate in the process. The most important thing was the participants should will to participate, not to participate with pressure or compulsory.

It can be seen that developing projects or activities should come from farmers and community. They created and operated by themselves by using existed resources in community to generate the sustainable development. The extension staffs and developer were to support and guide them how to employ the resources efficiently, as well as encourage community to be aware of the self-reliance. The self-reliance needs for skills of planning, operation to achieve the plan, and evaluation. Then bring the results to improve development in the next step. Therefore, the most important thing is to create a development process with the participation of the community, such as the analysis of the past and current issues of agriculture. People in the community raised the issues. Then, they participated in planning and operation. At this step, the staffs would closely suggested and guide the farmers. Also, the farmers had to continuously contact with the staff. There would be the activities related to the plan. For process monitoring and evaluation, the farmers and staffs would participated in monitoring and evaluation regularly, such as sending soil and water for quality checking, monitoring and performance analysis, common problems and then each cases. And after the project, in each activity, the farmers would be benefited. Also, they had an opportunity to participate and consult with the staffs. However, the problem that some farmers did not participate in the meeting due to the hard working was a barrier of participation in sustainable agricultural development under highland areas, which was the process of participation in this research. The extension staff or

developers stimulated and coordinated the process of participation in the community by searching the leaders in the community to transfer concepts and details of planning for sustainable agricultural development activities in the project to leads to the initial acceptance of farmers, the recruit people to participate, and problem analysis. The important thing for the leaders is to find farmers who trust worthy, creative, and willing to work for community.

From this study, the processes of farmers' participation in sustainable development in the highland area in planting on soil and water conservation of the Royal Project were created farmers' participated with the development agency in seven points. The indicator of success is to explore the information about the participation of farmers after the research period farmers' participate in; 1) Discussion 2) Suggesting and decision 3) coordination 4) action 5) Care taking 6) Benefits receiving and 7) evaluation The survey of 10 farmers is as follow:

Table 42 Participation level of Farmers in case study in Tin Tok Royal Project Development Center

No	Name	Before	After
1	Mr. Wichit Inchan	Moderate level	High level
2	Mr. Prasit Mata	Low level	High level
3	Mr. Wiroj Nochai	Moderate level l	High level
4	Mrs. Mali Inthanon	Low level	Moderate level
5	Mr. Sawat Khankheaw	Low level	High level
6	Mr. Thaworn Inchan	Moderate level	High level
7	Mr. Sompong Prompeng	Moderate level	Moderate level
8	Mr. Inwhan Yoinchai	Moderate level	High level
9	Mr. Khampun Lukelam	Low level	High level
10	Mr. Khankaew Pachontit	Moderate level	High level

From the comparison of the surveys of the level of farmers' participation of 10 farmers before and after the process of participation in the development of sustainable

agricultural development in the highland area in planting on soil and water conservation of the Royal Project found that farmers had the skills and experiences in participating in the activities of plants cultivation in soil and water conservation as the following.

1) Consultation or Discussion

It started with recruiting leaders and participants in the process to build a good relationship. There was an activity of consultation between farmers and head of the center and extension staffs of the Royal Project Development Center about planning of cultivation activities. The consultation with the staffs of Tin Tok Royal Project Development Center should be held before, during and after operation in agricultural activities, participation in planning the agricultural development activities in plants cultivation in soil and water conservation under highland area, where was the responsibility of the Tin Tok Royal Project Development Center, as well as participate in consultation with staff to educate farmers in cultivation by arranging the meeting and create a partnership between the research team.

2) Solutions and decisions

It started by organizing the forum to participate in problems define, analyze causes of problems and classify them, as well as solution planning according to the problem by analyze the strengths, weaknesses, opportunities and obstacles set of operating procedures. In the step of decision making, Weeraphon (1983) stated that all human beings would face failure firs. Then, the experience of failure would lead the ways of improvement. If individual try to find own experiences of decision making would take long time. In order to prevent the wrong decision, the process of decision making is important. Principles and techniques of a decision lead to the right decision in a short time. Alternative, usually, are at least two options. It can be said that without options, there is no decision. The decision can be divided into three categories: decision making under certain conditions, decision making under uncertain conditions, and decisions under risk condition. The criteria are that decision is not depend on circumstances or situation. If there is no information of situation, the decision is under the uncertain condition. The case of unknown probability of the situation and then make the decision, it becomes the decision-making under risk. Decision-making in everyday life considered as the decision under the least certainty.

To solve the problems had to focus on the causes of problems. Since the problem stems several causes, the cause that brought other causes should be resolved first. This kind to problem solving is a way to achieve the goal. Vichai (1993) presented the definition of decision that it is choosing between various options and practices accordingly. The leaders who are decision makers had to estimate the options to make the right decision. After consider the cause of problem, they should solve the problem. However, the way to solve each problem is varied. Environmental situations influence decisions. In some condition, the leader knows the exact result, which is called the If the decision to use alternative will result in what is a situation that can be controlled. However, some situations even been decided, it was also unlikely to result as needed. It may be because of other uncontrolled factors are involved. It is uncertain situation, which means that leader had to make decision under the risk. The situation of decision making includes:

1. There are choices.
2. There are objectives.
3. Need to think carefully to consider the process of selection. Not follow emotion and satisfaction.
4. Focuses on the future.
5. The circumstances might be uncertain, risks, and uncertain conditions.

Anan (1991) presented the meaning of the decision of that organization that it is an activity that all human being should not do for themselves, but for other people or organization that they are involved. Generally, "The decision means choosing between different options, both on the organization's objectives and assumptions out the best way to achieve that objective".

Decision-making process

Good decisions should follow the following steps.

1. Set objectives of the decision clearly. It important to understand the objective of decision.

2. Consider various related points. For example, if it is a decision to solve problem, it had to identify problems, find related information, information evaluation and set up issues.

3. Set options. The option had to be more than one. The results are expected from each alternative way are creative options. This requires thinking of new options may come from brainstorming or innovation or learning from any other experience.

4. Decide choice. The criteria of decision as the following may be used.

- The highest point, such as alternative which solve or remove all problem, it is selected, or options the alternative which provide most benefit is selected.
- The highest point of the low option, such as there is a low budget. Therefore, the scope of the existing budget, the option which provides the highest result would be selected.
- Make the least regret. It is a way to cause the least negative impact, such as least cost, least time, and least employment.
- Criteria of Satisfaction. In some cases, leader has to pay more to gain satisfaction. This may be a compromise between the related groups. Consistent with Rsna (1992) stated about decision-making process that includes five steps as follows.

  1. Set objectives or goals of the decision clearly.
  2. Set options for consideration decision.
  3. Checking to avoid or accept limitation.
  4. The decision analysis.
  5. Decisions based on objectives.

From the study farmer's participation process in the solution and decision proposal, it was found that farmers as the research team participated in solution and decision proposal in the project with the staff and head of the center. They participated in cultivation activity planning of the Tin Tok Royal Project Development Center during the research time. Moreover, they participated in proposing sustainable agriculture development under highland area approach.

3) Coordination

From the 10 farmers as a research teams who are coordinating with and staff to about agricultural activity by meeting the target groups. They participate in collaboration between the staff of The Tin Tok Royal Project Development Center and farmers. As a result, there were activities in cultivation in the level of small and

large group work. Participation in coordination with staff and farmers in cultivation makes the participation in coordination between The Tin Tok Royal Project Development Center in promoting knowledge to farmer's participation with Royal Project Development Centers to help support the cooperation activities related to plant cultivation in the Royal Project Development Centers area. In addition, the farmers and research team participated in coordination with Royal Project Development Centers in budget proposal for the activities of plant cultivation in the Tin Tok Royal Project Development Center.

4) Practice

The research makes the 10 farmer's participated in production planning with extension staff, such as preparing area for planting, care practicing in the manufacturing according to the instructions strictly as production programs throughout the production season, participating in implementing regulations of the market obligation of the Tin Tok Royal Project Development Center in pre-market system, chemical use in agriculture, participating in compliance for rules of the Royal Project about the employment of fertilizers, agricultural chemicals, with emphasis on the use of organic fertilizer in the production and reduce chemical use to disease prevention and eliminate insect pests, the best way to trash toxic cans and materials, participating in vetiver cultivation, activities in cultivation system on soil and water conservation areas to replace the destroyed forest, as well as supporting workers for activities under highland area.

5) Caring

The research team of 10 farmers' participated in with farmers who planting crops in Tin Tok Royal Project Development Center in taking care of productivity, road construction, selected factors of production, and agricultural equipments. They also participated in sending sample soil to determine the quality. Periodic food delivery in soil samples by soil. And crop yield monitoring agencies, as well as sending agricultural products to other organization to monitor. Moreover, they participated in preventing environmental damage in the area of the Royal Project Development Center, promoting the activities to conserve soil and water on the area of the center not to deforest for cultivation. Also, they participated in land and natural

resource employment in the highland area where risk to be the unsustainable agriculture. The research duration was between January 2009 and September 2009.

6) Benefit

The study found that the participants earned their incomes from product selling, such as 1) Mr. Wichit Inchan Income from fruit production 2,000 Baht and coffee 7,000 Baht 2) Mr.Prasit Mata Income from coffee production 20,000 Baht, fruit production 2,000 Baht and mushroom 7,000 Baht 3) Mr.Wiroj Nochai Income from fruit production 10,000 Baht and coffee 15,000 Baht 4) Mrs.Mali Inthanon Income from fruit production 1,000 Baht, vegetable production and mushroom 4,000 Baht and coffee 7,000 Baht 5) Mr.Sawat Khankheaw Income from fruit production 7,000 Baht,coffee production and vegetable production 30,000 Baht 6) Mr.Thawan Inchan Income from vegetable production 25,000 Baht,coffee 20,000 Baht,fruit 3,000 Baht and mushroom 7,000 Baht 7) Mr.Sompong Prompeng Income from vegetable and mushroom production 7,000 Baht,persimmon 5,000 Baht, coffee 10,000 Baht 8) Mr.Inwhan Yoinchai Income from coffee production 4,000 Baht, fruit 1,000 Baht and vegetable 20,000 Baht 9) Mr.Khampun Lukelam Income from coffee production 10,000 Baht,persimmon and mushroom 7,000 Baht Mr.Khankaew Pachontit Income from coffee production 7,000 Baht and fruit 2,000 Baht from the previous year.

The farmers' participation in the plant cultivation in soil and water conservation in the highland area of the Tin Tok Royal Project Development Center saved the natural resource and environment of the community. Sustainable farming, especially in the highland area, set groups of farmers to produce agricultural products. As the result, the risks in agricultural production were deducted. The participation of farmers provided knowledge of manufacturing, practicing, caring and harvesting. The benefit of the participation, quantitatively, found that, if farmers received high benefit form participation, it would interest to participate in agricultural activities, with many Royal Projects. Therefore, in the development activities that need clarification about the purpose of the activities and they will benefit the community how these things it is important that developers should not be ignored, especially in. economy-class family and community as a whole.

7) Monitoring and Evaluation

The study to create the farmers' participation process to make samples group participated in monitoring and evaluation. Also, it focused on supporting for farmers to participate in monitoring and evaluation results of plant cultivation in the highland area, such as production and marketing information with extension staff and the research team of the Royal Project. Moreover, the research team of the Tin Tok Royal Project Development Center participated in monitoring the operation of the farmers according to the regulations in the farming system under the Royal Project Foundation. They also participated in monitoring and evaluating the plant cultivation in the highland areas includes fruit, vegetables and coffee with the staffs. They participated monitoring and evaluation of soil quality, such as sending sample soils, meeting, soil analysis results receiving, which are the use of production factor to do agriculture with farmers and staff as the research team. They participated in monitoring and evaluating the activities of environment and natural resources conservation in the area of the Tin Tok Royal Project Development Center.

Findings of the research create a process of farmers' participation in sustainable agricultural development in the highland area as mentioned above. The research focused on encouraging the sample group to participate seven activities, included consultation, solution and decision proposal, coordination, operation, caring, benefit, and monitoring and evaluation. The activities consistent with Cohen and Afhoff (cited in Noipha, 1999) that participation can be divided into four parts which are 1) participation in decision-making process includes 3 step as pre-decision, making decision, and decided operation and 2) participation in operation includes resource support, management support, and assistance coordination 3) participation in benefit both in material, social, or individual benefits 4) participation in monitoring and evaluation Techarin (1984) discussed the steps of participation that leads to achieve the objectives and development policy as 1) participation in studying problems in the community, as well as the needs of the community 2) participation in creating model, solution to reduce or solve the problem, as well as to serve the need of community, and 3) participate in policy making, planning, and programming to eliminate the problem and serve the needs of the people 4) participate in co-decision with limited resources to benefit the public 5) participate in eliminate or improve co-

management systems to be efficient and effective 6) participation in investment projects in community activities 7) participate in policy, plan, and program, and activity to achieve the goals and 8) participate in control, monitoring, evaluation and caring for the programs activities that made by private and government to be used in long term. Unta (1985) discussed the participation of people in a concrete level that people use materials, labor, and time in community development. However, in abstract level, participation of people is the guide of their own conception of freedom of their life, feel bound, and responsibility. It can be seen that community participation is the key of the development of any activities related to the community. If people in the community do not feel the ownership and operate the activities, it may not be succeeded. However, if people in community have knowledge and comprehension of the activities actually, as well as be able to expect the benefits of their families and communities, together with adequate information until they aware of the problems of their families and community, then try to solve the problem and participate in group of community. The participation of this kind leads to the actual participation. The decision making process is not only about decision making, yet the process include the operation parallel with decision making also. For example, in organization management, to identify the development plan, the decision making related to population in the benefits and evaluation. The benefits directly affected operations. Moreover, benefits caused evaluation. Both benefits and evaluation stem from decision making according to mentioned steps. In addition, there is feedback of evaluation and operations return to decision also.

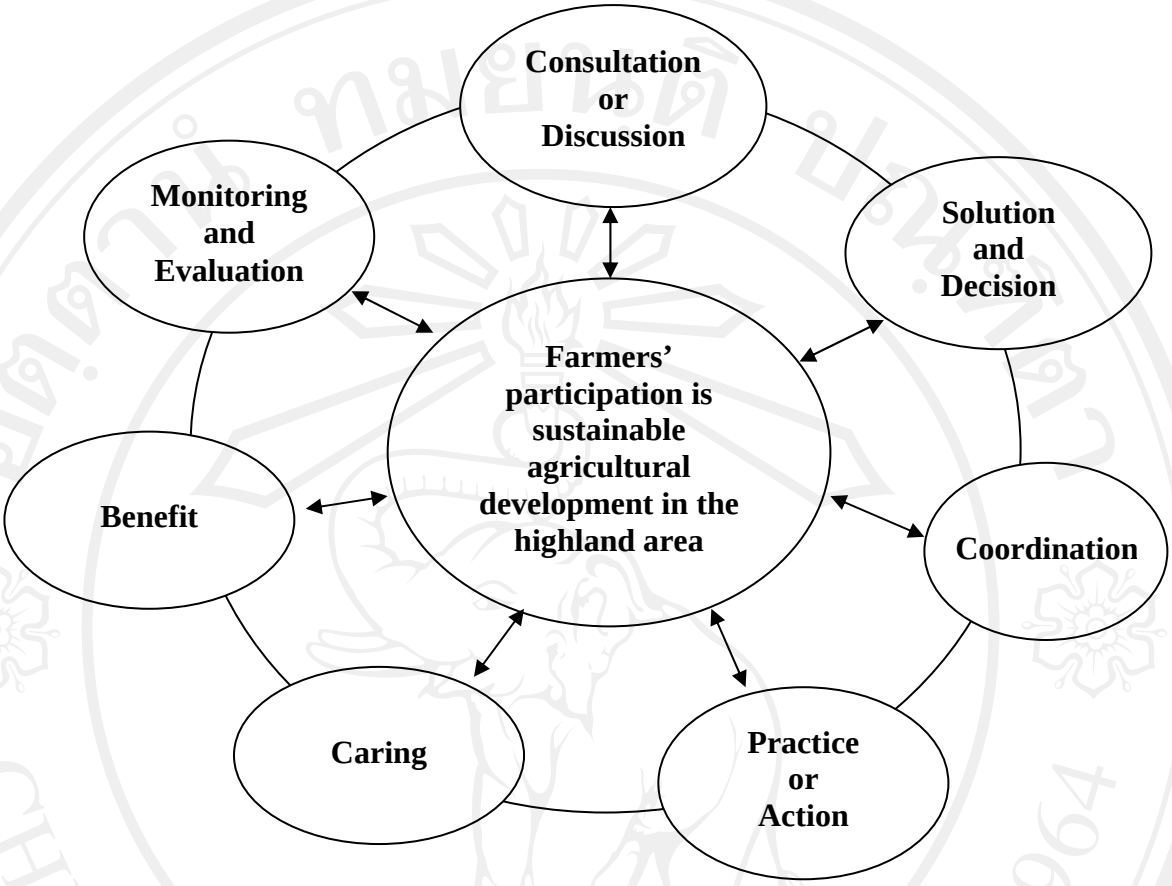

Figure 22 Farmers' participation in sustainable agricultural development in the highland area Frame

The suggestions from the research team of farmers' participation in sustainable agricultural development in the highland area are (1) implementation of the farmers' participation in sustainable agricultural development, the policy should be set by farmers as the center and cooperation head of the center, local development organization, and local people sincerely, (2) encourage community in the highland area to develop their ideas, visions, and initiation of group interest. They should be guided to initiate more than receive the idea of the extension staffs (3) the process of farmers' participation in the highland area should be used in other area to study the efficiency and development and expand to community.

The Evaluation of effectiveness of the farmers' participation process in sustainable agricultural development on plants cultivation in soil and water conservation in the highland area

The effectiveness of the farmers' participation process in sustainable agricultural development on plants cultivation in soil and water conservation in the highland area is tested by The researcher, the assistant researcher and the agriculture extension officer were acted as the follow - up team to study participation of the planters and taking part in planning to plant vegetable, fruit and coffee together with the team have took a trip to collect opinions of the planter, surveying and evaluating the project results during March, 2009 November, 2009. It can be concluded as follow;

The effectiveness of the farmers' participation process in sustainable agricultural development in the highland area was that the farmers operated according to the participation processes after the initial collaboration to create the appropriate way of working. In this step the research team, especially the researcher and assistant researcher have clarified the objectives and the importance of participation. To build the strong community with self-reliance, members of the community have to participation in problem analysis and present them, participation in consulting and finding solution, decision making, planning, operating coordinating, and benefiting from the program, as well as monitoring and evaluating in order to make the program to achieve the goal. The community should be well employed the natural resources before the development authorities come to help according to the country development objectives. That these will encourage the farmers to use existing capabilities are the foundation of development rather than waiting to receive assistance from development agencies. This will lead the local people to live based in development rather that waiting for assistant from development authorities.

From the observation of the changes of the operation to create the farmers' participation process in the sustainable agricultural development project in the highland area found that at the beginning of the project from the first, some farmer, such as Mr. Prasit Mala and Mrs.Mali Inthanon showed their unconfident by keep quiet. Also, in the operation step, some farmers showed their unconfident of plant caring, such as chemicals storage. The expectation analysis in planning showed that farmers would request the assistance from the Royal Project Development Center in production factors, such as water basin and reservoir for coffee and vegetable cultivation. The development idea from the farmers was less happened, though the

basic characteristics of the village quite strong from the leader and people cooperation. In the initial step, the research was conducted with the research team voluntarily. Then, it is encouraged farmers to recognize the benefit of participation with the assistance and extension staffs. The project emphasized on development of people development. From the monitoring and evaluation of the research team showed that when farmers' participated in any activities, they saw the importance of participation and coordination with the extension staffs. There was co-operation and exchange idea between them.

It can be said that 10 farmers who participated as the research team with the researcher and staff totally as 15 people participated in creating a participation process of sustainable agricultural development on plant cultivation in soil and water conservation in the highland area in the region had experienced in all development participation processes, agricultural activities, especially in strengthen the group participation. Other members of the community would be encouraged to realize to participate in criticizing and planning, as well as to realize the public consciousness of group development.

The operation according to the participation process of farmer was to lead them to participate in consulting, solution finding, decision making, coordination, operation, caring, benefiting, as well as monitoring and evaluation was complete in every steps found that.

1. The farmers were able to operate according to the participation process with the support of the researcher and the staff of the Royal Project.

2. Most of the plans were from farmers' participation. The farmers who were the research team participate in planning by focusing on the problems in community and led them to the operational plan.

3. The behavior of farmers to was significantly changed. They had tried to do the activities together. It can be seen that the study of agricultural problems of each group, farmers shared ideas with the support of the staffs.

It can be seen that the participation process needs the leader of the group. The leader of the group of this study was Mr.Wichit Inchan who responsible for continuously monitoring the operation in the first step. When group members understand the process, they were able to continue the process by themselves. The

study of participation process in sustainable agricultural development of plant cultivation in the highland area in soil and water conservation projects of the Tin Tok Royal Project Development Center provided the results according to the research objectives to create the process of farmers' participation in sustainable agricultural development of plant cultivation in soil and water conservation in the highland area. The research created the process in the area of the Tin Tok Royal Project Development Center. The research coordinated with the chief officer of the Center and the Center before the process operation by making the co-researcher and the leaders experienced in implementing the process. The researcher and co-had participated in every steps in the research. The leader of the farmer, Mr.Wichit Inchan said that the participation process was very beneficial because it meets the interests of community in self-development and provides opportunities for farmers to get involve with development agencies. Moreover, farmers had chances to begin the process of staging in agricultural problems and find solutions of agricultural development in the highland area by using data from the brainstorming of farmers and staging to the operational meetings and staging respectively.

The Evaluation of the Tin Tok Royal Project Development Center Changes: Case Study

Since the settlement of the farmers' participation process in the sustainable agricultural development of plant cultivation in soil and water conservation project in the highland area of the Tin Tok Royal Project Development Center, there were some changes as follows.

1. The changes of staff and leaders behavior: the staff planned the schedule of working monthly for the demonstration planting area, monitoring, and training course and field trip. Moreover, they showed their enthusiastic to participate in any activities. They participated in the activities frequently and continuously. In addition, they participated in discussion and decision making more, as well as participated in activity arrangement until the community become the social of learning for sustainable development

Figure 23 Visiting plan of extension staff

Figure 24 Visiting and contact between farmer and extension staff

2. The changes of the operation process: the process started from leader recruitment and take advantage of him. The research group has chosen Mr.Wichit Inchan as the leader of farmers. At the end of the research, he was elected as the leader of the village. To encourage farmers to participate in cultivation or other activities, they should brainstorm for solution or decision making, coordination, operation, caring, benefit, and monitor and evaluation of the agricultural development project in the highland area. The resource management and monitoring with the staff of the Tin Tok Royal Project Development Center at each phase according to the strategy of farmers' participation process was easily planned. The staff had supported and taken care during the operational period.

3. The farmers had more confident of them and group in operation. For example, the farmers were able to study the agricultural information, to analyze the problem and find solutions, as well as to participate in operation. Moreover, farmers trust the staff or chief officer and operate the project according to their suggestion. The supporters believe in the ability of the group which led to the sustainable development cooperation in the future.

Figure 25 Farmers' participation in Community development

4. The research findings showed that farmers' participation in natural resources and environment conservation in forestry and agriculture conservation, farmers share the idea to create the system of control forest fire, and water resources conservation with community participation, such as wage arrangement of forest monitoring, fire protection by building firewall, as well as planting the vetiver in conservative area without waiting for help form the development authority. Therefore, farmers have seen the operation of other centers, then, they realized the benefit of participation. In addition, they were able to develop the management plan in agricultural tourism with the assistant of the staff of the Royal Project.

Figure 26 Farmers' participation in growing vertiver grass

5. In participation skilled in sustainable agricultural development of plant cultivation in soil and water conservation system in the highland area, the farmers were able to operate the activities, such as planting, caring, protection of coffee and fruits. They also harvest and select the qualified product during the research time. It is likely to develop the participation in other activity with the development authorities.

Therefore, the process farmers' participation in sustainable agricultural development in the highland area provided chances for farmers' participate in consulting, finding solutions and decision making, coordination, operation, caring, benefit, and monitoring and evaluation. They operated follow each steps correctly. Also, they were transferred the process properly. The monitoring and evaluation and improvement stems from the development plan, which leads to social development, as well as to increase the potential of self-reliance of community.

Problems of the study

1. The problem of the lack of confidence to farmers to present their ideas. The staging took longer time. The research team solve the problem by divided the farmers into small groups according to the types of plant in order to provide chances for all farmers to share ideas.

2. The problem of meeting and staging. Sometimes farmers were not able to attend the meeting, especially during day time. Most of the farmers had to work on

fields. The research team solves the problem by asking the farmers to specify date and time for the meeting, such as at the meeting time of the village, and after religion activities.

3. The problem of communication breaks down. Some staff and farmers communicated in dialect. This leads to the misunderstanding, yet not be a serious problem.

Observation in changing behavior of farmer and research team of Tin Tok Royal Project Development Center

As following the a participatory process of farmers, found that the initial of the project operation, there were some farmer such as Mr. Prasith Matha, Mrs. Malee Inthanont, and Mr. Thaworn Injan interested a little in the participation. Even through they join in the group; they didn't give their idea in the meeting and stage. Because they maybe familiar the policy of the Royal Project Development Center and focus the financial support from Royal Project Development Center. They didn't interest to develop their community despite that this community has potential to develop including strongly leader, opinion leader, and community participation. So, the operation for creating the participation process strongly focused awareness of the benefit of community and potential of the community.

After operation of building participation in each step, the results showed that 10 farmers in the group focused to use the participation of agricultural development in the activity. They did the operation plan, plan improvement or followed other operation. They go along the operation, additionally, develop the farmer's participation and improvement in the good way.

The evidence of the development of the farmer's participation was farmers can plan the agricultural development with the staff of the supporting in the meeting and staging.

Figure 27 Making the operation plan

As the results of the operation in the initial phase, mostly of farmers did not have participation and unexpressed. In addition, mostly of the operation focus on the recourse from Royal Project Development Center, and the fiscal from external organization, i.e. Sub district Administrative Organization (SAO). Also, the majority focus on the policy of Royal Project Development Center. Nevertheless, the following of the participation process in each step found that the farmer developed themselves to expression and sharing their opinions continuously, i.e. the farmer at the Pok's village lack of labors in harvesting and grading of the persimmon, so they have planed to collect many farmers into group in order to harvesting and grading. For the weeding in plots and along the road, the line of fire, and repair of the water resource for planting, in the past, the farmers waited for the fiscal for construction but now they change by presenting the project to improve the pond to Royal Project Development Center and SAO to solve the primary problem. Then, the project will be changed to the big project after the project gets the fiscal from the organization.

Figure 28 Making a line of fire and weeding along the road

The leader of farmers has highly duty to stimulation by each farmer share their opinions and problems from agriculture by analysis of the basic data in each of agriculture and sharing to find the solution and decision, present the data analysis of the problem during the meeting. The making of the action plan in program crops planted in soil and water conservation under highland area and the action showed the significant changing, i.e. making the major plan from the meeting, the farmer changed from focusing on the recourse from external organization to follow the plan. For example, the group of farmer at the Pok's village have plan to train the farmer in soil and water conservation cropping systems for steep lands in the highland. As the results from the participation process, the farmers connect with Royal Project Development Center for presented the project and asked for collaboration. They need the expert officer to give the knowledge in the interesting topic that different in the past because Royal Project Development Center set the training project and make up a study trip.

According the results, it was really confirmed that farmer's participation study showed that 10 farmers had self development and enthusiasm in problems presentation to head and staff of Royal Project Development Center. In the case of liaison, there were cooperation between farmers and staffs of Tin Tok Royal Project Development Center by telephone. For example, if there were some problems, they tried to solve problem by themselves, cooperation for their activities, increasing the expression of courage and sharing their opinion include propose the new idea for agriculture development of their community. For meeting, staging arrangement and

activities, farmers increased to enjoy and participation by promoting and recommendation of staffs.

After using the participation process in Tin Tok Royal Project Development Center, farmers had more self development and enthusiasm. The participation process created thinking development includes problem, cause and solution, then show their opinion to meeting and stage arrangement. For that process, they also exchange their opinion by finding the process or target together. For example, increasing share their opinion and try to analyze the problem in the meeting by the layout of Royal Project Development Center was supported. For cooperation with other organizations, found that Royal Project Foundation, Sub district Administrative Organization, Land Development department, Royal Forest Department, Department of Agriculture Extension etc. were participation in the development and increasing role of development. In the past, organizations helped in each organization, whereas now all organization cooperated with community for thinking and planning. If there were some problem, they will go to the other organization for helping according the participation process. Factor that changing this behavior was useful of participation in this project that supporting from developing department gets benefit to community and they understand that the result of the development was common interest for attendance. For cooperation with organization, found that organizations participated in agriculture development in different roles as comparing in the past. Now, communities created and plan the project, solve the problem by themselves before helping from the organization. If any organizations have financial support, it will be have the meeting and stage arrangement for hearing problems and requirement of the community before support their project.

Farmers' participation in sustainable agricultural development in the Highland areas of the Royal Project and the economical planting in the water and soil conservation in the Royal Project was the creation of participation stage. If it was tested or demonstrated in different areas, especially the outcome of optional of the participation process and also have tool for measuring the success, built network of the participation process including internal and external reinforcement such as giving an opportunity, acceptance and awarding. They will motivate the sustainable development continually. Building the farmers' participation in sustainable agricultural development

in the highland areas will be got the exactly conclusion like general research and development that changing the development until the best results.

Farmers' participation in sustainable agricultural development in the Highland areas in the Royal Project and the economical planting in the water and soil conservation in the Royal Project was the novel activity in the agricultural supporting. This process will motivate the stakeholder in the policy and operating levels that awareness in the activities, then everyone must responsible in the overall operation together including Royal Project Development Center and farmers that were the target of the supporting in the area. Implementation must have meeting continually on order to improvement and solution of the problem in the production and marketing of the agricultural products, then continually evaluation of the performance to increase the success.

The results showed that the farmers of the six tribes participate in planting activities of the Royal Project Project Development Center relating consistent with ethnic characteristics, behavior, occupation, culture and tradition each family farmers. The community was all linked to the decision and participation in the activities of various crops. In addition, the comparison of farmers' participation each tribal showed different results. The results of the participation of farmers in growing crops in soil and water conservation in the highland on the issue of consultation, discussions, the proposed solution and decided, coordination, implementation, maintenance, benefits, monitoring and evaluation in the project plant under soil and water conservation found that urban farmers' participated in high level. Farmers Hmong, Lisu, Karen participated in medium level; in contrast, Lahu and Akha tribal farmers' participated in low level.

For the problems of farmer on a significant participant showed that: 1) Farmers didn't have enough time for participation of activities because of their work 2) Lacking of knowledge and understanding of the benefits from the participation and information, so they didn't need to participate in the activities that was made by Developing Center 3) Monoculture effect on the economy faster than sustainable agricultural development in plant cultivation project in soil and water conservation, so they were not interested and participation 4) Development authority didn't provide the opportunity farmers' participation in the preparation of the projects including

agricultural development project 5) Lacking of the financial support for the project and 6) Farmers lacked the participation in the monitoring and evaluation in the development projects.

The results of the suggestions on the significant participant in various activities showed that: 1) After complete the project, the development agencies and farmers should continue the evaluation program for finding the ways to improve the projects 2) The development authority should provide the farmers' participated in the preparation of project, all stages, in the future project 3) The development authority should educate the farmer in the participation and community leaders should be more involved in the participation with development authority.

Process of farmers' participation in sustainable agricultural development in the highland area stemmed from the collaboration of the research team to create the participation process of farmers to be the model of participation to be used further.

1. The location selection of the research, the research team focused on the Tin Tok Royal Project Development Center, Maeaon District, Chiang Mai province for the research.

2. The first meeting and forum 15 people were selected to create the process of participation. The objectives and guidelines of operation were described clearly. The activity of partnership was set. The researcher, assistant's researcher, head of Royal Project Development Center, staff, farmer leaders and farmers introduced themselves and shared ideas, as well as exchanged addresses and phone numbers of each other.

3. The second meeting and forum arranged to process the participation of farmers in the analysis of problems with Participatory Rural Appraisal, a tool used to create a process of farmers' participation in sustainable agricultural development in the highland area. There were in official grouping and problem analysis of the past agricultural operation. Also, there was a problem analysis between the research team by separate the research team into groups according to problems context, such as the causes and structure of problems, data collection, and data utilization. The results were problems that need to be solved, structure of problems, and solutions

4. The third meeting and forum arranged to create the process of farmers' participation planning, which is an instrument of informal operation. The problem can be resolved in concrete way by the tool. The solution can be led to implementation.

The results of this tool were the project plan of community, coordination with authorities outside community, and external binding. In this forum, the participants who were the representatives of the second forum had to report the collected data of agriculture.

5. Training and fieldtrips: there were 2 training in this research, which was extension staff training and farmer training. The trainings were to acknowledge farmers about production support according to groups of activity. The training started with the need analysis of training. The activities stemmed from the need of each groups, such as the lecture of interested topic, field trips inside and outside the Royal Project, meeting to exchange knowledge, as well practical training.

6. Monitoring the operation: the tool was Participatory Action + Evaluation, which was used to compliance activities, operation according to the operational plan, and co-operation plan. The management of obstacles and conflicts was planning the operational plan, management and learning from experience the conditions of success and failure.

7. Monitoring and evaluation: the operation in this step was the participation in monitoring and evaluation of the operation of the soil and water conservation planting project in the highland area. The researcher and research team focused on studying the obstacles and solutions, as well as training farmers to learn how to monitor and evaluate the operation of the project.

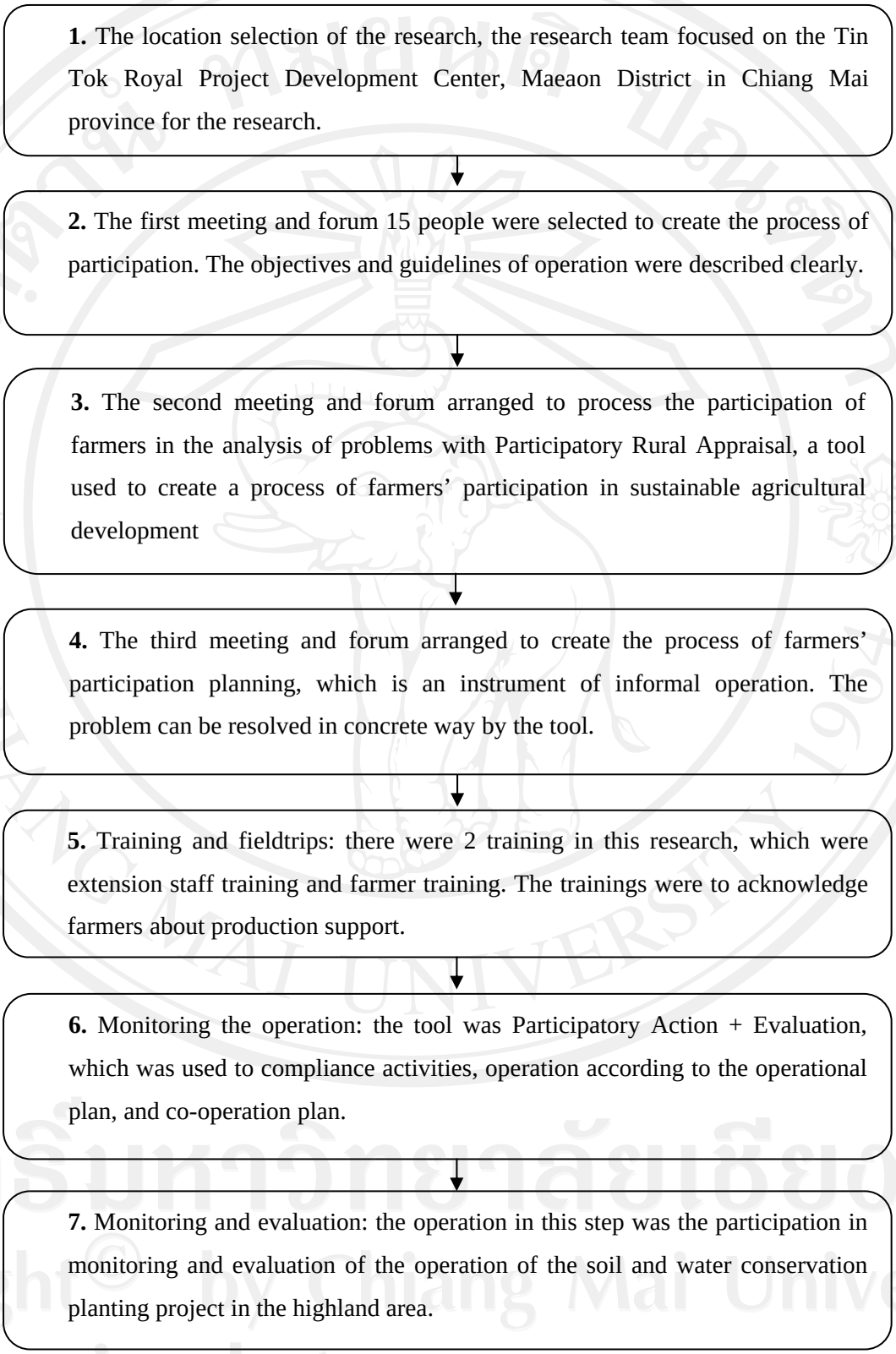

Figure 29 Process of farmers' participation in SAD in Tin Tok RPDC model

The results of the participation of farmers in the development of in sustainable agricultural development in the Highland areas of the Royal Project showed that the Royal Project Development Center selected the type of crops to suit the environment and the potential for farmers who were interested and participating voluntarily. Then, there were a meeting to have discussion for selected type of crops, manufacturing process, production planning and marketing, analysis of problems between staffs and farmers, monitoring of performance in the field, training and excursions both inside and outside the Royal Project. Monitoring and evaluation also included in the system as well; although, they were not high concentrated comparing with other activities or projects. But it made farmers more understanding in all stages of participation process. If they operated continuously, it could be increased them to have more skills and experiences.

The results of the role of practical work in sustainable agricultural development in the Highland area of the Royal Project and the economical planting in the water and soil conservation of the Royal Project showed that the structure and operation of the Development Center in the crop production consisted of officer from various center, central academics, farmers who lived in the promoting area. According the results, it was found that each person had different duties; for example, chief executive center and center responded for planning, policy formulation and oversight of the overall operation of the center. For workers including supporting staffs responded in the area and liaised with staff from central support staff and farmers. They were an important mechanism to get the job promotion and success of the mentor who advised farmers from the beginning to the end of the project; accordingly, the supporting staff must have knowledge and responsibility, sacrifice, and developers looking forward to an exactly successful. Nevertheless, farmers considered an important part to get the job success as a farmer working in the field and must be coordinated closely with authorities and farmer together.

Since the process of farmers' participation in sustainable agricultural development in the highland area has been set, the Tin Tok Royal Project Development Center changed as follows.

1. The behaviors of extension staff and farmer leaders have changed. The extension staffs have planned the monthly operational plan of the demonstrative area, monitoring and planning the field trips, moreover, the farmers showed their enthusiasm to participate in agricultural trainings continuously, as well as expressed ideas, problems and solutions

2. The group participation started with benefit finding and usage from farmer leader, as well as represent of local people to participate in operation support, which were consultation, proposing solutions and decision making, coordination, operation, caring, benefit, and monitoring and evaluation of agricultural development activities.

3. Farmers were confident in their capabilities of themselves and groups' extension staffs or head of the center. Moreover, they ensured to the support from the Royal Project and other authorities. Therefore, their was the strength of cooperation in sustainable development.

4. According to the study, there were changes of natural resources conservation in forestry, agricultural land use. Farmers' participated in preventing fire and conserve water resources. The community participated in monitoring forest area and fins the regulations of forest fire prevention.

5. The skills of farmers' participation in sustainable agricultural development in the highland area lead farmers to participate in research operation and likely to be developed to community participation with the Royal Project development Center.

Therefore, the process of farmers' participation in sustainable agricultural development in the highland area farmers lead farmers to participate in consultation, proposing solutions and decision making, coordination, operation, caring, benefit, and monitoring and evaluation. The proper knowledge transferring, monitoring and evaluation, operation improvement were affected to community development, which play the important role to increase self-reliance of communities.

The result of the development of the farmers' participation process in sustainable agricultural development in the highland area in plant cultivation in soil and water conservation as follow:

1. The process of developing the farmer's participation in sustainable agricultural development, including. That the farmers can do the processes involved after a collaborative process from start creating appropriate guidelines.

2. The farmers shared ideas, analyzed problems and solutions, participated in consultation, proposing solutions and decision making, coordination, operation, project planning and do follow the plan, caring, benefit from the project, as well as participated in monitoring and evaluation in order to lead the project achieve the goal.

3. Farmer was confident in expressing ideas, as well as operating the agricultural activities.

4. Farmers realized the benefits of participation with the supports of the project staff. Moreover, farmers realized the significant of participation in coordination with extension staffs.

5. Brainstorming and operation were widely happened in each group. It can be said that farmers' participated in sustainable agricultural development in the highland area experienced in building the process of agricultural project and activity participation, especially, strengthen farmer groups. Other groups were stimulated to realize in plan analysis, to conscious of community development by participating in projects, processes, and participating in consultation, proposing solutions and decision making, coordination, operation, caring, benefit, and monitoring and evaluation. From the operation in these steps, it was found that (1) the farmers were able to do follow the participation process, (2) most of the plan were from farmers' participation, (3) behavior of farmers were changed clearly. They tried to participate and self-reliance with the support of the staffs.

The elements of the participation process in the development and promotion of crops growing in the Highland area in the promotion of the Royal Project Development Center. Related staffs included academics, officers of the Development and Promotion of plants, Central Development, Director, Chief and staffs of the Royal Project Development Center and farmers. According the results, it was found that farmers' participation each tribe associated with external and internal factors, so the

development authority should promote and support the learning process participant in the community. However, the role of development authority should supervise and support people in the area rather than action and opportunity of community participated using local knowledge as direction for development. Additionally, brainstorm idea and information should reflect the community development authority and expanding the success through other communities