CHAPTER 3

METHODOLOGY

The main objective of this research on the model of agricultural extension to reduce corn biomass burning in Mae Chaem District, Chiang Mai Province, was to develop and test the model of agricultural extension for reducing corn biomass burning. This research was conducted in the form of Participatory Action Research consisting of quantitative research and qualitative research. Whereas, the researcher studied and developed a corn biomass chipper before testing its competency and the production cost. Subsequently, the model of agricultural extension was developed to reinforce the need for farmers to mill the remaining corn biomass on their farms with the chipper to produce corn biomass powder which would provide benefits and rewards in products as well as providing additional income to their families. This was another method to reduce the corn biomass burning in such areas. The methodology of this research consisted of the following target populations, sample groups, methods of data collection, research tools, and data analysis: controller modified

3.1 Target population

The target population of this research was farmers growing corn in three sub-districts located in Mae Chaem District, Chiang Mai district including Mae Na Jorn Sub-District, Ta Pha Sub-District, and Chang Kerng Sub-District.

3.2 Sample Size and Sample Technique

This research consisted of three major stages including setting the community stage, focus groups, and testing the appropriateness of the model of agricultural extension for reducing the corn biomass burning. The sample size of each stage was determined as follows:

Stage 1: Community Stage Setting

The researcher invited people with experience in corn growing and other relative people (e.g., committees of sub-district administrative organizations, village headmen, village

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chiefs, subdistrict agricultural officers, community leaders) to participate in this community stage The sample size and the purposive sampling was conducted as follows:

1st Community Stage: It was set in Mae Na Jorn SubDistrict and consisted of nineteen villages. The sampling was conducted based on the research objective by targeting people with experience in growing corn. Out of the three people from each village, fifty-seven were chosen and were invited to express their opinions in this community stage plus five relative people. As a result, the total sample size was 62 people.

2nd Community Stage:

It was set in Ta Pha Sub-District and consisted of ten villages. The sampling was conducted based on the research objective by targeting people with experience in growing corn. Four people from each village were present and out of them, forty people were invited to express their opinions in this community stage along with four relative people. As a result, the total sample size was 44 people.

3rd Community Stage:

It was set in Chang Kerng Sub-District and consisted of nineteen villages. The sampling was conducted based on the research objective and targeted people with experience in growing corn. Three people from each village showed up and out of them, fifty-seven were chosen to express their opinions in

this community stage plus 5 relative people. As a result, the total sample size was 62 people. Consequently, there were totally 168 sample farmers obtained from those three community stage settings.

Stage 2: Focus groups

In this research, the researcher held three focus groups and the purposive sampling was conducted in each focus group. Farmers with experience in growing corn for no less than 5 years were invited to participate in such focus groups and the sample size of each focus group was as follows:

1st Focus Group: It was held in Mae Na Jorn Sub-District with seven participants.

2nd Focus Group: It was held in Ta Pha Sub-District with six participants.

3rd Focus Group: It was held in Chang Kerng Sub-District with six participants.

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As a result, there were a total of nineteen sample farmers obtained from those three focus groups.

Stage 3: Testing Appropriateness of a Model of Agricultural Extension to Reduce Corn Biomass Burning

The sample group used in this research were farmers growing corn and participating in community stages set in three sub-districts and voluntarily participating in this research for testing the appropriateness of model of agricultural extension to reduce corn biomass burning. The number of volunteers of each sub-district was as follows:

The number of volunteers of Community Stage set in Mae Na Jorn Sub-District was forty-five. The number of volunteers of Community Stage set in Ta Pha Sub-District was thirty-five. The number of volunteers of Community Stage set in Chang Kerng Sub-District was forty. As a result, there were totally one hundred and twenty sample farmers obtained from those three testing events.

3.3 Data Collection and Research Tools

3.3.1 Data Collection

For primary data, the quantitative data was colllected from the questionnaires distributed to the sample group or farmers growing corn in Mae Chaem District. On the other hand, qualitative data was collected through the in-depth interviews based on the interview forms conducted in the focus groups and community stages. Secondary data was collected from some documents and research reports related to the solutions to reduce corn biomass burning, basic information of corn growing and burning in Mae Chaem District.

3.3.2 Research Tools

For quantitative research, the demanded quantitative data was some basic social and economic characteristics of the farmers as well as their opinions and satisfaction toward participating in the project of corn biomass distribution for replacing burning.

Tools used for collecting data for this part was the questionaire consisting of three parts of questions including:

a) Data on basic economic and social conditions of the participating farmers

b) Conditions of corn growing and behaviors on reducing corn burning

c) Knowledge on utilizing corn biomass to replace burning

d) Opinions of farmers toward utilizing corn biomass to replace burning

e) Attitudes and satisfaction of the farmers towards utilizing corn biomass to replace burning

f) Problems, threats, and suggestions on project participation

For quantitative research, the quantitative data of this research was the model of agricultural extension to reduce corn biomass burning that was obtained and collected by setting the community stages and focus groups. The survey of primary data was conducted by setting the community stages with the issue on toxicity and danger of the smoke caused by corn biomass burning as well as some guidelines for reducing burning and the mutual discovery of the model to reduce biomass burning that was conducted prior the setting of focus groups. Tools used in this process were open-ended questions with the main question on how the model of agricultural extension should be to bring satisfaction to farmers towards this participation in the manner of practical convenience and proper rewards.

3.4 Tool Testing

Content Validity – A questionnaire was used to obtain the answers to direct questions covering all objectives of this research. The researcher studied data from some related documents and research for developing the questionnaire as well as interviewed some farmers with similar characteristics as of those of the target population prior to consulting with the thesis advisor and some experts in the agricultural extension consulting with the thesis advisor and some experts in the agricultural extension field in order to inspect and edit using these suggestions obtained prior to conducting further testing.

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Reliability – The researcher tested the edited questionnaires on twenty groups of people with similar characteristics as of those targeted in the study, i.e., farmers growing corn in other sub-districts including Kong Kaek Sub-District in Mae Chaem District, Chiang mai Province. Some objective and subjective questions were used and the Conbach's Alpha Coefficient was calculated by using Likert`s scale, through SPSS for Windows. The results showed:

The Conbach's Alpha Coefficient of Part 1 of questionniare was 0.78. The Conbach's Alpha Coefficient of Part 2 of questionniare was 0.76. The Conbach's Alpha Coefficient of Part 3 of questionniare was 0.81.

3.5 Data Analysis

For quantitative data, the researcher analyzed the data obtained from questionniares after entering the data using SPSS for Windows and the statistics were as follows:

2.5.1 For the general quantitative data such as personal information, social and economic information, growing conditions and how to destroy the corn biomass, such data was analyzed by using the descriptive statistics including frequency, percentage, arithmetic mean, minimum, maximum, and standard deviation. The difference was tested by using the Paired T- test.

2.5.2 For data that was matters of opinion expressed was obtained by using Likert`s 5 rated scale based on the weight mean score, such data was compared with the following criteria:

Score:	1.00-1.80	means	lowest
	1.81-2.60	means	low
	2.61-3.40	means	moderate
	3.41-4.20	means	high
	4.21-5.00	means	highest

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3.5.3 Data obtained from objective questions was analyzed by using frequency and percentage and the scores were as follows: If the answer was "True", the score was 1. If the answer was "no", the score was 0.ข

3.5.4 The Model of Agricultural Extension Test was analyzed by using path analysis.

3.5.5 Qualitative data was obtained from focus groups, seminars, and critical talk performed at the community stages and it was analyzed by using content analysis. Patton (1990:381) explained that "Content analysis is a process to mentions, coding and grouping of basic data. This technique is the content analysis from interviews and dissertation".

3.6 Research Site

Mae Chaem District, Chiang Mai Province

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3.7 Research Duration

Table 3.1 The reseach duration and budget was 10 months from July 2014 to April 2015.

Month	Year	Activity
July	2014	Studied and drafted the questionnaire
August	2014	Tested the questionnaire prior to improving and concluding it
September	2014	Surveyed the target areas and made a meeting appointment
October	2014	Conducted the meeting and set the community stages
November	2014	Set the focus groups of targeted sample groups
December	2014	Conducted action research for collecting quantitative and qualitative data prior to training (Pretest).
January - March	2015	Visited the site providing for some suggestions and advice as well as collected quantitative and qualitative data prior to training (Post-test).
April	2015	Analyzed the obtained data.
May	2015	Wrote research report.