

# **CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE**

## **FACULTY OF TROPICAL AGRISCIENCES**



### **DIPLOMA THESIS**

## **Analysis of quality and extent of extension services in North Sumatra province, Indonesia**

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## **Declaration**

I hereby declare that I have written presented master thesis “Analysis of quality and extent of extension services in North Sumatra province, Indonesia” by myself with help of the literature listed in references.

Prague, 26 April 2013

.....  
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## Abstract

The Republic of Indonesia is the island country situated in south-east Asia. The basic pillar of its economy is agriculture. The number of population in Indonesia is increasing about 1% a year and the current number of inhabitants, 242 million, is creating huge pressure on the food self-sufficiency. The government has decided to strengthen the agriculture and make the agricultural production more efficient by the Strategic Plan 2010 – 2014, which is supposed to be a basic framework for agricultural development in Indonesia. The aim of this thesis was to analyze the current situation of extension services provided in Indonesia in terms of extent and quality. Summary of the available information about extension services was done from secondary literature sources. Primary data was collected in field survey conducted in the North Sumatera province in two regencies: Tapanuli Utara and Simalungun. The base of the survey consists on Participatory Rural Appraisal, which used semi-structured questionnaire, personal interview and matrix scoring. Target group of the survey involved small-scale farmers. The main focus was given to identification of the level of farmers' awareness about the provided extension services, their satisfaction with extension. The respondents from both regencies had almost similar experiences with extension services, which show that there is no difference between Tapanuli Utara and Simalungun in the providing of extension services. 41% of respondents were involved in some agricultural training and 87% of them had positive satisfaction about this experience. The most common reason, why respondents did not participate in any extension training, was absence of extension program in their village. From the survey is clear that the cooperation between farmers and extension agents is not efficient how it should or could be in comparison with the official reports presented by Indonesian government.

**Key words:** extension services, small-scale farmers, Participatory Rural Appraisal, North Sumatera province, Indonesia

## **Abstrakt**

Indonéská republika je ostrovní země ležící v jihovýchodní Asii. Základním pilířem její ekonomiky je zemědělství. Počet obyvatel v Indonésii se ročně zvyšuje o 1%. Současný počet obyvatel 242,000,000 vytváří obrovský tlak na potravinovou soběstačnost Indonésie, a proto se vláda rozhodla podpořit zemědělství a zefektivnit zemědělskou výrobu. Vydala Strategický plán 2010 - 2014, který by měl sloužit jako základní struktura pro rozvoj zemědělství v Indonésii. Cílem této práce bylo zanalyzovat současnou situaci poradenských služeb poskytovaných v Indonésii z hlediska jejich rozsahu a kvality. Shrnutí dostupných informací o poradenství bylo provedeno ze sekundárních literárních zdrojů. Primární data byla sesbírána během terénního výzkumu v provincii Severní Sumatra, v regentstvích Tapanuli Utara a Simalungun. Základním nástrojem pro sběr dat byl soubor metod zvaný Participatory Rural Appraisal, který používá polo-strukturovaný dotazník, osobní rozhovor a bodovací matici. Cílovou skupinou výzkumu byli drobní zemědělci. Hlavním cílem výzkumu bylo zjištění míry povědomí zemědělců o poskytovaných poradenských službách a jejich spokojenost s těmito službami. Respondenti z obou regentství měli téměř shodné zkušenosti s poradenskými službami. Toto zjištění dokazuje, že není žádný významný rozdíl mezi Tapanuli Utara a Simalungun v poskytování poradenských služeb. 41% respondentů již někdy prošlo zemědělských školením a 87% hodnotí tuto zkušenost jako pozitivní. Nejčastějším důvodem, proč se respondenti nezúčastnili žádného zemědělského školení, byla absence poradenského programu v jejich vesnici. Z průzkumu je zřejmé, že spolupráce mezi zemědělci a zemědělskými poradci není ideální v porovnání s oficiálními zprávami předloženými indonéskou vládou.

**Klíčová slova:** poradenství, drobní zemědělci, Participatory Rural Appraisal, provincie Severní Sumatra, Indonésie

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## List of Abbreviations

BIMAS	Bimbingan Massal
BPP	Balai Penyuluh Pertanian
FAO	Food Agricultural Organization
FFS	Farmer Field School
GDP	Gross Domestic Product
IPM	Integrated Pest Management
NGO	Non-governmental organization
NTP	Nilai tukar perami
PPL	Penyuluh Pertanian Lapangan
PRA	Participatory Rural Appraisal
R&D	Research and Development
T&V	Training and Visit
WKPP	Wilayah Kerja Penyuluh Pertanian



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# 1 Introduction

Indonesia is the island countries consists of many various religions, ethnics and linguistic diversities. The total number of inhabitants reaches almost 250 million and in the last 12 years has increased by 25 million people. It creates a huge pressure on the food availability and the efficiency of agricultural production. Therefore, the Ministry of Agriculture made the document, called Strategic Plan 2010 – 2014, which is supposed to be basic framework in development of agriculture in mentioned years.

The extension services as a tool of an adult education play important role in the agricultural development of Indonesia for many years. There is a long historical evolution of Indonesian agricultural extension from the top-down approach Training and Visit (T&V) to participatory bottom-up approach Farmer Field School (FFS). In 1989 FFS method was firstly introduced into practice in Indonesia, and thus Indonesian farmers have the longest experience with this extension method among the countries in Africa, Latin America and Asia. Well-functioning extension system should use the modern and traditional communication methods which are understandable to farmers and meet their information needs. The complete understanding of farmers' problems and needs is the bases of demand-drive extension system which is considered as an effective method for transfer knowledge from research level to farmers.

Indonesian farmers are facing many obstacles to their agricultural development. Like any country, Indonesia has also many challenges in its agricultural system which tries to step by step solve. This thesis provides assessment of farmers' experiences with extension services and the opinions about a quality of their agricultural development.

## 2 Literature Review

In the part of the thesis dedicated to summary of secondary data the author tries to describe the history of agricultural extension services in Indonesia, its current situation and some practical examples from the field.

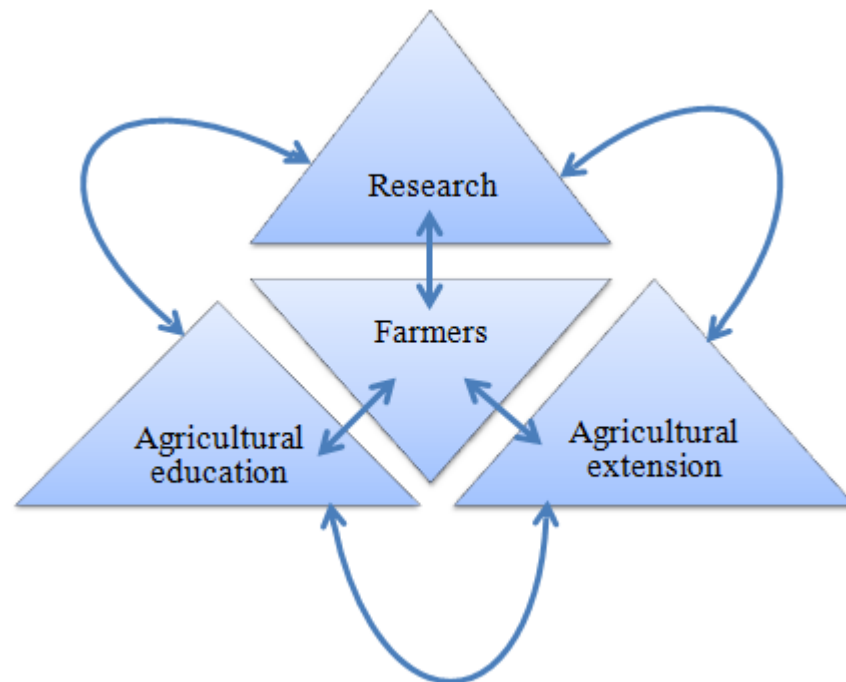
### 2.1 Agricultural extension services

The extension is an informal education process and a process of working with rural population. An informal education means a systematic learning process conducted outside the formal education structure (Coldevin, 2003). This process is offering farmers agricultural advice and knowledge to help them solve their problems within farming practice. The very important rule of extension services is that extension works with people, not for them. It means that farmers themselves can make wise decisions about their problems and way of life. The extension should support them in making decisions and offer some suitable solution (Oakley and Garforth, 1985).

The existence of agricultural extension services dates back far into history but we can say that the first modern kind of agricultural extension came into existence after the outbreak of potato blight in Europe in 1845. This crisis influenced the majority of potato production in Ireland and led to “the potato famine”. After that the wandering advisors began travelling around the districts of Ireland giving advice and demonstrations to farmers. Since 1914 the agricultural extension was extending to developing countries as well (Swanson *et al.*, 1997).

Agricultural extension has an important catalytic function in agricultural and rural development of farmers in developing countries (Oladele and Sakagami, 2004). This development depends on the fully functioning agricultural knowledge triangle system. Three key pillars of the agricultural knowledge triangle are: (i) research, (ii) higher agricultural education and (iii) agricultural extension (Eicher, 2001). The farmers profiting from improving agricultural development are integrated in the middle of this agricultural knowledge triangle (Rivera, 2001). In Figure 1 there is shown a scheme of agricultural knowledge triangle and farmers’ position within this structure. We can describe 2 relations shown in the scheme. In the ideal working triangle system the agricultural extension obtains

relevant information from the system of agricultural education and verifies that information by observation in the field. After the observation agricultural extension mediates a feedback from the field to education system. Agricultural extension and agricultural research have very close relation because of the fact that the most of advices, providing by extension services, are generated by research institutions.



**Figure 1. The scheme of agricultural knowledge triangle and farmers' position within this structure (Author's compilation based on Rivera, 2001)**

Nowadays extension services bear responsibility nearly for one billion small-scale farmers around the world. It means that there is urgent demand for the best way how to support farmers' empowerment in the term of information transfer, knowledge improvement and problem solutions (Davis *et al.*, 2010).

Well-organized extension system uses traditional and modern communication methods and should represent accessible source of information to farmers (Babu *et al.*, 2012). Agricultural extension should be demand-driven and uses participatory approaches to fulfill its main role of providing quality advising of farmers (Glendenning *et al.*, 2010), because there is no possibility of solving problems without involving the farmers in the development process (Habibie, 2003).

## 2.2 Information needs of farmers

Worldwide the agriculture is changing and developing as well as farmers' attitude to farming. This fact has outcome to unavoidable change of quantity and nature of information farmers needs (Oladele and Sakagami, 2004). The farmers' information needs are not only related to crop production, but also to postharvest processing, marketing and postharvest storage as well. It brings increasing importance of farmers' access to source of relevant and reliable information (Glendenning *et al.*, 2010). The process of obtaining required information is called information searching behavior. That is human behavior regarding active and passive seeking information available in various sources and through various channels (Wilson, 2000). The largest role influencing type of information needs and information searching behavior has education (Dutta, 2009).

Farmers have different strategies of searching information which are based on factors such as follows: years of farming experiences, type of farm and internet access. The last mentioned factor is connected with the development of using information technologies in developing countries. Generally, the farmers with more self-confidence about making decision abound with higher information searching behavior (Babu *et al.*, 2012). Extension services would understand the searching behavior and channels used by farmers to gain information. That is a prerequisite for efficient extension trainings. Benefits are more likely to be filled up when the information is relevant to farmers' needs (Okwu and Daudu, 2011) and when the information is changed in the form of message within a given context (Ikoja-Odongo and Ocholla, 2003).

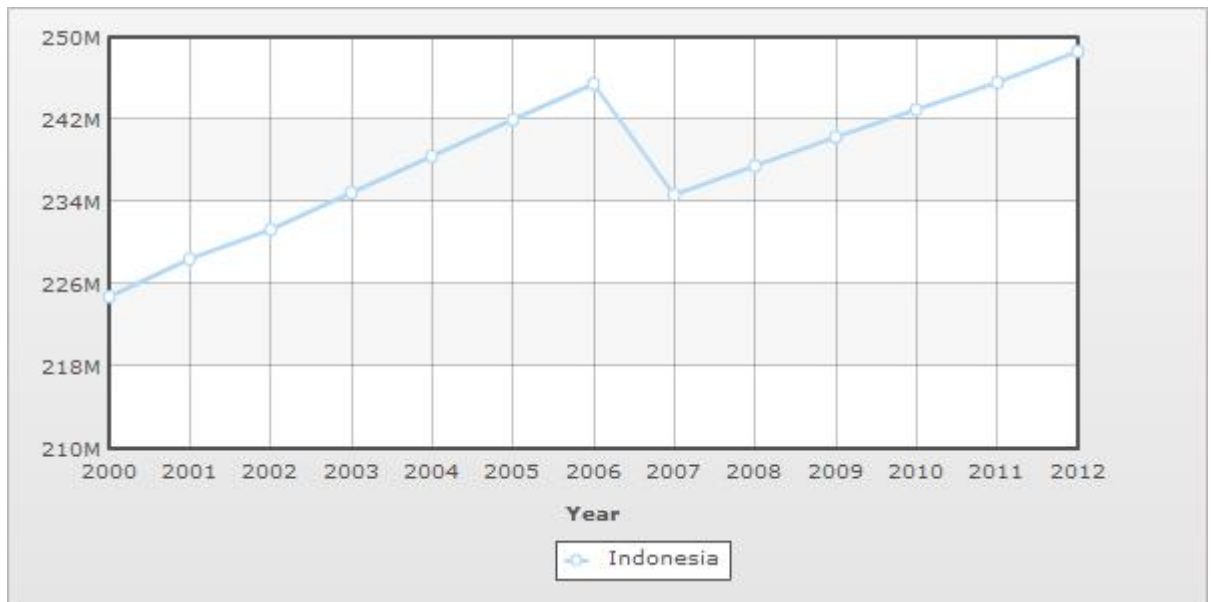
Glendenning *et al.* (2010) reported in their study that there are a number of key factors influencing the provision of information which provides agricultural extension to farmers. The key factors are such as follows:

- *human capacity* in the terms of quality and quantity of extension personnel,
- *content* in the terms of reliability, applicability and relevance of information,
- *processes* in the terms of a selection of proper procedure for sharing the information, and

- *technology* in the terms of suitable usage of technology for sharing information.

### 2.3 Background of current agricultural situation in Indonesia

The Republic of Indonesia, known as Indonesia, is the island country consisting of 17, 508 islands located in Southeast Asia. Capital city is Jakarta. Indonesia consists of various ethnic, linguistic and religious diversities (Portal Nasional RI, 2010). The basic pillar of Indonesian economy is agriculture. Agriculture provides important part of national income, employment and acts as a generator of foreign exchange. The share of agriculture on GDP is 15 % and the employment in agriculture is 38% of total employment (World Bank, 2010). Almost 70% of rural Indonesians work in agriculture (SMARTD, 2008). Indonesia has more than 248 million inhabitants (CIA, 2012). Only twelve years ago, in 2000, Indonesia has less than 225 million inhabitants (Index Mundi, 2011). It means that there is a big increase in number of population during one decade (Figure 2). Because of rapid population growth, the government seeks to improve the food self-sufficiency in Indonesia.



**Figure 2. Population growth in Indonesia between years 2000 and 2012 (Index Mundi, 2012)**

The Ministry of Agriculture made the document, called Strategic Plan 2010 – 2014, which is supposed to be basic framework in development of agriculture in mentioned years. According to Strategic Plan 2010 – 2014 agricultural development is based on local resources,

improved farm techniques (using of fertilizers, improved seeds), extension of irrigation facilities, welfare of farmers and expanded training of farmers (Ministry of Agriculture, 2010). Nowadays the agricultural sector in developing countries tends to be largely knowledge intensive and extension services seem to be relevant information source to farmers (Babu *et al.*, 2012).

## **2.4 History of agricultural extension services in Indonesia**

The first prototype of agriculture extension system was already in colonial era when Indonesia was under the control of the Dutch East Indies colonial government. Between 1830 and 1870 Indonesian farmers had to produce cash crops determined for export (tobacco, sugar cane). During the colonial era were reduced many traditional methods of farming, knowledge and skills of farmers. We can say that traditional agriculture suffered in this era (Van den Berg *et al.*, 2004). In 1911 there was established the Agriculture, Industry and Trade Department which was including new specialized institution the Agricultural Extension Service. Up to 1940's the extension services was on the voluntary base and under the decentralization policy. But after Indonesian independence in 1945, the policy shifted to centralized model and extension services became compulsory. In this form extension services remained further 20 years (Herianto *et al.*, 2010).

In the 1960's era was used "green revolution" technology focused on increasing rice production. This innovation was done through Mass demonstration program. In 1970's began era of improvement and strengthening of agricultural extension services (Hariadi, 2012). Indonesia tried to modernize its agricultural methods through new and effective inputs (pesticides, seeds and fertilizers), modern agricultural techniques (irrigation) and services (advices, marketing). Thanks to these agricultural improvements, Indonesia achieved rice self-sufficiency in 1984 (Lubis, 2012).

The BIMAS program (*Bimbingan Massal*) was implemented by extension service as a reaction on rice-focused era in Indonesia. This program brought many changes in Indonesian agriculture services. It was the first large-scale program which combined extension services with propagation of high-yield varieties and subsidized fertilizers and pesticides (Van den Berg *et al.*, 2004). The aim of this project was integrating of small-scale



farmer into huge plantation corporations (Fuglie, 2001). The important fact was that the extension activities were done through Training and Visit system (T&V). This system was introduced with the financial assistance of World Bank (World Bank, 2007). It is a typical representative of top-down approaches when new technologies are implemented and designed by government or other governing bodies. Usually proposed methods and processes are inconvenient and ineffective in practical use. There is no participation of farmers in process of identifying their problems and required solution how to sustainably overcome that. It means that T&V is only way how to transfer a technology to farmers. Instead of this, a learning approach is much more effective. That helps farmers to become responsible for their own development and through process of “naming the reality” they can confidently influence their own life (Habibie, 2003).

During the intensification of rice production appeared many complications connected with extreme widespread application of insecticides. One part of the “green revolution” package became serious threat for natural environment and health of farmers. There was a false belief that without insecticides there is no crop production (Ooi, 1998). In 1986 the Indonesian government decided to reduce state subsidies on pesticides and implemented the national IPM (Integrated Pest Management) technology (Van den Berg *et al.*, 2004). This program helped farmers to improve knowledge about ecological principles, life cycle of various types of pests and natural predators. Within this program was used FFS (Farmer Field School) method (Herianto *et al.*, 2010).

In 2000, the central government decentralized the extension services system. The responsibility and funding were removed to district level. The local government took over the principal role in agricultural development. This change brought decreasing importance of agriculture as a significant part of Indonesian economy because local autonomies have received no financial support from central government, so they focused their priorities in different direction (Lubis, 2012). Extension workers were poorly paid, had low motivation for extension work and started leaving their positions. Remaining workers have to cooperate with the same number of farmers, even more (Shetty, Chisholm and Chong, 2008). It caused that the extension workers have serious problems with solving the farmer’s problems (Herianto *et al.*, 2010).

## 2.5 Current system of agricultural extension services in Indonesia

This part of literature review is focused on short descriptions of basic components forming the current system of agricultural extension services in Indonesia. The selected components are such as follows: (i) legislation, (ii) structure and (iii) financing.

### 2.5.1 Legislation

Current situation of Indonesian extension system has started seven years ago, in 2006, when Extension Law – Law No. 16/2006 – was adopted by government. That was the beginning point of the farmer's empowerment (ICASEPS, 2012). This Law recognizes the three types of extension actors: government extension workers, private extension workers and self-supporting extension workers. That document allowed private sector and NGO's to engage in agricultural extension services and establish their own facilities (Lubis, 2012). It was also defined three primary sectors (agriculture, fisheries and forestry) by newly established institution the Agency for Extension Coordination (Herianto *et al.*, 2010).

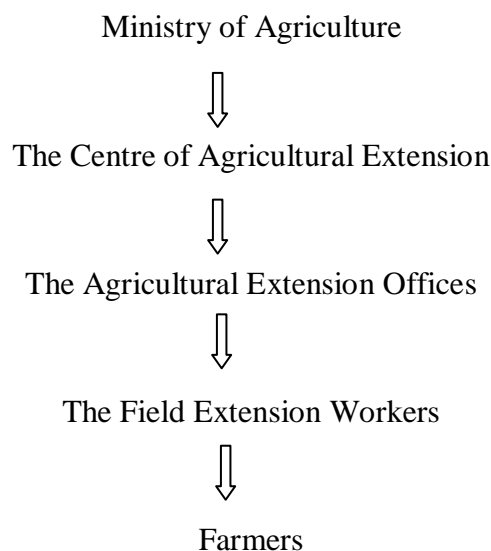
In Law No. 16/2006 are defined the principles, goals, responsible institutions, structure, extension methods, financing, conditions and basic rules of proper working extension system. In this governmental document is, among others, written: "To anticipate changes that will bring 21<sup>st</sup> century with the issues of globalization, decentralization, democratization and sustainable development; is necessary to realize agriculture, fisheries and forestry tough, productive, effective, competitive and able to provide welfare of all the people in Indonesia. To answer the changing strategic environment it is necessary to do revitalization of agriculture, fisheries and forestry." (Undang Nomor 16 tahun 2006).

In the term of "welfare of farmers" there is the indicator named NTP (*nilai tukar perani*) = farmers value exchange which is used for measuring relative level of farmer prosperity. This indicator is not able to describe the actual conditions of farmer's welfare, but still is using for calculating (Ministry of Agriculture, 2010). NTP express the ability to exchange the products sold by farmers with the products required for agricultural production and household consumption. The values of NTP are: (i)  $NTP > 100$  = farmer's income increased faster than expenditures, farmers have a surplus, (ii)  $NTP = 100$  = farmer's income is same as expenditures, (iii)  $NTP < 100$  = farmer's income is smaller than expenditures. The NTP value for North Sumatera is 103.03 (September, 2011) (Badan Pusat Statistik, 2012).

## 2.5.2 Structure of agricultural extension system

Current extension system is divided and controlled by autonomous provincial and district governments. These control units are often poorly financed, resourced and very often is underestimated their role in agricultural development. This leads to poor extension services and the satisfaction amongst extension workers and farmers is not on high level (Herianto *et al.*, 2010).

The basic structure of extension services is shown in Figure 3. On the top of the extension services structure is the Ministry of Agriculture that provides the legislation framework. The Centre of Agricultural Extension which is responsible for all extension activities is under the Ministry of Agriculture. At local level are Agricultural Extension Offices (BPP – *Balai Penyuluh Pertanian*) which are responsible for extension methods and materials. The final extension activities are carried out by the Field Extension Workers (PPL – *Penyuluh Pertanian Lapangan*) who are responsible for field visitation and transfer of technology and information. Each extension agent works in own Working Territory of Agricultural Extension (WKPP – *Wilayah Kerja Penyuluh Pertanian*) with local farmers (Habibie, 2003).



**Figure 3. Structure of agricultural extension services in Indonesia (Author's compilation based on Habibie, 2003)**

Each level of the extension services structure has its own characteristics and plays different role in the agriculture extension system. The following paragraph describes in more detail each particular level of Indonesian extension system (Rusmono *et al*, 2011):

a) Ministry of agriculture

The Ministry of agriculture in Indonesia is the highest national level of extension system in Indonesia with the responsibility for observance of the current Extension Law No. 16/2006. The other function of the Ministry of agriculture is improving in-country and international cooperation in extension.

b) The centre for agricultural extension

The centre for agricultural extension office closely cooperates with the Ministry of agriculture on defining extension policy, formulating principles, norms and regulatory; and participates on the preparation of a budgets for extension.

c) The agricultural extension offices

The agricultural extension offices provide education and extension trainings to the groups of farmers. Extension offices are responsible for developing policy and programs for the management of extension. In 2010 there were 4,329 of agricultural extension offices in Indonesia.

d) Field extension worker

Extension workers or extension agents supposed to help farmers with technical and marketing challenges. Extension agents are expected to transfer recommendations from government and information from research institutions to farmers. In 2011 there were 24,551 field extension workers (4,358 women and 20,193 men).

In the study of Sjah *et al*. (2006) is mentioned that there is not enough contact between extension agent and farmers mainly because of (i) lack of extension capacities and (ii) extension services perceiving by farmers as not relevant to their needs. Since 1996 extension workers are expected to be capable of providing advices relating to crop cultivation, animal husbandry, fisheries and forestry. It is assumed that extension workers' knowledge cover a wide range of agricultural topics.

#### e) Farmers

Farmers are target group of the agriculture extension system in Indonesia. We can say that farmers are clients who are on the receiving end (Van den Berg *et al.*, 2004).

In the study of Byrne *et al.* (2003) there is reported that farmers in Indonesia use less the information obtained from extension agent and their information searching behavior is mainly passive. This fact greatly contrasts with farmers in developed countries who actively seek for information and even are willing to pay for extension services.

### **2.5.3 Financing of agricultural extension system**

Financing of extension services is, in general, done in various ways. The most common way of financial support of agricultural extension is government financing through public expenditures on agricultural research and development (R&D) (Armas *et al.*, 2012).

In last ten years there was partial privatization of government services around the world. The private organizations and NGO's began to participate on agricultural extension services financing. It is clear that any entity that enters into funding tries to reach its own goals (van den Ban, 2000). An Indonesian model of extension financing consists of 6 levels: (i) central financing, (ii) provincial financing, (iii) district financing, (iv) village financing, (v) private financing and (vi) farmers' financing (Zakaria, 2003).

## **2.6 FFS method – characteristic and its role in current extension services in Indonesia**

Among the countries in Africa, Asia and Latin America, Indonesia has almost the longest experience with Farmer Field School (FFS). This approach has been promoted by many development agencies, such as World Bank, as an effective method how to transfer science-based knowledge to farmers (Feder *et al.*, 2003). FFS in Indonesia was introduced in 1989 by Food and Agriculture Organization (FAO). The main reason for introducing this method was to decrease volume of using pesticides through Integrated Pest Management (IPM) program (Quizon *et al.*, 2001). FFS as a participatory approach of extension services replaced the traditional agriculture extension which was designed as a top-down system. This system ignored knowledge of local farmers and transferred innovations from the research institutions

without knowing farmers' needs (Habibie, 2003). Between years 1989 and 1999 more than 1.2 million farmers graduated (Van den Berg *et al.*, 2004) from 1,800 Farmer Field Schools. The majority of the graduates obtained knowledge about cultivation rice (Braun and Duveskog, 2008). Up to 2005 there were carried out 48,000 of FFSs mainly focused on rice, vegetables, rats and cacao (Braun *et al.*, 2006).

FFS is an approach of adult education that facilitates farmers to learn new agricultural knowledge in an informal environment within their own farms. FFS approach is called "schools without walls" (Davis *et al.*, 2010). In the process of learning the farmers are assisted to carry out their own research, identify problems and come up with possible solution (Anandajayasekeram *et al.*, 2007). In Indonesia, FFS are the basic pillars of agricultural education regarding the trainings of full-time qualified trainers who provide the propagation of FFS in their communities. This practice enables the multiply effect of knowledge dissemination (Hess, 2007).

The typical form of FFS is the group of trainees consists from 20 – 25 farmers. The duration of FFS training is about 8 – 12 weeks and should cover one cultivation season. The principle of the training is the using of farmers' field as well as the experimentation plots designed especially for the purpose of FFS. Farmers can compare the results of their methods on their field and methods used by FFS staff on experimental plot. This comparison allows farmers to better understand taught procedure and easier accept new technique (Feder *et al.*, 2004).

The economic dimension of FFS becomes a serious problem because of the high fiscal expenses associated with the organization of FFS trainings. In Indonesia the final financial costs of participation in the FFS training are \$49 per farmer. The possible solution of this unsustainable situation is cost sharing with local NGOs which would participate in trainings providing (Feder *et al.*, 2004). It means that small local solutions of financing FFS approach are achievable but using FFS in large scale definitely brings risk of fiscal unsustainability (Quizon *et al.*, 2001). The study of Hess (2007) reported that is possible to reduce costs to \$50 per FFS due to the trainings of farmer trainers. This is the very important aspect of FFS that can guarantees the sustainability of Farmer Field Schools in Indonesia.

### 3 Objectives

The principle objective of this thesis lies in the assessment of extension services currently provided in North Sumatra. Three specific objectives were determined to fulfill the main objective.

The specific objectives are as follows:

- (i) to set up appropriate parameters for evaluation of extension services in conditions of North Sumatra,
- (ii) to conduct analyses of currently provided extension services according to the set up parameters, and
- (iii) to suggest optimization steps in order to achieve improvements in extension services.

Within this thesis two null hypotheses were formulated:

The first hypothesis is formulated regarding the fact that the Strategic Plan 2010 – 2014 has been implemented in Indonesia. This document issued by the Ministry of Agriculture in Indonesia is used as a framework for agricultural development in whole Indonesia without any preference of a certain area. On this fact the author assumes that provided extension services are without difference in both surveyed regencies.

H1: There are no significant differences between regencies Tapanuli Utara and Simalungun in provided agricultural extension services as perceived by farmers.

The formulation of second hypothesis is based on a common assumption that the age plays a significant role in success and level of learning process. Benin *et al.* (2011) stated that adoption of new knowledge is negatively associated with age.

H2: Younger farmers are more willing to learn new agricultural technologies and cooperate with extension agents.

## 4 Methodology

This study is based on the two main approaches such as (i) literature review based on a summary of existing literature resources and overview of published facts about extension services in Indonesia in general and (ii) a field survey. The last step to complete this study was processing of collected data. Figure 4 shows the basic scheme of each step of this study.

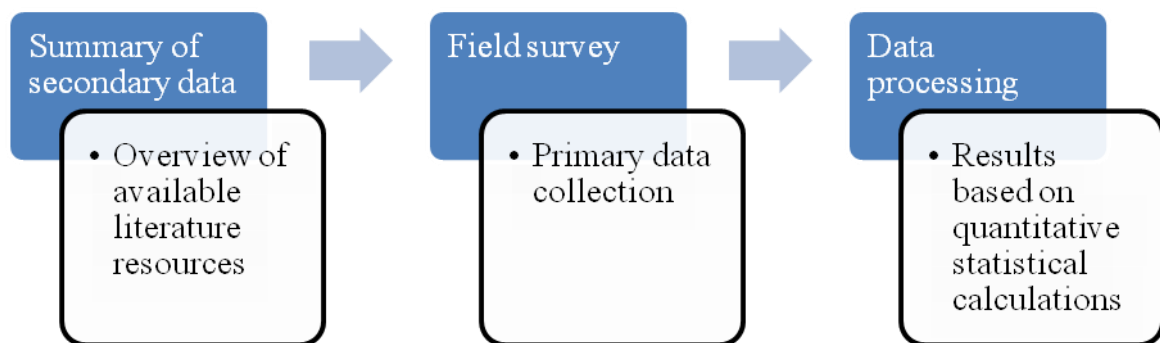


Figure 4. Scheme of working procedure in creation of the study

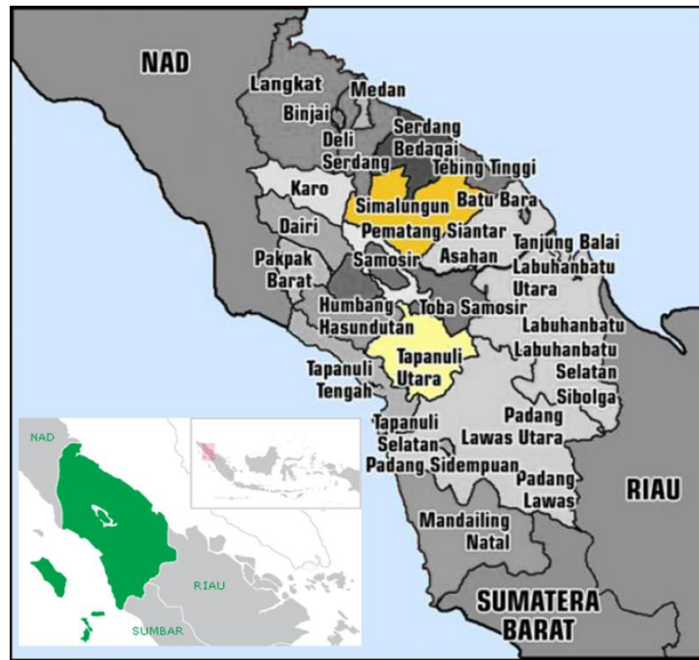
### 4.1 Summary of secondary data

Sources used for literature review were in English and Indonesian languages. The main types of sources were scientific journals such as *Extension Farming Systems Journal* and *Journal of International Agricultural and Extension Education*; research papers, reports, statistic databases such as *FAOStat* and *Badan Pusat Statistik*; and publications with extension services topics. The principal key words used for searching in databases were: *extension services, agricultural development, North Sumatra*.

### 4.2 Field survey

The survey was carried out in Tapanuli Utara and Simalungun regencies (marked on the map in yellow color) in North Sumatra province in Indonesia (Figure 5) in the period of July - September 2012.





**Figure 5. Map of Tapanuli Utara and Simalungun regencies, North Sumatra province, Indonesia (Author's compilation based on mapsof.net and sumatera-commercial.com)**

Selection of the study area was based on the following criteria:

1. presence of an existing solid base for conducting the survey. This requirement was fulfilled within the close cooperation between the Czech University of Life Sciences Prague and Indonesian university Politeknik Informatika Del in Balige.
2. presence of an operating training centre AgroIhutan in Pagarbatu. This centre works as a training farm for farmers and provides agricultural courses for students of agricultural high schools in surrounding.
3. presence of target group. The target group of the survey consisted of small-scale farmers owning land up to 5 ha. The main condition of small-scale farming is non-commercial production.

The survey was based on selected Participatory Rural Appraisal (PRA) methods which serve for active participation of local people in analyzing their current life and knowledge (Chambers, 1994). This function of PRA was used for exploring the current situation of extension services in the area and farmers' awareness about the agricultural extension trainings offered by extension services. The principle used methods were: (1) matrix scoring,

(2) personal interview and (3) questionnaire. These methods were extended with an observation as a tool for verifying collected data.

Matrix scoring was used to identify the main problems which currently constrain agricultural development of farmers. Personal interview was conducted in semi-structured form during visits of farmers on their farms.

The basic tool used in the survey for data collecting was a questionnaire. The questionnaire was prepared in English (ANNEX I.) and then translated into Indonesian languages (ANNEX II.) in order to facilitate communication with respondents. Despite the fact that the questionnaire was in Indonesian language, the interpreter was needed for successful questioning of respondents. Firstly, the interpreter could establish open and friendly contact with respondents. Secondly, personal contact allowed respondents to feel more relaxed during filling the questionnaire. The completing of questionnaires was conducted through personal contact, not through questionnaires distribution. The basic reason for that was better and more detailed completing of questionnaire and bigger participation of respondents in the survey. The interpreter was trained to understand the issues of the survey in order to assure avoiding potential misunderstanding. During the survey two local people helped arranged a direct contact with farmers. At the beginning of the survey the pilot testing of the questionnaire was conducted. On the basis of the results of the pilot testing the questionnaire was modified in terms of the number of questions and wording of questions.

#### **4.2.1 Questionnaire for farmers**

The questionnaire for farmers used in the survey was designed as semi-structured questionnaire including open-end and close-end (multiple choice) types of questions. The total number of questions is 27.

The questionnaire was divided into four parts such as follows (in the parenthesis number of relevant questions is provided):

- (i) questions (8) focused on general information about farmers' livelihood,
- (ii) questions focused on farmers' experiences with extension services (7 questions for farmers with some experiences with extension services and 4 questions for farmers without any experiences with extension services),
- (iii) questions (3) focused on secondary effect of extension services in term of spreading agricultural knowledge through trained farmers, and

(iv) additional questions (5) related to current problems of farmers.

In the questionnaire there are included questions with a 3-point Likert scale (*Level of Consideration* Likert-type scale) as a tool for discovering of respondent's priorities or degree of their agreement with statement (Clason and Dormody, 1994).

The expected number of answered and completed questionnaires was 100 units. During the field survey certain constrains and limitations appeared and allowed to complete 76% questionnaires. Randomly selected farmers were asked about their experiences and satisfaction with extension services provided in the area.

### **4.3 Data processing**

The gathered data from field survey were processed in the period from October 2012 to January 2013. A part of questionnaire was processed with the application of quantitative statistical methods. Two types of statistics were used for processing: (i) descriptive statistics (average, mean, percentage, standard deviation, coefficient of variation) and (ii) inferential statistics. The software STATISTICA version 10 was used for calculation of the statistics.

### **4.4 Limitations of survey**

The survey faced to many limitations. Among the most common belonged the time, the distrust of farmers, the language barrier and the rainy season.

The time was limitation in terms of the local time perception which is not as accurate as a time perception in Europe. That caused many postpones of arranged meetings with farmers.

The respondents were sometimes concerned why the survey is done and what are the reasons for questioning them. They mainly worried that survey is conducted by government officials and information obtained in interview will be misused. This distrust has originated in the past when in Indonesia governed authoritative regimes and an executive power suppressed anti-government activities. It took a time to dispel their worries and skepticism about the purpose of survey.

Dependence on a local contact person who mediated visits of potential respondents for the survey and dependence on an interpreter were expected limiting factor. That was mainly due to the language barrier between author and local people. The author's basics of Indonesian language were not enough for complete questioning of respondents. It was

necessary to use the services of an interpreter who is able to translate from official Indonesian language to English and from local languages to English. It could bring some misinterpretations during the translating.

The part of the survey was carried out during the rainy season which usually starts in October, but in 2012 began already in September which complicated time schedule of the interviewing. Transportation was more difficult and visits of farmers have to be sometimes postponed for half a day or more.

## 5 Results and discussion

This chapter presents the results of data processing corresponding with objectives of this thesis. The results of the survey are divided into three sub-chapters according to the division of the questionnaire: (i) characteristics of farmers, (ii) farmers who have participated in extension program and (iii) farmers who have not participated in extension program.

### 5.1 Characteristics of farmers

The distribution of surveyed farmers in the selected regencies was as follows: 43 respondents from Tapanuli Utara regency and 33 respondents from Simalungun regency.

Women account for 19.7% of respondents and men 80.3% of respondents. Men are usually head of family in traditional Indonesia households. This fact strongly contributes to the respondents' gender imbalance within the survey. The average respondent involved in the survey was 49 years old owner of 1.5 ha of land with twelve-year schooling (senior high school) living in a family of six members.

The willingness to learn new knowledge is the basic factor which influences the farmers' participation in extension trainings. Within the statistical calculations of correlation coefficient and coefficient of determination there were analyzed relations between respondents' willingness to learn new agricultural knowledge and independent variables such as (i) gender, (ii) age and (iii) education. In Table 1 there are shown correlation coefficients and coefficients of determination recalculated to a percentage for each variable. Relation between gender and willingness to learn new knowledge is negligible. The influence of gender to a level of farmers' willingness to learn new knowledge is only about 1.7%. In the study conducted by Benin *et al.* (2011) in Uganda was proved that gender has no statistically significant effect on willingness to participate in some extension training. It means that there are probably other factors such as size of field or education which have bigger influence on willingness to learn new agricultural knowledge and participate in extension trainings.

In the same study conducted by Benin *et al.* (2011) there was also discovered that influence of education on the willingness to learn new technology is about 41%.

This percentage is bigger than the percentage calculated within survey in North Sumatra province where was calculated the result of 7.3% influence of education on willingness to learn new knowledge. It means that level of education has lower effect on participation in some extension training in North Sumatra province than in Uganda. This finding is very interesting and we can deduce that farmers in Uganda are willing to learn a new knowledge on the base of higher awareness about importance of agricultural improvement. We can afford a claiming that this awareness is conditioned by a level of education. In contrast, the farmers in North Sumatra province have the awareness about importance of agricultural improvement without previous study experiences from formal education system.

The percentage of relation between age and willingness to learn new knowledge is 9% in North Sumatra province as well as percentage calculated within the study of Davis *et al.* (2010) conducted in East African region where the result is also 9%. The result shows that younger farmers are by 9% influenced to participate in some extension training and learn new knowledge than older farmers in North Sumatra province as well as in East African region.

**Table 1. Relations between respondents' willingness to learn new knowledge and variables (gender, age, education) expressed by correlation coefficient and coefficient of determination**

Willingness to learn new knowledge		
	<b>r *</b>	<b>r<sup>2</sup> x 100 [%] **</b>
<b>Gender</b>	- 0.13	1.7
<b>Age</b>	- 0.30	9.0
<b>Education</b>	0.27	7.3

NOTE: \* r = correlation coefficient, \*\* r<sup>2</sup> = coefficient of determination

It was discovered that 32% (24) of respondents have some off-farm activity which support a household income of farmers. Meindertma (1997) in the study conducted in Lombok in Indonesia found out that farmers use the income from off-farm activities to reinvest in their farming.

The most usual off-farm activities are managing small shop (27% of respondents) and working as a government employee (27% of respondents). Selling food and own farm products is quite often among rural people in North Sumatra province. State apparatus has

a strong position in whole Indonesia and it brings a lot of possibilities to work in public system as a government employee. All off-farm activities mentioned by respondents are listed in Table 2.

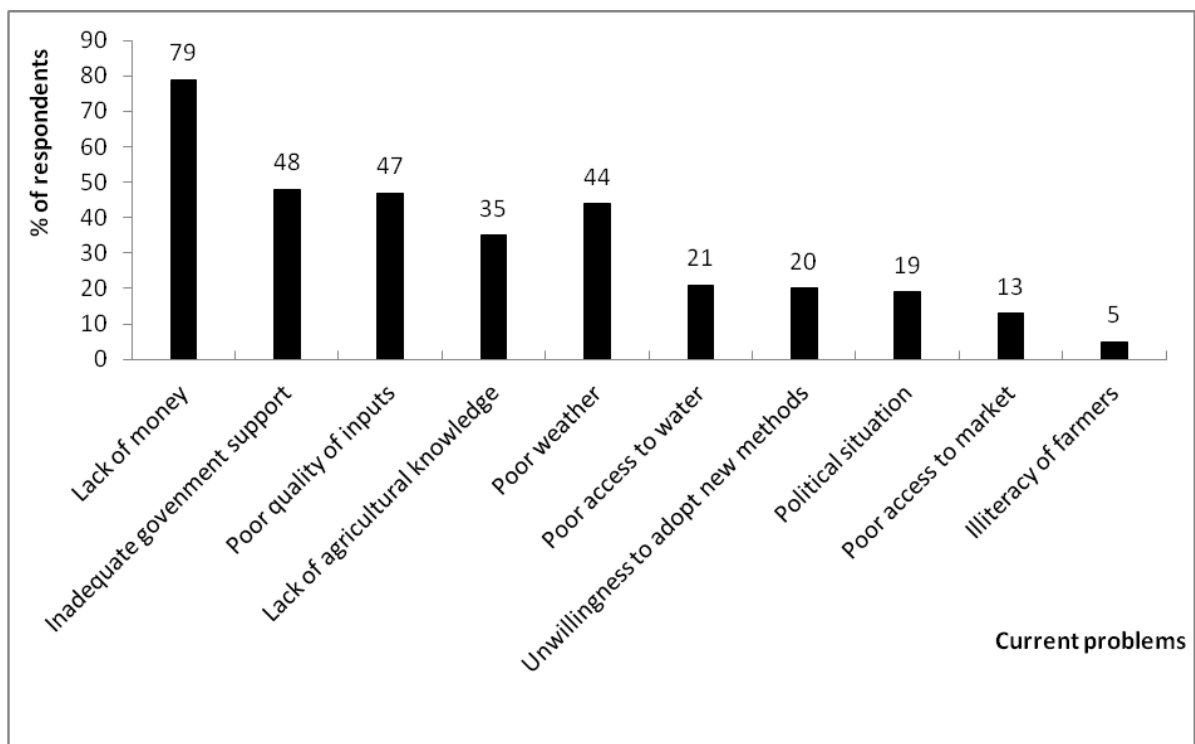
**Table 2. List of off-farm activities of surveyd farmers**

Off-farm activity	% of respondents
Shop	27
Government officer	27
Seasonal agricultural worker	11
Renting fields	11
Repairer	8
Teacher	8
Journalist	4
Masseur	4

The study was also focused on farmers' opinions about current problems which constrain their agricultural development. There were identified many problems and obstacles which complicate continuous improvement of farming activities. The most commonly reported problem is lack of financial resources. That was mentioned by 79% of respondents. The second and third most common problems are inadequate government support (48% of respondents) and poor quality of inputs (47% of respondents). The difference between Tapanuli Utara and Simalungun regencies in current problems reported by respondents is not significant.

From Figure 6 we can see for example that 35% of respondents feel that their agricultural knowledge is insufficient for the desired agricultural development. 44% of respondents consider the poor weather conditions as a big obstacle for farming improvement. Many surveyed farmers complain about the unpredictability of weather. In the previous years they were able to estimate when the rainy season comes, but nowadays they are quite uncertain about proper planning of each agricultural step during a growing season. This fact

can be huge threat especially during the harvest time when is keeping of a production in dry required. 19% of respondents feel uncomfortable about the political situation in the country. This finding can be due to lingering fear from the time of Suharto regime. Aspinal (2005) in his book describes the Suharto regime as an authoritarian with military control of whole country. At that time increasing economic growth was to the detriment of welfare of local people. The enormous corruption also took place at that time. The dictator Suharto ended up in the position of president in 1998. There is an assumption that older farmers still feel strong respect of government authorities.

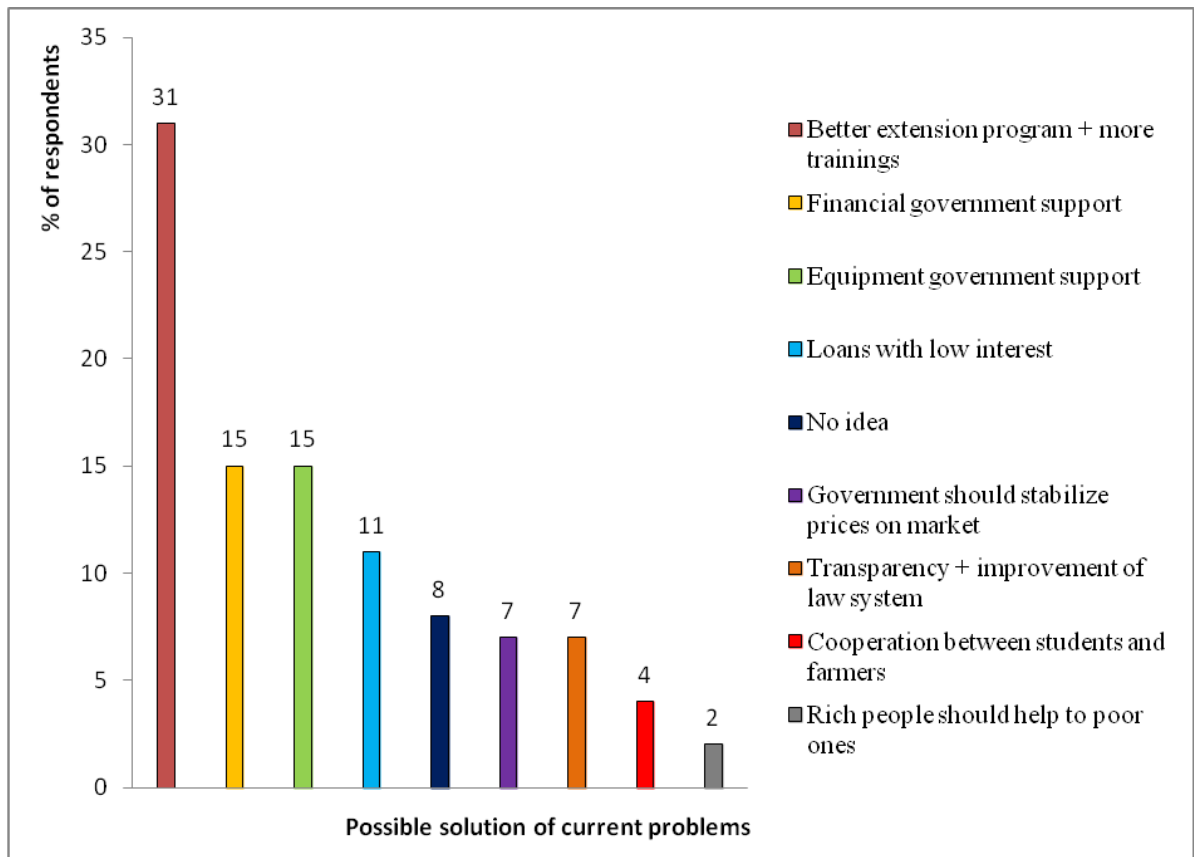


**Figure 6. Current problems of agricultural development which farmers are facing to (N=76)**

Respondents expressed their ideas about possible solutions of the current problems which constrain their agricultural improvement. The Figure 7 shows the possible solutions. For example 31% of respondents suggest improvement of extension programs and reinforce a number of extension trainings offered by extension services. This result shows that farmers perceive the amount of provided extension training as insufficient and agriculture extension should think about increase in agricultural trainings. Financial support from government would appreciate 15% of respondents and government subsidies in the form of equipment and seeds would appreciate the same amount of respondents (15%). The dismal situation



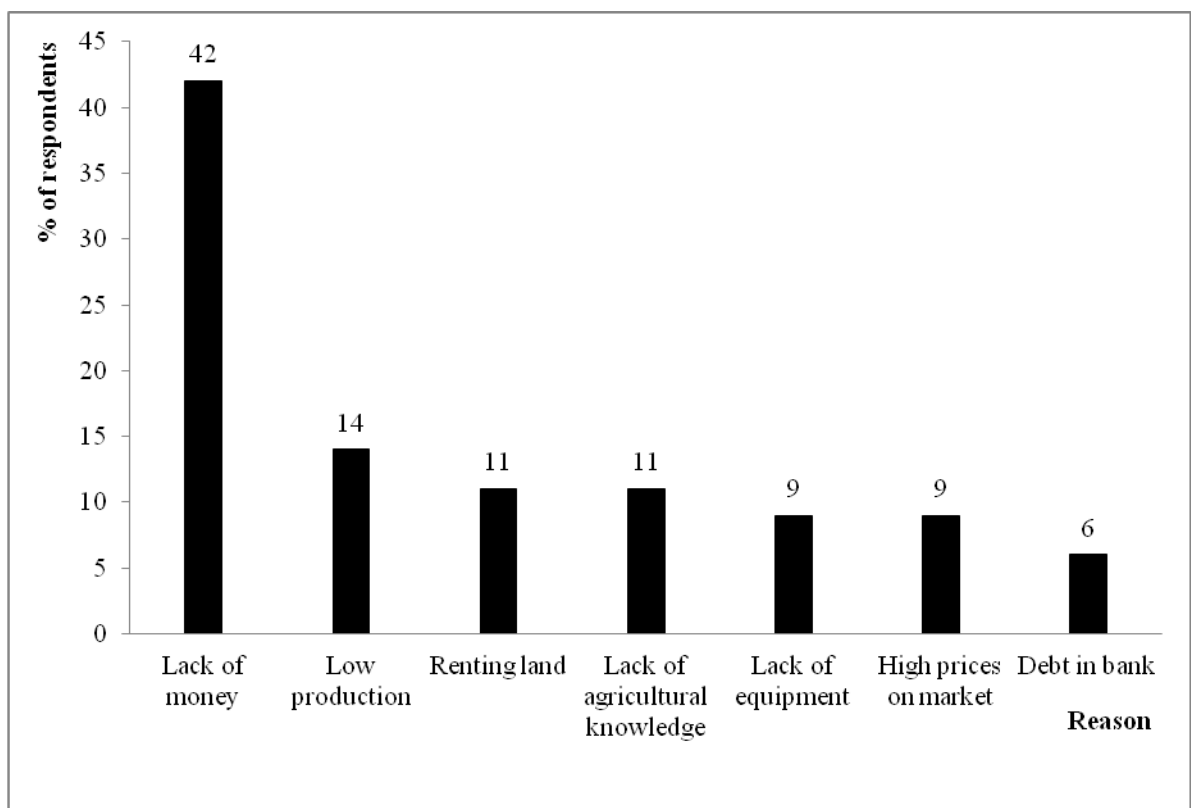
regarding lack of money would 11% of respondents solve by loans with low rate of interest (0.5% per month). Most of farmers would definitely appreciate decrease in administration and bureaucratic obstacles during a process of getting a loan from a bank. Other interesting suggestion is more intensive cooperation between farmers and students of agricultural high schools. This opinion has 4% of respondents. That would be really useful tool, for students, of connection with agriculture in practice. Students would have the opportunity to expand their knowledge on practical skills.



**Figure 7. Possible solutions of current problems constraining farmer's development (N=76)**

The survey was focused on respondents' perception of being poor farmer. A perception is subjective assessment of state of being and largely depends on the individuality of each person (Hayati and Karami, 2005). The results show that 72% of respondents feel to be poor farmer, 10% of respondents do not feel to be poor farmer and 18% of respondents feel to be somewhere in the middle. The main reasons why respondents feel to be poor farmer are as follow: lack of financial resources (42% of respondents), low production and consequently low income (14% of respondents), lack of land in private ownership (11% of respondents),

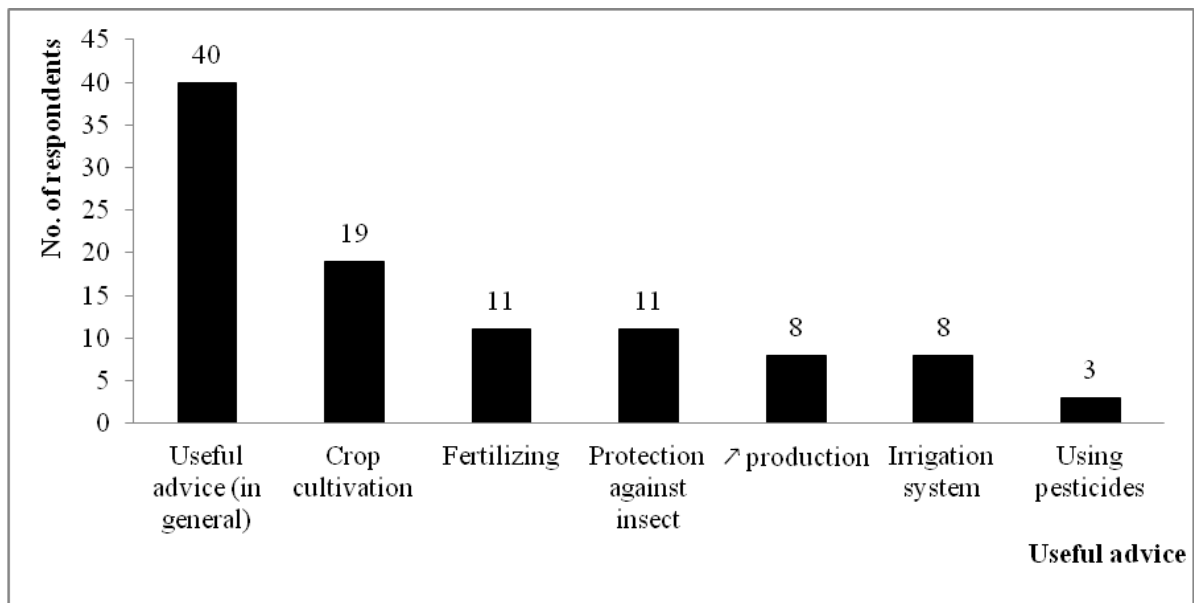
lack of agricultural education and access to information (11% of respondents), lack of equipment and inputs (9% of respondents), high purchase prices on market (9% of respondents) and debt with high interest in bank (6% of respondents). In Figure 8 there are reasons reported by respondents as causes to feel poor farmer. We can say that lack of money can be influenced by many factors including low production, lack of agricultural knowledge and long-term debt in a bank with high interest rate. In the study conducted in Iran by Hayati and Karami (2005) was reported that 9.7% of respondents think that a lack of agricultural knowledge is the reason for their poverty. This result is comparable with the findings of the survey in North Sumatra province where a lack of knowledge is reason for the poverty for 11% of respondents.



**Figure 8. Reasons why respondent feel to be poor farmer (N=76)**

The survey was also focused on identifying an existence of secondary spreading of agricultural knowledge through trained farmers. The author defined trained farmer as a farmer who participated in some extension training in the past and nowadays should pass gained knowledge on. It was discovered that 66% of respondents have ever obtained some advice or information from trained farmer. In Figure 9 is shown what type of advice was mostly

given by trained farmers to respondents. In the study conducted in India by Glendenning *et al.* (2010) was discovered that 16.7% of farmers prefer trained farmer as a source of agricultural information. In other study conducted in Nigeria by Okwu and Daudu (2011) was reported that 6.33% of farmers use trained farmer as a source of agricultural information. On the base of the findings we can say that the secondary spreading of agricultural information in North Sumatra province is on higher level in comparing with the results in case studies in Nigeria and India.



**Figure 9. Types of useful advice that respondents got from trained farmers (N = 53)**

Respondents were asked to evaluate the sources of agricultural information according to its credibility by 3-point Likert scale. The author selected *Level of Consideration* Likert-type scale (Vagias, 2006) with these options: (1) Would not consider, (2) Might or might not consider and (3) Definitely consider. The respondents should answer which source of agricultural information they consider as the most trustworthy. In Table 3 there are shown selected sources of agricultural information. The result is that the most trustworthy source of knowledge is “Extension agent”. The lowest value has “Village leader” as a source of information and its standard deviation shows that respondent’s answers are spread out from average at least from all of source of information. It means that majority of respondents trust “Village leader” at least. In case of “Family” the result is that this source of agricultural information is second most trusted, but its coefficient of variation is the lowest 23.96%.

It means that dispersion of a probability distribution is low and majority of respondents has the same answer in the case of “Family”. Babu *et al.* (2012) in the case study conducted in India identified that 51.2% of respondents (N = 576) said that the main source of agricultural information is “Extension agent”, 39.9% of respondents stated the “Family” as the main information source. Very strong position, among the respondents in India, has “Mass media” as the main source of information. 43.6% of respondents considered the television as important source of agricultural information. In this case we can say that extension services in North Sumatra province do not use the mass media for knowledge distribution in the quality way because the respondents considered “Mass media” as the third worst source of agricultural information.

**Table 3. Sources of agricultural information and their credibility evaluation**

Source of information	Average	SD	Coefficient of variation [%]
Extension agent	2.63	0.68	26.04
Family	2.61	0.62	23.96
Friend	2.43	0.78	32.19
Leaflets	1.89	0.85	44.96
Mass media	2.14	0.86	40.52
Paper publications	2.31	0.81	35.17
Trained farmer	2.34	0.80	34.32
Village leader	1.42	0.61	43.11

Within the survey there was assessed the respondents’ participation in some agricultural extension training. I was discovered that 41% of respondents have ever participated in some extension program and 59% of respondents have not participated in any extension program at all. For comparison of farmers’ participation in Tapanuli Utara and Simalungun regencies there was used the testing of means from both regencies by the T-Test. On the base of statistical calculations no significant difference between Tapanuli Utara and Simalungun regencies in number of participants in extension trainings was discovered. It means that the extent of provided extension services in both regencies is similar.

## 5.2 Farmers who have participated in extension programs

It was discovered that 31 respondents (41%) have participated in some training provided by extension centers in North Sumatra province. 68% of respondents were contacted by an extension agent offering them agricultural consultation in a case that farmers would voluntarily want to learn new knowledge. 22% of respondents contacted an extension agent themselves because they needed help within their farming and 10% of respondents were contacted by an extension agent because they live in the area which has been chosen by government as a target area of extension services activities. In Figure 10 there is shown how respondents started their participation in the extension trainings. The majority of the respondents were approach by an extension agent. This fact assumes that the beginning of farmers' participation in some training is mainly initiated by extension centers not by active approach of the farmers.

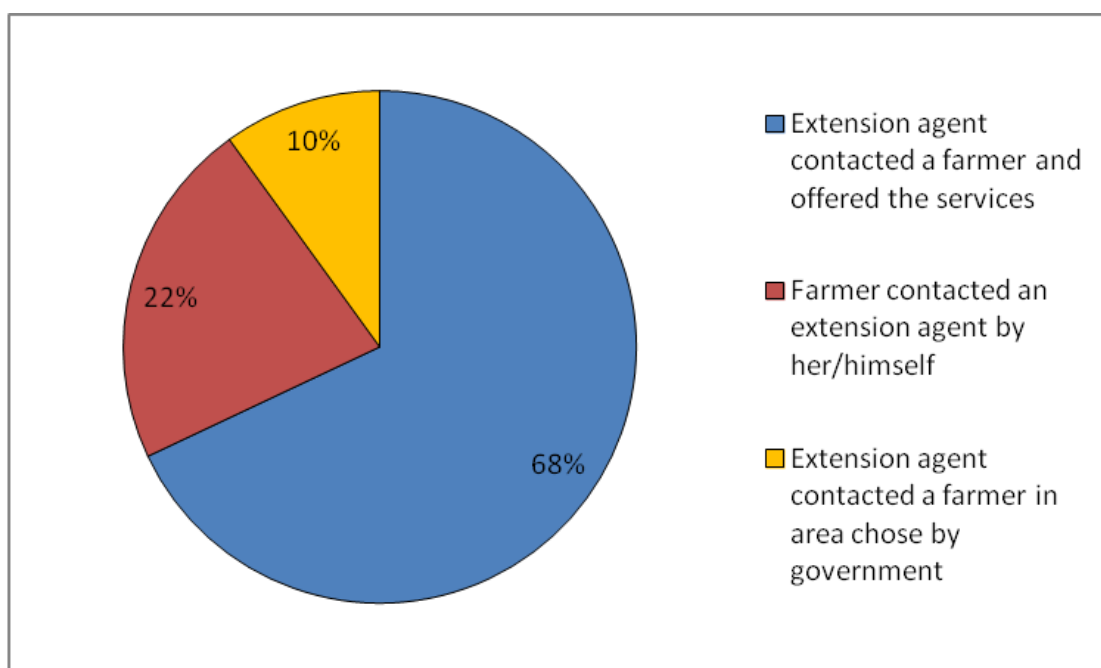


Figure 10. Beginning of cooperation between farmer and extension program (N=31)

### 5.2.1 The time and contribution of conducted extension trainings

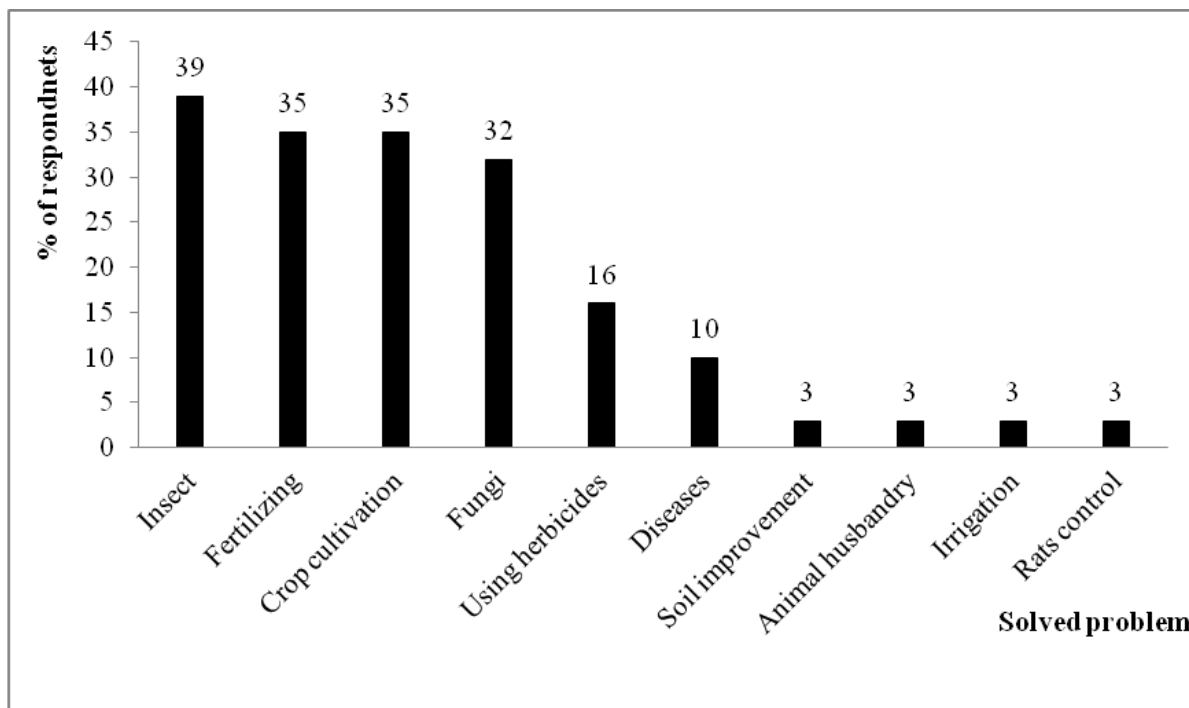
The survey was also focused on time period when respondents had their last extension training. The most of them had the last agricultural training 10 years ago (32% of

respondents). 26% of respondents have experience with extension services even 30 years old. The training which was held in last 2 years had 10% of respondents. Most of the respondents do not have recent experience with learning new knowledge. Markedly high concentration of respondents' experiences with extension trainings in time periods before 10 and 30 years can be explained by two important events in Indonesian extension services history. Herianto *et al.* (2010) describes in his study the implementation of Training and Visit (T&V) system as a part of green revolution during 1970s in Indonesia. After T&V was implemented there was significant intensification of extension trainings among Indonesian farmers leading to self-sufficiency in rice production in 1984. This event clarifies the 26% participation of respondents in extension trainings 30 year ago. Second important event, which falls within the period 10 years ago, was decentralization of extension system based on Indonesian Law No 22/1999. After the decentralization of extension services there were many projects on enhancing farmers to participate in extension activities. This can be explanation for 32% participation of respondents 10 years ago. Table 4 shows the most common time period in which respondents had their last extension training.

**Table 4. Time period when farmer had his/her last extension training (N=31)**

<b>Time period</b>	<b>% of respondents</b>
In last 2 years	10
In last 5 years	19
In last 10 years	32
In last 20 years	13
In last 30 years	26

Farmers improve their agricultural skills through extension trainings. The result is that 39% of respondents improved their knowledge about crop protection against insect. Figure 11 shows problems that respondents were able to solve, after their participation in agricultural extension training.



**Figure 11. Problems which extension agent helped to farmers to solve (N=31)**

### 5.2.2 Farmers' satisfaction with extension trainings

Positive satisfaction with training of extension services had 87% of respondents who mostly (44% of respondents) appreciate increase of production quality after cooperation with extension agent. 29% of respondents consider the extension agent's advice as useful information in general. In Table 5 we can in detail acquaint with the overview of respondents' appreciations of extension services' activities and improvements after implementation of extension agents' advices in practice.

**Table 5. Respondents' appreciations of extension services' activities (N=27)**

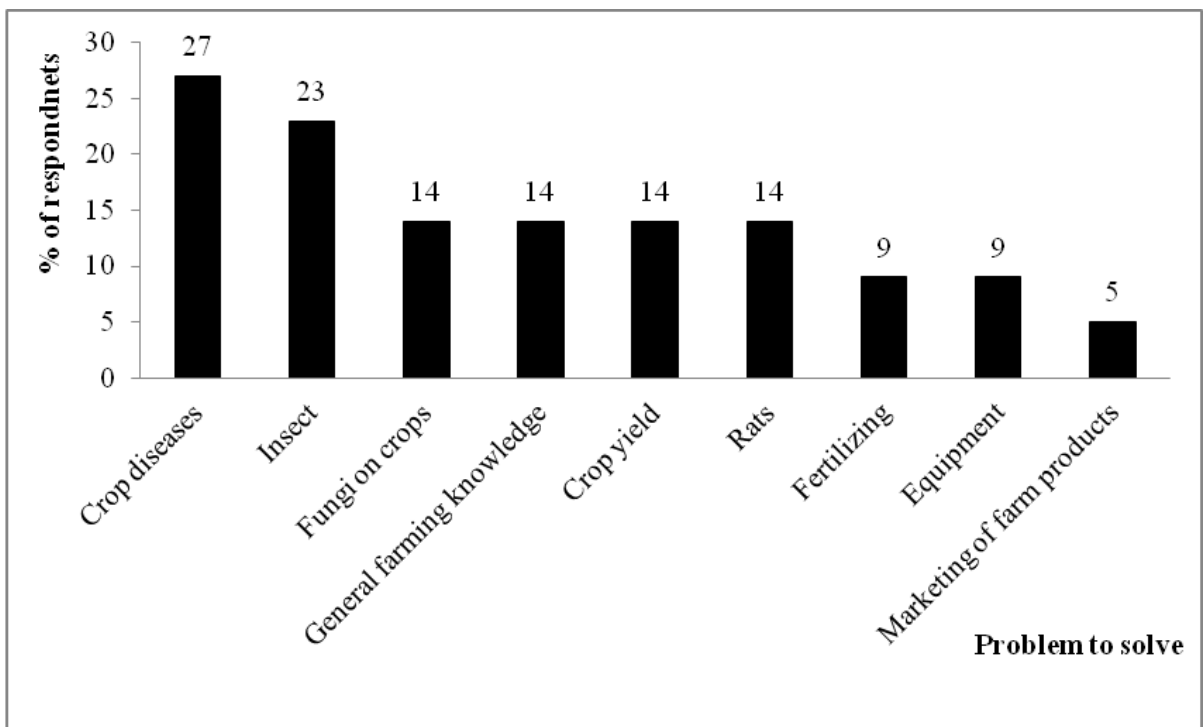
Appreciation	% of respondents
↗ quality of production*	44
Useful information	29
↗ farming knowledge**	18
Material subsidies	15
Good teacher	4

Note: \* ↗ is a symbol that signifies an increase in the production quality, \*\* ↗ is a symbol that signifies gaining more agricultural knowledge.

13% of respondents feel disappointment of extension agent advice. Most of the disappointed farmers (75% of respondents) consider that implementation of recommended

technique has no improving impact on their farming in practice and 25% of respondents think that the presented information was incomplete.

The survey was also focused on farmers' interest in further cooperation with extension agent. 71% of respondents stated that they would like to cooperate with extension agent in future as well. The most common problem within the respondents' farming are crop diseases (27% of respondents) mainly coffee diseases. 5% of respondents would like to improve their marketing skills to do better promotion of their farming products. In Figure 12 there are shown other challenges that respondents want to overcome in cooperation with an extension agent. The high percentage of respondents with an interest in further cooperation with extension services could be affected by high level of positive satisfaction with the extension services' activities. This positive experience supports farmers' interest in further agricultural development and farming improvement.



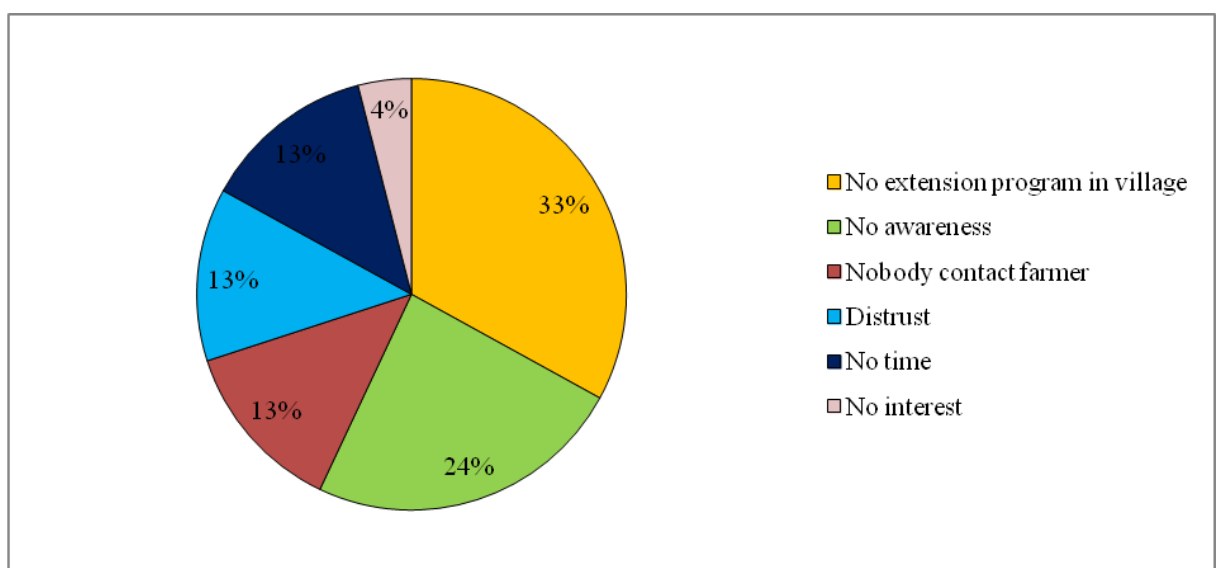
**Figure 12. Problems that farmers would like to solve in future in cooperation with extension agent (N=31)**

### **5.3 Farmers who have not participated in extension programs**

Farmers who have not participated in any extension program constitute 50% (45) of respondents. The survey discovered that these farmers have never been a part of any training



mainly because of absence of extension program in their village (33% of respondents). The second most common reason (24% of respondents) was no respondents' awareness about extension services and activities that extension services offer at all. The study conducted at the same issue was carried out by Davis *et al.* (2010) who analyzed the extension services in east Africa. He discovered that 7% of respondents had not joined any extension training because of the absence of extension program in their village. We can see that there is quite big percentage difference between east African region and North Sumatra province in the extension services coverage. Figure 13 shows other reasons why respondents have not participated in any extension training.



**Figure 13. Reasons why respondents never be a part of extension program (N=45)**

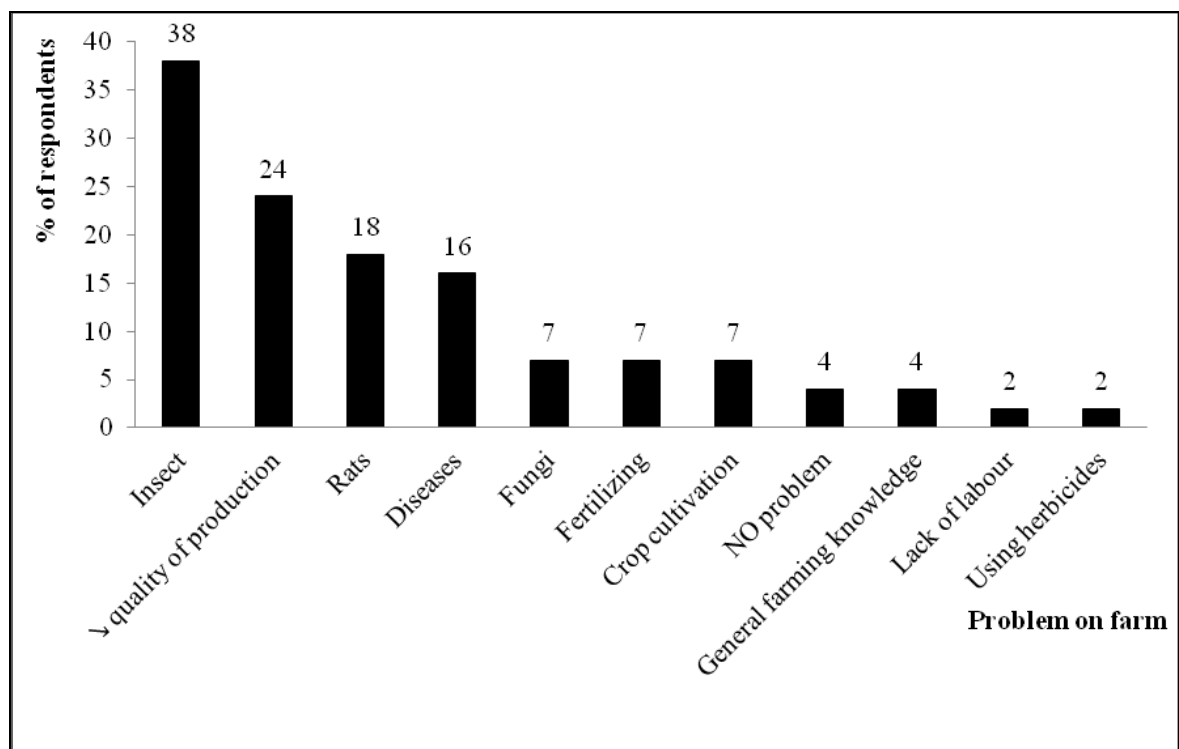
Despite of the fact that the farmers have never been a part of extension program the most of them (71% of respondents) expressed the interest in extension services activities. It means that farmers are largely willing to participate in some extension program.

### **5.3.1 The main problems within the respondents' farming**

The survey discovered that insect is the main problem on respondent's farms. 38% of respondents answered that insect is current issue on their farm. The most insects affected crop is coffee and then chili and rice. Low production quality makes troubles to 24% of respondents. The most common crop that quality is inadequate according to respondents is

coffee. We can see the possible connection between low quality of coffee production and insect problems within the coffee cultivation.

In Figure 14 there is shown succession of problems on respondents' farms which they would like to solve. Over 24% of respondents stated that they have more than one problem on their farm. For comparison with farmers with some experiences with extension services, the share of respondents with more than one problem on their farm is 27%. There is no numeric difference in amount of farming problems between farmers with experiences and farmers without experiences with extension services. Babe *et al.* (2012) analyzed farmers' information needs in India and discovered that 95% of respondents need information about diseases of rice. The survey in North Sumatra province discovered that coffee is the crop mostly affected by diseases and this problem has 16% of farmers without extension experiences and 27% of farmers with extension experience. Possible explanation, why more farmers with extension experiences stated that they would like to cooperate with extension agent on coffee diseases, is that they have a greater awareness of the symptoms of certain diseases due to previous extension training than farmers without extension experiences.



**Figure 14. Respondent's problems on farm that they would like to solve (N=45)**

### 5.3.2 Farmers' opinions about competencies of extension agents

A part of the questionnaire was focused on farmer's opinion on ability of extension agent to help them with any agricultural problem. Their opinions are based on the conception of work of extension agent rather than on their actual experiences with them. It means that their opinions are based on experiences interpreted by other farmers with extension services experiences or based on other sources such as mass media. 71% of respondents believe in competence of extension agent and 29% of respondents do not trust them. In Figure 15 there are shown respondents' opinions on work of extension agent. The biggest part of respondents (27% of respondents) believe that extension agents are adequately experienced to advise farmers. 18% of respondents think that extension agents use proper way of advising and the same share of respondents (18% of respondents) think that extension agents are not real experts and are not enough educated to teach farmers. Otherwise 6% of respondents are of the opinion that extension agents are well educated.

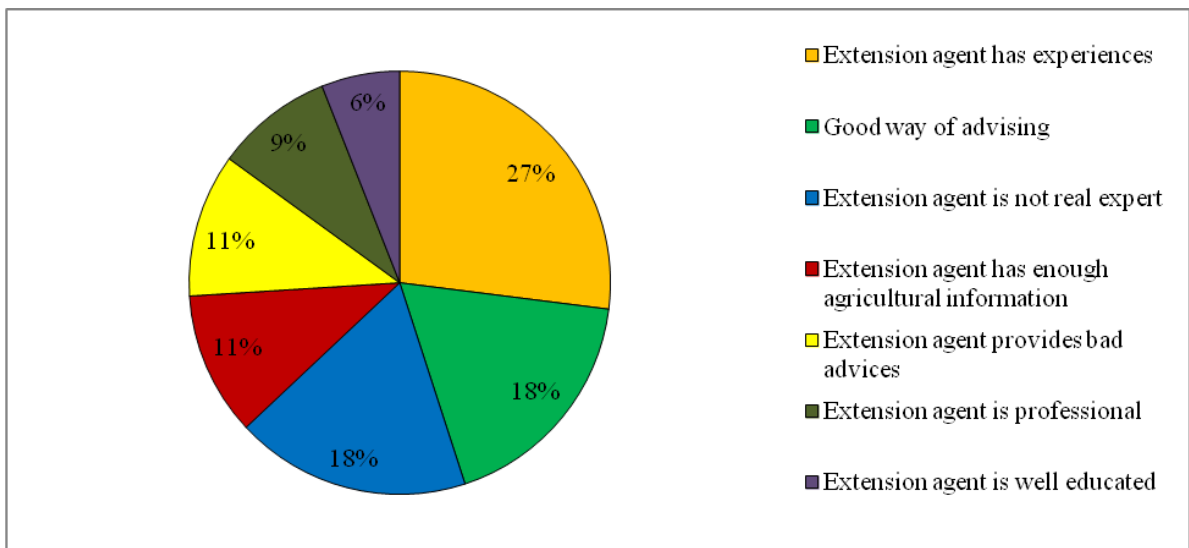


Figure 15. Respondent's opinions on work of extension agents (N=45)

## 6 Conclusion and Recommendations

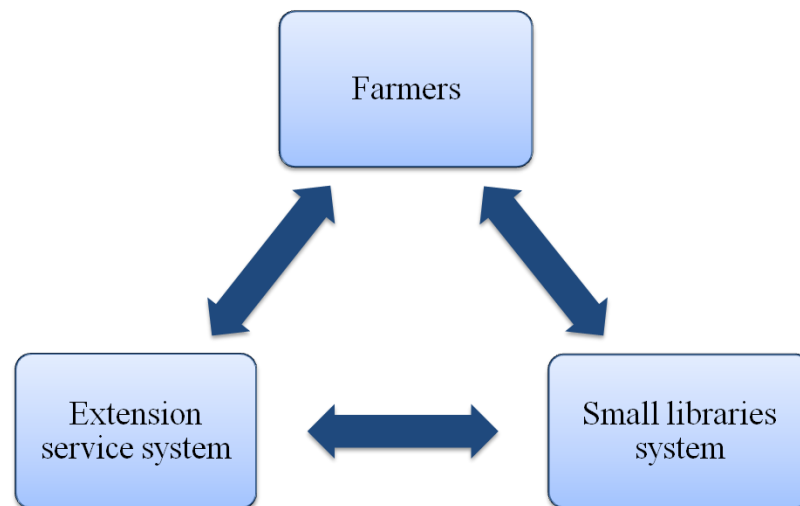
The farmers in Tapanuli Utara and Simalungun regencies have almost the same level of the experiences with extension services provided in these areas. The share of the farmers who have participated in extension trainings and the farmers who have not participated in any extension training is 41% to 59%. We can confirm, on the base of the results, that there is no significant difference between Tapanuli Utara and Simalungun regencies in provided extension services as perceived by respondents of the survey. It means that the formulation of the first hypothesis can be proved. Regarding a degree of influence of age on farmers' willingness to learn new knowledge we have to say that survey has not proved any relevant relation between these two variables. The farmers' willingness to learn new knowledge is 6% affected by age of farmers in Tapanuli Utara and Simalungun regencies. This result is unexpected and disproves the second hypothesis set up in the objectives of this thesis

Regarding the extent of extension services, the situation is not ideal, in spite of the fact that almost half of surveyed respondents have experiences with agriculture extension. The main argument for this statement is the fact that, from the farmers who do not have any experiences with extension training, 33% of respondents have worse access to extension program due to its absence in their village and 24% of respondents even do not know about a possibility to be involved in extension trainings. This finding does not correspond with the known fact that Indonesian government tries to support the agriculture also through strengthening the extension services as a tool of informal education of farmers leading to agricultural development.

The quality of extension services seems to be at a good level. The satisfaction with the agricultural extension in Tapanuli Utara and Simalungun regencies expressed 87% of surveyed farmers and 71% of these respondents intend to cooperate with an extension agent in the future as well. The group of farmers with no agricultural extension experiences is from 71% convinces that an extension agent would be able to provide them a solution of an agricultural problem in a case they would need. This percentage shows that the big among of surveyed farmers consider the agriculture extension in Tapanuli Utara and Simalungun regencies as a very good and reliable tool for improvement of their agricultural knowledge and skills.

As a possible solution of insufficient awareness about extension services among the farmers in Tapanuli Utara and Simalungun, the author suggests to develop an educational structure including extension services and extended by a system of small libraries.

These small libraries are relevant source of audio-visual materials with agricultural theme such as follows: (i) farming magazines, (ii) agricultural posters and (iii) radio/television broadcasting. All materials have to be in a format and language easily understandable for farmers. The principle condition for sustainable functioning of these small libraries is community based approach including the recognition of the information needs of the community (Aina, 2006). The similar system used in Africa has the growing importance as a progressive source of agricultural information (Dutta, 2009). Figure 16 shows the scheme of possible educational system consists of primary extension services system, new small libraries system and farmers.



**Figure 16. Scheme of possible education system extended by system of small libraries (Author's compilation based on Aina, 2006)**

The financing of the small libraries could be public (provided by government) or private (provided by local NGO). The best way of financing would be by a community itself in the form of regular contributions as is mentioned also in the study of Feder *et al.*(2010) which describes the levels of community participation in extension services. These libraries should be placed at the locations close to rural people and should properly extend the agricultural

materials provided by extension services. As the best location for a small agricultural library, the author suggests church surroundings. The position of religion is very strong in whole Indonesia. In Tapanuli Utara and Simalungun regencies there are represented mainly Christians and Christianity plays very important role in the life of local people every day. At least once a week, on Sunday, local people go to church. This is the main argument supporting the author's opinion that a location of small libraries should be close to local churches where the majority of community meets regularly. At these places is bigger probability to engage farmers' attention and invite them to learn something new and useful regarding their farming.

Author believes that this system of adult education supported by a propagation of agricultural knowledge through small community libraries would enhance the farmers' ability to obtain desired information and facilitate access of extension services to farmers.

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## 8 Annexes

### Annex I

#### Questionnaire for farmers – English version

##### I. *Personal information.*

1. Name:

2. Age:

3. Sex: a) male b) female

4. Name of the village/town:

5. How many years have you studied?

6. What is the number of members of your household?

7. What is the size of your cultivated field?

##### II. *Questions about experiences with extension services.*

Do/did you use the agricultural extension services?

- Yes – if yes, please skip to section A
- No – if no, please skip to section B

#### SECTION A

1. How did you start to cooperate with the agricultural extension agent?

- a) I contacted the centre of agricultural extension services myself because I needed help with some problem on my farm.
- b) The extension agent contacted me and offered me the agricultural extension services just in case I would be interested in it.
- c) The extension agent contacted me because I live in the area which was chosen by government.

**2. Did you have any extension training...**

- a) in last 2 years?
- b) in last 5 years?
- c) in last 10 years?
- d) in last 20 years?
- e) in last 30 years?

**3. What problem(s) have the extension agent helped you to solve?**

**4. Are you satisfied with these extension services?**

- a) Yes
- b) No

**5. If Yes, what do you appreciate on it?**

**6. If Not, in what part of extension services are you dissatisfied?**

**7. Would you like to cooperate with extension agent on another problem within your farming?**

**SECTION B**

**1. Why have you never been a part of the agricultural extension services?**

**2. Are you interested in agricultural extension services?**

**3. Do you have any problem/deficiency on your farm which you would like to solve?**

**4. Do you believe that the extension agent would be able to help you?**

- a) Yes – then Why?
  
- b) No – then Why?

III. Questions about secondary effect of extension services.

**1. Have you ever obtained the useful information/knowledge/advice from “trained” farmer who was the part of the extension services program?**

- a) Yes
- b) No

**2. If Yes, do you think that it helps you in your farming?**

**3. Evaluate please these sources of agricultural information by the credibility. What source would you consider as trustworthy?**

- 1. extension agent:**      a) Would not consider    b) Might or might not consider  
   c) Definitely consider
- 2. family:**                      a) Would not consider    b) Might or might not consider  
   c) Definitely consider
- 3. friend:**                      a) Would not consider    b) Might or might not consider  
   c) Definitely consider
- 4. leaflets:**                      a) Would not consider    b) Might or might not consider  
   c) Definitely consider
- 5. mass media:**                      a) Would not consider    b) Might or might not consider  
   c) Definitely consider
- 6. paper publication:**                      a) Would not consider    b) Might or might not consider  
   c) Definitely consider
- 7. “trained” farmer:**                      a) Would not consider    b) Might or might not consider  
   c) Definitely consider
- 8. village leader:**                      a) Would not consider    b) Might or might not consider  
   c) Definitely consider

IV. Additional questions

**1. What off-farm activities do you practice?**

**2. What is the share of your off-farm activities on your family income?**

**3. What are the current problems of agricultural development which farmers are facing to? Could you, please, sort them by importance?**

- a) Lack of financial sources

- b) Lack of information and new knowledge in agriculture
- c) Illiteracy of farmers
- d) Unwillingness to adopt new technologies/processes
- e) Poor quality of inputs (equipment, seeds, fertilizers,...)
- f) Inadequate government support
- g) Poor weather and climate conditions
- h) Poor access to water
- i) Poor access to a market
- j) Political situation in the country
- k) Others:

**4. Do you have any idea how to solve these problems?**

**5. Do you consider yourself to be a poor farmer?**

- a) No

Yes – than Why?

## Annex II

### Questionnaire for farmers – Indonesian version

#### *I. Informasi Pribadi*

1. Nama :
2. Umur :
3. Jenis kelamin : a) Laki-laki b) Perempuan
4. Nama desa :
5. Pendidikan terakhir :
6. Jumlah anggota keluarga yang tinggal serumah :
  - a. Dewasa : ..... orang
  - b. Anak-anak : ..... orang
7. Luas lahan pertanian :

#### *II. Pertanyaan tentang pengalaman dengan penyuluhan pertanian*

**Apakah kamu pernah mengikuti layanan Penyuluhan Pertanian?**

- a. Ya – Jika ya, anda dapat melanjutkan **ke Bagian A**
- b. Tidak – Jika tidak, anda dapat melanjutkan **ke Bagian B**

#### **Bagian A**

1. **Bagaimana kamu mulai bekerja sama dengan agen Penyuluhan Pertanian?**
  - a. Saya menghubungi Unit Penyuluhan Pertanian (UPT) karena saya membutuhkan bantuan terhadap masalah yang saya hadapi dalam pertanian.
  - b. Penyuluh Pertanian menghubungi saya dan menawarkan layanan Penyuluhan Pertanian
  - c. Penyuluh Pertanian menghubungi saya karena saya tinggal di daerah binaan pemerintah
2. **Apakah Anda memiliki pelatihan penyuluh pertanian**
  - a. dalam 2 tahun terakhir?
  - b. dalam 5 tahun terakhir?
  - c. dalam 10 tahun terakhir?
  - d. dalam 20 tahun terakhir?
  - e. dalam 30 tahun terakhir?
3. **Masalah apa saja yang dapat diselesaikan dengan bantuan Penyuluhan Pertanian?**
4. **Apakah anda puas dengan Penyuluhan Pertanian?**
  - a. Ya
  - b. Tidak

5. **Jika ya, adakah sesuatu yang berharga yang anda dapatkan dari Penyuluhan Pertanian?**
6. **Jika tidak, bagian manakah dari Penyuluhan Pertanian yang anda tidak puas?**

### **Bagian B**

1. **Mengapa anda tidak pernah mengikuti layanan Penyuluhan Pertanian?**
2. **Apakah anda tertarik untuk mengikuti layanan Penyuluhan Pertanian?**
3. **Apakah anda memiliki masalah pada pertanian anda yang ingin diselesaikan?**
4. **Apakah anda yakin bahwa Penyuluh Pertanian dapat membantu anda?**
  - a. Ya -- Mengapa?
  - b. Tidak – Mengapa?

### **III. Pertanyaan tambahan mengenai Penyuluhan Pertanian**

1. **Pernahkah anda mendapatkan informasi/ilmu/nasehat yang berguna dari “petani terlatih” yang pernah mengikuti program Penyuluhan Pertanian?**
  - a. Ya
  - b. Tidak
2. **Jika ya, apakah hal tersebut membantu?**
3. **Apakah anda yakin kepada sumber informasi Petanian dibawah ini?**

a. Penyuluhan Pertanian	:	a) Yakin	b) Biasa saja	c) Tidak yakin
b. Keluarga	:	a) Yakin	b) Biasa saja	c) Tidak yakin
c. Teman	:	a) Yakin	b) Biasa saja	c) Tidak yakin
d. Brosur	:	a) Yakin	b) Biasa saja	c) Tidak yakin
e. Media massa	:	a) Yakin	b) Biasa saja	c) Tidak yakin
f. Buku pertanian	:	a) Yakin	b) Biasa saja	c) Tidak yakin
g. Petani terlatih	:	a) Yakin	b) Biasa saja	c) Tidak yakin
h. Kepala desa	:	a) Yakin	b) Biasa saja	c) Tidak yakin

### **IV. Pertanyaan Tambahan**



- 1. Apakah kegiatan anda di luar kegiatan bertani?**
- 2. Berapa persen pendapatan anda dari kegiatan di luar kegiatan bertani?**
- 3. Apakah masalah pengembangan pertanian yang anda hadapi saat ini? (anda dapat memilih lebih dari satu pilihan)**
  - a. Kurang modal
  - b. Kurang informasi dan pengetahuan dalam pertanian
  - c. Buta huruf
  - d. Tidak terbuka untuk menerima teknologi baru
  - e. Kualitas yang tidak baik untuk input (peralatan pertanian, bibit, pupuk, dll)
  - f. Kurangnya dukungan pemerintah
  - g. Kondisi cuaca dan iklim yang buruk
  - h. Tidak ada akses untuk air
  - i. Tidak ada akses ke pasar
  - j. Situasi politik dalam negeri (korupsi dalam bidang pertanian)
  - k. Lainnya : .....
- 4. Bagaimana pendapat anda untuk mengatasi masalah tersebut (berdasarkan pertanyaan nomor 3)?**
- 5. Apakah anda menganggap diri anda sebagai petani miskin?**
  - a. Tidak

Ya – Mengapa?

## ANNEX III

### Photographic documentation of the survey



Photo 1. A completing the questionnaire with farmer and his family (Source: Eva Syrovátková, 2012)



Photo 2. An observation of respondent's field (Source: Eva Syrovátková, 2012)