Graduate School of Development Studies

The Returns to Schooling for Foodcrop-Farming Households : A Study on Lampung, Indonesia

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List of Acronyms

SUSENAS	:	Survey Sosial Ekonomi Nasional (Natinal Socio-economic Survey)
Std. Dev.	:	Standard Deviation
Hh	:	Household
Educ	:	Education

Abstract

Education through schooling is recently becoming an essential element in order to achieve higher quality of human capital especially on many developing countries.

Since many developing countries' economy is still based on the agricultural sector especially the sub-sector which producing food, the level of productivity in food production has to be increasing over time to supply the growing population. In this framework, the labour component in the production process plays a bigger role besides the physical capital since the land component is remained constant. This is the starting point from where the education policy for the farmer as the labour in farming production process has to be well-planned and managed. Furthermore, the better level of farmer education will support them in achieving a better income.

Relevance to Development Studies

[First para. no indentation]

Keywords

Chapter 1
Introduction

In many developing countries agriculture remains an important economic sector for most of people's livelihood because of its natural capacity as food and income provider. From the perspective of output shares and labour occupants, agriculture activity has been relatively the biggest among all economic sectors. Besides as natural provider for food and income to feed the rapidly growing population, agriculture outputs are also important as the supporting elements for the other economic sectors, industry and trading. For example, Karl Gunnar Myrdal (1898-1987) states "It is in the agricultural sector that the battle for long-term economic development will be won or lost"(Todaro 2000: 363).

On many developing countries the most part of populations work in agriculture sector. Unfortunately, since most of these developing countries are relatively low-income countries and suffer from high incidence of poverty then the agriculture-based economies have often been assumed to have close relationship with poor people (Schultz 1964b).

From the economic development perspective agriculture sector is still viewed as the resource for growth on most of not only developing but also developed countries' economy. In many countries, this sector has achieved significant advances during the second half of the twentieth century in order to enhance its capacity as the sector from which the resources come to support the development in subsequent sectors. Early work by Lewis (1954), Rostow (1956), and Ranis and Fei (1961) argued that the growth in agriculture sector capacity is an essential condition for developing the whole economy in most countries in the world (Ruttan 2002,Schultz 1964a). Their arguments could be acceptable when we observe closer that recently the earlier developed countries like USA, Canada, The United Kingdom, The Netherlands, French, Spain, and New Zealand and the new industrial countries like Japan, Korea, and Taiwan have achieved their industrial era after successfully transforming their agriculture to become a highly productive and efficient sector. Indeed, the transition from a natural-resource-based to a modern-sector-based economy,

however, takes time but the benefits from the successful process has been proven by those developed countries that during the last 40 years of the 20th century they have been able to boost their economies and greatly upgrade their people's standard of living (Francks et al. 1999,Ruttan 2002).

A number of factors have determined the successful development of the agriculture sector in the developed countries mentioned above. Advanced science involvement, sophisticated machineries, continuity of water supply and well-managed irrigation infrastructures, improved techniques in cultivation and production process, efficient utilization of inputs, institutional supports, and the increasing tendency of product demand (Mundlak 2005,Ruttan 2002,Schultz 1981). The academic and research institutions have also been giving important contributions to the enhancement in applied agricultural methods. Beside these physical and scientific factors, human capital in terms of the skill and knowledge of farmers who deal with agriculture activities also plays significant role in developing the agriculture sector. The more skillful and educated the farmers, the more developed the agriculture sector of a country is (Rozelle and Swinnen 2004,Schultz 1964b, 1972).

Unfortunately, those improvements achieved by developed countries were not easily directly transferable to be implemented in developing countries where numbers of differences and obstacles exist. Different climate and natural resource condition, lack of agricultural infrastructure, high inequality in land distribution, and difficulties in accessing the market for agriculture commodities are some obstacles found in most developing countries. Besides, even though they still remain to be rational allocators for the resources they owned, most farmers in traditional agrarian societies are poor, low-educated, and posses limited technical skill and economic opportunities for adjusting their agricultural capabilities in response to changes. The condition of such farmers may be described as "poor but efficient" (Lorand 1965,Schultz 1950, 1964b: 145-147), and this kind of human capital weakness remains a basic obstacles for developing countries to reach a competitive agriculture-based economy which can only be achieved by a well-educated population through higher education and dynamic Research and Development (R&D) (Macerinskiene and Vaiksnoraite 2006).

The link between education and economic development has been explored by several authors. For example, Schultz stated that "Education accounts for much of the improvement in population quality…Schooling is more than a consumption activity, in the sense that it is not undertaken solely to obtain satisfactions or utility while attending school…the public and private costs of schooling are incurred deliberately to acquire a productive stock, embodied in human beings, that provides future services. These services consist of future earnings, future ability in self-employment and household activity, and future consumer satisfactions" (1981: 14, 31). More than two decades later, supporting Schultz, Macerinskiene argues that "through education the individual acquires competences and skills whose essential characteristic is the ability to be transferable and negotiable on the employment market and which also have a transactional value and a direst bearing on individuals' average income throughout his live. The average earnings of individuals are closely related to their educational attainment." (2006: 83). Within the two points of time, through numbers of studies and observations in many countries worldwide, more and more economists have come up with results from fact which in line with the earlier two statements.

1.1   Background of the study

By the ongoing decentralization era in Indonesia, some portions of governmental responsibilities for society development have been transferred from the central to the local governments, either at provincial, district/regency and city/municipality levels. For most of local governments, improving the local society's economy and welfare have become the priority besides the infrastructure development. This has become the background of this study, beside the recent social and economic condition in Lampung which will be described below.

Lampung is one out of 33 provinces in Indonesia recently, on the southest part of Sumatera island. Until 1993 Lampung Province consisted of five sub-provincial regions; one city/municipality, Bandar Lampung which is the capital, and four districts/regencies: Lampung Utara (North Lampung), Lampung Tengah (Central Lampung), Lampung Selatan (South Lampung), and Lampung

Barat (West Lampung). As the increasing motivation of the central government to distribute the development programme more onto the remote areas, in 1995 two regencies were split-up into several smaller administrative areas. Former district of Lampung Selatan was split-up into districts of Tanggamus and Lampung Selatan; and former district of Lampung Utara into Tulangbawang and Lampung Utara. Afterwards in 1999 as the decentralization period started, the former district of Lampung Tengah was divided into Metro municipality, Lampung Timur regency and Lampung Tengah regency; and the former district of Lampung Utara was divided into Way Kanan regency and Lampung Utara regency. By the end of 1999, there have been ten local governments in Lampung Province.

1.2   Description of the research problem

The local economic structure of Lampung is dominated by agriculture sector which, during at least the last 11 years, has been the sector with the largest share in local output. On average, more than 34% share of the local output, which presented in the Gross Regional Domestic Product (GRDP) of Lampung Province, comes from the contribution of this sector, and it remains relatively stable during the 13 years presented. Furthermore, compared to the other eight sectors in GRDP, the highest proportion of people working in and obtaining benefit from the agriculture sector shows that the sector is still considered as the main source of livelihood.

Table 1
Total and Selected Sectoral Gross Regional Domestic Product (GRDP), Lampung
Province 1993-2005

Year	GRDP Total	Sectoral Shares in GRDP (%)		
		Agriculture	Industry	Service
1993	5,410,530	-	-	-
1994	5,796,541	34.50	14.51	11.01
1995	6,404,819	35.51	14.32	10.16
1996	6,914,211	34.02	14.52	9.63
1997	7,201,338	31.29	15.16	9.34
1998	6,701,179	35.87	16.32	9.28
1999	6,938,425	37.67	13.82	9.02
2000	7,174,254	36.56	13.69	8.91
2001	7,433,265	36.44	13.68	9.05
2002	7,817,341	34.71	13.31	8.92
2003	8,263,918	34.18	13.10	-
2004	8,682,860	34.35	13.05	-
2005	9,009,541	34.40	13.14	-

Source : BPS-Statistics, Lampung

Description : Using Constant Price Without Oil, Base Year 1993

Table 2
Population and Labour Force, Lampung Province 1993-2006

Year	Population	Labour Force				
		Total	Rural		Urban	
			Share from Total (%)	Share from Popul.(%)	Share from Total (%)	Share from Popul.(%)
1993	6,159,766	-		-		
1994	6,443,261	-		-		
1995	6,573,066	-		-		
1996	6,201,568	3,006,546	85.85	41.62	14.15	6.86
1997	6,869,065	2,949,691	84.81	36.42	15.19	6.52
1998	7,256,690	3,235,185	83.66	37.30	16.34	7.29
1999	7,231,814	3,187,079	83.34	36.73	16.66	7.34
2000	6,932,022	3,196,246	81.25	37.46	18.75	8.65
2001	6,944,976	3,212,575	80.56	37.27	19.44	8.99
2002	7,150,130	3,308,558	79.95	36.99	20.05	9.28
2003	6,730,994	3,361,020	79.49	39.69	20.51	10.24
2004	7,010,684	3,381,816	79.00	38.11	21.00	10.13
2005	7,401,100	3,343,115	79.00	35.69	21.00	9.49
2006	7,211,586	-		-		

Source : BPS-Statistics, Lampung

On the other aspect of development, the human development in Lampung Province has been left behind and remained unchanged during the last 6 or 7 years. Since 1999 when the Human Development Index (HDI) indicator was first published by The National Statistics Board of Indonesia

(Badan Pusat Statistik - BPS Indonesia), Lampung has been positioned on the lower rank compared to either the other Indonesian provinces or even the 10 provinces in Sumatera Island. During the last six years, Lampung could not even compete with the new-formed provinces (Bangka Belitung Province – No. 9; and Kepulauan Riau Province – No. 10) in improving its' human resources so that Lampung's position was degrading. The table below shows the national ranking position for provinces in Sumatera Island out of 33 provinces in Indonesia :

Table 3
Human Development Index (HDI) on Provinces in Sumatera Island, Indonesia

No.	Kode	Provinsi	Indeks Pembangunan Manusia (IPM)				Peringkat			
No.	Code	Province	Human Devel. Index (HDI)				Rank			
			1999	2002	2004	2005	1999	2002	2004	2005
1	11	Nangroe Aceh Darussalam (NAD)	65.3	66.0	68.7	69.0	12	15	18	18
2	12	Sumatera Utara	66.6	68.8	71.4	72.0	8	7	7	8
3	13	Sumatera Barat	65.8	67.5	70.5	71.2	9	8	9	9
4	14	Riau	67.3	69.1	72.2	73.6	4	5	5	3
5	15	Jambi	65.4	67.1	70.1	71.0	11	10	10	11
6	16	Sumatera Selatan	63.9	66.0	69.6	70.2	16	16	13	13
7	17	Bengkulu	64.8	66.2	69.9	71.1	13	14	11	10
8	18	Lampung	63.0	65.8	68.4	68.8	18	18	19	19
9	19	Bangka Belitung		65.4	69.6	70.7		20	12	12
10	20	Kepulauan Riau			70.8	72.2			8	7
		INDONESIA 1)	64.3	65.8	68.7	69.6				

Sumber/source :

Statistics – BPS Indonesia, April 2008 (http://www.bps.go.id/sector/ipm/table1.shtml)

Keterangan   : Untuk data tahun 2002, Propinsi Nangroe Aceh Darussalam, Maluku, Maluku Utara, dan Papua menggunakan data 2003 (AMH, MYS)

Note   : For year 2002, the data of NAD, Maluku, Maluku Utara, and Papua using the 2003 data (AMH, MYS)

1) Angka Indonesia merupakan rata-rata tertimbang dari angka propinsi dengan penduduk sebagai penimbang
Indonesian figures is weighted average from provinces figures with population as the weigh

The poor achievement in human development was in line with number of poor people in Lampung in the corresponding period. The number of poor people has been relatively unchanged during the period of 1996-2006 where the decreasing percentages were mostly caused by the increasing population.

Table 4
Poverty Incidence in Lampung Province

Year	Population	Poor People	
		Amount	Share from Popul.(%)
1996	6,201,568	1,712,100	27.61
1997	6,869,065		-
1998	7,256,690		-
1999	7,231,814	2,037,100	28.17
2000	6,932,022	1,776,166	25.62
2001	6,944,976		-
2002	7,150,130	1,650,700	23.09
2003	6,730,994	1,567,900	23.29
2004	7,010,684	1,561,800	22.28
2005	7,401,100		-
2006	7,211,586	1,751,770	24.29

Source : BPS-Statistics, Lampung

The picture of Lampung economic and social condition presented above showed some description of problems which recently happen. Started from those explanation we are now observing deeper to be more focusing on the education aspect of farmer households as the essential agent in agriculture sector.

1.3 Study Objectives and Research Questions

The purpose of this study is to analyze the influence of schooling on farmers' income. Specifically, the paper deals with two issues as its research questions:

1. Based on a household level microeconomic analysis, how does the relationship between the highest level of schooling of food crop farming household head and farmer income from crop and non-crop activities ?

2. How do schooling achievement of household member of farmer household contribute to household income ?

There are two main reasons which motivate the topic of this paper. First, there is a common perception among local leaders and development policymakers that the development of agriculture and industry sectors may be the most important part which give the biggest influences to the enhancement of local economy. On the other way around, it is often suggested that weakness

in agricultural and industrial sectors imply weakness in major economic activities in local level. (etc…)

Second, there are concerns about the improvement of human capital aspect in order to achieve better quality of human resource and, hence, open wider opportunity for the people to obtain higher income. The effort to reach this objective is by providing them higher and better education through schooling. In labour market, since the competition has become harder and tighter the better, highly specialized skill and knowledge is a requirement to increase one's productivity, get a well-paid job, and achieve a better standard of living. In its turn, this pattern of productivity adjustment will much assist the government poverty reduction programme by cutting-down the amount of poor people.

1.4   Study scope and limitations

Since some other factors out of schooling also affect the farmer households income, the limitation of this study could be :

- Since income from crop farming is highly affected by the fluctuative unpredictable market prices of the harvested commodity, the estimated parameters which determining income might not be precisely measured.

- This research is based on the Indonesia National Social Economic Survey (SUSENAS) on year 2004 which estimated parameters results could be different from the same research using different based year.

- Since the Indonesia National Social Economic Survey (SUSENAS) observes lot of household elements on individual, detailed items in its questionnaire there is a possibility that one or more elements asked in the questionnaire which could affect either schooling achievement or income were not included in this research which furthermore could affect the final result.

1.5   Research methodology

This research mainly explores the descriptive analysis in observing the relationship between schooling and farmer household income from crop and

non-crop activities in agriculture sector. A number of explanations about local farming activities will be presented to show the local agriculture realities and give some more realistic pictures related to interaction of observed variables. Literature-based explanations, documentation and evidence from other researches, and theoretical support about the benefit of schooling on developing society's welfare will also be presented in this paper.

To support the descriptive analysis, a simple regression analysis using Ordinary Least Square (OLS) method will also be conducted in this paper. This means to see the correlation between schooling and farmer household income from crop and non-crop activities. The simple statistical model developed for this analysis can be presented as :

$$Ln\ Y = a + b.\ X_1 + c.\ X_2 + d.\ X_3 + e.\ X_4 + f.\ X_5 + g.\ X_6 \ .$$

Where,

Y	=	annual crop income, or annual non-crop income, or annual total income
X_1	=	the highest level of schooling of household head
X_2	=	the highest level of schooling of household member
X_3	=	number of household member
X_4	=	size of harvested farmland on each farming season in one year (in hectare), for crop income and total income estimation
X_5	=	sales option in selling the harvested crop on each farming season, for crop income estimation
X_6	=	region difference
a	=	constant parameter
b, c, d, e, f, g	=	correlation parameters

This research exploits the primary data on household level based on the Indonesia Social Economic Survey (SUSENAS) 2004 collected by The Central Agency of Statistics – BPS Indonesia.

1.6 Description of related study and literatures

In terms of the relation between schooling and farmers income, a similar research was done by J. Edward Taylor and Antonio Yunez-Naude which analyzed the return from schooling in diversified rural economy using surveys on randomly selected households in four municipalities of Mexican states. The surveys were conducted from 1993 until 1996 with 391 household samples consisted of 2,986 household members. In the analysis, they included some other variables like the case of migration, remittances, experience of household head, the effect of state-location differences, value of livestock herd, and so on which may also affected the Mexican farmers income. From the research, they found the facts that schooling brings positive significant returns to rural households in Mexico as they stated in the conclusion "Households reap a total-income return of nearly 10% per year of household head's schooling and 5.5% per year of average schooling of other family members. Schooling significantly links rural households to new income sources, including local wage work and migration. It is also associated with a shift out of traditional, staple-crop production, where the returns from schooling, although positive, are low relative to cash-crop production and wage work" (Taylor and Yunez-Naude 2000: 296).

Focusing on general picture of schooling on Indonesia, Fasli Jalal and Nina Sardjunani mentioned the schooling discrepancy between urban and rural areas in national level which indicated from the literacy rate of the poorest group in each population aged 15-24 years. In 2002, the literacy rate in urban area was 97.9% while in rural area was 96.3%. The difference among provinces was even higher as what found in 2003, ranging from 80.3% in urban areas and 66.8% in rural areas. During 1980s in rural areas where education facilities were still relatively rare, the primary school enrolment rate was very low while the primary school drop-out rate was very high (Jalal and Sardjunani 2005: 7, 10). Two decades later, this may be the cause for the older population which most of them are farmers and remain reside in rural areas to be poor in skill and knowledge as well as low in productivity and standard of living. Another study conducted by Daniel Suryadarma, Asep Suryahadi, and Sudarno Sumarto of SMERU Research Institute, supporting the description Jalal and Sardjunani

presented earlier, gave a more specific view about schooling on junior secondary and primary levels.

As a complementary picture, another aspect of education in Indonesian was presented in Arjun S. Bedi and Ashish Garg (2000) who once observed the effectiveness of private versus public schools. They used the 1993 Indonesian Family Life Survey (IFLS) household data which contained 7,200 households conducted in 13 provinces covering 83% of national population. Some important points from their research are among other things 1) in Indonesia most of schools are publicly provided and financed; 2) the Indonesian educational system which is divided into primary (6 years), secondary (3 years), and higher (3 years) schooling; and 3) the use of labour market earnings as the measurement of school effectiveness. However, since there have been some adjustment in the Indonesian education system after 1993, one or more descriptions from Bedi and Garg's publication which are still recently relevant or valid will also be presented in this paper.

Chapter 2
Theoretical Framework

2.1   The Concepts of Human Capital and Schooling

Development is dealing with the improvement of people's welfare as the central focus. However, the people should be put in the position as not only the objective of the development process but also the mean by which the development goals can be achieved. Based on this school of thought, the improvement of people's skill and knowledge to be utilized and exploited effectively as participating agents in development process has been considered as one of important factors which leads to a better welfare of the society as a whole (Ray 1998,Todaro 1997).

Since Adam Smith introduced the modern economic concept within the frame of mercantilism more than 200 years ago, he had mentioned the importance of human skills and knowledge which accumulated through learning and education as a valuable capital in development process particularly in economic activities. What he formerly stated about so-called human resources has been placed as an essential factor which will significantly determine the wealth of society and nation. In his initial concept of human resources Smith had also described several more specific components which were dexterity, health, education, duration of human life, and wage differences between skilled and common labour. Later, Alfred Marshall asserted in his work "The Principles of Economics" that "The most valuable of all capital is that invested in human beings" while he associated the investment in human beings with the improvement in production process in terms of effectiveness and efficiency. Marshall also believed that overall effectiveness and efficiency in production processes as a whole will determined the level of wealth of nation (Abdallah 1998: 9-14).

Based on some concepts and analysis used by numbers of economists and researchers, the components which are usually included and mostly considered as human capital are education and health. Education can be seen from years of schooling taken or completed by the productive aged people, illiteracy rates

of society, and level of school enrolment of the schooling age children (aged up to 15 years old) (Schultz 1981)

One of factors which push the development of agriculture sector since the beginning of twentieth century is the high increase in world population due to the ability of this sector to provide commodities which are mainly for food consumption. Based on United Nations report in Ruttan's, compared to 1950 the number of world population could be more than tripled from approximately 2.5 billion to around 9-10 billion in 2050 and this increasing population will occur mainly in developing countries (Ruttan 2002).

Many books and literatures consider agriculture as the traditional sector in a country's economy after in 1954 Arthur Lewis published his beginning observation introducing the term of dual sector economic model which distinguished the economy into the traditional (that is agriculture) and the modern (which is industry and service) sectors. At that time, Lewis was thinking about the economic transformation, which later on also known as structural transformation, a process from traditional/agriculture-based to modern/industry-based economy. In his initial model, Lewis' assumed some characteristics of each sector. The traditional sector were having the excess supply and low productivity of labour, and low wages condition; the modern sector with excess supply of capital and higher wages. Johnston and Kilby also described similar characteristics about the traditional economy as 1) high percentage of population engaged in farming and the rural economy, 2) the productivity of this large rural labour force is relatively low, and 3) daily food consumption are commonly weighted toward less-preferred starchy foods although average consumption levels are above the subsistence threshold (Johnston and Kilby 1975: 8). The different characteristics between the two sectors would open the opportunity for interaction not only in labour-wages and capital-rents terms, but also in wider aspect of economy such as income, productivity, markets for goods and services, etc.

The important role of agriculture sector in reducing poverty is also supported by John Mellor in his so-called 'Mellor model on poverty reduction' (Besley and Cord 2007:39). Mellor constructed his model based on Lewis' dual economy model by classifying agriculture and industry sectors as the

'commercial' sectors and, furthermore, separately add the 'nontradable' sector which is informal and mostly rural. The commercial sectors are considered as the engine of growth because of their potential for rapid productivity improvements while the nontradable sector is the key of elasticity of connection between the overall economic growth and rapid poverty reduction.

Among those arguing that the sectoral composition of economic growth influences its potential to reduce poverty, most conclude that agriculture is the sector to focus on, especially in developing economies, in order to rapidly reduce poverty. Since in most poor countries the majority of the poor live in rural areas and are employed in agriculture, it seems logical that growth of agriculture is important for poverty reduction.

Furthermore, Todaro mentioned a few wider picture about the economics of agriculture development, by identifying three broad stages in the evolution of agricultural production, as "The first and most primitive is the pure, low-productivity, mostly subsistence-level, peasant farm. The second stage is what might be called diversified or mixed family agriculture, where part of the produce is grown for consumption and part for sale to the commercial sector. The third stage represents the modern farm, exclusively engaged in high-productivity specialized agriculture geared to the commercial market." (2000: 383). Agricultural modernization in mixed-market developing economies may be described in terms of the gradual but sustained transition from subsistence to diversified and specialized production. But such a transition involves much more than reorganizing the structure of the farm economy or applying new agricultural technologies. We have seen that in most traditional societies, agriculture is not just an economic activity; it is a way of life. Any government attempting to transform its traditional agriculture must recognize that in addition to adapting the farm structure to meet the demand for increased production, profound changes affecting the entire social, political, and institutional structure of rural societies will often be necessary." (2000: 384).

Based on the starting picture mentioned above, the economic transformation process should be able to bring the traditional, subsistence agricultural activities into a more modern, efficient, and diversified ones particularly in the rural areas of developing countries. Since the poverty

occurrence is generally found in rural agriculture people, this transformation process should be directed to give greater opportunity to the people in the bottom level of income so that they can improve themselves to go out from poverty condition.

Poverty can be seen from several basic dimensions, the most obvious one is hunger. In most of developing countries, poverty is largely a rural phenomenon. Rural areas are generally worse off in almost every aspects of poverty. People in rural areas tend to have not only lower levels in income, health, and education, but also limited access to basic services such as water and sanitation. Ironically, despite depending on agriculture as their main source of livelihood, they also suffer the most from hunger, lack of basic nutritional food, and food insecurity.

In the major efforts to reduce poverty, one of the most challenging problems is to establish how economic growth affects poverty. Despite that any economic growth is good for the poor, various efforts to understand better the mechanism of the relationship between economic growth and poverty have been undertaken. The reduction in poverty was primarily the result of increases in economic growth in which agricultural growth played an important part, generating incomes in rural areas where poor people predominantly reside.

2.2 The Conceptual Overview to Schooling and Farming

Another factor that encourages the agriculture development is the improvement in the area of research and technology. This improvement will affect the agriculture sector's production function from two sides which are the capital and labour factors. These are what Hayami, Ruttan, and Binswanger called mechanical technology (designed to substitute power and machinery for labour) and biological and chemical technology which designed to give contribution on land factor. All of these components were introduced in their model which was called the Induced Technical Change which put the technological factor as the endogenous component in the production function.

In the agriculture sector itself the role of farmer as labour component determines the productivity level in this sector in term of amount of production they produce and the level of income they obtain. On choosing the

way a farmer manages his/her agricultural production process the level of education will affect the entire activity.

As far as returns to education in agriculture are concerned, based on a review, Jamison and Lau (1982) report on average a positive impact of schooling to farm productivity in 37 studies. Phillips (1987) argued that schooling was either statistically insignificant or negative in some studies he reviewed. In some later studies Yang (1997, farming value-added in China)[1], Jolliffe (1996, farm profit in Ghana)[2], Azhar (1991, wheat output in Pakistan)[3], and Jacoby (1991, crop and livestock production in Peru)[4] reported that schooling brought a significant positive returns. Some contrasting results were shown by studies conducted by Adams (1995, gross value of wheat, sugarcane, and rice production in Pakistan)[5], Rosegrant and Evenson (1992, total factor productivity in India)[6], and Adams (1993, total household income, net of migrant remittances in Egypt)[7] which ended up with findings that schooling brings negative returns (Taylor and Yunez-Naude 2000). These contrasting results raise some questions in terms of not only whether schooling is really beneficial especially for the rural-agriculture community but also the most appropriate education policy for agricultural labourers in developing countries.

Chapter 3
Schooling and Farmer Income in Lampung

3.1   General Picture of Farmers in Lampung

Based on land ownership, locally in Lampung there are two categories of farmers. First, farmers who own farmland who may either cultivate the land themselves or ask other farmer to cultivate the land and give the reward to the working farmers. The reward can be in form of periodical payment of money (weekly, once every two weeks, or monthly), once payment right after the harvest, share the physical amount of harvested crop, or share the money after selling the harvested crop. Either the money payment or harvested crop sharing is generally based on spoken, unwritten agreement between the landowner and the tenant. Second, farmers who do not have farmland so they work for the landowners and receive payments in form of money or harvested crop shared. As the head of the household, both of landowner and the tenant have opportunity to obtain additional income from other non-farming activities, for instance, giving transportation service using motorcycle (named ojek), being a security officer at a nearby factory or shopping centre during midnight until the dawn, running a small and simple store/stall (named warung) on some parts within the house, and so on. To support the household head in obtaining income for the family, the family member can be a household servant for a better-class household/family during the day, or even help the household head in doing the farming activity.

However, not all farmers in Lampung are low-income farmers even though the number of successful and rich farmers are limited. The rich farmers usually own or manage large area of farming lands with workers, use and rent machineries for farming (handtractors, waterpumps, etc.), have their own transportation pick-ups or trucks for carrying the harvested crop to the market, and give money loan to other farmers in need.

As also occurred in most of farming area on Indonesia, there are three periods of farming season in one year the farmer in Lampung can have starting from planting until harvesting the crop. The first farming season is on the period of January-April, the second is on May-August, and the third is on

September-December. The first and the third farming season are usually in conformity with the rainy/wet season while the second season is on the same period with the dry season resulting only farmers resided in a well-irrigated area are able to conduct the food crop farming production process. However, if a farmer still wants to start his/her farming production on the dry season he/she usually utilizes an hourly-rented water pumping machine so he/she can obtain water from a nearby source.

Farmers often suffer from low commodity market price especially when the harvest season covers a very large area in a relatively short-period of time (1-3 weeks). The market price for the harvested crops often fluctuates with the tendency to be very low. To prevent the market price to be lower and harm the farmers the local government, with some backup from the central, usually takes action through The Logistic Affairs Agency (Badan Urusan Logistik-Bulog) by setting the floor price for the harvested commodity, buying the harvested crop directly from the farmers, and keeping them in Bulog's storage facilities. Even though in most of the time the floor price does not offer adequate profit margin to the farmers to achieve improvement for their necessities, it is still better compared to the market price. Unfortunately, repeatedly in recent years the local government does not support this policy by performing a well-managed agriculture-buffering mechanism and providing sufficient amount of budget for such activity. Often, Bulog's purchasing action does not simultaneously cover the entire farming areas on several regions during one period of harvest season. Besides, Bulog purchasing budget often runs out before it has covered the entire purchasing action during one harvest season. These failures have been leaving numbers of farmers who can not obtain the floor price then go selling their commodities using the market price. Certainly their income from selling the harvested crop will be lower when they can only obtain the market price which is lower than the Bulog's floor price.

In term of sales option which is the way of selling the harvested crop at the end of each farming season, there are three common ways well-known among the food crop farming buyers and sellers. The first one, which hereafter in this paper we would name it as Own Sales, is the common known selling-buying transaction where the farmer harvests his/her crop and then sells it to

the buyer on a certain level of price agreed by both parties. The marketplace for the transaction can be right outside the farmfield after the crop harvested, at the farmer's house, at a buyer's storehouse. The second one, which hereafter we would name it as On-field Sales, is an option which has similar selling-buying transaction mechanism to the first one. The difference is in form of the sales product where the crop offered is the mature crop which is still growing on the farmland. The third kind of sales option a farmer can take comes from an emergency need of money which later on may probably affect their crop income. Usually, most farmers have household saving or deposit in the form of money or dried food crop stock. However, many things can happen within the farming households in the period of 3-4 months as the crop grows in their farmland. In a relatively less developed rural farming area where the insurance market is still absent, the role of local money lender still seems important in backing up farmers in an emergency need of money. When their household savings can not cover the need, farmers often come to money lender with agreement to pay the money back on the incoming harvest time using their current growing crops. Due to the crop market price often becomes low when the harvest season comes, such low price is used by the money lender as the standard in valuing the farmer's current growing crop and, hence, determine the amount of money that the farmer can borrow. This locally money lending-borrowing mechanism, which hereafter we name it as Future Sales option or what locally so-called "Ijon", can completely sweep the farmers' opportunity out to gain crop income from their harvest.

Most farmers can choose one or more options in selling their harvested food crop in order to either protect their crop income from fluctuating market price or maximize their crop income. On a relatively more modern farming area on Java-Indonesia, the On-field sales option is usually selected by farmers since this option not only protects them from fluctuating food crop market price but also gives them some other advantages, for example, in term of cutting additional production cost during the harvesting process and keep them away from a troublesome work on managing the harvest (Undang 1996). The combination among each of sales option is also possible to take since some farmers have more than one farmland on scattered area so they are not

able to harvest all of their farmlands by their own. The combination commonly selected by farmers is own sales combined with future sales, or own sales with Future sales. It is very few number of farmers who combine future sales with on-field sales option.

3.2 Schooling in Farm Households in Lampung

Recently, the national formal education system consists of three main levels : basic education, secondary education, and higher education. Basic education consists of six years in primary or elementary school (Sekolah Dasar, abbreviated SD) and three years of junior secondary school (Sekolah Lanjutan Tingkat Pertama, SLTP). Secondary education consists of three years of schooling which gives priority on expanding knowledge and developing students' skills and professional attitude. This level includes the general secondary schools, vocational secondary school, religious secondary school, service-related secondary school, and special secondary school. On this level, students are prepared to either continue education to the higher level or enter the world of work. Higher education is the extension of the secondary level which aimed at developing knowledge and practical skills for specific professions through having education in academic, polytechnic, school of higher learning, institutes, and universities.

Generally in Indonesia, schooling achievement is measure based on the completion of education level which each level gives certificate stating a person finishes his/her learning courses and passes the final examination for a particular grade. It takes 6 years for the elementary education which recently starts at the age of 7, followed by 3 years junior secondary schooling, and the next 3 years of general or vocational higher schooling as the requirement for continuing to the college, academy, or university level. One will receive the certificate of elementary education completion when he/she completes his/her 6 years of elementary schooling. Otherwise he/she will not get the certificate if he/she drops out on, let say, 4th or 5th grade which consequently he/she will be considered as uneducated even though he/she is literate. The same way also counts for junior and higher secondary schools. Based on this system of

schooling classification a person's education is generally measured on what level, not on how many years, of schooling he/she completes.

In most of food crop farming household in Lampung, the household heads usually have a low or very low education. This condition is often exacerbated by a very low food crop price when the harvest season arrives resulting a low or very low level of household income. Due to the very low household income, a food crop farming household usually has a relatively low schooling level of household member similar to the household head.

Chapter 4
Empirical Analysis

The SUSENAS 2004 surveyed 7,002 households on Lampung Province whose househeads work in various economic sector. Out of those 7,002 respondents, as many as 4,036 (57.64%) were categorized as working in agriculture sector with various sub-sectors which, then, 3,632 (51.87%) of them worked in food crop agriculture. However, it was only 1,557 (42.87%) households who did the food crop farming production in 2003 while the other remaining 2,075 farmers did not. From the survey's questionnaire, it was not certain in what agriculture sub-sector the group of 2,075 households were working in to gain non-crop income. In principal, this estimation is based on the 3,632 agriculture households who gave sufficient answers in the SUSENAS questionnaire for which items are required in conducting this analysis. Since this survey was conducted in January-February 2004 the item of income from crop was based on 2003 farming activities which covered 3 farming seasons, the most common way farmers were doing food crop production in Lampung. The income from non-crop activity is also based on the 2003 data which calculated from the difference between household expenditure and income from crop.

There are two dependent variables in this analysis, crop income and non-crop income. Crop income is a kind of income source a foodcrop farming household received from selling the harvested foodcrop from farming activity. In this case, each time a farmer harvest his/her crop the amount of farming production (in kilogram) is multiplied by the selling price (in Rupiah currency per kilogram) on the corresponding farming season he/she obtained resulting the amount of crop income received by every single farming household in that particular farming season. Then, each seasonal crop income is summarized to get the annual crop income for every household. The data about the amount of farming production in each season and the corresponding selling price are available in the SUSENAS questionnaire. Meanwhile, the non-crop income is a kind of income source a foodcrop farming household received from activity outside the farming production which means that this kind of income could come from salary or wage, rent, profit sharing, and alike. Since there is no data on non-crop income for the foodcrop farming household in SUSENAS

questionnaire, the annual non-crop income is calculated from the difference between annual household expenditure and annual crop income. The annual expenditure is calculated from household's monthly expenditure which is available in the SUSENAS questionnaire times 12 months in one year. Consequently, the non-crop income resulted from the calculation could be more than zero (positive) when expenditure is bigger than crop income, or less than zero (negative) when expenditure is less than crop income. Logically speaking, when a farming household has a bigger expenditure than its crop income then the household must have another source of income, which is non-crop income, to cover its expenditure. In contrast, if a farming household has a lower expenditure than its crop income then it would have no interest in finding another source of income since it has savings from its crop income.

The two independent variables of schooling are referring to the highest level of education achieved by two separated parties in one household which are the household head and the household member excluding the household head, not mentioning the number of person in term of individual counting. As explained in the SUSENAS manual book the household member could be the wife/husband of the household head, the children, grandchildren, parents in law, and other person who has lived in the household for 6 months or more or a person who has lived in the household less than 6 months but intend to live in the household for 6 months or more. So, these two schooling variables consist of 1 observation representing the highest schooling level accomplished by the household head and another 1 observation representing the highest schooling level accomplished by one or more household member including the wife/husband of the household head, the children, grandchildren, parents in law, nephews, nieces, and other person who has lived in the household for the above stated period of time.

Most of the head of food crop farming households in Lampung had very low level of schooling attainment. Out of 3,632 farmers, 1,146 (31.55%) were uneducated while 1,592 (43.83%) completed a very basic schooling. It was even less than 1% of them who could afford to enrol in colleges, academics, polytechnics, or universities and obtain diploma or bachelor degrees. This sort of weaknesses in household head's education could be suspected to be the

background for the failure in gaining higher income for financing the family spending, moreover, the education for the family member or children. On their later generation, the impact could be seen on their children's schooling achievement which is relatively static compared to their parents. Within the domain of 3,632 farming households, the group consists of 1,146 uneducated and 1,592 very basic educated parents, which is as many as 2,738 parents or 75.39%, generate 2,645 (72.82%) children whose schooling achievement are also in a very basic level. The similar condition applies for the group of 8 parents completes their higher schooling until diploma/bachelor degree who produces 10 children with the same schooling achievement. The tabular and graphical formats of the description are presented below.

Table 5
Schooling Distribution of Household Head

Category		Frequency	Percentage	Cumulative
Code	Description			
1	No Education	1,146	31.55	31.55
2	Primary Education	1,592	43.83	75.39
3	Junior Highschool	605	16.66	92.04
4	General Senior Highschool	219	6.03	98.07
5	Vocational Senior Highschool	62	1.71	99.78
6	Elementary Diploma (D I/II)	3	0.08	99.86
7	Advanced Diploma (D III)	2	0.06	99.92
8	High Diploma/Bachelor (D IV/S1)	3	0.08	100.00
9	Postgraduate Education (S2/S3)	-	-	100.00
	TOTAL	3,632		

Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis

Figure 1
Schooling Distribution of Household Head
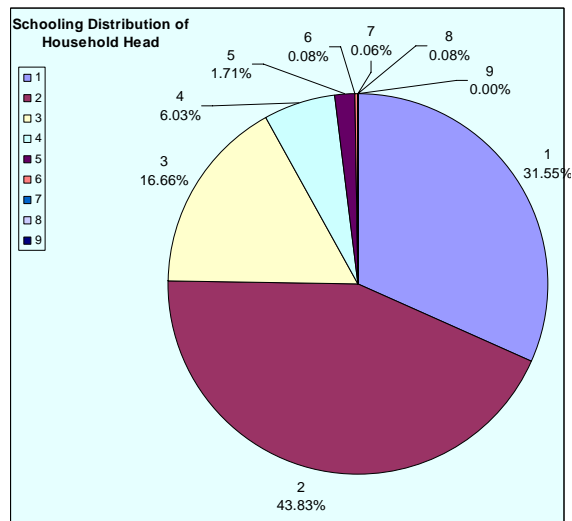
Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis.

Table 6
Schooling Distribution of Household Member

Category		Frequency	%	Cumulative
Code	Description			
1	Primary Education	2,596	71.48	71.48
2	Madrasah Ibtidaiyah (Primary Ed. - Islamic)	49	1.35	72.82
3	Junior Highschool	614	16.91	89.73
4	Madrasah Tsanawiyah (Junior HS - Islamic)	62	1.71	91.44
5	Senior Highschool	218	6.00	97.44
6	Madrasah Aliyah (Senior HS - Islamic)	20	0.55	97.99
7	Vocational Highschool	63	1.73	99.72
8	Elementary Diploma (D I/II)	3	0.08	99.81
9	Advanced Diploma (D III)	2	0.06	99.86
10	High Diploma/Bachelor (D IV/S1)	5	0.14	100.00
11	Postgraduate Education (S2/S3)	-	-	100.00
	TOTAL	3,632		

Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis

Figure 2
Schooling Distribution of Household Member
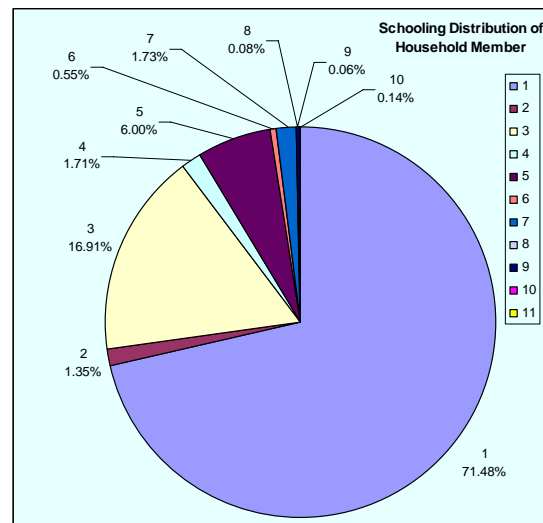
Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis

In the SUSENAS 2004 questionnaire, the options of schooling achievement between family head and family member are categorized differently. There were 11 categories for family member schooling level while 9 for the family head's. In order to set an equivalent categorization of schooling between household heads and members so they are comparable to each other and, moreover, arrange the dummy variables structure for the regression

analysis then we modify each of them into similar 8 categories. The structure modification is shown in table 7 below.

Table 7
Modified Distribution of Schooling and Dummy Arrangement

	Category	Household Head			Household Member		
Code	Description	Dummy	Freq.	(%)	Dummy	Freq.	(%)
1	Uneducated or not completing Elementary Schooling	eduhead1	1,146	31.55		-	0.00
2	Primary Schooling (elementary and junior secondary)	eduhead2	2,197	60.49	edufam1	3,321	91.44
3	General Senior Secondary Schooling	eduhead3	219	6.03	edufam2	238	6.55
4	Vocational Senior Secondary Schooling	eduhead4	62	1.71	edufam3	63	1.73
5	Diploma (D I/II/III)	eduhead5	5	0.14	edufam4	5	0.14
6	High diploma or Bachelor (D IV / S1)	eduhead6	3	0.08	edufam5	5	0.14
7	Post-graduated Schooling	eduhead7	-	0.00	edufam6	-	0.00
	TOTAL		3,632	100.00		3,632	100.00

Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis

The variable of seasonal farmland size refers to the size of farmland in hectare harvested by a farming household in each farming season. The variable of s1land represents the farmland size harvested in the first farming season or season 1 (January-April), s2land for the second farming season or season 2 (May-August), and s3land for the third farming season or season 3 (September-December). These are the components which directly determine the amount of harvested crop a farmer produce and, hence, influence the amount of crop income a farmer obtain. Since the farmland size data from the SUSENAS questionnaire is in the meter square (m^2) denomination then, before running the regression and carrying out the analysis, it is divided by 10,000 to obtain the size in hectare (Ha). The distribution of farmland size among 3,632 food crop farmers in Lampung is presented on the following table 8.

Table 8
Distribution of Farmland Size Among Food Crop Farmers in Lampung

No. (Group)	Size of Farmland (Ha)	Frequency of that size ownership	(%)	Cumulative
1	< 0.1	2,531	69.69	69.69
2	0.1 - 0.5	1,000	27.53	97.22
3	0.5 - 1	86	2.37	99.59
4	1 - 3	13	0.36	99.94
5	3 - 5	-	0.00	99.94
6	5 - 10	1	0.03	99.97
7	> 10	1	0.03	100.00
		3,632	100.00	

Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis

Figure 3
Distribution of Farmland Size Among Food Crop Farmers in Lampung
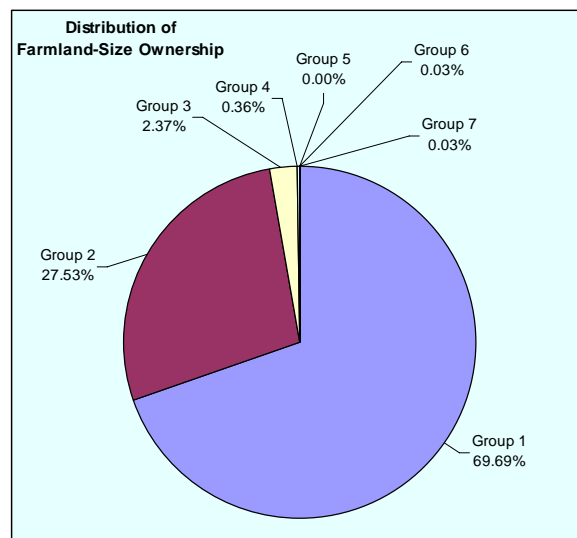
Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis

From the figures presented on the table above we can say that almost all (99.59%) food crop farmers in Lampung have less than one hectare of farmland. Based on the relatively very small size of farmland cultivated by most farmers in Lampung it is understandable if most of farming activities was done in purpose of maintaining subsistence farming instead of an economic effort in obtaining higher crop income. In some cases, one farming household could occupy several small-size of farmlands on scattered area and share the farm management to his/her reliable local tenant workers on a certain scheme which is proportionately profitable for both parties. For both landowner and tenant

farmers the tendency of increasing income received from more harvested farmland would be logically true even though they share the amount of harvested crop.

From one question in SUSENAS 2004 questionnaire asking whether a farmer did farming and afforded harvesting his/her crop or not in year 2003 there were 1,557 respondents answering 'Yes'. From this group of farmers cultivating their farmland during the 3 possible farming seasons in year 2003, in term of number of farmers could obtain harvest on each season there were 1,224 farmers could obtain harvesting on the first season (season 1, during January-April), 629 on the second season (season 2, May-August), and 498 on the third season (season 3, September-December). In term of harvest frequency of once during the year, as many as 606 farmers obtained harvest on the first season, 191 farmers on the second season, and 101 farmers on the third season. On the frequency of twice, 262 farmers could afford harvest on season 1 and season 2; 221 farmers on season 1 and season 3; while only 41 farmers on season 2 and season 3. After all, it was only 135 farmers (8.67%) out of 1,557 who could afford harvesting on every farming season, or three times harvesting on 2003. The complete, structured tabulation is shown on the following table 9.

Table 9
Harvest Frequency Description Among Food Crop Farmers in Lampung

Harvest				Number of
Frequency	Season			Farmer
1x	Season 1			606
		Season 2		191
			Season 3	101
2x	Season 1	Season 2		262
	Season 1		Season 3	221
		Season 2	Season 3	41
3x	Season 1	Season 2	Season 3	135
			Total	1,557
Number of farmer harvesting in Season 1				1,224
Number of farmer harvesting in Season 2				629
Number of farmer harvesting in Season 3				498

Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis

From the question on how a farmer sells his/her harvested food crop on each farming season there were 5 sales options described by the respondents : 1) Own Sales which is by harvesting and selling food crop by their own (indicated by code 1); 2) Future Sales which is giving up either the growing food crop on the farmland which is ready to be harvested or the harvested food crop as the payment for debt (Ijon, coded 2); 3) selling by combining Own Sales and Future Sales (coded 3); 4) On-field sales which is by selling the mature/ripe crop still growing in the farmland to the buyer (Menebaskan, coded 4), and 5) selling by combining Own Sales and On-field Sales (coded 5). It is possible for a farmer to choose different sales option on different farming season. These possibilities are reflected in the categorization of independent variables which represent every single option in each farming season. For example, the independent variable of mt1polapanen1 refers to the sales option of Own Sales in farming season 1, mt1polapanen2 refers to the sales option of Future Sales (Ijon) in farming season1, mt1polapanen3 for Combined Own Sales and Future Sales in farming season 1, and so on. The tabulation of sales options and the number of farmers chosen each option on each farming season are shown in table 10 below.

Table 10
Tabulation of Sales Option Chosen by Food Crop Farmers in Lampung

Code	Description	Season 1	Season 2	Season 3	TOTAL	(%)
1	Own Sales	1,198	541	421	2,160	46.24
2	Future sales (ijon)	5	73	64	142	3.04
3	Combined 1 and 2	2	-	-	2	0.04
4	On-field sales (Menebaskan)	5	7	-	12	0.26
5	Combined 1 and 4	14	8	13	35	0.75
9	Not Planting/Harvesting	333	928	1,059	2,320	49.67
	TOTAL	1,557	1,557	1,557	4,671	100.00

Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis

The independent variable of region represents the regional differences where a farming household is located or resided in. This regional representation is important since every district or municipality in Lampung has different characteristic in terms of land availability for farming, watering/irrigation infrastructure, education facilities and policies, job

opportunity in other sectors out of agriculture, numbers of market available, and so on. The ten variables of region is equal to the number of region in Lampung since each variable represents each district (known as Kabupaten) or municipality (known as Kota) in Lampung.

The dummy variables are applied in the regression representing the 4 categorical items which are the highest level of schooling of the household head (eduhead1, eduhead2, etc.), the highest level of schooling of the household member (edufam1, edufam2, etc.), the sales options of the harvested crop in each farming season (mt1polapanen1, mt1polapanen2, etc.), and the region difference (region1, region2, etc.).

For the category of highest level of schooling of the household head, since we can omit/pull out the post-graduated category (eduhead7) due to the absence of household head whose highest level of schooling is post-graduated, then 5 dummies are included in the regression for the remaining 6 categories, leaving out the bundled uneducated or not completing elementary category (eduhead1) as the pole.

In the case of household member's highest level of schooling, we can also eliminate the post-graduated category (edufam6) due to the absence of household member whose highest level of schooling is post-graduated, then 4 dummies are put into the regression for the remaining 5 categories, leaving out the primary (elementary and junior secondary) category (edufam1) as the pole.

Since there are 12 categories of sales options then 11 dummies are entered into the regression, leaving out the Own Sales in season 1 (mt1polapanen1) as the pole.

For dummy variable representing the regional difference, district of West Lampung (Kabupaten Lampung Barat – region1) is left out as the pole so there are 9 dummies are put into the regression.

The description of every single variable used in this analysis and its' descriptive statistics is presented in Table 11 below. However, each income model utilizes variables which are logically relevant in determining the dependent variable by which term we do not put, for example, the variable of farmland size into the non-crop income model since the non-crop income is

obtained from activity outside the food crop farming production. The complete results of the each income regressions are presented on the appendix of this paper.

The error term applied on the statistical/regression analysis in this paper is 5% by which the confidence interval is 95%. For the currency conversion to provide an understandable more global picture in this analysis the assumption of currency exchange rate is 14,000 Rupiah (fourteen thousand Rupiah) per 1 Euro or Rp 14,000/Euro.

Table 11
Variables Description and Descriptive Statistics

No.	Name	Description	Mean	Std. Dev.
1	lninccrop	Logarithm Annual Crop Income, for crop income analysis	14.9209	0.7554
2	lnincnonc	Logarithm Annual Non-crop Income, for non-crop income analysis	15.4701	0.5124
3	lntotinc	Logarithm Annual Total Income, for total income analysis	15.5385	0.4227
4	eduhead1	The highest level of schooling of Household Head : uneducated or not completing elementary	0.3155	0.4648
5	eduhead2	The highest level of schooling of Household Head : primary (elementary and junior secondary)	0.6049	0.4889
6	eduhead3	The highest level of schooling of Household Head : general senior secondary school	0.0603	0.2381
7	eduhead4	The highest level of schooling of Household Head : vocational senior secondary school	0.0171	0.1296
8	eduhead5	The highest level of schooling of Household Head : diploma (D I/II/III)	0.0014	0.0371
9	eduhead6	The highest level of schooling of Household Head : high diploma (D IV)/ Bachelor	0.0008	0.0287
10	eduhead7	The highest level of schooling of Household Head : post-graduated	-	-
11	edufam1	The highest level of schooling of Household Member : primary (elementary and junior secondary)	0.9144	0.2798
12	edufam2	The highest level of schooling of Household Member : general senior secondary school	0.0655	0.2475
13	edufam3	The highest level of schooling of Household Member : vocational senior secondary school	0.0173	0.1306
14	edufam4	The highest level of schooling of Household Member : diploma (D I/II/III)	0.0014	0.0371
15	edufam5	The highest level of schooling of Household Member : high diploma (D IV)/ Bachelor	0.0014	0.0371
16	edufam6	The highest level of schooling of Household Member : post-graduated	-	-
17	s1land	Size of harvested farmland in season 1 (Ha)	0.1963	0.9892
18	s2land	Size of harvested farmland in season 2 (Ha)	0.0704	0.2273
19	s3land	Size of harvested farmland in season 3 (Ha)	0.0491	0.1641
20	b2r3	Number of family member	4.1861	1.6004
21	mt1polapanen1	Sales option- season 1- Own Sales	0.9788	0.1442
22	mt1polapanen2	Sales option- season 1- Future sales (ijon)	0.0041	0.0638
23	mt1polapanen3	Sales option- season 1- Combined Own sales and Future sales	0.0016	0.0404
24	mt1polapanen4	Sales option- season 1- On-field sales (menebaskan)	0.0041	0.0638
25	mt1polapanen5	Sales option- season 1- Combined Own sales and On-field sales	0.0114	0.1064
26	mt2polapanen1	Sales option- season 2- Own Sales	0.8601	0.3472
27	mt2polapanen2	Sales option- season 2- Future sales (ijon)	0.1161	0.3205
28	mt2polapanen3	Sales option- season 2- On-field sales (menebaskan)	0.0111	0.1050
29	mt2polapanen4	Sales option- season 2- Combined Own sales and On-field sales	0.0127	0.1121
30	mt3polapanen1	Sales option- season 3- Own Sales	0.8454	0.3619
31	mt3polapanen2	Sales option- season 3- Future sales (ijon)	0.1285	0.3350
32	mt3polapanen3	Sales option- season 3- Combined Own sales and On-field sales	0.0261	0.1596
33	region1	Region in Lampung- district of West Lampung (Kabupaten Lampung Barat)	0.1297	0.3360
34	region2	Region in Lampung- district of Tanggamus (Kabupaten Tanggamus)	0.1082	0.3107
35	region3	Region in Lampung- district of South Lampung (Kabupaten Lampung Selatan)	0.1311	0.3375
36	region4	Region in Lampung- district of East Lampung (Kabupaten Lampung Timur)	0.1118	0.3151
37	region5	Region in Lampung- district of Central Lampung (Kabupaten Lampung Tengah)	0.1382	0.3452
38	region6	Region in Lampung- district of North Lampung (Kabupaten Lampung Utara)	0.1077	0.3100
39	region7	Region in Lampung- district of Way Kanan (Kabupaten Way Kanan)	0.1220	0.3273
40	region8	Region in Lampung- district of Tulang Bawang (Kabupaten Tulang Bawang)	0.1267	0.3326
41	region9	Region in Lampung- municipality of Bandar Lampung (Kota Bandar Lampung)	0.0041	0.0641
42	region10	Region in Lampung- municipality of Metro (Kota Metro)	0.0206	0.1422

For each crop, non-crop, and total income analysis the household kept as the base/control/benchmark is the one with the following characteristics depending on which variables/regressors are relevant to the dependent variable (regressand) : the household head is uneducated or not completing elementary school (the schooling level category of eduhead1); the highest level of schooling of household member is primary schooling (edufam1); choosing the sales option of Own Sales on every farming season (mt1polapanen1 for farming season 1, mt2polapanen1 for farming season 2, and mt3polapanen1 for farming season 3); and resided on the district of West Lampung (region1). By this treatment, all categorical dummy variables of the control/benchmark group are left out in the regression (Gujarati 2003: 301-303).

Before starting the regression analysis it is necessary to present the general picture of crop income, non-crop income, and total income for each highest level of schooling category of household head and of household member, respectively. The annual average amount of each type of income for each category of highest schooling level is shown in Table 12.

Table 12
Annual Average Income of Highest Level of Schooling of Household Head and of Household Member

Description of Schooling Category	n	Crop Income (Rupiah)		Non-crop Income (Rupiah)		Total Income (Rupiah)	
		Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.
The Highest Schooling Level of Household Head							
Eduhead1 : Uneducated	1,146	380,508	2,063,302	5,595,465	3,441,544	6,046,480	3,218,511
Eduhead2 : Primary	2,197	329,394	1,601,181	5,704,882	2,952,517	6,082,862	2,797,847
Eduhead3 : General senior	219	465,840	2,719,085	6,070,425	3,580,893	6,668,339	3,433,763
Eduhead4 : Vocational senior	62	580,488	1,533,836	7,106,317	3,859,486	7,686,805	3,614,634
Eduhead5 : Diploma	5	1,813,000	2,536,010	6,674,091	4,157,128	8,487,091	3,012,639
Eduhead6 : High diploma	3	-	-	11,500,000	6,813,821	11,500,000	6,813,821
Eduhead7 : Post-graduated	-	-	-	-	-	-	-
The Highest Schooling Level of Household Member							
Edufam1 : Primary Schooling	3,321	346,266	1,775,445	5,657,296	3,087,985	6,060,034	2,905,222
Edufam2 : General senior	238	484,355	2,647,208	6,007,772	3,585,186	6,613,656	3,447,921
Edufam3 : Vocational senior	63	516,274	1,478,914	7,630,654	5,057,883	8,146,928	4,856,581
Edufam4 : Diploma	5	1,813,000	2,536,010	6,674,091	4,157,128	8,487,091	3,012,639
Edufam5 : High diploma	5	-	-	10,400,000	5,056,137	10,400,000	5,056,137
Edufam6 : Post-graduated	-	-	-	-	-	-	-

Source: National Socio-economic Survey (SUSENAS) 2004, BPS Indonesia / Author Analysis

4.1 The Effect of Schooling on Crop Income of Food Crop Farming Households

4.1.1 The Return to Highest Level of Schooling of Household Head and of Household Member on Crop Income

Table 13 below presents the determinants of variables resulted from crop income regression for the highest level of schooling of household head and of household member for food crop farming households in Lampung. The confidence interval of the regression is 95% or with error term 5%.

Table 13
Determinants of Annual Crop Income of Food Crop Farming Household

No.	Variable	Brief Description	Coefficient	Std. Error	P > t
1	eduhead2	Hh Head highest schooling : primary	0.3085	0.2951	0.296
2	eduhead3	Hh Head highest schooling : general senior secondary	- 2.8694	2.1768	0.188
3	eduhead4	Hh Head highest schooling : vocational senior secondary	0.7943	2.9741	0.789
4	eduhead5	Hh Head highest schooling : diploma (D I/II/III)	7.1963	3.1237	0.021
5	eduhead6	Hh Head highest schooling : high diploma/ Bachelor	- 4.5074	6.6008	0.495
6	edufam2	Hh Member highest schooling : general senior secondary	3.5051	2.0794	0.092
7	edufam3	Hh Member highest schooling : vocational senior secondary	1.2417	2.9766	0.677
8	edufam4	Hh Member highest schooling : diploma (D I/II/III)	-	-	-
9	edufam5	Hh Member highest schooling : high diploma/ Bachelor	0.6834	5.8093	0.906
10	b2r3	Number of family member	- 0.1135	0.0872	0.193
11	s1land	Size of harvested farmland in season 1 (Ha)	0.4334	0.0947	0.000
12	s2land	Size of harvested farmland in season 2 (Ha)	0.4488	0.4579	0.327
13	s3land	Size of harvested farmland in season 3 (Ha)	1.4135	0.6071	0.020
14	mt1polapanen2	Sales option- season 1- Future sales (ijon)	- 5.4831	2.5722	0.033
15	mt1polapanen3	Sales option- season 1- Combined Own&Future sales	4.3166	3.8114	0.258
16	mt1polapanen4	Sales option- season 1- On-field sales (menebaskan)	- 1.7778	2.8007	0.526
17	mt1polapanen5	Sales option- season 1- Combined Own&On-field sales	- 3.7843	2.5319	0.135
18	mt2polapanen2	Sales option- season 2- Future sales (ijon)	6.3177	1.0411	0.000
19	mt2polapanen3	Sales option- season 2- On-field sales (menebaskan)	0.3416	2.3863	0.886
20	mt2polapanen4	Sales option- season 2- Combined Own&On-field sales	- 0.4593	1.9264	0.812
21	mt3polapanen2	Sales option- season 3- Future sales (ijon)	- 5.0586	1.1807	0.000
22	mt3polapanen3	Sales option- season 3- Combined Own&On-field sales	1.3901	2.5906	0.592
23	region2	Region in Lampung- district of Tanggamus	2.9505	0.7063	0.000
24	region3	Region in Lampung- district of South Lampung	3.7229	0.6381	0.000
25	region4	Region in Lampung- district of East Lampung	0.1282	0.6551	0.845
26	region5	Region in Lampung- district of Central Lampung	- 1.7892	0.6253	0.004
27	region6	Region in Lampung- district of North Lampung	0.3098	0.7865	0.694
28	region7	Region in Lampung- district of Way Kanan	- 2.4664	0.6596	0.000
29	region8	Region in Lampung- district of Tulang Bawang	0.1904	0.8029	0.813
30	region9	Region in Lampung- municipality of Bandar Lampung	- 2.2687	1.7877	0.205
31	region10	Region in Lampung- municipality of Metro	6.2254	0.9876	0.000
32	Constant	Constant or Y-intercept	2.2899	0.7057	0.001
33	Adj. R-squared	Adjusted Coefficient of determination	0.1986	-	-
34	n	Number of observation	1,557	-	-

Based on the statistical figures from the regression result presented above, compared to the control/benchmark group we can list some interpretation that :

- The household head whose highest schooling level is diploma (eduhead5), working together with his/her household member whose highest schooling level is primary education (edufam1) in their farmland, would be able to gain additional crop income more than sevenfold (719%) for the household. In term of the highest achievement in obtaining incremental crop income, since this is also statistically significant according to the regression result, this can be seen as the best combination of working partner a household head and a member can have in order to obtain the highest increase in their household's crop income. The runner-up position goes to the household head with vocational senior secondary schooling (eduhead4). Working together in food crop farming with his/her household member whose schooling level is primary would bring them 79% additional income even though this increase does not seem statistically significant.

- For the household member, the highest schooling level which gives the best additional crop income is general senior secondary school (edufam2) which can make him/her obtains about 3.5 fold of additional crop income if the member works together in food crop farming with his/her household head who is uneducated (eduhead1), even though statistically this is not significant. The next lower achievement in term of obtaining additional crop income is gained by the household member who is vocational senior secondary educated, which can increase crop income by 124% working together with the household head.

- Each person of household member (b2r3) excluding the household head would reduce the portion of additional crop income by 11% more or less but this is statistically insignificant.

- Based on the regression estimate, harvesting 1 more hectare of farmland in the third farming season during September-December (s3land) is the best choice in order to get the highest increase in crop income by 141%,

followed by the second season during May-August (s2land) with approaching 45% increase. Harvesting 1 more hectare of farmland in the first season during January-April (s1land) would be statistically more significant to gain incremental crop income compared to the second season, even though the increase is only 43%.

- In term of sales option, selling the harvested crop with future sales option in farming season 2 during May-August (mt2polapanen2) would bring the highest increase in crop income by more than six fold (632%) for a farming household with uneducated household head, highest level of primary schooling for the household member, and resided in the district of West Lampung (Kabupaten Lampung Barat). Selecting the same sales option on the first farming season during January-April (mt1polapanen2) would be the most harmful way since this choice would cut the amount of crop income by more than 500%.

- Municipality of Metro (Kota Metro – region10) and district of South Lampung (Kabupaten Lampung Selatan – region3) are consecutively the best regions for a farming household with similar schooling characteristic to the control/benchmark group in order to obtain a higher crop income. Moreover, these two regions have the same level of statistical significances in bringing 622% and 372% increase to farming household's crop income, respectively.

- As stated by the constant, a farming household in the control/benchmark group who has no household member and farmland would has annual crop income as many as $e^{2.2899}$ or 9.87 Rupiah (about 0.0007 Euro).

- The reported adjusted R^2 suggests that this model explains 19.86% of total variation on food crop farming household's annual crop income while the other 80.14% variation is not covered by this model.

4.1.2 The Return to Highest Level of Schooling of Household Head on Crop Income

The determinants of regressors resulted from crop income regression for the highest level of schooling of household head, separated from the highest level of schooling of household member, for food crop farming households in Lampung are presented in the following Table 14.

Table 14
Determinants of Annual Crop Income of Food Crop Farming Household

No.	Variable	Brief Description	Coefficient	Std. Error	P > t
1	eduhead2	Hh Head highest schooling : primary	0.3389	0.2944	0.250
2	eduhead3	Hh Head highest schooling : general senior secondary	0.5786	0.6454	0.370
3	eduhead4	Hh Head highest schooling : vocational senior secondary	2.2766	1.0447	0.029
4	eduhead5	Hh Head highest schooling : diploma (D I/II/III)	7.2022	3.1241	0.021
5	eduhead6	Hh Head highest schooling : high diploma/ Bachelor	- 3.8401	3.1262	0.219
6	b2r3	Number of family member	- 0.1143	0.0872	0.190
7	s1land	Size of harvested farmland in season 1 (Ha)	0.4322	0.0947	0.000
8	s2land	Size of harvested farmland in season 2 (Ha)	0.4410	0.4578	0.336
9	s3land	Size of harvested farmland in season 3 (Ha)	1.4113	0.6071	0.020
10	mt1polapanen2	Sales option- season 1- Future sales (ijon)	- 5.5072	2.5725	0.032
11	mt1polapanen3	Sales option- season 1- Combined Own&Future sales	4.2717	3.8119	0.263
12	mt1polapanen4	Sales option- season 1- On-field sales (menebaskan)	- 1.8230	2.8009	0.515
13	mt1polapanen5	Sales option- season 1- Combined Own&On-field sales	- 3.8014	2.5322	0.134
14	mt2polapanen2	Sales option- season 2- Future sales (ijon)	6.3089	1.0412	0.000
15	mt2polapanen3	Sales option- season 2- On-field sales (menebaskan)	0.3382	2.3864	0.887
16	mt2polapanen4	Sales option- season 2- Combined Own&On-field sales	- 0.4726	1.9267	0.806
17	mt3polapanen2	Sales option- season 3- Future sales (ijon)	- 5.1024	1.1806	0.000
18	mt3polapanen3	Sales option- season 3- Combined Own&On-field sales	1.3492	2.5907	0.603
19	region2	Region in Lampung- district of Tanggamus	2.9947	0.7057	0.000
20	region3	Region in Lampung- district of South Lampung	3.7196	0.6382	0.000
21	region4	Region in Lampung- district of East Lampung	0.1661	0.6538	0.800
22	region5	Region in Lampung- district of Central Lampung	- 1.7824	0.6254	0.004
23	region6	Region in Lampung- district of North Lampung	0.3054	0.7866	0.698
24	region7	Region in Lampung- district of Way Kanan	- 2.4713	0.6597	0.000
25	region8	Region in Lampung- district of Tulang Bawang	0.2280	0.8026	0.776
26	region9	Region in Lampung- municipality of Bandar Lampung	- 2.2698	1.7879	0.204
27	region10	Region in Lampung- municipality of Metro	6.2204	0.9876	0.000
28	Constant	Constant or Y-intercept	2.2827	0.7057	0.001
29	Adj. R-squared	Adjusted Coefficient of determination	0.1983	-	-
30	n	Number of observation	1,557	-	-

According to the above presented regression result, the interpretation are listed as follows :

- The household head whose highest schooling level is diploma (eduhead5), would be able to gain additional crop income by more than sevenfold (720%) for the household. The second position is the household head with

vocational senior secondary education (eduhead4) who would bring more than twofold (227%). Both estimates are statistically significant.

- Each person of household member (b2r3) excluding the household head would be negatively affect the incremental crop income by 11% more or less even though this coefficient is statistically insignificant.

- Based on the regression estimate, harvesting 1 more hectare of farmland in the third farming season during September-December (s3land) is the best choice to get the highest additional portion of crop income by 141%, followed by the second season during May-August (s2land) with 44% increase. Harvesting 1 more hectare of farmland in the first season during January-April (s1land) would be statistically more significant to gain incremental crop income compared to the second season, even though the increase is only 43%.

- In term of sales option, selling the harvested crop with future sales option on farming season 2 during May-August (mt2polapanen2) would bring the highest increase in crop income by more than six fold (630%). The second best choice is by combining own sales and future sales on farming season 1 (mt1polapanen3) since this way would bring 427% increase in crop income. In contrast, selecting the sales option of either future sales on the first farming season (mt1polapanen2) or future sales on the third farming season (mt3polapanen2) would cause high loss on the amount of crop income by more than 500%.

- Consistent to the previous crop income estimate, municipality of Metro (region10) and district of South Lampung (region3) are still the first and second best region for a food crop farming household with similar schooling characteristic to the control/benchmark group to obtain a higher crop income. Moreover, these two regions have the same level of statistical significances in bringing 622% and 372% increase to farming household's crop income, respectively. A contradictory estimation occur to district of Way Kanan (region7) and municipality of Bandar Lampung (region9) on which region the crop income would decrease by 247% and 227% respectively.

- As predicted by the constant parameter, a farming household in the control/benchmark group whose head is uneducated, has no household member and farmland would has annual crop income as many as $e^{2.2827}$ or 9.80 Rupiah (about 0.0007 Euro).

- The reported adjusted R^2 suggests that the model explains 19.83% of total variation on food crop farming household's annual crop income while the other 80.17% variation is not covered by this model.

4.1.3 The Return to Highest Level of Schooling of Household Member on Crop Income

The determinants of variables resulted from crop income regression for the highest level of schooling of household member, separated from the highest level of schooling of household head, for food crop farming households in Lampung are presented in the following Table 15.

Table 15
Determinants of Annual Crop Income of Food Crop Farming Household

No.	Variable	Brief Description	Coefficient	Std. Error	P > t
1	edufam2	Hh Member highest schooling : general senior secondary	0.7901	0.5947	0.184
2	edufam3	Hh Member highest schooling : vocational senior secondary	1.7066	1.0491	0.104
3	edufam4	Hh Member highest schooling : diploma (D I/II/III)	7.0089	3.1200	0.025
4	edufam5	Hh Member highest schooling : high diploma/ Bachelor	- 3.6038	2.7000	0.182
5	b2r3	Number of family member	- 0.1136	0.0872	0.193
6	s1land	Size of harvested farmland in season 1 (Ha)	0.4336	0.0946	0.000
7	s2land	Size of harvested farmland in season 2 (Ha)	0.4528	0.4572	0.322
8	s3land	Size of harvested farmland in season 3 (Ha)	1.4486	0.6059	0.017
9	mt1polapanen2	Sales option- season 1- Future sales (ijon)	- 5.4258	2.5722	0.035
10	mt1polapanen3	Sales option- season 1- Combined Own&Future sales	4.4384	3.8105	0.244
11	mt1polapanen4	Sales option- season 1- On-field sales (menebaskan)	- 1.6506	2.8004	0.556
12	mt1polapanen5	Sales option- season 1- Combined Own&On-field sales	- 3.7723	2.5317	0.136
13	mt2polapanen2	Sales option- season 2- Future sales (ijon)	6.3268	1.0411	0.000
14	mt2polapanen3	Sales option- season 2- On-field sales (menebaskan)	0.2129	2.3853	0.929
15	mt2polapanen4	Sales option- season 2- Combined Own&On-field sales	- 0.3551	1.9250	0.854
16	mt3polapanen2	Sales option- season 3- Future sales (ijon)	- 5.0563	1.1807	0.000
17	mt3polapanen3	Sales option- season 3- Combined Own&On-field sales	1.4234	2.5907	0.583
18	region2	Region in Lampung- district of Tanggamus	2.9657	0.7042	0.000
19	region3	Region in Lampung- district of South Lampung	3.7209	0.6375	0.000
20	region4	Region in Lampung- district of East Lampung	0.1637	0.6517	0.802
21	region5	Region in Lampung- district of Central Lampung	- 1.7499	0.6251	0.005
22	region6	Region in Lampung- district of North Lampung	0.3246	0.7864	0.680
23	region7	Region in Lampung- district of Way Kanan	- 2.4470	0.6595	0.000
24	region8	Region in Lampung- district of Tulang Bawang	0.2093	0.8006	0.794
25	region9	Region in Lampung- municipality of Bandar Lampung	- 2.2802	1.7874	0.202
26	region10	Region in Lampung- municipality of Metro	6.1849	0.9866	0.000
27	Constant	Constant or Y-intercept	2.4500	0.6811	0.000
28	Adj. R-squared	Adjusted Coefficient of determination	0.1982	-	-
29	n	Number of observation	1,557	-	-

According to the above presented regression result, the interpretation are listed as follows :

- The household member whose highest schooling level is diploma (edufam4) is the one would be able to gain the biggest additional crop income by sevenfold (700%) for the household. The second position is the household member with vocational senior secondary education (edufam3) who would bring 170% incremental income. However, the second position is not statistically significant which is contrary to the first.

- Each person of household member (b2r3) excluding the household head would cause the incremental crop income decrease by more or less 11% even though this coefficient is statistically insignificant.

- Based on the regression estimate, harvesting 1 more hectare of farmland in the third farming season during September-December (s3land) is the best choice to get the highest additional portion of crop income as many as 144%, followed by the second season during May-August (s2land) with 44% increase. Harvesting 1 more hectare of farmland in the first season during January-April (s1land) would be statistically more significant to gain incremental crop income compared to the second season, even though the increase is only 43%.

- In term of sales option, selling the harvested crop with future sales option on farming season 2 during May-August (mt2polapanen2) would bring the highest increase in crop income by more than six fold (632%). The second best choice is by combining own sales and future sales on farming season 1 (mt1polapanen3) since this way would provide increase in crop income more than fourfold (427%). Contrary to two options mentioned above, selecting the sales option of either future sales on the first farming season (mt1polapanen2) or future sales on the third farming season (mt3polapanen2) would cause high loss on the amount of crop income by more than 500% (542% and 505% for each sales option).

- Consistent to the previous two estimates of additional crop income, municipality of Metro (region10) and district of South Lampung (region3) are still remain as the first and second best region for a food crop farming

household to obtain the highest increments. Moreover, these two regions have the same level of statistical significances in bringing 618% and 372% increase to farming household's crop income, respectively. A contrasting estimate occur to municipality of Bandar Lampung (region9) and district of Way Kanan (region7) on which region the crop income would decrease by 228% and 244% respectively.

- The constant parameter in this regression predicts a farming household in the control/benchmark group whose member has primary education, has no household member and no farmland to harvest would has annual crop income as many as $e^{2.45}$ or 11.59 Rupiah (about 0.0008 Euro).

- The reported adjusted R^2 suggests that the model explains 19.82% of total variation on food crop farming household's annual crop income while the other 80.18% variation is not covered by this model.

4.2 The Effect of Schooling on Non-crop Income of Food Crop Farming Households

For non-crop income analysis the household kept as the control group is the one with the following characteristics : the household head is uneducated or not completing elementary school (the schooling level category of eduhead1); the highest level of schooling of household member is primary schooling (edufam1); and resided on the district of West Lampung (region1). The three categorical dummy variables of the control group are also left out in the regression.

4.2.1 The Return to Highest Level of Schooling of Household Head and of Household Member on Non-Crop Income

The determinant of variables resulted from non-crop income regression for the highest level of schooling of household head and of household member for food crop farming households in Lampung is presented in the following table 16. The confidence interval of the regression is also 95%.

Table 16
Determinants of Annual Non-crop Income of Food Crop Farming Household

No.	Variable	Brief Description	Coefficient	Std. Error	P > t
1	eduhead2	Hh Head highest schooling : primary	0.0263	0.0167	0.115
2	eduhead3	Hh Head highest schooling : general senior secondary	0.0636	0.1063	0.550
3	eduhead4	Hh Head highest schooling : vocational senior secondary	- 0.1674	0.1447	0.247
4	eduhead5	Hh Head highest schooling : diploma (D I/II/III)	- 0.1572	0.2023	0.437
5	eduhead6	Hh Head highest schooling : high diploma/ Bachelor	0.0290	0.4233	0.945
6	edufam2	Hh Member highest schooling : general senior secondary	0.0503	0.1010	0.618
7	edufam3	Hh Member highest schooling : vocational senior secondary	0.3412	0.1417	0.016
8	edufam4	Hh Member highest schooling : diploma (D I/II/III)	-	-	-
9	edufam5	Hh Member highest schooling : high diploma/ Bachelor	0.4708	0.3346	0.160
10	b2r3	Number of family member	0.1417	0.0047	0.000
11	region2	Region in Lampung- district of Tanggamus	0.0330	0.0311	0.288
12	region3	Region in Lampung- district of South Lampung	- 0.1905	0.0297	0.000
13	region4	Region in Lampung- district of East Lampung	0.0348	0.0308	0.258
14	region5	Region in Lampung- district of Central Lampung	0.1376	0.0289	0.000
15	region6	Region in Lampung- district of North Lampung	0.0335	0.0309	0.278
16	region7	Region in Lampung- district of Way Kanan	- 0.0570	0.0298	0.056
17	region8	Region in Lampung- district of Tulang Bawang	- 0.0188	0.0297	0.527
18	region9	Region in Lampung- municipality of Bandar Lampung	0.4920	0.1186	0.000
19	region10	Region in Lampung- municipality of Metro	0.0315	0.0575	0.584
20	Constant	Constant or Y-intercept	14.8513	0.0312	0.000
21	Adj. R-squared	Adjusted Coefficient of determination	0.2345	-	-
22	n	Number of observation	3,586	-	-

The following interpretations are according to statistical figures from the regression result presented above :

▪ Either the household head's highest level of schooling of general senior secondary school (eduhead3) or of high diploma/bachelor (eduhead6), working together with his/her household member whose highest schooling level is primary education (edufam1) outside food crop farming activity, would only gain additional crop income about 6% and 2% respectively for the household. Contrary to the previous estimate, the household head with highest level of schooling of diploma (eduhead5) and vocational senior secondary school (eduhead4), working together with his/her household member whose highest schooling level is primary education (edufam1) outside food crop farming activity, will gain lower non-crop income as 15% and 16% respectively compared to the control group. However, all of those estimations are not significant statistically.

▪ As the partner for the uneducated household head to work outside food crop farming, the household member with highest level of schooling of high diploma/bachelor (edufam5) and vocational senior secondary

(edufam3) would bring the first and second highest additional non-crop income as many as 47% and 34% respectively.

- In this model, each person of household member (b2r3) excluding the household head would increase the portion of additional non-crop income by 14% more or less and this estimate is statistically insignificant.

- The first and second best region where the household head and household member as partnership, with similar characteristic to the control group, can find job outside food crop farming which brings higher non-crop income for the household is municipality of Bandar Lampung (region9) and district of Central Lampung (region5). Each of these two regions would make them able to gain 49% and 13% income increment, respectively.

- As stated by the constant, a farming household head and member in the control group, working together as partnership outside food crop farming activity would has annual non-crop income as more or less as $e^{14.8513}$ or 2.82 million Rupiah (about 201 Euro).

- The value of adjusted R^2 tells us that this model explains 23.45% of total variation on food crop farming household's annual non-crop income. The other 76.55% variation is not covered by this model.

4.2.2 The Return to Highest Level of Schooling of Household Head on Crop Income

The determinants of regressors resulted from non-crop income regression for the highest level of schooling of household head, separated from the highest level of schooling of household member, for food crop farming households in Lampung are presented in the following Table 17.

Table 17
Determinants of Annual Non-crop Income of Food Crop Farming Household

No.	Variable	Brief Description	Coefficient	Std. Error	P > t
1	eduhead2	Hh Head highest schooling : primary	0.0279	0.0166	0.093
2	eduhead3	Hh Head highest schooling : general senior secondary	0.1208	0.0338	0.000
3	eduhead4	Hh Head highest schooling : vocational senior secondary	0.1449	0.0587	0.014
4	eduhead5	Hh Head highest schooling : diploma (D I/II/III)	- 0.1574	0.2025	0.437
5	eduhead6	Hh Head highest schooling : high diploma/ Bachelor	0.4990	0.2598	0.055
6	b2r3	Number of family member	0.1417	0.0047	0.000
7	region2	Region in Lampung- district of Tanggamus	0.0365	0.0311	0.240
8	region3	Region in Lampung- district of South Lampung	- 0.1898	0.0297	0.000
9	region4	Region in Lampung- district of East Lampung	0.0385	0.0307	0.210
10	region5	Region in Lampung- district of Central Lampung	0.1373	0.0289	0.000
11	region6	Region in Lampung- district of North Lampung	0.0326	0.0309	0.292
12	region7	Region in Lampung- district of Way Kanan	- 0.0568	0.0299	0.057
13	region8	Region in Lampung- district of Tulang Bawang	- 0.0177	0.0297	0.550
14	region9	Region in Lampung- municipality of Bandar Lampung	0.4926	0.1186	0.000
15	region10	Region in Lampung- municipality of Metro	0.0423	0.0574	0.461
16	Constant	Constant or Y-intercept	14.8496	0.0312	0.000
17	Adj. R-squared	Adjusted Coefficient of determination	0.2334	-	-
18	n	Number of observation	3,586	-	-

Based on the above presented regression result, the interpretation are as follows :

- The biggest increment of annual non-crop income for the household will be obtained by the working alone household head whose highest schooling level is high diploma/bachelor (eduhead6), which is as many as 49% even though this estimate is statistically insignificant. The second position which is statistically significant is the household head with vocational senior secondary education (eduhead4) who would bring about 14%.

- Each person of household member (b2r3) excluding the household head would bring incremental crop income by more or less 14%.

- Municipality of Bandar Lampung (region9) and district of Central Lampung (region5) are still the first and second best region for a food crop farming household head to obtain a higher crop income. These two regions have the same level of statistical significances in bringing 49% and 13% increase to farming household's non-crop income, respectively. A contradictory estimate happens in district of South Lampung (region3) and district of Way Kanan (region7) on which region the non-crop income would decrease by 18% and 5% respectively.

- As predicted by the constant parameter, a farming household in the control group would has annual non-crop income as many as $e^{14.8496}$ or 2.81 million Rupiah (about 200 Euro).

- The reported adjusted R^2 suggests that this model explains 23.34% of total variation on food crop farming household's annual non-crop income while the other 76.66% variation is not covered by this model.

4.2.3 The Return to Highest Level of Schooling of Household Member on Non-crop Income

The determinants of variables resulted from non-crop income regression for the highest level of schooling of household member, separated from the highest level of schooling of household head, for food crop farming households in Lampung are presented in the following Table 18.

Table 18
Determinants of Annual Non-crop Income of Food Crop Farming Household

No.	Variable	Brief Description	Coefficient	Std. Error	P > t
1	edufam2	Hh Member highest schooling : general senior secondary	0.0876	0.0306	0.004
2	edufam3	Hh Member highest schooling : vocational senior secondary	0.1798	0.0574	0.002
3	edufam4	Hh Member highest schooling : diploma (D I/II/III)	- 0.1727	0.2021	0.393
4	edufam5	Hh Member highest schooling : high diploma/ Bachelor	0.4980	0.2011	0.013
5	b2r3	Number of family member	0.1417	0.0047	0.000
6	region2	Region in Lampung- district of Tanggamus	0.0282	0.0310	0.362
7	region3	Region in Lampung- district of South Lampung	- 0.1950	0.0295	0.000
8	region4	Region in Lampung- district of East Lampung	0.0292	0.0305	0.339
9	region5	Region in Lampung- district of Central Lampung	0.1360	0.0289	0.000
10	region6	Region in Lampung- district of North Lampung	0.0315	0.0308	0.307
11	region7	Region in Lampung- district of Way Kanan	- 0.0578	0.0298	0.053
12	region8	Region in Lampung- district of Tulang Bawang	- 0.0221	0.0296	0.455
13	region9	Region in Lampung- municipality of Bandar Lampung	0.4853	0.1185	0.000
14	region10	Region in Lampung- municipality of Metro	0.0313	0.0574	0.585
15	Constant	Constant or Y-intercept	14.8709	0.0287	0.000
16	Adj. R-squared	Adjusted Coefficient of determination	0.2342	-	-
17	n	Number of observation	3,586	-	-

The interpretation we can draw from the above presented regression result are as follows :

- The household member whose highest schooling level is high diploma/bachelor (edufam5) is the one would be able to gain the biggest additional non-crop income by 49% for the household. The second

position is the household member with vocational senior secondary education (edufam3) who would obtain 17% incremental income. Both estimates are statistically significant.

- Each working person of household member (b2r3) excluding the household head would gain incremental non-crop income by more or less 11% and this is significant in term of statistical measurement. This estimate is also consistent to both non-crop income estimates presented previously.

- Also consistent to the previous two estimates of additional non-crop income, Municipality of Bandar Lampung (region9) and district of Central Lampung (region5) are still the first and second best region for a food crop farming household head to obtain a higher non-crop income. These two regions have the same level of statistical significances in bringing 48% and 13% increase to farming household's non-crop income, respectively. A contrasting estimate occurs in district of South Lampung (region3) and district of Way Kanan (region7) on which region the non-crop income would decrease by 19% and 5% respectively.

- The constant parameter in this regression predicts a farming household in the control group would has annual non-crop income as many as $e^{14.8709}$ or 2.87 million Rupiah (about 205 Euro).

- The adjusted R^2 suggests that the model explains 23.42% of total variation on farming household annual non-crop income while the other 76.58% variation is not covered by this model.

4.3 The Effect of Schooling on Total Income of Food Crop Farming Households

Since total income comes from crop income and non-crop income the regression estimate utilizes all independent variables or regressors described in table 11, leaving out the first dummy variable of each categorical regressors by which left out household is treated as the control/benchmark group. The number of observation is 3,632 as many as all food crop farming household surveyed by Susenas 2004. Similar to crop income and non-crop income

regressions, total income regression is also conducted with confidence interval 95% or error term 5%.

4.3.1 The Return to Highest Level of Schooling of Household Head and of Household Member on Total Income

Table 18 below presents the determinants of regressors resulted from total income regression for the highest level of schooling of household head and of household member for food crop farming households in Lampung.

Table 19
Determinants of Annual Total Income of Food Crop Farming Household

No.	Variable	Brief Description	Coefficient	Std. Error	P > t
1	eduhead2	Hh Head highest schooling : primary	0.0250	0.0127	0.049
2	eduhead3	Hh Head highest schooling : general senior secondary	0.0252	0.0815	0.757
3	eduhead4	Hh Head highest schooling : vocational senior secondary	- 0.0638	0.1111	0.566
4	eduhead5	Hh Head highest schooling : diploma (D I/II/III)	0.2016	0.1555	0.195
5	eduhead6	Hh Head highest schooling : high diploma/ Bachelor	- 0.0425	0.3250	0.896
6	edufam2	Hh Member highest schooling : general senior secondary	0.0748	0.0775	0.335
7	edufam3	Hh Member highest schooling : vocational senior secondary	0.2630	0.1087	0.016
8	edufam4	Hh Member highest schooling : diploma (D I/II/III)	-	-	-
9	edufam5	Hh Member highest schooling : high diploma/ Bachelor	0.4438	0.2567	0.084
10	b2r3	Number of family member	0.1342	0.0036	0.000
11	s1land	Size of harvested farmland in season 1 (Ha)	0.0294	0.0059	0.000
12	s2land	Size of harvested farmland in season 2 (Ha)	0.0427	0.0268	0.112
13	s3land	Size of harvested farmland in season 3 (Ha)	0.2155	0.0360	0.000
14	mt1polapanen2	Sales option- season 1- Future sales (ijon)	0.0319	0.1632	0.845
15	mt1polapanen3	Sales option- season 1- Combined Own&Future sales	0.1079	0.2435	0.658
16	mt1polapanen4	Sales option- season 1- On-field sales (menebaskan)	0.0703	0.1789	0.694
17	mt1polapanen5	Sales option- season 1- Combined Own&On-field sales	0.0932	0.1599	0.560
18	mt2polapanen2	Sales option- season 2- Future sales (ijon)	0.1594	0.0660	0.016
19	mt2polapanen3	Sales option- season 2- On-field sales (menebaskan)	- 0.1992	0.1518	0.189
20	mt2polapanen4	Sales option- season 2- Combined Own&On-field sales	- 0.0589	0.1230	0.632
21	mt3polapanen2	Sales option- season 3- Future sales (ijon)	- 0.2955	0.0702	0.000
22	mt3polapanen3	Sales option- season 3- Combined Own&On-field sales	0.1858	0.1653	0.261
23	region2	Region in Lampung- district of Tanggamus	0.0867	0.0240	0.000
24	region3	Region in Lampung- district of South Lampung	- 0.0071	0.0228	0.754
25	region4	Region in Lampung- district of East Lampung	0.0799	0.0239	0.001
26	region5	Region in Lampung- district of Central Lampung	0.1171	0.0223	0.000
27	region6	Region in Lampung- district of North Lampung	0.0583	0.0238	0.014
28	region7	Region in Lampung- district of Way Kanan	- 0.0926	0.0232	0.000
29	region8	Region in Lampung- district of Tulang Bawang	0.0221	0.0236	0.350
30	region9	Region in Lampung- municipality of Bandar Lampung	0.4321	0.0912	0.000
31	region10	Region in Lampung- municipality of Metro	0.2935	0.0445	0.000
32	Constant	Constant or Y-intercept	14.8934	0.0238	0.000
33	Adj. R-squared	Adjusted Coefficient of determination	0.3380	-	-
34	n	Number of observation	3,632	-	-

Based on figures from the regression result presented above, the interpretation are as follows :

- Even though all coefficients are more likely to be insignificant, the highest level of schooling of the household head, by which the head can obtain the highest increment on annual total income when he/she works together with the household member whose highest schooling level is primary education, is diploma (eduhead5). On this working partnership, they can gain only 20% of additional total income for the household which is the highest percentage they can get. Working together with the primary educated household member, the second highest percentage of additional total income can be earned by the household head with either primary (eduhead2) or general senior secondary educated (eduhead3) in the amount of 2.5% more or less.

- Working together with an uneducated household head to earn annual total income for the household, the highest percentage of income increment is obtained by the household member with the highest level of schooling of high diploma/bachelor degree (edufam5) by as many as 44%, even though this estimate is not significant statistically. The second highest percentage can be earned by a household member with vocational senior secondary education (edufam3) with 26% increment on total income and, moreover, this estimate is significant statistically.

- Each additional working person of the household member (b2r3), excluding the presently working household head and member, would earn more or less 13% increment on household's total income. This estimate is also significant statistically.

- The regression estimate shows that in food crop farming production harvesting 1 more hectare of farmland on the third farming season during September-December (s3land) is the best way in order to get the highest increase in total income which is 21%, followed by on the second season during May-August (s2land) with 4%, and on the third season during September-December with approaching 3% increment.

- Even though this choice is not significant statistically, selling the harvested crop with combined Own Sales and On-field Sales on farming season 3 during September-December (mt3polapanen3) is the best option which would bring the highest increment in food crop farming household's total income by 18%. In contrast, the worst option is doing Future Sales on the same farming season (mt3polapanen2) which would reduce the amount of total income by 29%.

- Municipality of Bandar Lampung (region9) and Municipality of Metro (region10) are consecutively the best regions for a food crop farming household to be resided in for obtaining the first and second highest increment of total income. Moreover, these two regions are statistically significant in bringing 43% and 29% increase to household's total income, respectively.

- As stated by the constant, a farming household in the control/benchmark group who has no other household member working and no farmland would has annual total income as many as $e^{14.8934}$ or 2.93 million Rupiah (about 209 Euro).

- The adjusted-R^2 the regression resulted suggests that this model explains 33.80% of total variation on food crop farming household's annual total income while the other 66.20% variation is not covered by this model.

4.3.2 The Return to Highest Level of Schooling of Household Head on Total Income

Table 20
Determinants of Annual Total Income of Food Crop Farming Household

No.	Variable	Brief Description	Coefficient	Std. Error	P > t
1	eduhead2	Hh Head highest schooling : primary	0.0266	0.0127	0.036
2	eduhead3	Hh Head highest schooling : general senior secondary	0.1053	0.0258	0.000
3	eduhead4	Hh Head highest schooling : vocational senior secondary	0.1802	0.0453	0.000
4	eduhead5	Hh Head highest schooling : diploma (D I/II/III)	0.2013	0.1556	0.196
5	eduhead6	Hh Head highest schooling : high diploma/ Bachelor	0.4014	0.1996	0.044
6	b2r3	Number of family member	0.1342	0.0036	0.000
7	s1land	Size of harvested farmland in season 1 (Ha)	0.0294	0.0059	0.000
8	s2land	Size of harvested farmland in season 2 (Ha)	0.0410	0.0269	0.127
9	s3land	Size of harvested farmland in season 3 (Ha)	0.2144	0.0360	0.000
10	mt1polapanen2	Sales option- season 1- Future sales (ijon)	0.0302	0.1633	0.854
11	mt1polapanen3	Sales option- season 1- Combined Own&Future sales	0.1060	0.2437	0.664
12	mt1polapanen4	Sales option- season 1- On-field sales (menebaskan)	0.0725	0.1790	0.686
13	mt1polapanen5	Sales option- season 1- Combined Own&On-field sales	0.0956	0.1600	0.550
14	mt2polapanen2	Sales option- season 2- Future sales (ijon)	0.1594	0.0660	0.016
15	mt2polapanen3	Sales option- season 2- On-field sales (menebaskan)	- 0.2009	0.1519	0.186
16	mt2polapanen4	Sales option- season 2- Combined Own&On-field sales	- 0.0598	0.1230	0.627
17	mt3polapanen2	Sales option- season 3- Future sales (ijon)	- 0.2951	0.0702	0.000
18	mt3polapanen3	Sales option- season 3- Combined Own&On-field sales	0.1876	0.1654	0.257
19	region2	Region in Lampung- district of Tanggamus	0.0897	0.0240	0.000
20	region3	Region in Lampung- district of South Lampung	- 0.0063	0.0228	0.783
21	region4	Region in Lampung- district of East Lampung	0.0836	0.0239	0.000
22	region5	Region in Lampung- district of Central Lampung	0.1172	0.0223	0.000
23	region6	Region in Lampung- district of North Lampung	0.0579	0.0238	0.015
24	region7	Region in Lampung- district of Way Kanan	- 0.0922	0.0232	0.000
25	region8	Region in Lampung- district of Tulang Bawang	0.0232	0.0236	0.326
26	region9	Region in Lampung- municipality of Bandar Lampung	0.4331	0.0912	0.000
27	region10	Region in Lampung- municipality of Metro	0.3020	0.0444	0.000
28	Constant	Constant or Y-intercept	14.8921	0.0238	0.000
29	Adj. R-squared	Adjusted Coefficient of determination	0.3370	-	-
30	n	Number of observation	3,632	-	-

Based on statistical estimate from the regression result presented above, the interpretation we can draw are as follows :

- As its statistical significance is also supporting, the highest level of schooling of the household head by which the head can obtain the highest increment on annual total income is high diploma/bachelor (eduhead6) which is as many as 40%. The second highest percentage of additional total income can be earned by the household head with highest level of schooling of diploma (eduhead5) in the amount of 20% but this is not statistically significant.

- Each additional working person of the household member (b2r3), excluding the presently working household head, would earn more or less

13% increment on household's total income. This estimate is also significant statistically.

- The regression estimate shows that in food crop farming production harvesting 1 more hectare of farmland on the third farming season during September-December (s3land) is the best way in order to get the highest increase in annual total income which is 21%, followed by on the second season during May-August (s2land) with 4% even though this is statistically insignificant, and the lowest on the third season during September-December with approaching 3% increment.

- Even though this choice is not significant statistically, selling the harvested crop with combined Own Sales and On-field Sales on farming season 3 during September-December (mt3polapanen3) is the best option which would bring the highest increment in food crop farming household's annual total income by approaching 19%, followed by the option of future sales in farming season 2 (mt2polapanen2) with achieving 16% increment. In contrast, the first and second worst option is doing either future sales on farming season 3 (mt3polapanen2) which would reduce the amount of annual total income by 29% or on-field sales in farming season 2 (mt2polapanen3) which results 20% cut in annual total income.

- Municipality of Bandar Lampung (region9) and Municipality of Metro (region10) are sequentially the best regions for a food crop farming household to be resided in for obtaining the first and second highest increment on annual total income. Moreover, these two regions are statistically significant in bringing 43% and 30% increase to household's total income, respectively.

- As stated by the constant, a farming household in the control group who has no other household member working but only the household head and has no harvested farmland would has annual total income as many as $e^{14.8921}$ or 2.93 million Rupiah (about 209 Euro).

- The adjusted-R^2 the regression resulted suggests that this model explains 33.70% of total variation on food crop farming household's annual total income while the other 66.30% variation is not covered by this model.

4.3.3 The Return to Highest Level of Schooling of Household Member on Annual Total Income

Table 21
Determinants of Annual Total Income of Food Crop Farming Household

No.	Variable	Brief Description	Coefficient	Std. Error	P > t
1	edufam2	Hh Member highest schooling : general senior secondary	0.0810	0.0234	0.001
2	edufam3	Hh Member highest schooling : vocational senior secondary	0.1935	0.0443	0.000
3	edufam4	Hh Member highest schooling : diploma (D I/II/III)	0.1869	0.1553	0.229
4	edufam5	Hh Member highest schooling : high diploma/ Bachelor	0.4137	0.1544	0.007
5	b2r3	Number of family member	0.1343	0.0036	0.000
6	s1land	Size of harvested farmland in season 1 (Ha)	0.0295	0.0059	0.000
7	s2land	Size of harvested farmland in season 2 (Ha)	0.0411	0.0268	0.125
8	s3land	Size of harvested farmland in season 3 (Ha)	0.2162	0.0360	0.000
9	mt1polapanen2	Sales option- season 1- Future sales (ijon)	0.0345	0.1632	0.833
10	mt1polapanen3	Sales option- season 1- Combined Own&Future sales	0.1169	0.2435	0.631
11	mt1polapanen4	Sales option- season 1- On-field sales (menebaskan)	0.0731	0.1789	0.683
12	mt1polapanen5	Sales option- season 1- Combined Own&On-field sales	0.0963	0.1599	0.547
13	mt2polapanen2	Sales option- season 2- Future sales (ijon)	0.1600	0.0660	0.015
14	mt2polapanen3	Sales option- season 2- On-field sales (menebaskan)	- 0.1967	0.1518	0.195
15	mt2polapanen4	Sales option- season 2- Combined Own&On-field sales	- 0.0523	0.1229	0.671
16	mt3polapanen2	Sales option- season 3- Future sales (ijon)	- 0.2970	0.0702	0.000
17	mt3polapanen3	Sales option- season 3- Combined Own&On-field sales	0.1791	0.1653	0.279
18	region2	Region in Lampung- district of Tanggamus	0.0825	0.0239	0.001
19	region3	Region in Lampung- district of South Lampung	- 0.0112	0.0227	0.622
20	region4	Region in Lampung- district of East Lampung	0.0753	0.0237	0.002
21	region5	Region in Lampung- district of Central Lampung	0.1157	0.0223	0.000
22	region6	Region in Lampung- district of North Lampung	0.0573	0.0238	0.016
23	region7	Region in Lampung- district of Way Kanan	- 0.0930	0.0232	0.000
24	region8	Region in Lampung- district of Tulang Bawang	0.0197	0.0236	0.404
25	region9	Region in Lampung- municipality of Bandar Lampung	0.4263	0.0911	0.000
26	region10	Region in Lampung- municipality of Metro	0.2918	0.0444	0.000
27	Constant	Constant or Y-intercept	14.9118	0.0219	0.000
28	Adj. R-squared	Adjusted Coefficient of determination	0.3379	-	-
29	n	Number of observation	3,632	-	-

Based on statistical estimate from the regression result presented above, the interpretation we can draw are as follows :

- As both of their statistical significances are also supporting, the highest level of schooling of the household member by which he/she can obtain the highest increment on annual total income is high diploma/bachelor (edufam5) which is as many as 41%. The second highest percentage of additional total income can be earned by the household member with highest level of schooling of vocational senior secondary (edufam3) in the amount of 19%.

- Excluding both household head which is assumed not working and presently working household member, each additional working person of the household member (b2r3) would earn more or less 13% increment on household's annual total income. This estimate is significant statistically.

- The regression estimate shows that in food crop farming production harvesting 1 more hectare of farmland on the third farming season during September-December (s3land) is the best way in gaining the highest increase in annual total income which is 21%, followed by on the second season during May-August (s2land) with 4% even though this is statistically insignificant, and the lowest on the third season during September-December with approaching 3% increment.

- Even though this choice is not significant statistically, selling the harvested crop with combined Own Sales and On-field Sales on farming season 3 during September-December (mt3polapanen3) is the best option which would bring the highest increment in food crop farming household's annual total income by approaching 18%, followed by the option of future sales in farming season 2 (mt2polapanen2) with achieving 16% increment. In contrast, the first and second worst option is doing either future sales on farming season 3 (mt3polapanen2) which would reduce the amount of annual total income by 29% or on-field sales in farming season 2 (mt2polapanen3) which results 19% loss in annual total income.

- Consistent with the two regression estimates of annual total income previously described, Municipality of Bandar Lampung (region9) and Municipality of Metro (region10) are sequentially the best regions for a food crop farming household to be resided in for obtaining the first and second highest increment on annual total income. Moreover, these two regions are statistically significant in bringing 42% and 29% increase to household's total income, respectively. In contrast, district of Way Kanan (region7) and district of South Lampung are sequentially the worst regions to be resided in since each of them could cause 9% and 1% loss in household's annual total income.

- As stated by the constant parameter, a farming household in the control group who has no working household head, no other household member working but only the presently working household member, and has no harvested farmland would has annual total income as many as $e^{14.9118}$ or 2.99 million Rupiah (about 213 Euro).

- The adjusted-R^2 the regression resulted suggests that this model explains 33.79% of total variation on food crop farming household's annual total income while the other 66.21% variation is not covered by this model.

Chapter 5
Conclusion and Suggestion

5.1   Conclusion

Answering the research questions presented in the beginning of this paper then some conclusion can be withdrawn from the analysis explained previously are as follows:

1. A higher level of schooling achieved by a farmer household head will open wider opportunity for him/her to earn higher annual income from food crop farming activity. As shown by the increasing coefficient in line with the increasing household head's education level categories where household head and member are put separately in each crop income, non-crop income, and total income regression, a more educated farmer will be able to obtain higher crop income. This finding is in line with the theory mentioning higher education is parallel with higher income.

2. A similar tendency also occurs to the higher level of schooling achieved by the household member, higher education brings higher income. It can be seen from the regression coefficients where the household head and household member are separated.

3. It is better to manage the household head and household member not working together in the same food crop farming activity since the regression with separated household head and household member gives higher income coefficient compare to the regression with merged household head and household member.

4. Since negative coefficient raises on each top category of schooling for both household head and household member in the separated crop income regression, there is a tendency that the household head and household member whose each level of schooling is high diploma/bachelor or higher would be no longer working in food crop farming activities.

Beside the main objective on answering the research questions, some other findings can be extracted from this analysis are:

1). In order to obtain incremental annual crop income :

- no matter if they work together or separately, harvesting additional 1 hectare of farmland on farming season 3 during September-December would be the best option for either household head or household member since this way will give them 141%-144% additional income. They can also do harvesting additional hectare of farmland on farming season 1 or farming season 2 even though these choices give them a lower incremental income as about 43%-45%.

- Selecting sales option of future sales (ijon) on farming season 2 during May-August is another choice since this way will bring 630%-632% incremental annual crop income, the highest. On farming season 1, they should select the sales option of Combined Own Sales and Future Sales (mt1polapanen3) which can make their income 427%-443% higher. Finally, on farming season 3 they should choose the sales option of Combined Own Sales and On-field Sales (mt3polapanen3) since this option would give 134%-142% additional crop income.

- Municipality of Metro (region10) would be the first ranked choice of location to be resided in and doing the food crop farming activities, followed by the district of South Lampung (region3) on the second rank. In this case it is understandable since these two regions have better irrigation infrastructures.

2). In order to obtain incremental annual non-crop income :

- No matter if they work together or separately, each additional working person in the household, excluding the presently working household head and member, would give about 14% increments. However, this choice should follow the local regulation especially about labour or permitted ages for working.

- Municipality of Bandar Lampung (region9) and district of Central Lampung (region5) have been statistically significant and also consistent as the first and second best choices in finding job outside food crop farming activity. In municipality of Bandar Lampung, a food

crop farmer can obtain 48%-49% increment while in district of Central Lampung 13%.

5.2 Suggestion

Some suggestion can be offered from this analysis are among other things:

- Even though it is not appeared in this analysis, schooling keeps playing important role in improving farmer's skill and knowledge. The government should provide more and better rural schooling facilities to create a higher quality of the incoming generation of farmers.

- The size of farmland remains a very basic and highly significant aspect in order to open wider opportunity for farmers to achieve higher income. Reaching for a relatively better equality in distribution of farmland should be one of important objectives for the regulator.

- The frequency of available farming activities during one year also much determine the amount of crop income the farmers can obtain. Since farming highly depends on water availability then the irrigation infrastructures should be put in high priority.

- The buffering mechanism for the farming commodity market prices conducted by Bulog should be better managed to protect farmers from disadvantages due to fluctuative selling prices.

- The support in building the insurance market for farmers should also be in high priority in the government rural development programme.

- Since schooling needs a relatively longer period for its' effect to appear then, perhaps, some more advanced analysis using longer period of observation will show the effect on farmers' income comes from schooling.

Appendix

Crop Income Regression For Household Head and Household Member

(n = 1557)

Source	SS	df	MS				
Model	11981.9252	30	399.397508				
Residual	44005.1163	1526	28.8369045				
Total	55987.0416	1556	35.9813892				

Number of obs = 1557
F(30, 1526) = 13.85
Prob > F = 0.0000
R-squared = 0.2140
Adj R-squared = 0.1986
Root MSE = 5.37

lninccrop	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
eduhead2	.3085217	.2950785	1.05	0.296	-.2702807	.8873241
eduhead3	-2.869371	2.176777	-1.32	0.188	-7.139163	1.400421
eduhead4	.7942671	2.974079	0.27	0.789	-5.039448	6.627982
eduhead5	7.196297	3.123663	2.30	0.021	1.06917	13.32342
eduhead6	-4.50735	6.60078	-0.68	0.495	-17.45491	8.440211
edufam2	3.505107	2.07942	1.69	0.092	-.5737158	7.583929
edufam3	1.241746	2.976631	0.42	0.677	-4.596974	7.080466
edufam4	(dropped)					
edufam5	.6834399	5.809348	0.12	0.906	-10.71171	12.07859
b2r3	-.1134942	.087185	-1.30	0.193	-.2845093	.0575209
s1land	.4333626	.0946648	4.58	0.000	.2476757	.6190494
s2land	.4487731	.4578839	0.98	0.327	-.4493752	1.346921
s3land	1.413506	.6070647	2.33	0.020	.2227368	2.604276
mt1polapan~2	-5.483138	2.572213	-2.13	0.033	-10.52858	-.4376908
mt1polapan~3	4.316623	3.811423	1.13	0.258	-3.159558	11.7928
mt1polapan~4	-1.777709	2.800733	-0.63	0.526	-7.271402	3.715983
mt1polapan~5	-3.784295	2.531926	-1.49	0.135	-8.750718	1.182128
mt2polapan~2	6.317658	1.04107	6.07	0.000	4.275578	8.359739
mt2polapan~3	.3416239	2.386281	0.14	0.886	-4.339113	5.022361
mt2polapan~4	-.4593497	1.92638	-0.24	0.812	-4.237983	3.319283
mt3polapan~2	-5.058618	1.180654	-4.28	0.000	-7.374495	-2.742741
mt3polapan~3	1.390132	2.590641	0.54	0.592	-3.691461	6.471726
region2	2.950482	.7063442	4.18	0.000	1.564974	4.33599
region3	3.722939	.6381237	5.83	0.000	2.471247	4.974631
region4	.1282016	.6550845	0.20	0.845	-1.15676	1.413163
region5	-1.789199	.6253478	-2.86	0.004	-3.015831	-.5625667
region6	.3097529	.786504	0.39	0.694	-1.23299	1.852496
region7	-2.466364	.6596131	-3.74	0.000	-3.760208	-1.17252
region8	.1904103	.8029356	0.24	0.813	-1.384564	1.765384
region9	-2.268663	1.787703	-1.27	0.205	-5.775277	1.237951
region10	6.225373	.9876042	6.30	0.000	4.288168	8.162578
_cons	2.289872	.7057441	3.24	0.001	.9055408	3.674203

Crop Income Regression for Household Head (n = 1557)

Source	SS	df	MS		
Model	11881.3699	27	440.050736		
Residual	44105.6717	1529	28.8460901		
Total	55987.0416	1556	35.9813892		

Number of obs	=	1557
F(27, 1529)	=	15.26
Prob > F	=	0.0000
R-squared	=	0.2122
Adj R-squared	=	0.1983
Root MSE	=	5.3709

lninccrop	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
eduhead2	.3389402	.2944422	1.15	0.250	-.238613	.9164935
eduhead3	.5786448	.6454281	0.90	0.370	-.6873732	1.844663
eduhead4	2.276598	1.044729	2.18	0.029	.2273442	4.325852
eduhead5	7.20219	3.124154	2.31	0.021	1.07411	13.33027
eduhead6	-3.840085	3.12616	-1.23	0.219	-9.9721	2.29193
b2r3	-.1142511	.08718	-1.31	0.190	-.2852561	.0567539
s1land	.4321804	.0946745	4.56	0.000	.2464748	.617886
s2land	.4410286	.4577979	0.96	0.336	-.4569497	1.339007
s3land	1.411317	.6070619	2.32	0.020	.2205551	2.602079
mt1polapan~2	-5.507225	2.572516	-2.14	0.032	-10.55326	-.461192
mt1polapan~3	4.27168	3.811929	1.12	0.263	-3.205482	11.74884
mt1polapan~4	-1.822991	2.800868	-0.65	0.515	-7.31694	3.670957
mt1polapan~5	-3.801407	2.532239	-1.50	0.134	-8.768436	1.165621
mt2polapan~2	6.308918	1.041207	6.06	0.000	4.266572	8.351263
mt2polapan~3	.338185	2.386421	0.14	0.887	-4.34282	5.01919
mt2polapan~4	-.4726508	1.926661	-0.25	0.806	-4.251829	3.306528
mt3polapan~2	-5.102371	1.180592	-4.32	0.000	-7.418122	-2.78662
mt3polapan~3	1.349216	2.590686	0.52	0.603	-3.732458	6.43089
region2	2.994691	.7057189	4.24	0.000	1.610412	4.378971
region3	3.719627	.6381969	5.83	0.000	2.467793	4.971461
region4	.1660882	.6538047	0.25	0.800	-1.116361	1.448537
region5	-1.782432	.6254165	-2.85	0.004	-3.009197	-.5556667
region6	.3053907	.7865958	0.39	0.698	-1.23753	1.848312
region7	-2.471348	.6596807	-3.75	0.000	-3.765322	-1.177373
region8	.2279841	.8025707	0.28	0.776	-1.346272	1.80224
region9	-2.269801	1.787953	-1.27	0.204	-5.7769	1.237299
region10	6.220386	.9875936	6.30	0.000	4.283205	8.157568
_cons	2.282675	.7057079	3.23	0.001	.8984169	3.666933

Crop Income Regression for Household Member (n = 1557)

Source	SS	df	MS
Model	11844.0528	26	455.540491
Residual	44142.9888	1530	28.8516267
Total	55987.0416	1556	35.9813892

Number of obs = 1557
F(26, 1530) =   15.79
Prob > F   = 0.0000
R-squared   = 0.2115
Adj R-squared = 0.1982
Root MSE   = 5.3714

lninccrop	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
edufam2	.7900539	.5947039	1.33	0.184	-.3764672	1.956575
edufam3	1.706573	1.049103	1.63	0.104	-.3512598	3.764406
edufam4	7.008919	3.120021	2.25	0.025	.8889478	13.12889
edufam5	-3.603779	2.70009	-1.33	0.182	-8.900049	1.69249
b2r3	-.1136438	.0871852	-1.30	0.193	-.2846589	.0573713
s1land	.4335729	.0945746	4.58	0.000	.2480633	.6190824
s2land	.4528094	.4572315	0.99	0.322	-.4440574	1.349676
s3land	1.448552	.6059039	2.39	0.017	.260062	2.637042
mt1polapan~2	-5.42577	2.572234	-2.11	0.035	-10.47125	-.3802939
mt1polapan~3	4.438399	3.810475	1.16	0.244	-3.035908	11.91271
mt1polapan~4	-1.650563	2.800387	-0.59	0.556	-7.143565	3.84244
mt1polapan~5	-3.772332	2.531683	-1.49	0.136	-8.738268	1.193604
mt2polapan~2	6.326786	1.041082	6.08	0.000	4.284687	8.368884
mt2polapan~3	.2129049	2.385324	0.09	0.929	-4.465945	4.891755
mt2polapan~4	-.355059	1.924996	-0.18	0.854	-4.130969	3.420851
mt3polapan~2	-5.056274	1.180658	-4.28	0.000	-7.372153	-2.740395
mt3polapan~3	1.423394	2.59067	0.55	0.583	-3.658246	6.505035
region2	2.965742	.7041664	4.21	0.000	1.584509	4.346975
region3	3.720871	.6375498	5.84	0.000	2.470307	4.971435
region4	.1637036	.6516847	0.25	0.802	-1.114586	1.441993
region5	-1.749944	.6250652	-2.80	0.005	-2.97602	-.5238691
region6	.3246082	.7863659	0.41	0.680	-1.217861	1.867077
region7	-2.446967	.6595062	-3.71	0.000	-3.740598	-1.153335
region8	.2093227	.8006174	0.26	0.794	-1.361101	1.779746
region9	-2.280212	1.787359	-1.28	0.202	-5.786144	1.225721
region10	6.184851	.9866328	6.27	0.000	4.249555	8.120147
_cons	2.44997	.6810585	3.60	0.000	1.114063	3.785877

Non-crop Income Regression for Household Head and Household Member
(n = 3586)

Source	SS	df	MS			
Model	224.325635	18	12.4625353			
Residual	717.002104	3567	.201009841			
Total	941.327739	3585	.262573986			

Number of obs = 3586
F(18, 3567) = 62.00
Prob > F = 0.0000
R-squared = 0.2383
Adj R-squared = 0.2345
Root MSE = .44834

lnincnonc	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
eduhead2	.026294	.0166688	1.58	0.115	-.0063874	.0589754
eduhead3	.0635747	.106272	0.60	0.550	-.1447854	.2719348
eduhead4	-.1673895	.1446754	-1.16	0.247	-.4510444	.1162653
eduhead5	-.1571652	.2023332	-0.78	0.437	-.5538656	.2395353
eduhead6	.029035	.4233176	0.07	0.945	-.8009339	.8590039
edufam2	.0503429	.101014	0.50	0.618	-.147708	.2483939
edufam3	.3411576	.1417396	2.41	0.016	.0632588	.6190564
edufam4	(dropped)					
edufam5	.4707845	.3345928	1.41	0.160	-.1852279	1.126797
b2r3	.1416834	.0047059	30.11	0.000	.1324569	.1509099
region2	.033053	.0310782	1.06	0.288	-.0278798	.0939859
region3	-.1904818	.0296665	-6.42	0.000	-.2486469	-.1323167
region4	.0348224	.0307629	1.13	0.258	-.0254923	.0951371
region5	.1376363	.0289166	4.76	0.000	.0809416	.194331
region6	.0335213	.0308717	1.09	0.278	-.0270066	.0940491
region7	-.0570492	.0298484	-1.91	0.056	-.1155708	.0014724
region8	-.0187719	.029661	-0.63	0.527	-.0769263	.0393824
region9	.4919815	.1185739	4.15	0.000	.2595021	.7244609
region10	.03152	.0575043	0.55	0.584	-.0812247	.1442646
_cons	14.85129	.0311567	476.66	0.000	14.7902	14.91238

Non-crop Income Regression for Household Head
(n = 3586)

Source	SS	df	MS			
Model	222.74689	15	14.8497927			
Residual	718.580849	3570	.201283151			
Total	941.327739	3585	.262573986			

Number of obs = 3586
F(15, 3570) = 73.78
Prob > F = 0.0000
R-squared = 0.2366
Adj R-squared = 0.2334
Root MSE = .44865

lnincnonc	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
eduhead2	.0279558	.0166407	1.68	0.093	-.0046705	.0605821
eduhead3	.1207985	.0337939	3.57	0.000	.0545412	.1870558
eduhead4	.1448765	.0586692	2.47	0.014	.0298479	.259905
eduhead5	-.1573764	.2024707	-0.78	0.437	-.5543462	.2395934
eduhead6	.4989726	.2598014	1.92	0.055	-.0104014	1.008347
b2r3	.1417456	.0047077	30.11	0.000	.1325155	.1509757
region2	.0365203	.0310692	1.18	0.240	-.0243949	.0974354
region3	-.1897839	.0296839	-6.39	0.000	-.2479831	-.1315848
region4	.038491	.0307237	1.25	0.210	-.0217468	.0987288
region5	.1373014	.028934	4.75	0.000	.0805726	.1940301
region6	.0325814	.030888	1.05	0.292	-.0279785	.0931413
region7	-.0567818	.0298665	-1.90	0.057	-.1153388	.0017753
region8	-.0177263	.0296723	-0.60	0.550	-.0759027	.04045
region9	.4925605	.118654	4.15	0.000	.2599242	.7251969
region10	.0422788	.0573656	0.74	0.461	-.0701938	.1547514
_cons	14.84963	.0311722	476.37	0.000	14.78851	14.91074

Non-crop Income Regression for Household Member
(n = 3586)

Source	SS	df	MS			
Model	223.237266	14	15.945519			
Residual	718.090473	3571	.201089463			
Total	941.327739	3585	.262573986			

Number of obs = 3586
F(14, 3571) = 79.30
Prob > F = 0.0000
R-squared = 0.2372
Adj R-squared = 0.2342
Root MSE = .44843

lnincnonc	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
edufam2	.0876341	.0306428	2.86	0.004	.027555	.1477132
edufam3	.1797927	.0573747	3.13	0.002	.0673022	.2922833
edufam4	-.1726762	.202124	-0.85	0.393	-.5689663	.2236138
edufam5	.4979902	.201126	2.48	0.013	.1036567	.8923237
b2r3	.141755	.004706	30.12	0.000	.1325282	.1509817
region2	.0282059	.0309618	0.91	0.362	-.0324987	.0889106
region3	-.1950083	.0295569	-6.60	0.000	-.2529584	-.1370582
region4	.0292308	.0305577	0.96	0.339	-.0306814	.089143
region5	.1360586	.0289108	4.71	0.000	.0793753	.192742
region6	.0315076	.0308618	1.02	0.307	-.029001	.0920161
region7	-.0578019	.0298503	-1.94	0.053	-.1163273	.0007235
region8	-.0221184	.0295989	-0.75	0.455	-.0801508	.035914
region9	.4852558	.1185314	4.09	0.000	.2528597	.7176519
region10	.0313008	.057365	0.55	0.585	-.0811706	.1437722
_cons	14.87095	.0286999	518.15	0.000	14.81468	14.92722

Total Income Regression for Household Head and Household Member
(n = 3632)

Source	SS	df	MS				
Model	222.81577	30	7.42719232		Number of obs =		3632
Residual	425.93468	3601	.118282333		F(30, 3601) =		62.79
					Prob > F =		0.0000
					R-squared =		0.3435
Total	648.75045	3631	.178669912		Adj R-squared =		0.3380
					Root MSE =		.34392

lntotinc	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
eduhead2	.0250153	.0127182	1.97	0.049	.0000797	.0499508
eduhead3	.0251745	.0815018	0.31	0.757	-.1346199	.1849688
eduhead4	-.0638262	.111069	-0.57	0.566	-.2815907	.1539383
eduhead5	.2016532	.1554624	1.30	0.195	-.10315	.5064564
eduhead6	-.0424772	.3250118	-0.13	0.896	-.6797029	.5947484
edufam2	.0747708	.0775076	0.96	0.335	-.0771923	.2267339
edufam3	.2630144	.1087463	2.42	0.016	.0498038	.4762249
edufam4	(dropped)					
edufam5	.4438412	.256693	1.73	0.084	-.059437	.9471194
b2r3	.1342431	.0036249	37.03	0.000	.1271359	.1413502
s1land	.0294049	.0058871	4.99	0.000	.0178624	.0409473
s2land	.0427107	.0268426	1.59	0.112	-.0099174	.0953389
s3land	.2155451	.0359831	5.99	0.000	.1449957	.2860945
mt1polapan~2	.031934	.1632163	0.20	0.845	-.2880717	.3519397
mt1polapan~3	.1078684	.243546	0.44	0.658	-.3696334	.5853703
mt1polapan~4	.0703478	.1788775	0.39	0.694	-.2803636	.4210591
mt1polapan~5	.09319	.1598905	0.58	0.560	-.220295	.406675
mt2polapan~2	.159447	.0659574	2.42	0.016	.0301293	.2887646
mt2polapan~3	-.1992551	.1517835	-1.31	0.189	-.4968454	.0983353
mt2polapan~4	-.058928	.1229697	-0.48	0.632	-.3000252	.1821693
mt3polapan~2	-.2955102	.0701511	-4.21	0.000	-.43305	-.1579704
mt3polapan~3	.1858306	.1653407	1.12	0.261	-.1383402	.5100015
region2	.0866672	.0239796	3.61	0.000	.0396523	.1336821
region3	-.0071403	.0228227	-0.31	0.754	-.051887	.0376063
region4	.0798674	.0239075	3.34	0.001	.0329938	.126741
region5	.1170615	.0223422	5.24	0.000	.0732568	.1608661
region6	.058339	.0237718	2.45	0.014	.0117314	.1049466
region7	-.0926095	.0231834	-3.99	0.000	-.1380635	-.0471555
region8	.0220887	.0236315	0.93	0.350	-.0242438	.0684212
region9	.4321094	.0911712	4.74	0.000	.2533571	.6108618
region10	.2934966	.0444708	6.60	0.000	.2063062	.380687
_cons	14.89339	.0238328	624.91	0.000	14.84666	14.94012

Total Income Regression for Household Head

(n = 3632)

Source	SS	df	MS
Model	221.858324	27	8.21697496
Residual	426.892126	3604	.118449536
Total	648.75045	3631	.178669912

Number of obs =	3632
F(27, 3604) =	69.37
Prob > F =	0.0000
R-squared =	0.3420
Adj R-squared =	0.3370
Root MSE =	.34416

lntotinc	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
eduhead2	.0265769	.0126978	2.09	0.036	.0016812	.0514725
eduhead3	.1052691	.0257669	4.09	0.000	.0547498	.1557883
eduhead4	.1801927	.0453473	3.97	0.000	.0912837	.2691017
eduhead5	.2013115	.1555721	1.29	0.196	-.1037067	.5063297
eduhead6	.4013801	.19955	2.01	0.044	.010138	.7926222
b2r3	.1342475	.0036267	37.02	0.000	.1271368	.1413581
s1land	.0293759	.0058912	4.99	0.000	.0178256	.0409262
s2land	.0410116	.0268543	1.53	0.127	-.0116395	.0936628
s3land	.2143981	.0360057	5.95	0.000	.1438045	.2849918
mt1polapan~2	.0301514	.163329	0.18	0.854	-.2900751	.350378
mt1polapan~3	.1059994	.2437166	0.43	0.664	-.3718368	.5838355
mt1polapan~4	.0724677	.1789977	0.40	0.686	-.2784791	.4234146
mt1polapan~5	.0955613	.1599976	0.60	0.550	-.2181334	.4092561
mt2polapan~2	.1594582	.0660026	2.42	0.016	.0300521	.2888644
mt2polapan~3	-.2009088	.1518867	-1.32	0.186	-.4987013	.0968838
mt2polapan~4	-.059836	.1230554	-0.49	0.627	-.3011011	.1814291
mt3polapan~2	-.2950975	.070199	-4.20	0.000	-.4327312	-.1574638
mt3polapan~3	.1875541	.1654523	1.13	0.257	-.1368354	.5119437
region2	.0897511	.0239706	3.74	0.000	.0427539	.1367483
region3	-.0063046	.022836	-0.28	0.783	-.0510775	.0384682
region4	.0835817	.0238735	3.50	0.000	.0367749	.1303886
region5	.1171607	.0223565	5.24	0.000	.073328	.1609935
region6	.057939	.023786	2.44	0.015	.0113036	.1045743
region7	-.0921557	.0231978	-3.97	0.000	-.1376378	-.0466736
region8	.0232306	.0236391	0.98	0.326	-.0231168	.0695781
region9	.4331485	.0912348	4.75	0.000	.2542716	.6120254
region10	.3019726	.0443618	6.81	0.000	.2149958	.3889494
_cons	14.8921	.0238451	624.53	0.000	14.84534	14.93885

Total Income Regression for Household Member

(n = 3632)

Source	SS	df	MS
Model	222.256745	26	8.54833635
Residual	426.493705	3605	.11830616
Total	648.75045	3631	.178669912

Number of obs = 3632
F(26, 3605) = 72.26
Prob > F = 0.0000
R-squared = 0.3426
Adj R-squared = 0.3379
Root MSE = .34396

lntotinc	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
edufam2	.0810025	.023361	3.47	0.001	.0352003	.1268046
edufam3	.1934809	.0443412	4.36	0.000	.1065445	.2804172
edufam4	.1868706	.1552927	1.20	0.229	-.1175998	.491341
edufam5	.41374	.1543597	2.68	0.007	.111099	.716381
b2r3	.1342927	.003625	37.05	0.000	.1271855	.1413998
s1land	.0294861	.0058868	5.01	0.000	.0179444	.0410278
s2land	.0411068	.0268158	1.53	0.125	-.0114689	.0936825
s3land	.2161944	.0359836	6.01	0.000	.145644	.2867447
mt1polapan~2	.0344786	.1632263	0.21	0.833	-.2855464	.3545036
mt1polapan~3	.1169431	.243527	0.48	0.631	-.3605214	.5944077
mt1polapan~4	.0731387	.1788681	0.41	0.683	-.2775541	.4238316
mt1polapan~5	.0963259	.1598921	0.60	0.547	-.2171621	.409814
mt2polapan~2	.1599825	.0659595	2.43	0.015	.0306609	.289304
mt2polapan~3	-.1966867	.1517598	-1.30	0.195	-.4942303	.100857
mt2polapan~4	-.052255	.1229356	-0.43	0.671	-.2932853	.1887754
mt3polapan~2	-.2970483	.0701522	-4.23	0.000	-.4345903	-.1595063
mt3polapan~3	.1791303	.1653219	1.08	0.279	-.1450034	.503264
region2	.082529	.0238906	3.45	0.001	.0356886	.1293694
region3	-.0112123	.0227311	-0.49	0.622	-.0557794	.0333548
region4	.0752788	.023746	3.17	0.002	.0287219	.1218358
region5	.1156882	.0223349	5.18	0.000	.071898	.1594785
region6	.0572721	.0237611	2.41	0.016	.0106855	.1038586
region7	-.0930006	.0231823	-4.01	0.000	-.1384523	-.0475489
region8	.0196774	.0235831	0.83	0.404	-.0265601	.0659148
region9	.4263272	.0911317	4.68	0.000	.2476524	.6050021
region10	.2918517	.0443722	6.58	0.000	.2048546	.3788489
_cons	14.91184	.0219492	679.38	0.000	14.8688	14.95487

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