The long way to farming:
the plans of agriculture students in Thailand

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Abstract

Young people that obtained a diploma of agriculture may constitute a key group of policies that support the installation of young farmers in Thailand. The studies investigate the plans that students in agricultural studies have of becoming a farmer, the constraints they perceived to start farming and to what extent the contents of agricultural studies fit with their interests. A total of 187 students and 18 staff of agricultural education organizations were interviewed. Among students, 61% were interested to become full-time farmers and 32% were interested to become part-time farmers, in the long term. However, due to perceived lack of resources (access to land, to capital, to the skills needed to set up the farm of their wishes), many of them planned to engage in a more or less long career plan to obtain these resources before being actually able to start farming.

Keywords: agricultural studies: vocational education; Thailand.

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Chapter 1: Introduction

1.1 Background

Thailand is facing an unprecedented aging of its population (Oizumi, 2007), a phenomenon that affects particularly the agricultural sector. A study of two villages in the Northeast of Thailand revealed that over a period of 25 years (1982–2008), the average age of the farmers increased from 36 to 55 years (Rigg, 2012). Another study in one village of the same region highlighted a wide gap in the age pyramid: young people (between 20 to 40 years old) were absent, and elder farmers were often living with their grandchildren. Moreover, two thirds of the households were receiving remittances, which were on average the largest sources of income (Nilsen, 2014). This phenomenon is fueled in particular by the decreased involvement of young people in farming. The agriculture labor force has continually decreased over the last decades due to the exodus of young people from rural areas (Knodel, 2007; Poungchompu, 2012). Due to the displacement of youth, the agricultural sector remains under pressure having a great impact on rural economic activities. The major consequences and effects of youth migration from rural areas include a reduction in agricultural labour force (the phenomenon known as "brain drain", hence rural areas and the agricultural sector become trapped in a vicious cycle of poverty (Uma *et al*., 2013)), low agricultural productivity, high cost of labour, reduction of household annual income, farm work mostly done by aged parents, unavailability of farm labour and food insecurity in households. Indeed, labor productivity in Thailand is lower in the agricultural sector compared with industry and services and this participates in further decreases in the sector's attractiveness (Suphannachart et al., 2016).

A commonly used argument to explain this situation is that young people are no longer interested in farming (Ministry of Agriculture and Cooperatives, 2017, p. 44) or that some changes in cultural preferences made many rural inhabitants seeing now farming as a hard and low-status activity (Rigg et al., 2012). However, the entry in farming of some people takes place, but at an increasingly old age. Rigg et al. (2014) found that in Northeast of Thailand, many people start farming in their late 40s or 50s, after having worked for two decades in industries, what could explain in part this aging of Thai farmers.

In 2013, the Thai agriculture sector contributed around 8.3 percent to the GDP whereas 39.1 percent of Thailand's labor force was engaged in this sector (Bank of Thailand, 2014). Moreover, other benefits are attributed to this sector. It plays an important role in keeping families in rural areas even if a rural exodus has taken place quite significantly in recent years (Knodel, 2007). An OECD report from 2009 based on an analysis realized using data from different countries including Thailand stated that growth in agricultural incomes was especially important for poverty reduction (Cervantes-Godoy et al., 2009). However, a FAO global review of ageing and rural development (Stloukal 2004) suggests that, because of ill health, relatively low literacy, discrimination in credit markets, and shorter investment horizons, old people tend to be slower to adopt new crops and technologies, to be less market-oriented and less inclined to make long-term investments than young people. The average age of farmers is 51 years old and 19.1% of farm holders are 65 years old or more (National Statistics Office, Agricultural census, 2013). Therefore, the aim announced by Government to "explore the usage of science, technology, and innovation to boost the country's economy, focusing on industrial and agricultural sectors" (Jones, 2017) will be difficult to achieve without an important involvement of youth in farming activities in the years to come.

Thai Government is more and more aware of the issue of youth involvement in farming and launched a series of pilot programs over the past decade. For instance, the Agricultural Land Reform

Office (ALRO) provides land and support to young farmers (Project: Sor Por Kor - สปก) and the "Young Smart Farmers" program help farmers networking and getting access to markets. However, a policy document recently stated that "Most of the state policies, programs, and projects in the past were short term with no continuity. Often, they were launched to solve immediate problems with no collaborations among concerned ministries" (Ministry of Agriculture and Cooperatives, 2017).

1.2 Problem statement

To counter the trend of aging farmers, there is a need to support the installation of young farmers. A core group for this new generation of farmers may be the young people who obtained an agricultural diploma. They are expected to have some willingness to engage in the agriculture sector and to have at least a part of the required agricultural knowledge. However, their involvement in farming is not granted. A study ran in 2017 found that among 1,067 Thai high school students and vocational college students, 95% of them considered that agriculture work was important to Thailand's economy but only 43% indicated a willingness to work in this sector. Others did not plan to engage in farming because of a lack of competencies, or because they don't own land (Maejo Poll, 2017[1]). Regarding data about the occupation of vocational students in agriculture few months after their graduation, 50% of graduate students were working in the agricultural sector in 2016, a rate that was lower during years before as only 29% and 31% of graduate students were working in the agricultural sector in 2015 and 2014. According to the director of a vocational college of agriculture met in April 2018, 70% of students do not work in agriculture after graduation. Without giving any more precise figures, he suggested that this situation was not peculiar to his college. Several reasons can be advanced to explain this situation. It is possible that students feel they do not get sufficient skills in the Thai agriculture education system (Traimongkolkul et al., 2006; Hallinger et al., 2011).

Traimongkolkul (2005) pointed out the necessity of adapting the agricultural education system to the bilateral direction of Thai agriculture: (1) agriculture for competitiveness and (2) agriculture for sustainability of the society. Then, Hallinger (2011) mentioned the 'reform fatigue' characterizing Thai education, stating that even the last important reform of education implemented in 1999 was not implemented in a sufficient way around the country more than 10 years later. The Ministry of Agriculture acknowledged the importance of the improvement of the education system in improving the agricultural sector in the twenty-year agriculture and cooperative strategy plan (Ministry of agriculture and cooperatives, 2017). In this report, the necessity of maintaining the interest of farmers' family members in the agriculture sector was highlighted. According to this document, the solution would be to provide through higher education possibilities more knowledge, understanding, and thoughts on sustainable agriculture to the new generation of farmers. The Ministry of agriculture also pointed out the necessity to cooperate more with the Ministry of education.

As considering previously, the major part of students does not become a farmer at the young stage, although they seem to be privileged candidates to take the succession of old farmers, who are for a part of them their own parents. However, to public document acknowledges such potential in Thailand. The present study aims to investigate the pathway between agricultural studies and farming.

[1] http://www.maejopoll.mju.ac.th

1.3 Objectives of the study

The present study aims to understand whether and how Thai agriculture students plan to engage in farming in the future. The study assesses the visions that these students have of farming, their plans in the future, what kind of farms they wish to have, and what are the constraints they think they will face starting farming. It also investigates the objectives of the curricula in agricultural studies and to what extent it fits the interests of students.

Chapter 2: Literature review

2.1 Importance of agricultural sector for Thailand

2.1.2 Importance for the Thai economy

From a general point of view, Thai agriculture has good assets: advantageous geography, soils and climate, suitable conditions for agriculture and a great farming legacy built on a long evolution of knowledge and techniques (Falvey, 2000). However, the sector faces challenges such as unsteady prices of products, a decrease in farmers' income and population ageing. Thailand can be considered as an important agricultural product exporter as they exported a value of 612.87 trillion baht (17.76 trillion US$) of agricultural products in 2007. They are net exporter as they imported agricultural products from the international market at the value of 181.41 trillion baht (5.26 trillion US$) the same year. Thailand was a net exporter of agricultural and food products, but also one of the tenth major suppliers in the world food trade. Nowadays, Thailand is still an important exporter of agriculture products as displayed in Table 1.

Table 1: Thailand's top agricultural export commodities and its world ranking (Source: Suwannarat, 2014 - The Board of Investment of Thailand, 2013)

Commodities	World ranking
Sugar	N° 1
Casava	N° 2
Fish products	N° 3
Rice and grains	N° 6

Thailand was also the most important rice exporter until 2012. In 2012, due to unfavorable government subsidy policies, Thailand lost its place to the benefit of India and Vietnam. The main importers of Thai rice are Benin, Philippines and China (Source: Thai rice exporters, 2018).

The importance of the agricultural sector compared to other sectors is nowadays lower than in the past. Agriculture part of GDP fell from 30% in 1970 to 10% in 1990 (Falvey, 2000) and stopped to decrease since this time (Nowadays = 8.3%). However, the agriculture sector total production did not stop to increase during this period. The agricultural GDP grew by about 12.3 times in the 30 years between 1961 and 1991, but the non-agriculture sector registered a growth by 55 times during the same period. As it is depicted in the next figure, the part of the agricultural sector in the GDP was replaced by Industry and Service sectors. Now the distribution of importance of these 3 sectors seems stable.

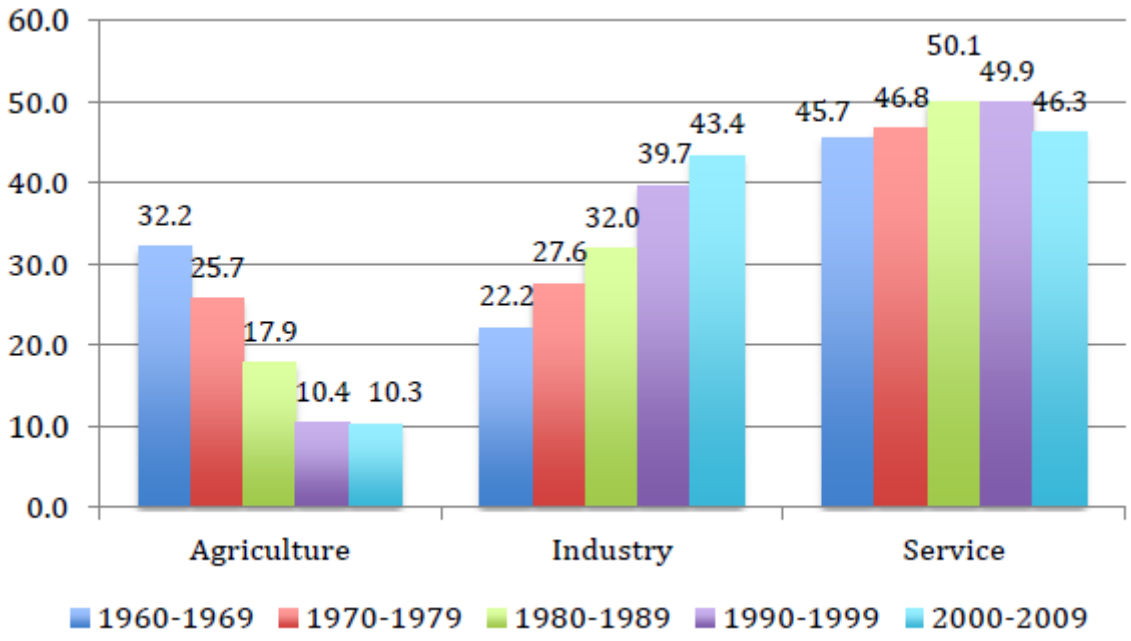


Figure 1: Sectoral value-added in Thailand (% of GDP) (Source: Suwannarat, 2014)

Agriculture has been an important economic sector for the development of Thailand and was viewed as the "backbone" of the country. Over the past five decades, the agricultural sector used to be the key engine of economic growth in Thailand. In 1960, the share of agriculture in GDP was higher than the industrial sector with 32.1 and 22.1 percent, respectively (Suwannarat, 2014).

Table 2: Share of the cultivated area by crops, from 1971-2007

Period	Share of planted area (%)					Average total cultivated area
	Rice	Upland crop	Vegetables	Tree crops	Total	(million ha)
1971-75	63.21	22.63	0.81	13.35	100.00	12.88
1976-80	60.41	26.27	0.68	12.64	100.00	15.43
1981-85	57.15	29.93	0.56	12.37	100.00	17.23
1986-90	56.19	30.54	0.42	12.86	100.00	17.78
1991-95	55.60	29.01	0.43	14.97	100.00	17.31
1996-00	58.40	24.63	0.45	16.52	100.00	17.57
2001-07	59.53	20.84	0.32	19.31	100.00	17.94

Source: Calculated from a data set of Office of Agricultural Economics.

As displayed in the previous table, no major change occurred in the total cultivated area and in the area used for each crop categories.

Thailand now has the ambition to become the kitchen of the world. This ambition is built on the world's per capita food consumption growth, requiring 60 percent more food by 2050 (Onanong Tapanapunnitikul and Siriluk Prasunpangsri, 2014). However, even if the importance of the agro-industry sector increases, the labor force in the agriculture sector has decreased gradually. This could become a problem in the future.

In 2013, the agriculture sector contributed to only 8.3 percent to the GDP (Table 3). However, the agriculture sector income was distributed to most of the Thai population compared with other sectors, since 39.1 percent of Thailand's labor force is engaged in this sector (Bank of Thailand, 2014). It demonstrates that agriculture is the main livelihood provider for an important part of the Thai people. Since the number of workers involved in industrial and services sector was almost stationary for 20 years, agriculture is the only way to get a livelihood for this part of the population, that means a decrease of agriculture productivity could impact them.

Table 3: Structure of the economy in Thailand, 2013

Sector	GDP by sector (%)	Labour force by sector
Manufacturing	38.1	13.8
Wholesale and Retail Trade	13.4	15.3
Transport, storage and communication	10.2	2.7
Agriculture	8.3	39.1
Construction and mining	4.3	6.6
Other sectors*	25.7	22.5

* Financial, education, hotels and restaurants, etc
Source: Bank of Thailand, 2014

The agricultural research system in Thailand is managed by the government agencies under the Ministry of Agriculture and Cooperatives (MOAC), mainly funded from the government budget. This Ministry is also supposed to manage the dissemination of research findings. It accounts for around 95 percent of the total government budget for all agricultural research and extension (Poapongsakorn, 2006) and more than half of this budget is allocated to crop farming, far surpassing that for livestock, forestry or fishery.

Some researchers argue that Thailand's publicly-funded agricultural research and extension programs have not been particularly effective. According to them, most new crops, technologies or inputs are introduced by farmers themselves, or by agricultural companies, rather than by the public sector. Government programs to introduce new crops, techniques, or technology have often reached limited numbers of farmers, leading to disappointing results (Sirisup and Kammeier 2003).

2.1.2 Social and food security importance

Even if agriculture is not the most important activity in Thailand considering its importance in national GDP, this sector provides income and food to many people. The role of agriculture is both social protections, not provided by the non-agricultural sectors, and the regulation of the mobilities of the countryside to the city. The food availability and accessibility have already been challenged by the global economic crisis, by climate change, and by food-fuel crops in the late 1990s and could then be challenged again in the case of another economic or climate crisis, an important threat for the 39% of people depending on agriculture.

As it is described in Table 4, there are large inequalities between urban and rural people in Thailand:

Table 4: Distribution of the Poverty rate in different regions of Thailand (National poverty level); Source: international policy workshop on rural-urban poverty, Wuttisorn, 2014

Table 1 : Urban Poverty Rate (%)

Region	2012	2013
Bangkok	1.91	1.06
Central	4.74	3.95
North	15.71	15.21
Northeast	19.13	16.39
South	9.02	7.98
Total	**8.80**	**7.70**

Table 2 : Rural Poverty Rate (%)

Region	2012	2013
Bangkok		
Central	8.92	6.72
North	18.43	17.77
Northeast	20.10	17.88
South	15.70	12.67
Total	**15.96**	**13.89**

The rural poor people mostly work in the agricultural sector. Most of them also live in remote areas, where accessibility to public services—infrastructure, education, health as well as administrative services—is limited.

This inequality is also observable among people who work in different sectors. Farming sector in Thailand comprises 4.7 million of farm households with an average land holding of about 3.6 ha. per farm household and a family size of 3.95 people per household (OAE, 2008). Their average annual income in 2006 was 196,389 baht (5,692 US$) per household or about 49,719 baht (1,441 US$) per capita. This amount of income is twice lower than the self-employed non-farm workers and three times lower than that of the factory workers. The low income of farm and rural households have inevitably led them to live in poorer conditions. Moreover, many farmers are affected by household food poverty and malnutrition. For poor people, food represents a considerable portion of the expenditure. The high food price and inflation rate directly affect their livelihood status. In addition, small farmers are the ones who are impacted by soaring input prices and rising production cost (Isvilanonda, 2007).

2.2 Ageing of Thai farmers

Like many countries of Asia, Thailand is facing unprecedented aging of its population (Oizumi, 2013) due to a decrease in mortality and fertility. The shift towards older age structures is particularly marked in the agricultural workforce, where demographic changes have been reinforced by the tendency of young people to seek non-agricultural employment (Bryant, 2005).

Nowadays, Thai farmers are on average 57 years old and 25% of them are older than 65. A study of two villages in the Northeast of Thailand revealed that over 25 years (1982–2008), the average age of the farmers increased from 36 to 55 years (Rigg, 2012). Another study in one village of the same region pointed out a wide gap in the age pyramid: young people (between 20 to 40 years old) were absent, and elder farmers were often living with their grandchildren. In these villages, farming is not the main source of income anymore. Moreover, cultural preferences have changed and many rural inhabitants (both younger and older generations) see now farming as a hard and low-status activity (Rigg et al., 2012).

The following plot depicts this evolution in the age groups of farm holders over 40 years.

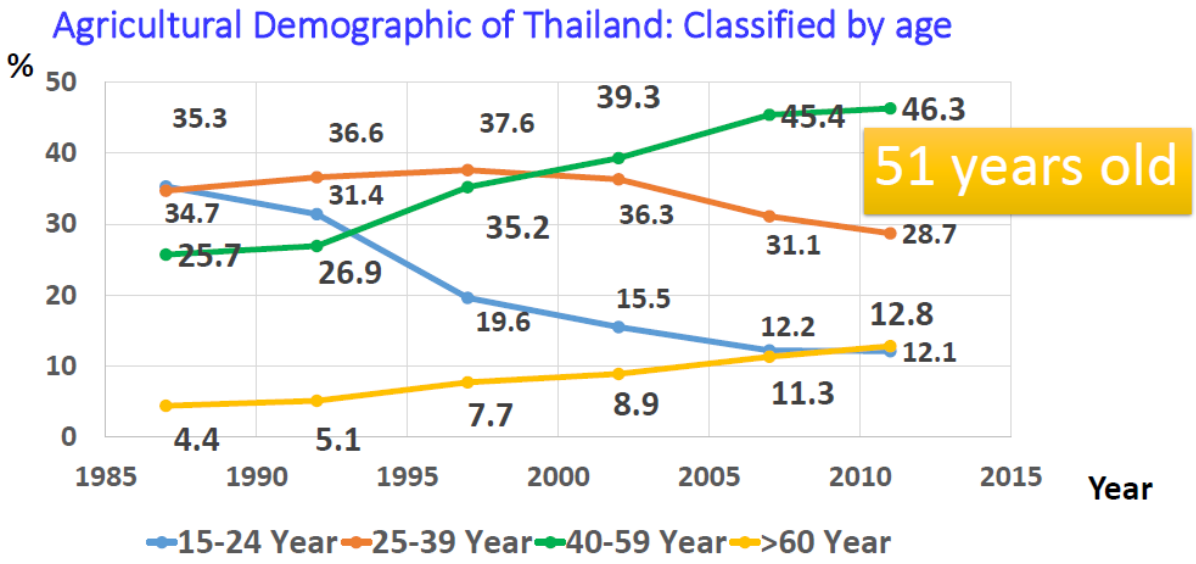


Figure 2: Agricultural demographic evolution of farm holders in Thailand classified by age (Source: Tappanapunitikul, 2014)

This could represent a problem for the agriculture sector as, according to many sources, having a large share of ageing people among the farming population could block technological development and productivity. The international literature on the aging of farmers suggests that old people may be less flexible and less open to new technology than young people. A FAO global review of ageing and rural development (Stloukal 2004) suggests that, because of ill health, relatively low literacy, discrimination in credit markets, and shorter investment horizons, old people tend to be slower to adopt new crops, new varieties, and technologies, to be less market-oriented and less inclined to make long-term investments than young people.

Thai agriculture has been diversifying away from rice production, and has become more capital intensive and market-oriented. Almost 20 years ago, some scholars have argued that older farmers were less able or willing to participate in this transformation: Improved transportation and communications, constant population flows to and from the capital, rural industrialization, and the expansion of state services (police, irrigation, roads, electricity, health, etc.) have now defined a mixed economy where agriculture is specializing in high-value cash crops and where the younger generation has little commitment to farming (Molle and Srijantr 2003: 23).

2.3 Youth enrollment in agriculture

2.3.1 Youth enrollment in farming

Young enrollment in farming is nowadays quite low in Thailand. As seen previously, the number of Thai farmers younger than 35 years old is decreasing since many years, showing that even if some people still settle farms in Thailand, they do it when they get older. No clear results about the causes of this situation were found in the literature, except some mentions to general difficulties encountered by Thai farmers, the lack of profitability, difficult access to market and exposure to natural risks.

Several studies analyzed the vision that high school students have of agriculture and of becoming a farmer in other countries. For most of them, the methodology was based on the completion of a paper questionnaire. For instance, the study by Grannec et al. (2017) was based on answers of 1113 students who fulfilled forms. We also analyzed results from a survey conducted by Maejo poll (2017), based on answers of 1067 students, a survey conducted by Bednarikova et al. (2016), based on answers of 474 students and a survey conducted by Shiraz et al. (2017), based on 196 students' answers. By contrast, some studies were based on face to face interviews such as the one realized by Yeboah et al.

(2016) on 38 students and 34 parents' interviews. Similarly, two studies based on face to face interviews were realized among rural young instead of students. The first was realized by Abdullah et al. (2013) among 250 young rural in Malaysia and the second by Ruiz Salvago et al. (2018) among 87 young rural in Thailand.

The attitude toward farming and agriculture is often mentioned as one of the main factors in students' choices to do farming. Yeboah et al. (2016) assessed the type of job that high school students found desirable. According to this study, students' predisposition to farm was related to the profitability of farming in the area where parents were living. Bednarikova et al. (2016) indicated more readiness to do farming when the respondents intended to work in agriculture and when the respondents believed that it was not difficult to establish one's own business in the parental municipality. For Shiraz (2017), agriculture students said that lack of capital, of knowledge, of access to land, the riskiness of the activities were key factors preventing their engagement in farming. For Grannec (2017), French agricultural students are equally interested in agriculture sector which has a bad reputation, here swine farming, compared with other sectors.

Some of the previously mentioned studies also indicated a strong influence of family background on students' intention to become farmers. Bednarikova et al. (2016) found out that students' readiness to work in the agricultural sector in parents' municipality depended, inter alia, on whether the respondent's parents were supporting the study of agriculture and if the respondent's family owned agricultural land. This influence of the situation of the family was also mentioned by Abdullah (2013) in Malaysia.

External factors such as government support and promotion through carnivals and festivals can also have an influence on the predisposition of young people to farm (Abdullah, 2013). Abdullah (2012) stated with an exploratory research design through literature and document analyses that most of young people have a positive perception about agriculture but only a few of them are involved directly in this field. This finding was also mentioned by Ruiz Salvago (2018).

Two studies were realized in Thailand about the willingness of young people to do farming. The first one was realized by Krajangchom in 2015 and intended to study general characteristics of farmer's descendants and their households in Sanpatong district, Chiang Mai province. The aim was also to determine factors related to the motivation of farmer's descendants on agricultural inheritance. Opinion about agriculture in this community is that farming is very tiring, with a high risk of oversupply, an exposure to natural disasters, and requiring loans to do it in a sustainable way. However, more than half of the farmers in the community still want their children to continue to do farming. Results demonstrated that the time the household was consecrating to the farming activity, the agricultural information farmer's descendant was receiving from parents and others and their attitude toward agriculture were significantly influencing the willingness of young people to farm.

The second study was realized by Maejo Poll in 2017 among students from high schools, vocational colleges, and universities of agriculture. The study intended to prospect the potential part of young that could become the next generation of Thai farmers. Results proved that even though almost all students were aware of the importance of agriculture for their country, less than half of them planned to do farming after having graduated.

2.3.3 Supports for young farmers in Thailand

The Thai government is more and more aware of the issues related to an aging population. The 10th National Economic and Social Development Plan (NESDP) (2007-2011) mentions that Thailand becomes an aging society. In the 11th NESDP (2012-2016), this issue is related to the agricultural sector: "Labor shortages are rising in the agricultural sector, as Thailand becomes an aging society." The document points out that the labor shortage in the agricultural sector will come from two trends: the aging of the society and a shift of workers to the industrial and service sectors (Office of the National Economic and Social Development Board, 2011). In order to attract young farmers and skilled

labor to engage in farming, the plan proposed three directions: 1) to provide arable land ready for cultivation to young farmers; 2) sources of funds should be easily accessible to them, and 3) there should be a good image of the profession of farmers. The 12th NESDP (2017-2021) confirmed the aim of supporting a new generation of farmers (Office of the National Economic and Social Development Board, 2016).

As a consequence of this increased interest, a series of pilot programs have been launched over the past decade. For instance, the Agricultural Land Reform Office (ALRO) provided land and support to several young farmers. Also, the "Young Smart Farmers" program help farmers to do networking and having access to markets.

However, the last report of the 12th National Economic and Social Development Plan[2] mentioned that "Most of the state policies, programs, and projects in the past were short term with no continuity. Often, they were launched to solve immediate problems with no collaborations among concerned ministries". Their actions to solve this problem are to manage better the influx of foreign workers, to promote the farm mechanization, the skill development of farm labor, the protection as well as the social welfare guarantee system for farm labors. Even if no policy change was done since the publication of this report and January 2018, different aims were settled to solve these problems (Ministry of Agriculture and Cooperatives (2017):

- Joining academies with agriculture curriculum in transferring to them, farmers' children, and other people destined to be engaged in agricultural production, new technology in agricultural production, business administration, marketing, and access to credit sources.

- Rerouting new farmers' attitudes through providing them with incentives and prides for their farming inheritance in the form of awards for best farmers in selected fields, and the publicity of their achievements.

- Developing a welfare system for farmers

- Carrying out a continuous long-term agricultural debt adjustment program

- Providing knowledge about sustainable agriculture to future farmers by working with the Ministry of Education in developing a curriculum containing knowledge on sustainable agriculture like organic farming, integrated farming, the New Theory agriculture.

- Developing the market places of safe agricultural products as an alternative for the consumers

[2] THE TWENTY-YEAR AGRICULTURE AND COOPERATIVE STRATEGY (2017-2036) AND THE FIVE-YEAR AGRICULTURE DEVELOPMENT PLAN

2.4 Thai agriculture education

2.4.1 Thai general education

a. General education in Thailand

Education in Thailand is under the responsibility of the Ministry of Education (from pre-school to senior high school. Government entities involved in education are Ministry of education (MoE), Ministry of Labor (MoL), Office of the Higher Education Commission (OHEC), Office of the National Education Standards and Quality Assessment (ONESQA) and Office of the Vocational Education Commission. Free basic education of fifteen years (counting kindergarten that is not included in our scheme) is guaranteed by the constitution.

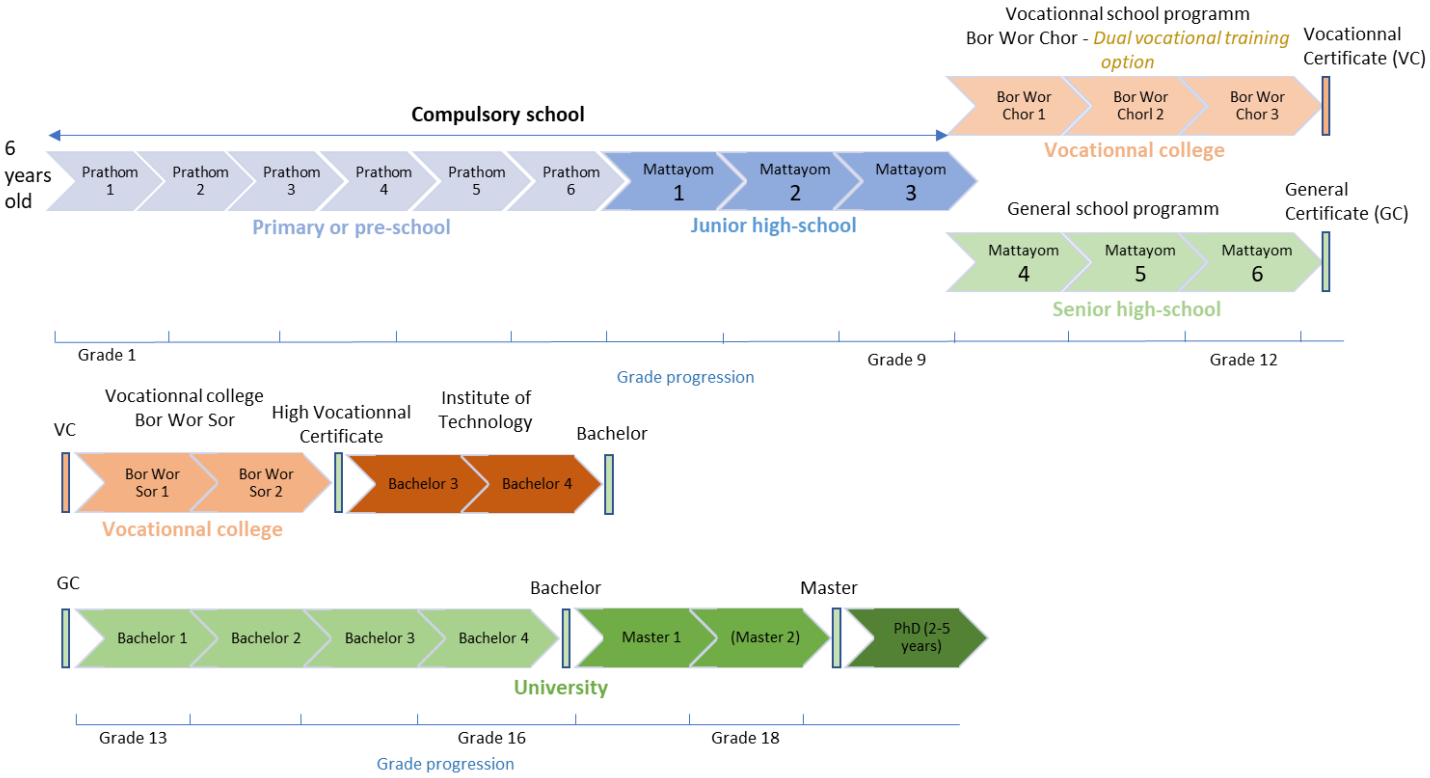


Figure 3: Functioning of the Thai education system (Source: Ministry of education Thailand)

Higher education is under the jurisdiction of the Ministry of University Affairs. Thailand includes 170 institutions of higher education, both public and private, offering 4,100 curricula. During the first years of the 21st century, the number of universities increased dramatically following a decision by the Thaksin government to rename many public institutes as universities. For the 2015 academic year, **the universities could accommodate 156,216 new students, but only 105,046 applied to take entrance exams**[3].

There are 416 vocational institutions of higher learning in Thailand, all managed by the Vocational Education Commission (there are also private vocational institutions). Students can start technical and vocational education at the senior high school level, the moment when general and vocational tracks are separating. Nowadays, around 60 percent of students follow the general

[3]« General education Unis face crisis as students turn away "by DUMRONGKIAT MALA https://www.bangkokpost.com/news/general/1008477/unis-face-crisis-as-students-turn-away. View our policies at http://goo.gl/9HgTd and http://goo.gl/ou6Ip. © Bangkok Post Public Company Limited. All rights reserved

education programs, but the government's aim is to achieve an equal balance between general and vocational education.

Three levels of Vocational Education are offered:

- the Certificate in Vocational Education (*Bor Wor Chor*) from grade 10 to grade 12 and which gives access to the technical diploma
- the Technical Diploma (*Bor Wor Sor*) from grade 13 to grade 14 and which gives access to university and higher diploma
- the Higher Diploma from grade 14 to grade 16, based on which admission to the university for a bachelor's degree program may be granted

Students can have the possibility to do a Dual vocational training with half of the time spent in practical training. Dual vocational training can offer both Bor Wor Chor and Bor Wor Sor with the same number of years of studying as a classical Vocational Education degree.

Last Thailand's major educational reform initiatives are generally known as the National Education Act (NEA) and were set up in 1999 (*ONEC, 1999*). This reform results mainly from the shock of the Asian economic crisis and subsequent political reforms such as the new Constitution of 1997, which mandated both educational reform and decentralization (*Fry, 2013*). According to Fry (2013), the substantive thrusts of the NEA were to:

"decentralize authority, engage local initiative in the management and delivery of educational services, support the integration of 'local wisdom' into the curriculum, empower teachers, create a more active learning environment for pupils and refocus the system from quantity of graduates to quality of learning"[4]

Results of these reforms were evaluated in Hallinger's paper (2011) employing a problem-based learning design and using lower inference methods of investigation in schools and classrooms. Results indicate that there are no significant disparities between regions of Thailand, but that an important part of teachers and schools have difficulties applying the reforms to their pedagogy methods more than 10 years after this reform.

2.4.2 Agriculture education

The following information comes from the Thai Ministry of Education website and the work of Traimongkolkul (2006) about Thai agricultural education.

Agricultural colleges and universities in Asia were inspired by the U.S. land-grant model. This model began in the United States with the Morrill Act in 1962 and consisted on giving public lands to states provided the lands be sold or used for profits and these profits used to establish colleges that would teach agriculture and the mechanical arts. Like the original model, their missions were to teach, to research and outreach. Three factors mainly contributed to the important development of agricultural studies in Thailand: the vision of the fore-founders and supportive political wills, the green revolution movement in Thailand during the 1960s and 1970s and the international supports, heavily influenced by the United States of America. The situation is that presently, nearly all of the total 74 Thai universities all around the country offer programs in agriculture or related sciences and a total of 45 vocational colleges of agriculture are distributed throughout the territory.

Several problems in the Thai agricultural education system are regularly mentioned. The dean of the faculty of agriculture in Kasetsart University, indicated between 2012 and 2013 a decrease of 7% of the number of applicants to Bachelor of Agriculture and an important fall of agriculture major

[4] SOURCES: (FRY, 2002; HALLINGER, 2004; KANTAMARA, HALLINGER, & JATIKET, 2006; PENNINGTON, 1999; ONEC, 1999; THONGTHEW, 1999; WONGWANICH & WIRATCHAI, 2004).

choice from 1st or 2nd place to 3rd or 4th place[5]. Traimongkolkul et al. (2005) confirmed these trends and stated a decrease in the number and quality of students entering agricultural programs.

In Thailand, the link between colleges of agriculture and the ministry of agriculture is not strong as colleges are managed by the ministry of education. As research and extension in agriculture is the responsibility of the Ministry of Agriculture, college professors tend to lose their sense of research-extension mission (Traimongkolkul, 2006). Vocational colleges of agriculture were considered as key institutes in providing some educational opportunity to the poorer population of youth. According to Traimongkolkul (2006), vocational colleges of agriculture were facing critical problems of declining enrollment and subsequent budget shortfalls (though they still have important work to do to adopt the reforms dating back almost 20 years[6] - Hallinger, 2011). In this regard, vocational colleges of agriculture are gradually moving away from its agricultural specialization, turning toward comprehensive vocational/technical education without adequate resources. As Traimongkolkul said in 2006 "This trend will have an adverse impact on future development of most colleges of vocational agriculture and the nation's vocational manpower in agriculture". The finding is despite the proliferation of degree programs offered by universities, declining interest in the conventional agricultural sciences has been evident in the recent decade. As a case in point, the coming decade (the 2010s) may see a loss of critical mass, since up to 30-50% of senior professors in major universities will retire.

The main specialized curriculums proposed in agriculture education are Bor Wor Chor, Bor Wor Sor (Vocational college) and Bachelor (Vocational college, Institute of technology and Faculty. Prices and advantages of these different curriculums are presented in the next table.

Table 5: Price and advantages of each agriculture curriculums proposed in Thailand (Source: Office of Vocational Education Commission, Office of Higher Education Commission)

	Bor Wor Chor	Bor Wor Sor	Bachelor
Admission fee	Free	Free	Depend on Organism (i.e.: Kasetsart University = 14 000 baht/ semester)
Food and accommodation	Supported	Not Supported	Not Supported

[5] Statistics data of Kasetsart University

[6] National Education Act (NEA) - 1999 (ONEC, 1999)

Chapter 3: Methodology

This chapter describes the conceptual framework, site selection, research design method, and data analysis and techniques.

3.1 Type of research and conceptual framework

The research design is based on a qualitative and quantitative study, which aims to develop an in-depth understanding of the willingness of students in agricultural studies to do farming and what are the conditions under which those students consider farming an economically viable source of livelihood. The research sought to understand how these students perceived agriculture, what was the main external influence that built this perception (school, family, media…), who among them would be ready to become farmers and what kind of farming they would like to do. The main questions we tried to answer in this study are:

(1) What factors influence the insertion of young people in agriculture training?

(2) How training influence students and how they live it?

(3) What are the objectives, reference models and pedagogy used by the training organizations?

(4) What distinguishes agriculture students who want to become farmers from others?

The conceptual framework of the study is presented in the next figure:

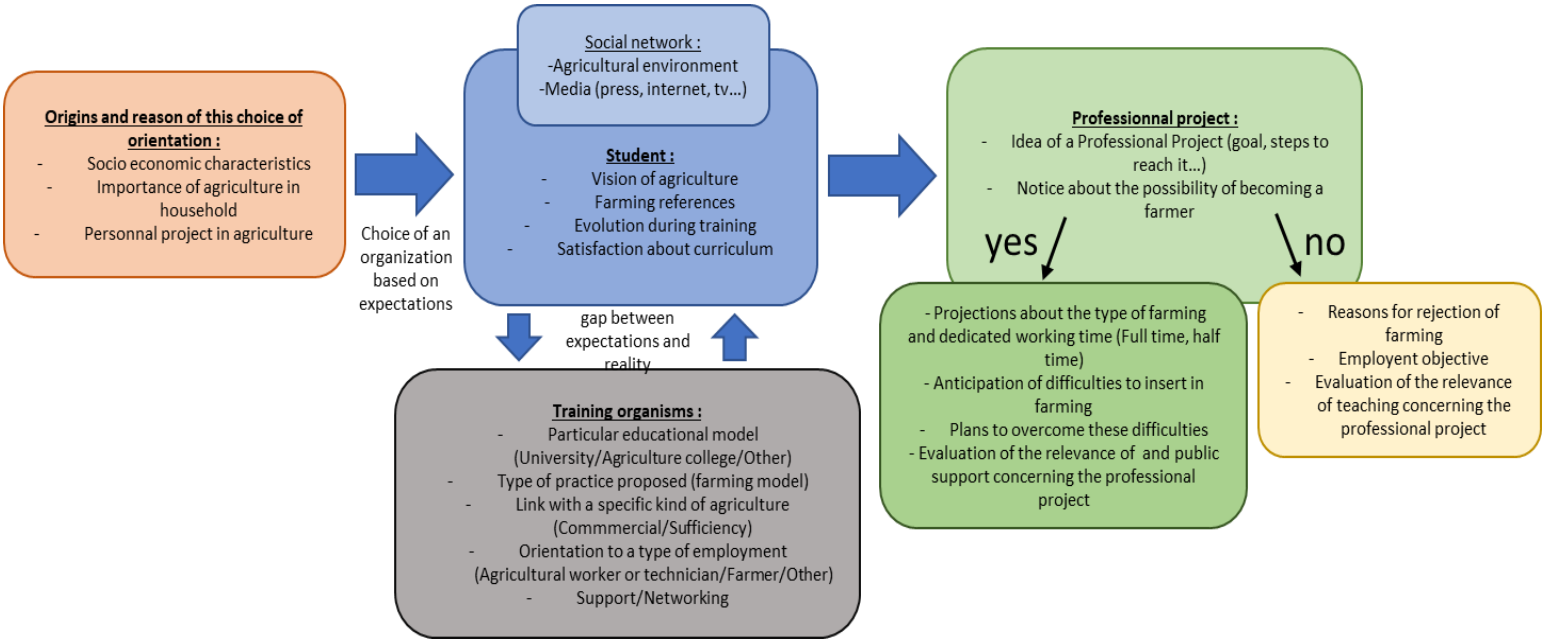


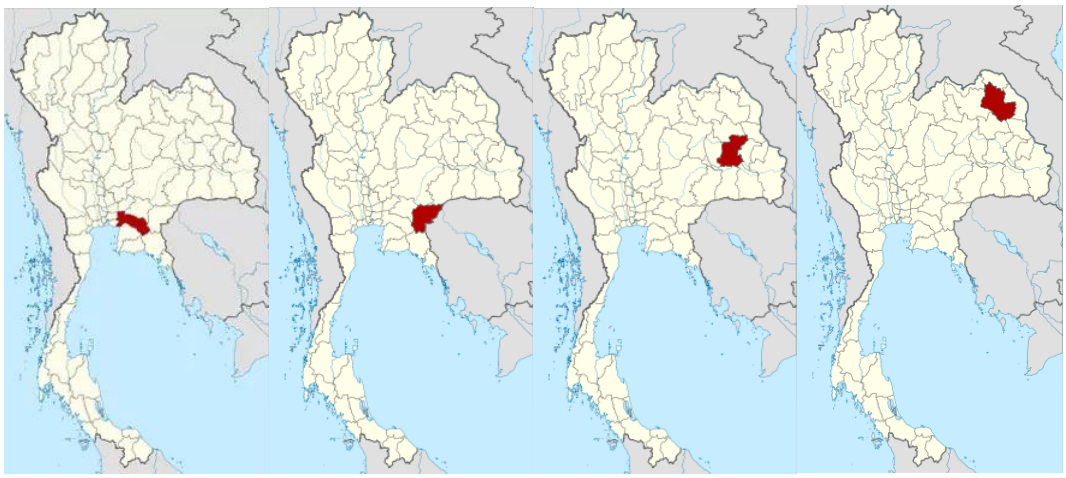
Figure 4: Conceptual framework of the study

3.2 Site selection

Qualitative interviews with directors, teachers, professors, and policymakers were carried out in Bangkok, Suphanburi, Chachoengsao, Sa Kaew, Chonburi, Khon Kaen, Roi Et, and Sakhon Nakhon provinces, in Thailand. We interviewed students from Chachoengsao college of agriculture and

technology, Sa Kaew college of agriculture and technology, Roi Et college of agriculture and technology and Kasetsart university – Sakhon Nakhon site.

Figure 5: From left to right, Chachoengsao, Sa Kaew, Roi Et and Sakhon Nakhon province



Characteristics of these four provinces are presented in the next table:

Table 6: General characteristics of the four provinces studied here (Source: National Statistical Office of Thailand)

	Chachoengsao	Sa Kaew	Roi Et	Sakhon Nakhon
Population	709 889	552 187	1 308 318	1 115 539
Population density (hab/km²)	132	76	160	116
GPP/capita (bahts)	421 597	57 116	65 658	66 567

For the qualitative interview among educational staff, 5 colleges of agriculture (Chachoengsao, Sa Kaew, Chonburi, Khon Kaen, and Roi Et) and two faculties (Kasetsart at Sakhon Nakhon site and Chulalongkorn at Bangkok site) were visited. Then, based on the number of students, the majors proposed and the support of educational staff, three colleges, and one faculty were chosen to interview students.

In each college, interviews were performed focusing on *Bor Wor Sor* or *Bachelor* students. The total number of respondents was 187: 25 respondents from Chachoengsao college, 24 respondents from Sa Kaew college, 88 respondents from Roi Et college and 50 from Kasetsart University – Sakon Nakhon site.

3.3 Research Design

This research is an exploratory type using in-depth interviews. Specifically, the study has employed this tool aiming to understand the experience of students in agriculture and their vision of farming perspectives.

3.3.1 Resource person interview

This research is based on the analysis and synthesis of two types of interviews. First, the study collected data from in-depth interviews with educational staff, researchers and policymakers, in order to better understand the context of agricultural education in Thailand. Twenty interviews of this kind were conducted with 4 college directors, 5 college teachers, 2 faculty dean, 2 faculty professors, 1 province director of the department of agriculture and cooperative, 1 officer in Office of Vocational Education Commission and two professors from the faculty of Agricultural Education (Kasetsart University).

3.3.2 Students interview

Secondly, primary data from 187 in-depth interviews with students from three colleges and one faculty of agriculture were conducted to understand the determinants that make students planning to do farming or not and, for those who plan to do it, which difficulties they could face in settling their farm. The research design stipulated that respondents should be studying in first or second year of Bor Wor Sor in the case of college students or studying in the third or fourth year of Bachelor in the case of faculty students at the time of recruitment.

The interview aimed to assess their background, their vision of agriculture and the main constraints they had in mind to start farming.

To this end, the interview was structured in 5 different parts (see annex 1):

A - Personal information
B – Choice of agricultural studies
C – Vision of agriculture
D – Relation to study and professional insertion
E – Professional plan

Workshops were then organized in two colleges with some of previously interviewed students first and then with professors. The workshops were separated into two parts, the presentation of the results of interviews and a debate around the main ideas obtained from interviews.

3.4 Data analysis and Techniques

Qualitative analyses were applied based on the information gathered from students. The data and information collected from the survey were coded, entered, processed, and analyzed by quantitative and qualitative analysis techniques.

3.4.1 Quantitative Analysis

- Descriptive Statistics: Data collected from surveys was used as quantitative information to extract details on age, sex, main and secondary occupation, incomes, education, major, plan after school, farming experience, parent's occupation, land size, and type of crop. Pie, line, charts, and tables were employed in the representation of quantitative data. This set of statistics were used to describe demographic and socio-economic conditions of students in our sample.

- Analytical Statistics or Chi-square was employed in order to analyze the association between students' socio-economic factors (an organism of study, parent's occupation…) and students answer about their reason to study agriculture, their vision of agriculture, their willingness to do farming, etc.

- One-way ANOVA was employed to analyze the correlation between students' dream farm characteristics, willingness to do farming or constraints in their farming plan and socio-economic factors (curriculum, economic status, parent's farm characteristics and type of crop of their parent's farm).

3.4.2 Qualitative Analysis

After the interviews, the responses of the selected respondents were coded into Microsoft Excel and SPSS for analysis. We have addressed the same item (vision of agriculture, willingness to do farming, constraint in their farming plan) with different approaches (Role model about agriculture, potential dream of doing farming, plan to do farming later, assessment of their perception about main farming constraints) in order to have different perspectives of the same matter, and to avoid any preconception (parent's experience, current issues) that might shape their vision on farming.

Table 6: Description of coding of the interviews of students

Variable	Description	Measurement
Gender	Gender of respondents	0= male; 1=female
Curriculum	Curriculum currently followed	0= Bor Wor Sor; 1= Bachelor
Major	Major of the curriculum currently followed	0= Agriculture machinery; 1= Animal Sci.; 2= Fisheries; 3= Plant Sci.; 4= Agriculture industry; 5= Agricultural resources; 6= Agricultural resources and product management
Family members 1st occupation	Main occupation of each family members (Father, Mother, member 3, member 4, member 5)	0= Farmer; 1= Farm laborer; 2= Business owner; 4= Employee, private sector; 5= Public officer; 6= Other; 7= Housewife; 8= Retired; 9= Unemployed; 10= Studying; 11= No precision
Family members 2nd occupation	Second occupation of each family members (Father, Mother, member 3, member 4, member 5)	0= Farmer; 1= Farm laborer; 2= Business owner; 4= Employee, private sector; 5= Public officer; 6= Other; 7= Housewife; 8= Retired; 9= Unemployed; 10= Studying; 11= No precision; 12= No second occupation
Child of farmer	Whether any household member have a farming activity or no	0= No; 1= Yes
Type of crops	In the case the household have a farming activity, which kind of crops	0= No farming; 1= Rice; 2= Cassava; 3= Corn; 4= Sugarcane; 5= Vegetables; 6= Palm trees; 7= Rubber trees; 8= Fruit trees; 9= Eucalyptus; 10= Pasture; 11= Bamboo; 12= Mushroom
Plot owned/renter	In the case the household have a farming activity, do they rent or own their land	0=No farming; 1=Owned; 2= Rented
Type of animals	In the case the household have a farming activity, which kind of animals	0= No farming; 1= Cattle; 2= Buffalo; 3= Pig; 4= Goat/Sheep; 5= Poultry; 6= Duck; 7= Horse; 8= Fish/Shrimp; 9= Frog
Curriculum previously followed	Type of curriculum that the student followed before his/her current curriculum	0= Bor Wor Chor Animal Sci.; 1= Bor Wor Chor Plant Sci.; 2= Bor Wor Chor Fisheries; 3= Bor Wor Chor Agriculture Industry; 4= Bor Wor Chor Other; 5= Bor Wor Sor Animal Sci.; 6= General certificate; 11= DUAL training
The organism in which student previously studied	The organism in which the student previously studied	0= Same organism than currently; 2= Other vocational college; 3= High school; 4= Non-formal education institute

Reason for choosing this curriculum and major	Reason that make the student enter the curriculum he/she is following	0= Financial reason; 2= Practical reason; 3= Future prospect; 4= Personal values; 5= Influence of the environment; 6= Skill search; 7= Specificity of the organism; 8= Parents' order; 9= No reason
Difficulties encountered to enter the curriculum	If yes or no student face difficulties to enter this curriculum and, if yes, which ones	0= No; 1= Yes, Administrative problem; 2= Yes, Financial problem; 3= Yes, Parents disagreement with this choice
Organism the student applied in after his/her certificate/Bor Wor Chor	Every organism for which student had applied in after reaching his/her certificate/Bor Wor Chor, in order of preference	0= This organism, 1= Vocational college (different than this one); 2= University; 3= Other
Curriculum the student applied for after his/her certificate/Bor Wor Chor	Every curriculums student had applied for after reaching his/her certificate/Bor Wor Chor, in order of preference	0= This curriculum, 1= Agriculture curriculum; 2= Social sciences; 3= Sciences; 5= Other
Choice-related to a willingness to work in agriculture later	If the student entered this curriculum with a specific professional aim, and if yes which one	0= Yes, continue parents' farm; 2= Yes, support my parents with farming activity; 3= Yes, work as officer in agriculture; 4= Yes, work as employee in agriculture; 5= yes, create a business related to agriculture; 6= yes, have access to higher studies in agriculture; 7= No, project non-related with agriculture; 8= No, parents' order to study here; 9= No, no idea of a professional project
Main sources of knowledge regarding agriculture	From where/who/what the student had to receive his/her pieces of knowledge about agriculture since the beginning of his/her life	0= Family; 1= Academic training; 2= Professional experience; 3= Internet; 4= Other; 5= No idea/No answer
Main positive aspects of being a farmer	Which characteristics/ conditions of the farming activity student find attractive and would like to have in his/her personal activity	0= Work for the general interest/Helping other people; 1= Working conditions= freedom; 3= Sustainable work; 4= Adaptable work; 5= Interesting work; 6= Good environment of work – quality of life; 7= No idea
Main negative aspects of being a farmer	Which characteristics/ conditions of the farming activity student dislike and would like to avoid in his/her personal activity	0= High capital requiring; 1= lack of profitability; 2= Technical complexity of the activity; 3= Hard work conditions; 5= Social imprisonment; 6= Participation to environment degradation; 7= Other; 8= No disadvantages; 9= No idea
Hard work conditions	Refers to the job's nature of farming (e.g. Working long hours under the sun)	1= due to this fact, I am not interested in farming; 2= It is a major issue; 3= small inconvenient; 4= It is an issue but does not affect me; 5= not a problem at all, I don't see it as an issue
Low profitability	Refers to the low profits made from farming activities	1= due to this fact, I am not interested in farming; 2= It is a major issue; 3= small inconvenient; 4= It is an issue but does not affect me; 5= not a problem at all, I don't see it as an issue
Lack of opportunity of increasing incomes in the future	Refers to the lack of potential for economic growth in farming activities	1= due to this fact, I am not interested in farming; 2= It is a major issue; 3= small inconvenient; 4= It is an

		issue but does not affect me; 5= not a problem at all, I don't see it as an issue
Limited access to land	Refers to the inability to use land and other natural resources, to control the resources and to transfer the rights to the land and take advantage of other opportunities.	1= due to this fact, I am not interested in farming; 2= It is a major issue; 3= small inconvenient; 4= It is an issue but does not affect me; 5= not a problem at all, I don't see it as an issue
High capital Investment	High capital required for all the different stages of farming activity (starting a farm, management of the farm, marketing of the product)	1= due to this fact, I am not interested in farming; 2= It is a major issue; 3= small inconvenient; 4= It is an issue but does not affect me; 5= not a problem at all, I don't see it as an issue
High-risk activity	Refers to the uncertainty and unpredictability of all the factors that involve farming activity (e.g. Weather, price fluctuations, etc.). Farmers have to make decisions taking into account factors that are beyond their scope.	1= due to this fact, I am not interested in farming; 2= It is a major issue; 3= small inconvenient; 4= It is an issue but does not affect me; 5= not a problem at all, I don't see it as an issue
Low social status	Refers to the honor or prestige attached to the farming occupation	1= due to this fact, I am not interested in farming; 2= It is a major issue; 3= small inconvenient; 4= It is an issue but does not affect me; 5= not a problem at all, I don't see it as an issue
Role-model concerning agriculture	Refers to the main source of inspiration of the student about agriculture, the actors of his/her agriculture model	0= Public personality; 1= Model farmer; 2= Family; 3= Teachers; 4= Senior students/Alumni's; 5= Local farmers (neighbors); 6= Big company; 7= Other; 8= No idea; 9= No role model
The idea of a dream farm	Refers to the existence of a dream in student mind to do farming in a situation with no agriculture constraints	0= No; 1= Yes
Participation in applied work during the curriculum	Refers to practical training student had followed during his/her curriculum	0= No; 1= Yes
Involving in a personal farming project	Refers to any personal farming activity student can have at home or in his/her organism of training, for economic or research purpose	0= No; 1= Yes
Future plan (right after the current curriculum)	What student plan to do right after his/ her curriculum	0= Bachelor of agriculture (Faculty) ; 2= Bachelor of agriculture (Rajamangala) ; 3= Master of agriculture (Faculty); 4= Bachelor of another subject; 5= Work in parents' farm; 6= Establish a farm; 7= Work as employee in the field of agriculture; 8= Work as officer in the field of agriculture; 9= Work in other sector as employee; 10= Work in other sector as officer; 11= No idea/ Other

Future plan (in 10 years)	What student plan to do in 10 years	0= Own a farm; 1= Work in parents' farm; 3= Employee (agriculture related); 4= Government officer; 5= Government officer (Agriculture related); 6= Government officer (Agriculture related); 6= Government officer (Non-agriculture related) / No idea; 7= Business owner (Non-related with agri); 8= Part-time farmer; 9= No idea
Farming plan later	Indicates if student plan to do farming at a moment of his/her life or not	0= No; 1= Yes
Capital constraint	Indicates, for students who plan to do farming later, if he/she thinks he/she could face a lack of capital in his/her farming settling	0= No; 1= Yes
Knowledge constraint	Indicates, for students who plan to do farming later, if he/she thinks he/she could face a lack of knowledge in his/her farming settling	0= No; 1= Yes
Land constraint	Indicates, for students who plan to do farming later, if he/she thinks he/she could face difficulties in accessing to land in his/her farming settling	0= No; 1= Yes
Market constraint	Indicates, for students who plan to do farming later, if he/she thinks he/she could face difficulties in accessing to land in his/her farming settling	0= No; 1= Yes

Chapter 4: The Thai agriculture education system

This part clusters information extracted from face to face and phone interviews with different actors of the Thai agriculture sector and agriculture education. People interviewed were:

- Directors and Teachers in the college of agriculture and technology

- Deans and professors in the Faculty of agriculture or agriculture education

- Trainers in Agriculture NGO

- Staff from Land Development office

- Officer in Office of Vocational Education Commission

4.1 Agriculture education in Thailand - Overview

Many organisms provide agriculture courses in Thailand: about 24 faculties of agriculture, numerous vocational colleges, and technical institutes. We will focus on this part on organisms that intend, as the only goal or not, to train young people who (may) want to settle as farmers after their studies. "Parallel" agriculture education is also provided by NGOs like Khao Kwan NGO, which provides training about organic rice farming to farmers and non-farmers in rural provinces.

4.1.1 General information

Since the 1960s and during the whole green revolution, agriculture education became very important because farmers needed to learn about some new chemical substances, new plant varieties, and new technologies. Since this time, new agriculture training organisms appeared in Thailand. Over the past twenty years, the sector is facing a decrease in popularity causing a decrease in youth involvement in agriculture studies, according to a professor in the faculty of agriculture education at Kasetsart University (Kamphaeng Saen). Organisms that provide higher education with the aim of training agriculture knowledgeable people are colleges of agriculture and technology, faculties of agriculture (Kasetsart University, Maejo University, Khon Kaen University…) and institutes of technology (Rajamangala, Ladkrabang). Faculties of agriculture education (The main one is a part of Kasetsart University) train agriculture teachers for schools, high schools[7] , and vocational colleges.

Colleges of agriculture and technology accept students from junior high school or high school. Teachers in these colleges are generally trained at the faculty of agricultural education, the organism that develops education programs of these colleges jointly with the Office of Vocational Education Commission (OVEC). According to a professor at the faculty of agricultural education interviewed in October 2018, this kind of study has a bad reputation and students who enroll in it have generally no other choice, despite the fact that, as he mentioned, "the technical knowledge that students acquire in these colleges is really important for their career".

The purposes of the colleges are detailed in the next parts but, as mentioned by many interviewees, they are expected to train both agricultural workers and farmers.

Universities accept only students with a normal certificate (no students from vocational studies). Professors have generally a Ph.D. in agriculture subjects. They usually adapt the content of their

[7] As agriculture is important in Thai society, agriculture basics (gardening…) are taught in normal school and high school

courses to current issues and agriculture challenges. Universities provide B.Sc. in different fields concerning agriculture such as machinery, animal science, plant science…

The **Institutes of technology** have the same status as Universities, with the right to grant a degree in accordance with the law of educational institutions. Their mission is to manage professional education at university level and their particularities are that they accept in Bachelor students from vocational colleges. Two of these institutes provide courses in agriculture: Ladkrabang and Rajamangala. Ladkrabang institute of technology, located in Bangkok province, provides bachelors (and master) in agriculture (i.e.: agriculture communication, agriculture's development management, soil and natural resources management, animal sciences). There are nine Rajamangala universities of technology in the whole Thailand and they have a faculty of agriculture. These two kinds of organisms are the only way, along with a special bachelor curriculum provided by Maejo University[8], for students from colleges of agriculture and technology to study further and get a Bachelor of Agriculture. As no information was found about any intention to train farmers in these institutes, nobody from these institutes was interviewed and we do not present more information about these institutions in this report.

According to staff members from Faculty of agriculture education (Kasetsart University), the general trend of agriculture education is to decrease the agriculture part in general curricula (primary school, high school), both in rural and urban areas and to increase general part in agriculture specialized curriculum. The curricula change every 5 years (In education in general) and the current problems of agriculture are considered in these reforms. However, educational staff doubt about the effects that these changes can have on farming issues: "changing the curriculum can change the knowledge we provide to students, but it doesn't create changes in people's way of life. When farmers grow rice and rice price decreases, better curricula cannot help them". We ask the co-author of a research work which prescribed many changes in the Thai agriculture education system (Traimongkolkul, 2005) if changes were adopted since this time and nothing changed in general educational philosophy according to him. He still pinpointed small changes as an increasing diversity of courses provided in agriculture faculty curriculum (soil science, plant science, entomology…).

4.1.2 Philosophy of agricultural education

According to a professor in the faculty of agricultural education (Kasetsart – Kamphaeng Saen), interviewed in October 2018, the main functions of agriculture education in Thailand are "teaching, researching and academic services" even if the "research part" concerns mainly universities. Their aims are also to provide the agriculture sector demand with manpower and, according to this professor, "to train the new generation of farmers". When we asked students, what was the best way to acquire enough knowledge to be a farmer today, one of the professors from this same faculty mentioned "a Bachelor of Agriculture in university" despite it is a very general curriculum, far from the fields. Then, this professor also mentioned that students who apply in the faculty of agriculture today mainly want to become officers and not farmers and their number is decreasing because the number of jobs provided by the government in this sector is decreasing as well. These elements question the idea that the faculty of agriculture intends, at least partly, to train farmers. Even if most of the agriculture faculties do not intend to specifically train farmers, three of them aim to train a "future generation of agriculture entrepreneurs" based on the provision of specific curricula. We focused here on these three curricula, which are detailed in the next parts.

Agriculture philosophy proposed in vocational colleges and universities is the "competitive agriculture" according to staff from a faculty of agricultural education. A professor mentioned that "we

[8]Well-reputed university regarding agriculture, located in Chiang Maï

teach students about how to produce high yields". Sufficiency agriculture, popularized in the 90s by the late King Rama IX, is also promoted, mainly in primary, normal junior high school and high school (non-vocational institution) as these students learn about everyday-life agriculture. This version is however partly contradicted by numerous evocations of "sufficiency agriculture" by educational staff during our interviews, mainly from colleges of agriculture but also from universities.

4.2 Agriculture education in Thailand – Colleges of agriculture and technologies

4.2.1 Overview

Colleges of agriculture and technology are vocational colleges managed by the Office of Vocational Education Commission[9] (OVEC). There are 47 of these colleges in the whole of Thailand. These organisms provide different types of curriculum:

- Bor Wor Chor: From grade 10 to grade 12
- Bor Wor Sor: From grade 13 to grade 14
- Bachelor (not in every college)
- Special curriculum (destined to farmers or other workers generally)

A major/minor system is proposed in these curriculums. Students can choose between different specialties (Plant science, animal science, fishery…) depending on the college. In most colleges considered in this study, both agriculture and business management curriculum were proposed in Bor Wor Chor and Bor Wor Sor.

The content of curricula is diversified, considered as not so specific by both teachers, directors, and agriculture educational faculty staff. According to teachers and directors, students learn about plant science, animal science, machinery, fisheries, agriculture industry, plant physiology, fruit crops, plant breeding, pest management… The curriculum starts from courses about production to courses about customer's relation. Marketing and new technologies aspect must be provided in the courses, according to the faculty of agriculture education. Most of the colleges provide lessons about organic farming, mainly in theory, but sometimes they provide practical work and even organic farm visits.

The share of practical work in the curriculum depends on the curriculum and organism. Considering the time of training, there is about 70% of practice and 30% of theory for Bor Wor Chor and 50-60% of practice and 40-50% of theory for Bor Wor Sor according to all educational staff interviewed in these colleges. A particularity of this kind of college is that dormitory and food are free of charge for Bor Wor Chor and Bor Wor Sor students during the three years. Bor Wor Chor students are also exempted from tuition fee contrarily to Bor Wor Sor students.

4.2.2Aim of the curriculum

The office of the Vocational Education Commission (OVEC) supervises vocational colleges. It presents itself as "an organization that produces and develops quality manpower to meet the needs of the nation and the private sector"[10]. However, as agriculture seems to be a special sector, Bor Wor Sor curriculum intends to produce skilled technicians, according to a teacher who mentioned the driving line of OVEC in this direction, but also farmers to feed the countries, according to colleges teachers. The driving line followed by colleges of agriculture considering the orientation of students is not clear. Some educational staff members think that students are scheduled to become farmers as

[9] http://www.vec.go.th/
[10] http://www.vec.go.th

they said: “We want our students to be farm business owners”. However, this point of view is not shared by everyone as some teachers from other colleges said the contrary: “students are trained to become an employee in agriculture then”. During an interview, a director of a college of agriculture said “I think we actually don’t train enough students for the agriculture private sector demand of manpower” which clearly puts into perspective that students, at least an important part of them, are trained to meet demands from companies. Some members of college staff consider it is too difficult to start farming without capital and experience and students should first be employees for some years. For instance, a teacher who said: “If they had opportunities to work in large companies (in Charoen Pokphand for instance), I would tell students to go to work for these companies.”

Student’s ability to manage a business after finishing the curriculum is substantiated by the important part of Bor Wor Sor (and Bor Wor Chor) courses that are dedicated to farm accounting and farm management. Thus, students generally participate in many projects during their curriculum:

- Senior project (Agricultural business management): Group project about a farming activity requiring budgets calculation and funds research
- Personal interest project (one/semester): Personal project in which a student can choose the subject. He must then write a report about it with technical details, accounts, ways of selling… Advisors are teachers from college.

For these projects, students can take a loan (2500 baht/students) from college and use either college land or their parents’ land to do these farming projects. Then they must refund college but keep the profits according to a professor in Roi Et college.

4.2.3 Student admission

Colleges of agriculture administration use many ways to promote their curricula to students. They mainly use websites; teachers and students are sent to junior high schools to present the curriculum and promote it to high school students. Less frequently, they use billboards in streets or advertising on the radio. Another popular way to promote their organism is to visit villages to help farmers that have farming problems and to participate in public events (agricultural fair…). Open days are also organized in some colleges, enabling students to present their projects to visitors, parents and administration staff. This kind of event help show to parents a good picture of the college. Arguments used by teachers and staffs to students to convince them are generally “If your parents haven’t money, come, we have free dormitory and free meal”, according to a teacher from Sa Kaew college interviewed in September 2018.

There is no selection to enter in Bor Wor Chor or Bor Wor Sor. Students must have reached grade 9 (end of Junior high school) for Bor Wor Chor or grade 12 (end of high school/Bor Wor Chor) for Bor Wor Sor, to have parent’s agreement and to send an application or to register directly at the college. For Bor Wor Chor admission, there is a quota system with 3 different statuses: “free acceptation”, “half fee” quota and “accepted with exam” determined directly by teachers from Junior high school that will choose students able to go in the college or not. These quotas are sometimes based on a test but, according to the directors and teachers of five agriculture colleges, all candidates are accepted nowadays. Even more, not enough students apply compared with the available places in some of them. This situation is the same for Bor Wor Sor with the difference that students come from Bor Wor Chor, those ones are generally encouraged to continue in Bor Wor Sor by their teachers, or by high school staff. In this case, students just have to apply the curriculum and they are all accepted then.

4.2.4 Students’ characteristics and background

According to some college educational staff members, young people who study at colleges of agriculture and technology are generally from modest families. According to a college director, they

are sent to colleges because their parents want them to study to get a diploma but do not have enough money to send them to high school or university. According to other teachers, students often have low academic grades, but parents want them to continue their studies. Most of the students' parents are farmers (70% of students are from farming families according to a college director) and employees and they want their children to be housed and fed in the college. This is one of the main reasons they send their children to college according to teachers. They also mentioned that most of the students of agricultural colleges come from the province of the college or the surrounding provinces.

The choice of studying in the college of agriculture can also be the students' own choice. Some of them choose to come here because they want to learn about agriculture (fruits, plants): mainly because of the practical and theoretical class proposed by the college but also because they can use the land of the school to farm at the same time (30%-60% of them do this kind of activity according to a college director). Colleges also offer the possibility to register at "Future farmers of Thailand"[11]. Some of the students plan to carry on farming on the family farm after their parents retired.

Some particularities proposed by organisms can influence students to join. For instance, Chachoengsao college of agriculture and technology permits to students to participate in an annual national competition in fruit crops and Roi Et college of agriculture and technology proposes an exchange program with Israel farms for one year.

4.2.5 Practical work / Internships

With regard to practical farming activities, colleges are generally endowed with agricultural land of a large area (60 – 800 rai). In this area, there are crops field, fruit trees, vegetable gardens, fish pound, stables… In most of the colleges visited during this study, part of the land was made available to students by the school to offer them the possibility to grow their own crops or raise their own animals. Some students do this kind of practical work as research work but also as personal work to sell products and get some income at the same time as they get experience from this farming activity. They generally sell it to college canteen and employees or at the local market (30-60% of students are involved in this kind of activity).

Students must do at least 320 hours of internship in BWC (for most of those we interviewed, during the 2nd year) and 320 hours in BWS (some students will do an internship during the first years and other during the second year depending on the college and personal situation). They can do their internship in farms, factories, public offices, hotel… according to their preferences. The organism is chosen by the students with sometimes the help of teachers. Then, teachers negotiate directly with the organism to get the trainee accepted and even sometimes to negotiate some stipends or free accommodation... Some students do an internship in farms but a lot of them do it in the office or factories. Some colleges propose dual training with private companies. For instance, Bor Wor Sor agriculture mechanics works with Mitr Pohl[12] or for Bor Wor Sor animal science has connections with private animal farms.

4.2.6 After the curriculum

College administrations do not organize surveys about what students do after having graduated. According to the directors and teachers we met, students' orientation after graduation depends on the organism but they agree that really few students get involved in farming/own a farm during the

[11] Thai association managed locally by students and aiming to ease farming project creation; Some meetings exist between them and foreign country similar organization. i.e. Future Farmers of Korea (https://th.wikipedia.org/wiki/องค์การเกษตรกรในอนาคตแห่งประเทศไทย_ในพระราชูปถัมภ์ฯ)

[12] Large-scale Thai sugar company (https://www.mitrphol.com/home.php)

ten first years after having graduated. According to the director of Chachoengsao college of agriculture, his former students become farmers on average 23 years after they finish the curriculum, at approximately 40 - 45 years old. He said during an interview in September 2018, “Since I work here, we had 33 classes of students (1/year) and the classes number 1 to 10 are those in which people are now owning a farm, the others still get employed to get money and knowledge”.

Educational staff considered that students from Bor Wor Chor continue their studies in a large majority (70-80%), mainly in Bor Wor Sor in the same college., Then, after Bor Wor Sor, all staff members agreed that most of the students would go to work in private companies and public offices, with or without continuing first in bachelor, in the first years after they graduated. Regarding the mindset of students, their real career choices, opinions of staff members are divided between:

- Those who think that most of the students want to work for companies or government to improve themselves and their knowledge and to go farming after some time;
- Those who think that students prefer being an employee/officer in agriculture because farming is a difficult work without profit;
- Those who think students have not concrete plans and that they will follow their parents. Then, if parents are farming and agree, they will continue farming with them, if not they will work as an employee or an officer.

Many directors and teachers described a small but existing category of students that, at the moment they enter Bor Wor Sor, see the college of agriculture as a default choice and are not interested in agriculture. Those students are described as “Those who see college as a cheap alternative of studying in order to continue to university afterwards”. A staff member commented that “they (these students) come because they don’t want to stay at home but they don’t like neither animals nor farming work that they saw as low-status work”. Staff members considered that 20% of the total students in Bor Wor Sor had such a mindset and this percentage increases in Bor Wor Chor.

In Bor Wor Chor, a significant share of students quits the curriculum before the end. According to colleges directors, some students quit because they were forced to come here by their family, others were from regular schools and did not like the vocational system and others just did not like the subject of study. Directors also pointed out that students are still young and searching for what they are interested in doing. The number of students failing their exam is almost 0% because there are always 2nd exam and a 2nd chance for students who fail.

4.2.7 Organisms in our study

The next table presents the main characteristics of the 5 colleges that were visited during this study (number presented were either estimated by educational staff or found in official reports of activity; data 2017 - 2018).

College's characcteristics	Chachoengsao college of agriculture and technology	Chonburi college of agriculture and technology	Sa Kaew college of agriculture and technology	Khon Kaen college of agriculture and technology	Roi Et college of agriculture and technology
Proposed curriculums (BWC) – NB of students/year	Agriculture (30) Computer science (30)	Agriculture (30) Computer science (30)	Agriculture (20) Business management (20)	Agriculture (130) Business management (40)	Agriculture (50) X
Proposed Curriculums (BWS) - NB of students/year	Plant science (10) Animal science (10) X Computer science (10) X	Plant science (6) Animal science (6) Fisheries (12) Computer science (12) Mechanic science (12)	Plant science (5) Animal science (5) Agro-Industry (5) Agriculture mechanics (5) Fishery (5)	Plant science (40) Animal science (40) Agro-industry (40) Agriculture mechanics (40) Business management (40)	Plant science (40) Animal science (20) Agro-industry (20) Agriculture mechanics (10) Fishery (20)
Proposed curriculums (Bachelor) – NB of total students	X	X	X	Plant science (27)	Plant science (10) Animal science (10)
Special training for farmers (Agriculture, accountancy, fisheries, computer science)	Yes	Yes	Yes	Yes	Yes
% of quit – BWC	30%	20%	15%	20%	15%
% of quit – BWS	10%	0%	1%	20%	0%
% of quit – Bachelor	X	X	X	0%	0%
BWC --> BWS	70%	80%	40%	95%	100%
BWS --> University (Maejo, Rajamangala, Ladkrabang)	50%	30-90%	50%	45%	50%

Table 7: Characteristics of the 5 colleges of agriculture and technology surveyed in this study (1st part)

College's characcteristics		Chachoengsao college of agriculture and technology	Chonburi college of agriculture and technology	Sa Kaew college of agriculture and technology	Khon Kaen college of agriculture and technology	Roi Et college of agriculture and technology
BWC --> Parents'farm		30%	0%	25%	5%	0%
BWS --> Parents'farm		50%	0%	10-15%	10%	10%
BWS Evolution (Long term)	Farmer	30%	0%	No idea	No idea	No idea
	Other	70%	10%	No idea	No idea	No idea
Philosophy (Aim is to train:)		Farmers	Agriculture employees	Agriculture employees	Both farmers and agriculture employees	Farmers
Other		X	X	X	X	2 programs with foreign countries (Israel; Denmark)

Table 8: Characteristics of the 5 colleges of agriculture and technology surveyed in this study (2nd part)

4.2.8 Evolution of this system in last years

According to most college staff members we interviewed, the number of students and teachers in the college of agriculture is decreasing. Concerning students, this trend is highlighted by the plot in figure 1.

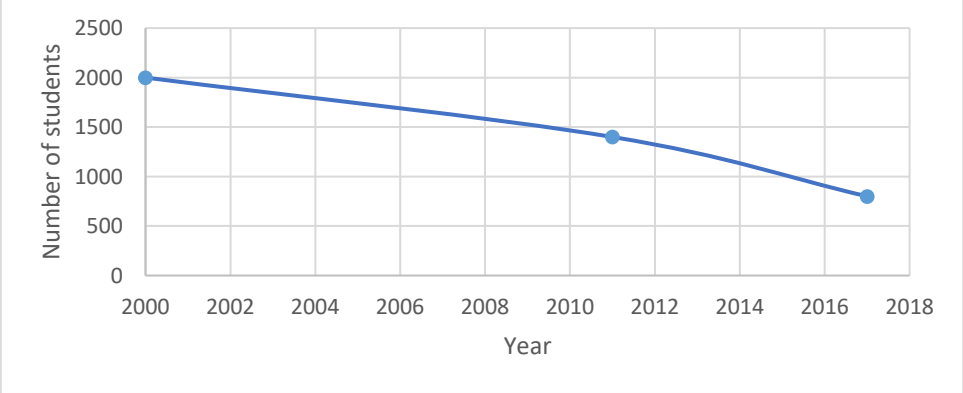


Figure 1: Evolution of the number of students in the Khon Kaen college of agriculture and technology (Source: college administration)

Factors pointed by the staff of the college of Khon Kaen for this decrease are the creation of other schools in the area, the parent's negative perspective of farming and the general disinterest of young for agriculture. The government launched free education in agriculture vocational colleges around the year 2539 (1996) and launched 15 years of free education in regular high schools in 2545 (2002). Since high schools' fees are free now, students tend to choose more this kind of studies as it has a better reputation and provides good chances to go to university.

According to directors, students have now more options than in the past to continue their studies. There were fewer colleges and high schools in rural areas before.

Staff members considered that students' parents seem bothered by the idea of having their children involved in a farming activity as they consider it hard work. Furthermore, a lot of parents who are themselves farmers have a negative view on agriculture work and encourage children to choose another way. Many teachers had retired or quit during the last years and were not renewed because of budget decreases.

Some directors also mentioned the students' lack of interest in agriculture. As the policy imposed by OVEC is to accept everybody, many students come to these colleges as a default choice and are not serious during their studies then. Moreover, the college staff deplores that OVEC took decisions during the last years to orient curriculums to more and more general training (especially Bor Wor Chor) disconnecting students from the "real" agricultural world.

However, some directors pointed out that even if the number of students who wanted to go back home farming was quite low, it has been now increasing since 1 or 2 years, notably because students have now more role models that present them possibilities to farm like the Young Smart Farmers. Other agriculture colleges such as Khon Kaen and Roi Et colleges decided to "change their tactics" and focusing less on "white shirt" students (students joining them after grade 9, normal students), apparently less and less interested in agriculture. They now try to recruit farmers (without a certificate – they do not especially focus on young farmers) and provide the class in the college or directly in their villages to teach them about agriculture. They call them "multi-color shirt" people. These farmers participate in special curricula about many agriculture subjects on the weekend and can finally receive a BWC or a BWS.

4.3 Agriculture education – Faculty, "Agriculture entrepreneur" training

4.3.1 General

This kind of curriculum intends to "create a new generation of agricultural entrepreneurs" and was created in the early 2010s by some of the best universities in the country in response to the "lack of interest" of young people to farming and the phenomenon of farmers aging. It exists 3 curriculums of this kind in Thailand:

- **B.Sc.[13] Agricultural Resources and Production Management** – Kasetsart University (Since 2012)
200 students (50/ year)

- **B.A. Agricultural Resources Administration** – Chulalongkorn University (Since 2012)
200 students (50/year)

- **B.A. Cultural Landscape Management** – Mahidol University (Since 2015)

During this research work, we focused mainly on the two first curricula and following details concern mainly these two curriculums.

These curricula are new, and their creators developed them considering all the constraints that Thai farmers can face (complexity of farm management, lack of technologies knowledge and access). Then, curricula focused on processing and post-harvesting management, marketing plus all the classical knowledge a farmer needs to know to have a sustainable farming activity. The content of these curricula is decided by faculty staff and they adapt it occasionally to the current major problems that Thai agriculture faces. These curricula intend to be adapted to Thai society and people demand. They also include courses about organic farming.

[13] B.Sc. = Bachelor of Science; B.A. = Bachelor of arts

The Faculty of Natural Resources and Agro-Industry (Kasetsart – Sakon Nakhon) also provides a special curriculum to farmers. For instance, if they face crop diseases, farmers can ask for the knowledge they want to acquire, then professors can teach them about these specific subjects.

These Universities provide a part or the complete curriculum in a rural area (Sakon Nakhon province for Kasetsart – whole curriculum; Nan province for Chulalongkorn – half of the curriculum, the other half takes place in Chulalongkorn University, Bangkok). They also increased the part of practical work in the curriculum thanks to farm internships. They encourage students to learn from real case studies and so they organize field trips to farms, agribusiness factories, etc.

4.3.2 Aim of the curriculum

Contrarily to classical agriculture faculty, whose aim is to produce employees for the agricultural sector, the aim of these 3 curricula is to train the new generation of farmers. An interviewed professor from Chulalongkorn University said "This curriculum was created in using our king (late king RAMA IX) knowledge to help the community. It is not intending to create agriculture laborer but real farmers".

To summarize the general philosophy of these curricula, the idea is to provide students with high management, accountancy, and marketing skills, a practical farming experience, to aggregate it to their own farming experience and turn them into model farmers. Then this new generation can go back to farming in their places and have a strong influence on all the surrounding area's agriculture.

4.3.3 Students' admission

These faculties recruit only high school students (mostly having a science certificate) and they are selected based on their GPA (Grade Point Average[14]) first. Then staff interview students and evaluate their attitude about the farming activities. Finally, they meet the parents and present them the curriculum to try to convince them to let their children follow an agriculture curriculum (As it was previously explained, most of the parents are not "enthusiastic" that their children become a farmer). Chulalongkorn faculty select only students from agriculture families contrarily to Kasetsart faculty that accept "all background" students. Both faculties promote their curriculum directly in public schools, with staff presentation to students and also have a website. However, these organisms have a non-negligible asset that vocational colleges do not have: they are part of some of the best countries' universities. Their reputation is enough to attract students as the number of candidates is increasing each year in both institutions. In Chulalongkorn faculty, there were approximately 100 candidates for 50 places over the last years and 70 candidates for 50 places in Kasetsart faculty.

4.3.4 Students characteristics and background

For B.Sc. Agricultural Resources and Production Management (Kasetsart), students are mainly farmers' descendants but not necessarily. 60% of students come from Sakon Nakhon (the province where the faculty is located) and all come from East Thailand according to educational staff.

For B.A. Agricultural Resources Administration (Chulalongkorn), all students are farmers' descendants and come from rural areas all around Thailand but mainly from North-East and North provinces.

Contrarily to college students, faculty students are expected to be here by their own choice according to professors and dean.

[14] Accumulated score in 2ndary school based on American system

4.3.5 Practical work / Internship

B.Sc. Agricultural Resources and Production Management curriculum is provided in Sakon Nakhon Province, in the local campus of Kasetsart University, the biggest campus of Thailand in term of lands (4000 rai of land including 1000 rai of a forest, 2000 rai of agriculture land). Students in the plant production field of study can use the lands to grow their own crops and sell it at a local night market. Also, the practical class takes place in the fields of the faculty. In the second year, students do internships in campus farm and in the third year, they do a 3-month internship in private farms (mostly paid internship, some students do an internship in Japan, Cambodia, Korea…).

The B.A. Agricultural Resources Administration infrastructures in Nan province include a farm in which students can grow plants and raise livestock, chicken or pig on the local model and small-scale farming way. Also, at 20 km from Nan school, there is a center dedicated to the practice of sufficiency economy (13 rai). Staff from university use this land to show integrated farming practice. Students do a one-month internship in farms during the third year of a bachelor.

4.3.6 After the curriculum

In both curricula, students are supposed to be interested in farming as they are selected mainly for this reason. Staff members of both academic institutions indicated that most of their students would become farmers but not necessarily right after their graduation.

For B.Sc. Agricultural Resources and Production Management, no data was collected for the moment as the curriculum is new (the first graduation took place in 2015).

For B.A. Agricultural Resources Administration, no data was collected but the dean of the faculty estimates that:

- 10 – 15% of students follow up with a Master degree (mainly in Chiang Mai University, Kasetsart University, Chulalongkorn University…),
- 10% go back home and start their own farming business/ work in parent's farms (Mainly in integrated farming (organic vegetables…)
- 5 – 10% will work in "community social responsibility" – Associative work to help rural communities
- 2 – 5% will go work in a social company
- 60 – 73% of students: No idea

Staff from both curriculums indicated that no students quit or fail during their bachelor.

4.3.7 Organisms in our study

The next table presents the main characteristics of the two faculties which were visited during this study as well as the third one which we did not visit (numbers presented were estimated by educational staff for the year 2017 - 2018):

Characteristics	Kasetsart University – Faculty of Natural resource and Agro-Industry	Chulalongkorn University – School of agricultural resources	Mahidol University
Proposed curriculums (Bachelor) – NB of students/year	B.Sc. Agricultural Resources and Production Management (50)	B.A. Agricultural Resources Administration (50)	B.A. Cultural Landscape Management
Proposed curriculums (Other) - NB of students/year	Special training (200)	Special training	X
% of quit	0%	0%	X
Bachelor --> Master	10%	10-15%	X
Back in parent's farm	No idea	10%	X
Philosophy	Farmers	Farmers	Farmers
Other	Full curriculum in Sakon-Nakhon Province	Half curriculum in Nan province	

Table 8: Characteristics of the 3 faculties surveyed in this study

4.3.8 Evolution of this system in last years

The number of students trained in these curricula is increasing year after year. For instance, Chulalongkorn University curriculum staff think about extending their class to 70 students in the next years and changing their way of recruiting: they think about opening the curriculum to children from non-farming families. As these curriculums are new, it is complicated to have precise data concerning the future of graduate students.

4.4 Evaluation of agricultural education system

4.4.1 Faculty

As mentioned previously, there is a decrease of students applying to faculties of agriculture and a decrease of "motivated students": According to the faculty of agriculture education staff, many of the candidates apply only because of low admission requirements of faculties of agriculture. They also considered that new students are generally not good in sciences as the level of teaching in high school is considered as low. They mentioned that even students who are not in this case (such as those who

participate in agriculture demonstration school club[15] who are generally "top note" students) change of topic after their bachelor to do other subjects (medicine, sciences…).

A second problem mentioned by agricultural education staff concerns the lack of practical work provided in the faculties of agriculture. Universities have not enough budget to buy farming equipment (in particular they lack new technologies equipment) and teachers are mainly lecturers so there is not a much practical class for students. Also, according to a professor from the faculty of agricultural education, curricula should be more specifics (i.e.: two fields: Plant science and Animal science). These issues were said by both faculty staff and people from Khao Kwan[16] who estimated that students should also have more internships during their studies. Educational staff said there is a shortage of agriculture teachers, an essential link to transmit the knowledge from one generation to the next.

4.4.2 Colleges of agriculture and technology

A professor from the faculty of agricultural education estimated that students would probably not have enough knowledge to become a successful farmer after graduating from vocational colleges. As Vocational studies consist of just 2 years of training (Bor Wor Sor), he estimated it is not enough to be confident about starting a farm. The following quote from this professor describes well limitations of agriculture studies in Thailand:

"At the end of their studies, students (from both vocational colleges or university) can grow and harvest plants, raise animals but they have not enough knowledge to manage a farm with success, they have not enough knowledge in marketing for instance. In Thailand, […] your activity is expected to be profitable, so you can't start farming without enough capital. Students then work first for companies to get experience and to save money before returning to their own land." (October 2018)

Finally, another problem touched upon by agricultural education faculty members is the delay the Thai agricultural sector have regarding organic farming. Organic farming is promoted by not so much "knowledge people" today in Thailand according to agriculture professors. According to the professor of the faculty of agriculture education, "It is an important challenge and we have a lack of knowledge about this kind of farming". Moreover, despite a general interest in organic farming, in line with the very popular "sufficiency agriculture", universities provide many courses about chemicals because their curricula are designed to sustain national economic development plan. Concerning organic farming, researches on the topic could be improved according to this professor. This idea was confirmed by people working in the NGO Khao Kwan.

4.5 After studying

This section describes the point of view of educational staff on student's future and mind about agriculture.

4.5.1. Students vision of agriculture

No consensus was found from the qualitative interviews regarding the students' opinion of the farming profession. Some college professors think that young graduates are not so interested in agriculture, that they prefer going to university, work for a company first and go farming when they are older. The main reason for this situation would be that students consider agriculture as a hard profession. Despite this consideration, some would still like to be farmers because they will have no choice except going home after graduation and work with their parents on the family land. Others who

[15] Private demonstration school (primary and secondary level) in Kasetsart University. Students participating receive scholarship and intensive training.
[16] NGO specialized in organic rice trainings based in SuphanBuri

want to experiment will work as employees or study further first and come back to agriculture afterwards. This pathway is generally encouraged by teachers.

Other educational staff members think that both BWC and BWS students are interested in farming. According to them, many students think agriculture is important for Thai people and would be an interesting career but under specific conditions. For example, one teacher said, "I think technology could make the new generation looking back to farming and being attracted by this kind of work". Others also mentioned that some students are more interested in commercial crops, they would like to do chemical farming and would follow crops trend so they are not so motivated in the college curriculum, which does not follow commercial farming philosophy, according to him.

The third main idea that emerged from the interviews is that students are still too young to make major choice students do not have yet firm ideas about what they want to do later. According to these staff members, it is the role of the college to inform them but not to force their choice. A director was thinking this way and said "This is not about the image of farming that students have, the issue is what we show them here, it should be a kind of farming they would like to do. We need to help them to make a choice, not forcing them in a way. We try to make Bor Wor Chor students continuing in Bor Wor Sor because we know it will permit them to be more fully-grown, mature in their head and they could do a better choice".

4.5.2 Youth enrollment in agriculture

The importance of young enrollment in farming for the Thai agriculture future was underlined by most of the interviewees: "If we had more young farmers, even with no experience, they could use new technologies, making cost of labor decrease since the labor productivity would increase", "They should be more aware of today's agriculture challenge and then create an increase of […] quality in agriculture production", "Young farmers are more creatives and have better adaptation capacity compared to old farmers. They are also more competent in learning and applying the new knowledge." The people we interviewed, and especially university staff, are confident about the positive effect that young enrollment could bring to Thai agriculture. They think young farmers could better understand market and demand and then add processing and value to their products with all their knowledge. They are also convinced that the settlement of young farmers could permit to spread knowledge in each region and then improve farming conditions even for old farmers.

Young enrollment in agriculture nowadays regroups people from many different origins. According to NGOs staff, they can roughly be divided into four categories:

- Young people from farming families without a diploma: people with low study level who work with parents on the family farm since a young age;
- Young people from farming families with diploma: people issued from Faculty of agriculture, college of agriculture who will work with parents on the family farm since a young age (after studies)
- Young people with a city background: a young former urban worker with a good level of study in any field who will start a farming business
- Former office/factory workers: Former urban worker who will continue familial farming business or start a new farm because he is tired of working from 9 AM to 5 PM and dream of a better life in term of income and happiness (start farming generally after 40 years old)

We will focus in this study on the 2nd category.

Regarding the willingness of students to do farming, a large majority of them will probably not do farming right after their studies according to interviewed college staff. Students who want to do farming will go to work on their parent's land (for a minority of them) or save money with their jobs in

companies or for the government (for a majority of them). Children of farmers will not necessarily go farming. Those who are capable of working will mostly choose to work in a factory at first. A teacher also pointed out that young people see as a model to go to the city and most of them would go there if they had the opportunity to do so. In the case of universities, some graduated students prefer working first for companies, in order to learn and get capital to then start their own farm. When they enter Chulalongkorn B.A. "Agricultural Resources Administration" for instance, a curriculum recruiting only farmers' descendants, students "promise to go back to their home" (One professor from Chulalongkorn, October 2018). Some will just get experience and capital and will go back home later, others get locked in a comfortable urban life and will continue working for companies for a long time. Such point of view was shared by NGOs staff who think that graduate students would prefer to work in large companies than having their own farm.

According to interviewed college staff members, young people's willingness to become farmers depends mostly on crops price. For instance, some will come back in the fields if the price increase and shift to another work if price decrease later. According to faculty staff members, students mainly face a problem of confidence. During students' evaluation (Interviews at different moments of their bachelor), they commonly say about themselves that they have not enough techniques and not enough knowledge to manage a farm.

Regarding the part of students who become farmers, staff from colleges of agriculture observed that they rely more on new technologies, they do agriculture in a different way than their parents. They will choose a more intensive kind of farming, on smaller lands, and they will spend less time on farming activity. Some young people have two different farming activities, they do mixed/integrated farming. A part of them will farm only during some periods of the day or even work on their farm as the second occupation, before and after their main job. It is hard to do farming as a full-time job, then some young will farm just for self-consumption as they do not have enough capital to invest more. Some landowners leave their fields unused because they already have enough money or another source of income.

According to college teachers, the perfect time to settle a farm is when someone is between twenty and thirty years old but it depends on young confidence in his/her knowledge, capital, network... Some students have planned to be a farmer for a long time but will need to work first to get more farming skills, confidence, and network. People we interviewed mentioned that a student should have skills in farming techniques, management, resources (soil, climate, varieties…) and a good network to be successful.

4.5.3 Constraints of enrollment in agriculture

Visions from college and university staff differ concerning the constraints somebody could face in starting a farming activity. College staff focuses mainly on technical difficulties when University staff think the main constraints are parents who prevent their children against farming.

According to many colleges staff members, the lack of capital is the main constraint faced by students who want to settle a farm. Vocational students are mostly from poor farming families with low income. Parents cannot help their children to get enough capital to settle a farm. According to these teachers and directors, having sufficient capital is a required condition to do farming and students in their organisms have low access to capital. Then teachers assume students can face the difficulty of unfair sales channel and the high price of inputs. These two problems are related to the lack of capital as their parents are poor because of this lack of profitability of agricultural activity. Some teachers also mentioned that students could not have enough experience in farming and marketing to start a farm when they finish their studies. From several sources, agriculture training should teach more about marketing to students and farmers.

The main idea of university staff is that families do not want their children to suffer a farming life and they do not believe in their children ability to do farming considering the numerous challenges

that Thai farmers face nowadays. Parents want a good life for their children and do not want them to do hard and low paid work as farming. This point of view is especially present in mind of those who are themselves, farmers. As an important part of Thai farmers are poor, they contract debts to send their children to university. Then students must pay for their parent's debt, so they need safe and well-paid work. Even if the student has a bachelor's in agriculture, his/her parents will not understand if he/she comes back to his/her village to do farming, they will think they spend their money for nothing. For most Thai people, a diploma means that one's can become rich, and prosperity means city job.

4.5.4 Support for young enrollment in farming

No specific information was obtained during the interviews in colleges about any public support to young farmers nowadays. Some interviewees even oppose the idea of the government supporting young farmers: "I think it is not the role of the government to support young farmers, young farmers should support the government"

Faculties of agriculture seem to play more a role of connecting students and Government agencies, such as:

- The new farmer program ("สปก") by ALRO that provide a 6-month training for farmers and then provide them some land.
- Thailand 4.0: Support to start up commercial projects promoting added value agriculture, the transformation of products (food processing, cosmetic…).

The idea that was clearly underlined in these interviews is that even if some supports are existing for young farmers, the transmission of information between government and training institutions is inefficient and most of agriculture education staff are not aware of these supports, which suggests students also do not know about supports that could be provided by the Government to help start farming. Staff and students were more aware of support provided by private agro-industry companies such as Mitr Pohl (sugar company) that help students in participating in a Dual Vocational Training. Staff also mentioned that any projects would depend on the province governor and some of them are not interested in the agriculture issue. By contrast, staff members from Khao Kwan pointed out that no marketing support was implemented by the government although the problem is well known.

Most of our interviewees mentioned already existing public policies as a good way to improve the current situation. They said first that the faculties of agriculture are providing quality training support to farmers in Thailand, with the support of private companies. In this sector, a dean we interviewed mentioned that communication between farms and research center is getting better and that faculty staff knows better farmers' problems and are able to provide solutions According to professors of a Faculty of agriculture, the Thai model is based on the universities that are the center of knowledge. Universities create knowledge, transmit it to schools where students will learn it and then report it in their families and their communities. Then, they said that the "self-sufficiency economy" settled by the late King Rama IX was a sufficient source of inspiration for students, providing them the base of farming: to be self-sufficient and then sell the surplus.

About the main ideas of supports that could be created to improve the current situation, educational staff members mentioned:

- Support the development of organic farming: Improve consumer access to information, improve farmer access to new technologies
- Change the production philosophy: Focus on product quality instead of product quantity, educate people about the environment and health;

4.5.5 Thai agriculture challenges

Here are listed the problems faced by farmers and the Thai agricultural sector in general according to the agricultural staff members questioned.

A frequently mentioned problem is related to the sales channel, considered particularly unfair to farmers in Thailand. According to teachers from a college in the East of Thailand: “The market system is not to the advantage of a farmer” and farmers should “avoid middlemen that generally take a too much important part of the money from products”. Low and unsteady prices of agricultural products were generally highlighted as the reason why agriculture is so unprofitable today in Thailand and then so unpopular. People often referred to both the downward price fluctuations of agricultural products and the agricultural input price fluctuation and general upward trends. University also mentioned first the farmers’ lack of understanding of the markets. They said for instance that demand for organic products was existing, but farmers did not necessarily know about that.

Khao Kwan staff members also mentioned the significant difference between the purchase price and the selling price (middlemen “drawdown”) and the frequent price fluctuation (of both products and inputs) making farmer life unstable. A situation that they link with (1) the adoption of commercial farming practices, (2) the standardization of agricultural practices (and varieties of plants) and (3) the market opening to foreign countries (ASEAN).

However, this problem of unsteady price was linked with anarchic productions of Thai farmers in the mind of a college teacher who said “Someone gets money from rubber trees and then everybody will plant rubber trees. Then the market is overflowed, prices decrease, and farmers get low profits.” This brings us to two others frequently mentioned problems: the lack of education of Thai farmers and the lack of organization of Thai agriculture, often stated by the teachers and directors of agriculture college. According to some teachers, this organization of the sales channel should be improved by setting up clear outputs for farmers, “For instance in Belgium, when a farmer grows crops, he already knows to whom he will send it” and also by encouraging farmers to sell their products directly: “We need […] to encourage farmers to sell themselves their products.” Faculty staff also deplored that old farmers cannot or do not want to use new technologies, “old farmers are farming this way only because they have been doing the same for all their lives” a situation that makes Thai agriculture production decreasing as the quality of the products. Solutions proposed were to improve access to education and also drawing inspiration from international models as mentioned by this teacher working in a college of agriculture which proposes an exchange program with Israeli farms: “As it is the case in Israel, I think we must have farmers with qualifications (with agriculture and economic diploma), they could then develop many different successful models and increase the image of farmers, then more people would be interested in farming…”

NGOs staff pointed out a problem of lack of knowledge and organization in agriculture sector but talked about different causes and solutions. They blamed the influence of government and companies on farmers, specifically the advertisements for industrial agriculture, chemicals and seeds in rural areas. They considered that these advertisements are a main source of influence for many farmers causing changes in their farming ways. Farmers will then start agriculture using a lot of chemicals and commercial varieties. Then farmers will have problems of soil, of income (increasing of input prices), of plant resistance to pests and natural hazards…

Other problems were mentioned such as the lack of production factor (land, machinery) in general, the lack of access to new technologies and the attitude of people towards agriculture. According to some directors and teachers from colleges of agriculture, agriculture means hard work for a large majority of Thai people and that is a part of the problem of farmer aging. According to University staff, most of the farmers do not want their children to do agriculture because they suffered from debts and hard work during their life’s and they don’t want their kids to undergo the same way. These farmers somehow pushed their children out of agriculture aiming a better future for them and the whole

family. Moreover, in this kind of family, farmers have difficulties to work on their land in getting older and often sell it. This phenomenon breaks the land and knowledge transfer between parents and children that are from a farming family. Both college and faculty staff considered it as a waste as with new technologies and better ways to develop agriculture activities that exist now, farming work could be more profitable and more comfortable for a young person ready to settle a farm.

Some University staff we interviewed also pointed out the capturing of agriculture production factors by big companies that bought lands from farmers discouraged to do farming for previously mentioned reasons. NGOs staff also talked about this fact and reject the fault on “The Mainstream agriculture” which make farmers “spending more and more money in fertilizers and seeds and to have intensive land tenure (i.e.: growing two seasons of rice/year). Then, they cannot continue this way as they have to face low crop prices and inputs high prices and they have sell their land to new owners.”

Finally, all these issues have important impacts on farming perception by Thai people. Because of the experience of current farmers, Thai people figure out that agriculture activity is not profitable. This bad vision feeds the vicious circle of agriculture abandonment.

Chapter 5: Agriculture students' plan and attitude toward farming

5.1 General characteristics and background of students

5.1.1 General characteristics of the sample

The sample includes 187 students from three different Thai colleges of agriculture and technology (Chachoengsao college, Sa Kaew college, and Roi Et college) and one faculty of agriculture (Kasetsart Sakhon Nakhon – Faculty of Natural resources and Agro-Industry). The form used to collect the data is presented in **Appendix 1**.

a. Colleges :

We interviewed 137 students from 3 colleges of agriculture and technology. They were predominantly between 18 and 21 years old. 61% of them were male and 39% were female.

Chachoengsao		Sa Kaew		Roi Et	
NB	**%**	**NB**	**%**	**NB**	**%**
25	18%	24	18%	88	64%

Table 9: Number of students interviewed in each college

Each college proposes different majors:

- Plant science (Chachoengsao, Sa Kaew, Roi Et)
- Animal Science (Chachoengsao, Sa Kaew, Roi Et)
- Fisheries (Roi Et)
- Agriculture industry (Sa Kaew, Roi Et)
- Agriculture machinery (Sa Kaew)

The level of studies for the students and the major they choose is described in the table below:

Curriculum		
Year	**NB**	**%**
BWS 1	50	36%
BWS 2	87	64%
TOTAL	137	100%
Major		
Categories	**NB**	**%**
Plant Science	77	56%
Animal Science	36	26%
Fisheries	13	9%
Agriculture industry	9	7%
Agriculture machinery	2	1%

Table 10: Curriculum and major for students from agriculture college

b. Faculty :

We interviewed 50 students from the faculty of Natural Resources and Agro-Industry (Kasetsart) in Sakon Nakhon. They are predominantly 20-22 years of age. They were on average older than colleges

students, which is normal as we interviewed only students in 3rd and 4th year of bachelor curriculum. 38% of them were male and 62% were female.

The faculty propose different majors:

- Plant science
- Animal Science
- Fisheries
- Agricultural Resources
- Agricultural Resources and product management

The level of studies for the students and the major they choose is described in the table below:

Year		
Categories	**NB**	**%**
Bachelor 3	24	48%
Bachelor 4	26	52%
TOTAL	50	100%
Major		
Categories	**NB**	**%**
Plant Science	3	6%
Animal Science	10	20%
Fisheries	3	6%
Agricultural resources	6	12%
Agricultural Resources and product management	28	56%
TOTAL	50	100%

Table 11: Curriculum and major for students from agriculture college

5.1.2 Student's geographical and socio-economic characteristics

The students' household main characteristics are summarized in Table 4. These households consist of the respondents (students), their parents, brothers and sisters and extended family like grandparents, uncles or aunts, in many cases.

NB of family members		***NB of Workers in family***	
Mean	4,50	**Mean**	2,10
SD	1,68	**SD**	0,81
Father Age		***Mother Age***	
Mean	48,81	**Mean**	46,37
SD	7,11	**SD**	6,37

Table 12: Descriptive statistics about the number of household members and the number of workers in each family; Descriptive statistics about parent's age

Parents are on average 40-50 years of age, which means that they would continue to work for 15 or 20 years before retiring. On average, two people are working in each household. Workers are generally the parents and sometimes children, grandparents or uncles/aunties. Other members are children, students, housewives, elderly and, more rarely, unemployed parents.

A one-way ANOVA was realized on SPSS to check any significant difference in these characteristics. There are no significant differences in these characteristics between college and faculty students as

presented in Table 5, except for mother's age which is significantly higher for faculty students because they are a little bit older than college students.

ANOVA College/Faculty	Sig.
NB of family members	0,990
Nb of family workers	0,698
FatherAge	0,774
MotherAge	0,019

Table 13: Results of 1Way ANOVA for four different parameters; Computed using SPSS

The following figure displays the main sources of income (some family members have a secondary source of income) among the total 659 members that composed students' households. Farming activity is clearly dominant in this kind of household. Households generally include one or two people having a farming activity, one member having another kind of professional activity, one child or one retired/housewife/unemployed people and the student.

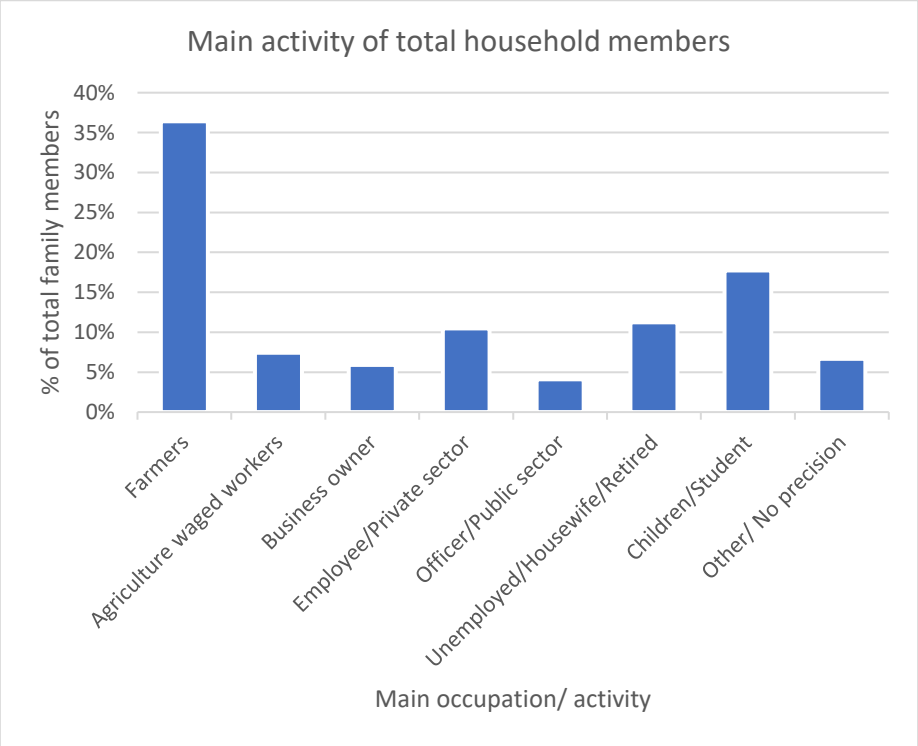


Figure 6: Distribution of main activities of students' household members (N = 659)

5.1.3 Importance of farming for household

85.6% of households include at least one farmer (at least practiced by one member of the family, as a first or a second occupation, on rented or owned land). According to a Khi² test, there is no statistical difference in the number of households in which at least one member is doing farming considering different organisms (college/faculty).

The following figure displays the degree of importance of farming for students' households. The majority of households rely mainly on farming (in 73% of them, farming is the only or the main activity) although it would be a sufficient activity for only 33% of households. Other households have another source of income, more or less important depending on the case.

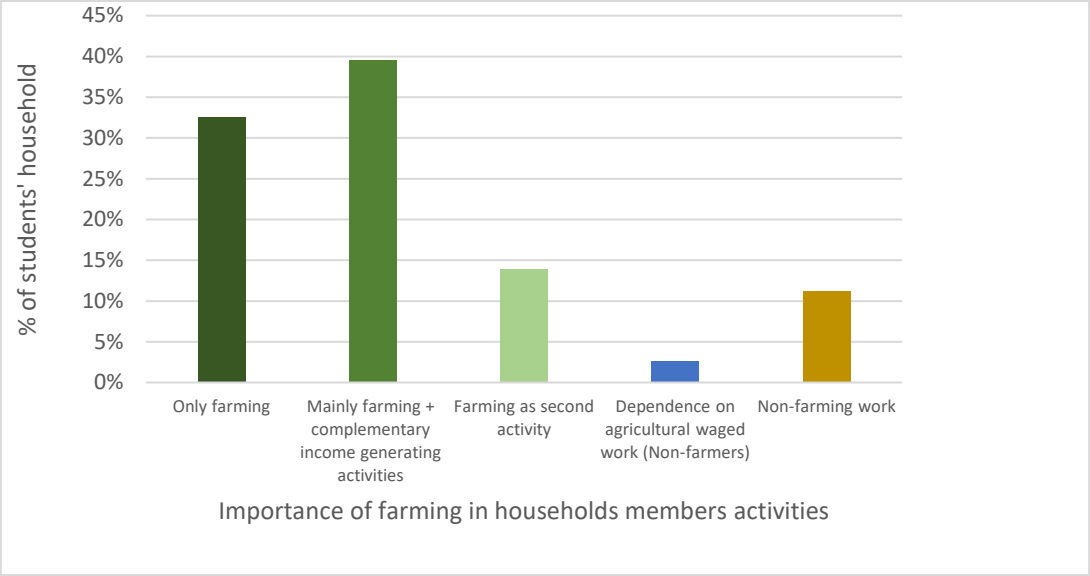


Figure 7: Importance of farming in household's activities (N = 187)

	Only farming		Mainly farming + complementary income		Farming as second activity		Dependence on agricultural waged work		Non-farming work	
	NB	%	NB	%	NB	%	NB	%	NB	%
College (N=137)	37	27%	58	42%	25	18%	5	4%	12	9%
Faculty (N=50)	24	48%	16	32%	1	2%	0	0%	9	18%
Total (N=187)	61	33%	74	40%	26	14%	5	3%	21	11%
X^2 Faculty/College	0,01		X		0,01				X	

Table 14: Importance of farming in households' activities; Khi² test between categories of students regarding their organism of study (college/faculty) (N = 187)

Definitions:

Only farming: The only source of income of the household is farming – At least the two main household members (Father and mother or, if they are deceased or absent, the one or two first members mentioned by the student) do farming as only activity (neither other main occupation nor second occupation different to farming).

Mainly farming + complementary income generating activities: One or several main household members do farming as a 1st activity but one or several main household members do another activity (except being a housewife, a student, children, unemployed or retired).

Farming as a second activity: No main household members do farm as a 1st activity but one or several main household members do farm as a second activity or another member (member 3, member 4) do farming as 1st or 2nd activity.

Dependence on agricultural waged work (Non-Farmer): No member is involved in the farming activity and at least one of the two parents or main household members is doing farm laboring as a first or second activity

Non-agriculture activity: No family member is involved in a farming or farm laboring activity.

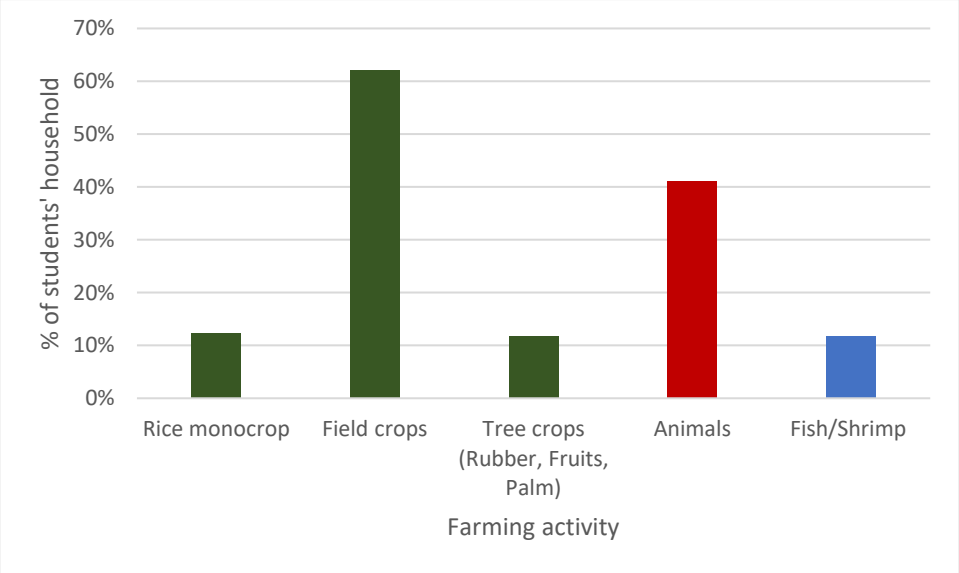
In faculty students' households, there are significantly more members who do only farming and fewer members who do farm as a second occupation compared with the households of college students.

In 18% of households, one member at least works as a farm laborer, as a 1st or 2nd activity. This rate is about 22% in households of college students and 4% in households of faculty students. 15% of them (total students' household members) also have a farming activity.

5.1.4 Farm diversity in households

For this part, we selected a sample of 161 (86%) households having a farming activity. The average size of the household farm is 25.2 rai (SD: 27.4 rai), the biggest farm is about 205 rai and the smallest is about less than one rai. There is a statistical difference between college and faculty students' household farm size according to the result of a one-way ANOVA on SPSS (sig. = 0.05; N = 161). According to this test, the farm of faculty students' household is bigger (mean = 31,1 rai) than the farm of college students' household (mean = 22.3 rai).

Figure 8: Distribution of farming activities type among households having a farming activity



	Rice monocrop		Field crops		Tree crops (Rubber, Fruits, Palm)		Animals		Fish/Shrimp	
	NB	%	NB	%	NB	%	NB	%	NB	%
College (N=137)	19	14%	84	61%	17	12%	56	41%	18	13%
Faculty (N=50)	4	8%	32	64%	5	10%	21	42%	4	8%
Total (N=187)	23	12%	116	62%	22	12%	77	41%	22	12%
X^2 College/Faculty	X		X		X		X		X	

Table 15: Distribution of farming activities type within households having a farming activity, differences between categories of students (N=161)

Definitions:

Rice monocrop: Household members have a paddy and eventually extra animals raising or fish and shrimp pound.

Field crops: Household members grow a most important area of paddy (with another crop), cassava, corn, sugarcane or vegetables field than other crops and eventually extra animals raising or fish and shrimp pound.

Tree crops (Rubber, Fruits, Palm): Household members grow a most important area of palm trees, Hevea, eucalyptus, bamboo or fruit trees than other crops and eventually extra animals raising or fish and shrimp pound.

Animal: Household members have an animals' raising activity (can be as the main activity or as a second activity with other crops) – animals raised are: poultry and cattle (20% of total households each) and swine (12% of total households).

Fish/shrimp: Household members raise fish and shrimp as a main or a second activity with other crops.

Most of the students' families have "field crops" farms, they grow mainly paddy, cassava, corn, sugarcane or vegetables (**61%**). A non-negligible part of them raise animals and/or fish and shrimp.

There is no significant difference between the kind of farming among faculty and college students' household.

5.1.5 Profitability of the farming activity

For this part, we estimated the income that every household could get from farming depending on their activities and the area of land dedicated to each crop. For animal raising and fish and shrimp farms, we used the average income of Thai farmers in North-East region depending on their area of land (Source: Office of Agricultural Economics).

The general statistics of this estimated agriculture income in our sample is presented in the next table (N = 161):

TOTAL (bht/household/year)		*Total 2 (baht/worker/month)*	
Mean	88074,42	**Mean**	3967,60
SD	127045,68	**SD**	6289,70

Table 16: Descriptive statistics of estimated agricultural income in our sample

A one-way ANOVA was realized to check any significant differences between college and faculty students and no positive significance was found (sig.: 0.564; N = 161).

We also realized a one-way ANOVA to check any significant difference of agriculture income among households in the 3 different groups of farming importance (1. Only farming, 2. Mainly farming + other activities, 3. Farming as the second occupation). There is no significant difference between these 3 groups (sig.: 0.284; N = 161).

Descriptive statistics

Depending variable: Agriculture Income1

ImportanceOfFarming	Mean	SD	N
1.Only farming	102710,9	141429,1	61
2.Mainly farming	83528,4	128797,5	73
3.Farming as second occupation	55953,1	74164,3	26
Total	86360,7	127209,2	161

Table 17: Descriptive statistics performed on SPSS on farming income of households depending on farming importance in household activities (5.1.3 Importance of farming

5.2 Attitude toward agriculture

5.2.1 Motivation to enter agriculture curriculum

100% of students in bachelor were studying in high school previously (most of them have a science certificate). Considering colleges students, 51% have a Bor Wor Chor (most of them were studying Bor Wor Chor in agriculture in the same college they were studying at the time of interview – 47%) and 49% were previously in high school. These rates are logical as Faculty accepts only students with a certificate and Colleges generally encourage their Bor Wor Chor students to continue in Bor Wor Sor. However, there is an important difference between the student's previous curriculum depending on the three different colleges as described in the next table.

% of students in each colleges			
Student's previous curriculum	Chachoengsao	Sa Kaew	Roi Et
Bor Wor Chor	76%	63%	41%
Normal Highschool	24%	37%	59%

*Table 18: Table representing the students' previous curriculum (as % of total **interviewed** students for each agriculture college*

A Khi² test was performed and highlighted a significant difference in the background of students between Sa Kaew and Roi Et colleges (p= 0.05) and between Chachoengsao and Roi Et colleges (p= 0.01). The number of organisms proposing curriculums after high school level in each area could explain these results as it was pointed out as an important factor by a college director.

During interviews, the director of Chachoengsao college indicated that 80% of Bor Wor Sor students were previously Bor Wor Chor students. The same ratio was approximately 65% in Sa Kaew college and 45% in Roi Et college, that is really close to the results presented in the previous table. We can hypothesize that the college of Chachoengsao is close to several agglomerations with universities (Chachoengsao, Chonburi, Bangkok), and so students from normal high school in the area are less attracted to come study in colleges as they have many alternatives.

Concerning Sa Kaew college, less Bor Wor Chor students continue in Bor Wor Sor (40%) in the same college (without any clear reason mentioned). We know that 20% of Bor Wor Chor quit the curriculum before the end each year and we assume that the other ones go to work as farm laborers, employees or in parent's farm according to a teacher from this college. The college is far from the cities compared to Chachoengsao college. It is located 5 km away from the border with Cambodia, then approximately 75% of college students are from Cambodia (we interviewed only the Thai students in this survey). Most of the students who were in high school previously come from Aranyaprathet, the city in which the college is located. As this city is very off-centered compared to Thailand, we assume that students from this high school have few other possibilities to study elsewhere.

In Roi Et college, 100% of students who complete Bor Wor Chor continue in Bor Wor Sor in the same college according to the deputy director. This is still logical, even considering the low rate of Bor Wor Chor in the previous table, because this college, contrarily to the previous one, includes much more Bor Wor Sor students compare to Bor Wor Chor. Even though all the 70 Bor Wor Chor students who finish their curriculum each year would continue in Bor Wor Sor, there would be still many places for students from other training institutions (40 places). Considering the very important number of places available for high school students, different assumptions can be made. This college, contrarily to the two others, has a very good national reputation. According to staff from Chachoengsao and Roi Et college, it is considered as one of the five best agriculture colleges in Thailand. Then, it is located really close to the provincial capital, the city of Roi Et (15 km) and there are many high schools in this area but few universities of agriculture are located in the area (The closest one is Khon Kaen University, at 120 km from Roi Et).

Agriculture Bor Wor Sor was the first choice of studies for 69% of students in the sample. 16% would have preferred to go to University, 11% would have preferred to go to another vocational college and the last 4% would have preferred to go to another type of educational institution (military academy, private school, no studies…). Furthermore, a total of 38% of the students would have preferred to do something else or came there "by default", considering the 31% that indicated another first choice of study and the 7% who were forced by their parents to study here. Regarding students who did not intend to come here (N=52), 58% were from normal high school and 42% were from vocational college. This result demonstrates that even if there is a difference between different organisms, it is too small to conclude a general default choice made by high school students and a real

choice made by college students. Those students who planned to do something else mostly planned to do something different from agriculture. For instance, a college student said: “I would prefer to enter Rajabat University in Law Bachelor because it permits to get a government job easily”.

The studied bachelor was the first choice of studies for **26%** of faculty students. **64%** of them would have preferred to study at another university and **8%** would have preferred to study in another kind of organism. Only one student indicated a “default” choice or parents’ order as the reason to enter this curriculum. According to these results, the faculty curriculum is considered as a “second choice” study for much more students that the 3 colleges of agriculture. For example, one student said: “My first choice was to study the agriculture bachelor at Khon Kaen University because it was close to my parents’ place” and another said, “I would have preferred to go to Faculty of forestry at Kasetsart University-Bangkhen because I wanted to be forest ranger”.

Only **5%** of students (all of them are Bor Wor Sor students) declared that they faced difficulties to enter the curriculum, which confirms the statements made by educational staff about the non-selectivity of agriculture colleges.

Concerning Kasetsart University (Sakhon Nakhon), even if a GPA’s selection is done, admission was not considered as difficult by students as most of them did not face any difficulty to enter the curriculum. We assume that this is due to a lack of candidates, as result of parents’ negative vision of agriculture, as we mentioned previously (**Chapter 4**) or just the distance with Bangkok, what would implicitly decrease reputation of this faculty. Most of 64% Faculty students who made another study choice wanted to go first to Khon Kaen University or Kasetsart University (Bangkok), two of the best universities of agriculture, to study in classical agriculture B.Sc. These universities do not especially intend to train farmers or “agriculture entrepreneur”. What raises the following question: “do faculty students are really interested in becoming a farmer or do they just want to study in a prestigious university?” We will try to answer this question in the following parts in analyzing their career plan.

Figure 9 summarizes the reasons proposed by students, using the following definitions.

Financial reasons: Students who mentioned the low price of the studies or the limited financial capacities of their family.

Practical reasons: Students who mentioned the ease of entry or completion, the low difficulty of the curriculum or the advantage of being not far from his home.

Prospects: Students who mentioned the possibilities offered by the curriculum to then find a job, to continue studies or to be a farmer.

Personal values: Students who mentioned a personal interest in agriculture, values of their family or willingness to live in the countryside.

Influence of the environment: Students who mentioned an influence from teachers or friends on their choice of organism.

Skill search: Students who mentioned a willingness to acquire knowledge or practical skills.

Specificity of the organism: Students who mentioned a special characteristic of the organism/Curriculum (Dual program, the importance of practical work, good reputation…).

Will of the parents: Students who mentioned their choice was ordered by parents.

No reason: Students who could not explain why they choose this curriculum.

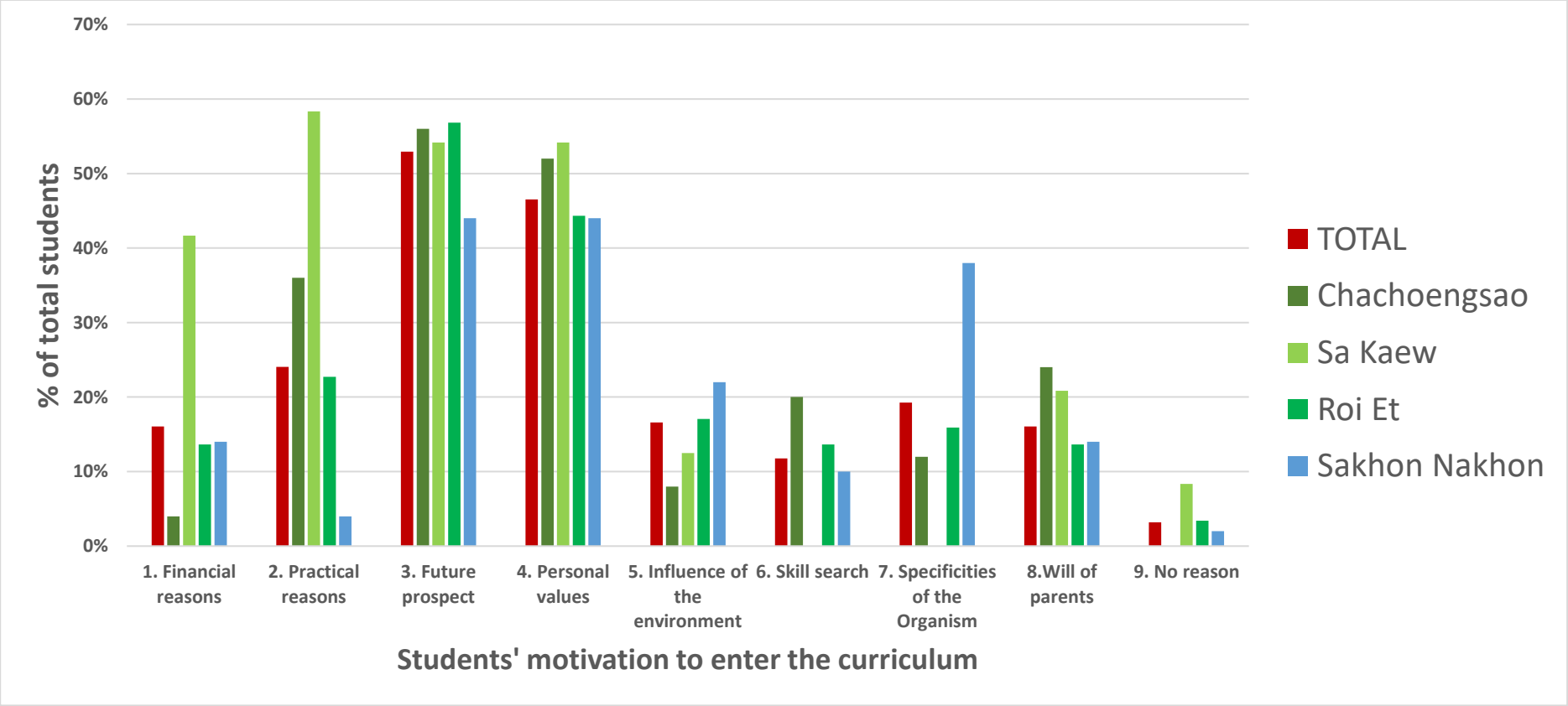


Figure 9: Students' main reasons to enter Bor Wor Sor or Bachelor (as % of total students), total and for each organism

An idea emitted in some literature (*Pimpa, 2007)* and by some college directors and teachers, is that the main reasons which motivate students to choose vocational colleges are either financial or practical. Bor Wor Sor constitutes a cheap alternative to University, that is expensive for this kind of family, for both Bor Wor Chor and local high school students, even if the level of interest of students is generally higher in Bor Wor Sor than in Bor Wor Chor according to educational staff. However, our data demonstrates that most of students choose to study to improve their future prospects (among 137 students, 16% are here for job opportunities, 6% to have the possibility of studying further, 26% to learn how to be a farmer and 20% to learn how to fix problems in family's farm, some can have various of these motivations in the same time) and personal values. Practical and financial reasons come in 3rd and 4th position. We see here that even if at least **38%** of students are here for other reasons than a deep interest in agriculture, the majority is here to have a career after in the field of agriculture and almost half of students recognized agriculture as a part of their personal and family values, so something important for them.

A college student mentioned "I choose this curriculum (Bor Wor Sor) because it permits to do a lot of practical work and I am interested in agriculture", another said "I think I will do farming in the future and my family do rice farming, so plant science was more relevant to learn useful skills to manage this kind of farming".

With regard to the Bachelor proposed by Kasetsart University, reasons to enter the curriculum pinpointed out by students fit better what educational staff said during the interviews, acknowledged as a deep interest in agriculture and a willingness to acquire knowledge to become a good farmer. However, almost 40% of students chose this curriculum because of the "specificity of the organism" which could mean for the complete curriculum proposed or, as it is the case here, the reputation of the organism. Students also mentioned the "long name of the major" what would be, according to them, a good point to be recognized after curriculum (by companies to be employed or banks to get a loan). To illustrates this point, one student mentioned he "chose Kasetsart University because it is a famous university, it has a good reputation" and another said he "chose here because the name of the curriculum makes it serious and will help me to get a job, also because I want to improve my parents' farm and I am interested in animal science".

The students' answer differed based the colleges we studied. Results of different colleges are homogeneous for most reasons except for the following two reasons:

% of students in each colleges			
Reasons to get involve in this curriculum	Chachoengsao	Sa Kaew	Roi Et
1. Financial reasons	4%	42%	14%
2. Practical reasons	36%	58%	23%

Table 19: Students' reasons to get involve in agriculture curriculum (as % of total students) for each agriculture college in our study

This difference can be explained regarding the gap in curriculum's prices, a socio-economic difference between these places or a difference of "reputation" between these three colleges. No differences of price were notified in the tuition fees of these tree organisms (Bor Wor Chor: between 300 and 500 baths – Bor Wor Sor: between 2000 and 2500 baths). Roi Et and Sa Kaew provide free food and accommodation to their Bor Wor Sor students (See table above).

Sa Kaew students are motivated by the closeness and the low price of the college. We can assume that students are from poorer families than in other colleges. Their difficult financial situation was highlighted by a teacher and the college is in an isolated area. This assumption could explain why a high rate of students chose this college for financial reasons. To support this possibility, National

Economic and Social Development Board of Thailand data indicates that Sa Kaew was the poorest province between the four we study here, considering Global Provincial Product/capita (in baht). Chachoengsao GPP/capita is 421 597 baths, Roi Et GPP/capita is 65 658 baths and Sa Kaew GPP/capita are 57 116 baths (Sakhon Nakhon GPP/capita is 66 567 baht).

Agriculture College	Chachoengsao		Sa Kaew		Roi Et	
Curriculum	BWC	BWS	BWC	BWS	BWC	BWS
Tuition fee	No	Yes	No	Yes	No	Yes
Free food and accomodation	Yes	No	Yes	Yes	Yes	Yes

Table 20: Characteristics of different colleges concerning Tuition fee, food and accommodation

Regarding the practical reasons, most of Sa Kaew students were previously studying in the same district (in the same vocational college or Aranyaprathet high school) contrarily to Chachoengsao and specially Roi Et colleges in which students are from many surrounding provinces, we can assume students in Sa Kaew college are more motivated by proximity with the college.

Regarding the curriculum proposed by Kasetsart University, the admission fees are similar than those for agriculture B.Sc. in Bangkhen[17]: 14 000 bahts/year. Admission fees to enter an agriculture bachelor in Khon Kaen university are lower: 8000 bahts/year[18].

We asked students about the career plan they had in mind before entering in Bor Wor Sor/Bachelor, results are depicted in figure 5.

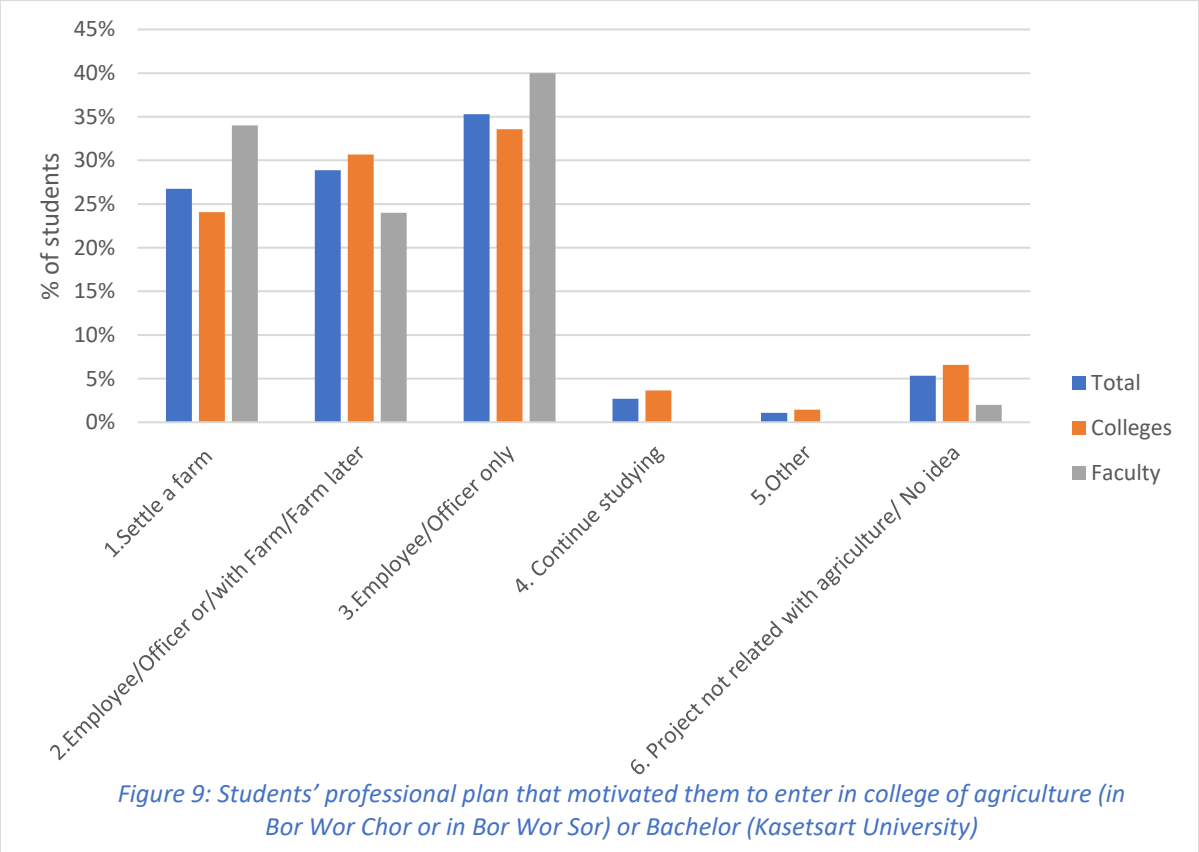


Figure 9: Students' professional plan that motivated them to enter in college of agriculture (in Bor Wor Chor or in Bor Wor Sor) or Bachelor (Kasetsart University)

[17] https://www.enttrong.com/2134; data from 2015
[18] http://registrar.kku.ac.th

This figure demonstrates that the plans students had in mind when they entered Bor Wor Sor or Bachelor are not so different regarding if they are studying at college or faculty. The aim of this question was to know for which professional purpose students chose to study further and what opportunities they were expecting from it. 35% of the students indicated it would permit them to do an activity different than farming but still linked with agriculture (i.e. officer, private farm manager...) and that they were not planning to own a farm at any moment of their life. 27% of students entered the current curriculum because they wanted to do farming as a full-time activity, directly after their graduation or later. Such a number may appear as low given the fact that the aim of this curriculum, according to a qualitative interview in **chapter 4**, is to train mainly farmers. For college, no references permit to evaluate this rate as the aim of the organism is not obvious.

Regarding the 5% of students who had a professional project not linked at all with agriculture, two of them said they enrolled in the curriculum because of parent's order, two of them wanted to study in another curriculum, one chose it for practical reasons (not far from home, cheap studies) and two chose it because their teachers or their friends influenced them to enroll.

We realized a Khi² test to find a link between students who had another study choice in mind or those who were forced to study here by their parents and those who did not plan to do farming. Results are presented in the following table.

X^2	1.Parents order/ Default choice	2. Choice 1 / Only choice	3. 2nd or 3rd choice
1.Settle a farm only	0,211	0,421	1,173
2.Employee/Officer/ Own business with/or Farm	0,069	0,038	0,001
3. Other	0,021	0,440	0,756

Khi² Obs	3,13
Khi² treshold	9,49
ddl	4
p	0,05

Table 21: Results of Khi² test using "forced by parents/default choice", "1st choice of study", "2nd choice of study" categories and 1,2 and 3 professional plan categories from Figure 5 - (N=187)

In our sample, there is no significant relationship between the students' willingness to enter the curriculum and the professional plan they had in mind when they entered this curriculum according to the Khi² test we performed here.

5.2.2 Agricultural sources of knowledge

1st source in term of importance						
	Family	**Academic training**	**Professionnal experiences**	**Internet**	**Other**	**No idea/ No answer**
NB	111	65	6	2	2	1
%	59%	35%	3%	1%	1%	1%
2nd source in term of importance						
	Family	**Academic training**	**Professionnal experiences**	**Internet**	**Other**	**No idea/ No answer**
NB	15	77	6	11	11	67
%	8%	41%	3%	6%	6%	36%
3rd source in term of importance						
	Family	**Academic training**	**Professionnal experiences**	**Internet**	**Other**	**No idea/ No answer**
NB	8	6	7	11	7	148
%	4%	3%	4%	6%	4%	79%

Table 22: Main sources of agriculture knowledge that students indicated during the interviews (N = 187)

The previous table indicates that students' main agriculture pieces of knowledge are provided by two sources: parents/family and academic training (it can be current academic training, for most students, or previous academic training, for example for students who followed a Bor Wor Chor in agriculture). These results can be considered as normal as most of the students are from farming families. Students probably helped their parents on the farm, they have agricultural knowledge influenced by family and neighboring farmers. Then college influence is also strong on their vision of agriculture. The interesting thing to emphasize is the low rate of students mentioning the internet or their professional experience. As it was mentioned in **chapter 4**, some differences in the philosophy of training were highlighted by educational staff. To control any influence of these potential differences on students' answer, we realized a Khi² test on the main sources of knowledge (Family and Academic) depending on the training institutions.

	Chachoengsao	**Sa Kaew**	**Roi Et**	**Sakhon Nakhon**
1. Family	52%	50%	52%	80%
2. Academic training	48%	50%	38%	16%

X²	**Family**	**Academic**
Chachoengsao	0,49	0,83
Sa Kaew	0,65	1,11
Roi Et	0,29	0,50
Sakhon Nakhon	3,13	5,34

X² Obs	**12,33**
X² treshold	9,21
ddf	2
p	0,01

Table 23: Rates of main sources of agricultural knowledge for each organism; Result of X² test considering main source of agricultural knowledge students have (family or academic) depending on their organism (Faculty, college 1, college 2, college 3) – (N = 187)

Results are surprising as there is no significant difference between the three colleges but between colleges and faculty students. Faculty students would be inclined to mention more their family as the 1st source of agriculture knowledge (80%) than colleges students (52%). Faculty students spent twice

more times in their current curriculum (we interviewed the only year three and four of bachelor) than college students (except those who did a Bor Wor Chor previously), it is curious that most of them think their main source of agriculture knowledge is their family. The studied Bachelor in agriculture intends to "create the new generation of farmers" and aims to provide the required knowledge to "agriculture entrepreneurs".

One possible explanation is that the curriculum focuses more on management, marketing, and accountancy skills and that students still consider this knowledge apart from "pure farming activity". This explanation is not satisfactory as, from an objective standpoint and even if farming is an activity that should be learned in practicing, spending almost three or four years in University is supposed to bring more (or at least equal) knowledge than helping parents on the farm during childhood. A second possible explanation is that college students mentioned more academics as their first source of knowledge because some of them did a Bor Wor Chor before their Bor Wor Sor (Bor Wor Chor are practical curriculum, focused on farming activities with plants and animals). Within the college students, 23% have a Bor Wor Chor and mentioned academic as their first source of knowledge and 29% have a Bor Wor Chor and mentioned family as their first source of knowledge. This demonstrates that the difference between these two groups (family and academic) is not about doing a Bor Wor Chor before entering in Bor Wor Sor or not.

Respondents also mentioned their role model in farming, what means the person/group of person/symbol that mainly influenced the way they see farming (we used the expression "idol[19]" concerning farming during the interview to explain to students what we were looking for). The following figure indicates that colleges students are more inspired by models representing the traditional way of farming (62% of college students): their parents (28% of college students), public personalities (23% of colleges students; mostly the king Rama IX) or teachers (11%); than model farmers they could have found on the internet, in the media or during their internship (12% of college students) or senior students from their organism (13% of college students). These results indicate that an important part of colleges students learns in a rigid framework of agricultural influences, a framework composed of farming family, school and national symbols and with few links to new kinds of farming that could be found in the media, in visiting farms...

To illustrate this, one student said: "I have two role models about farming: my mother, she teaches me agriculture and how to spend money carefully, and the late King Rama 9, because he taught us to think about a better way to develop agriculture and to live in a sufficient way". The trend is slightly different for faculty students that, even if the family is still the role model of an important part of students (30%), are numerous to have another farming actor as a role model. They mentioned a model farmer from the internet, in the media or met during their internship (24% of faculty students), a local farmer (6%) or a private company (6%). As the curriculum is still new (it opens in 2012), they have no senior students as a role model for the moment as they are probably not successful farmers yet. Maybe this situation will change in the next years.

This difference between these two types of organisms is due to the many visits that faculty students have with model farmers (that were mentioned by many students during interviews) contrarily to college students who visit most rarely this kind of farmers. For example, one student said "My main role models are parents' neighbors who are farmers and the farmer who received me as a trainee. He owns a Government farm and then he is at the same time a farmer and a public officer", another said "My model farmer is a farmer from the internet. He is farming in a very classical and sufficient way and has a beautiful mixed farm". There is a parallel with the Smart Farmers (SF) project, which intends to promote role models' farmers and make them influence other farmers. This project does not target directly the students in our sample, but they are potential future farmers so still

[19] A person or thing that is greatly admired, loved, or revered (source: oxford dictionaries), here concerning farming practices

concerned. Few of colleges students and less than 25% of faculty students (that often visit role model farmers, SF are active in Sakon Nakhon province according to the province director of agriculture extension) mention this kind of farmers as a model. It could mean that neither them nor their family know or consider official “model farmers” as a strong influence concerning agriculture in their daily life as if there was a kind of distance between students and this kind of project.

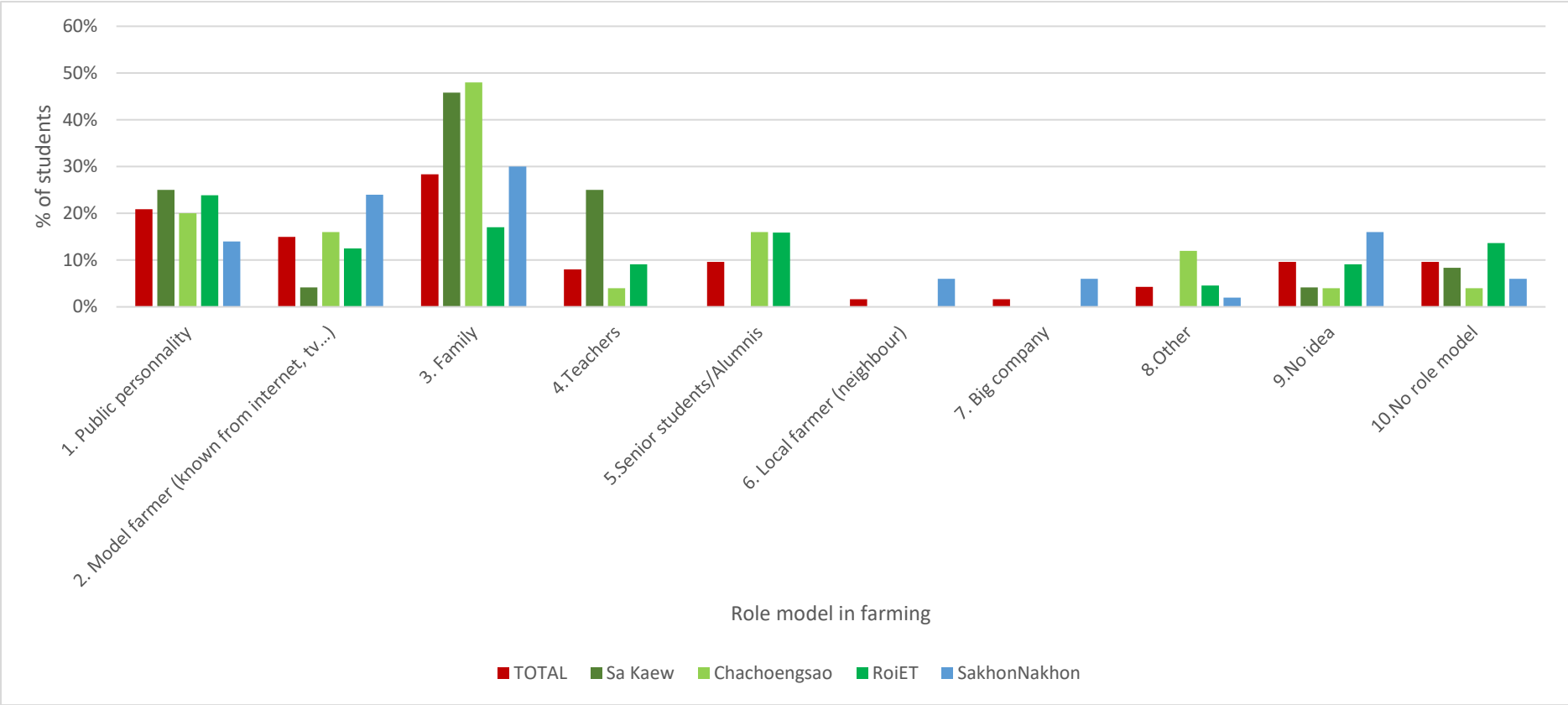


Figure 10: Distribution of students' agriculture/farming role model (in % of total sample)

5.2.3 Vision of the farmer work:

Not all students are from farming families but all of them come from rural areas. They all have a relevant opinion on farming and this opinion will participate in building their professional plan. To know better their opinion on farming, we asked them what aspects of the farmer's profession attracted them/what advantages they could find in being a farmer and what aspects were discouraging them to do it/what drawbacks they could find in being a farmer. The following plots present the main advantages and disadvantages according to students' answers.

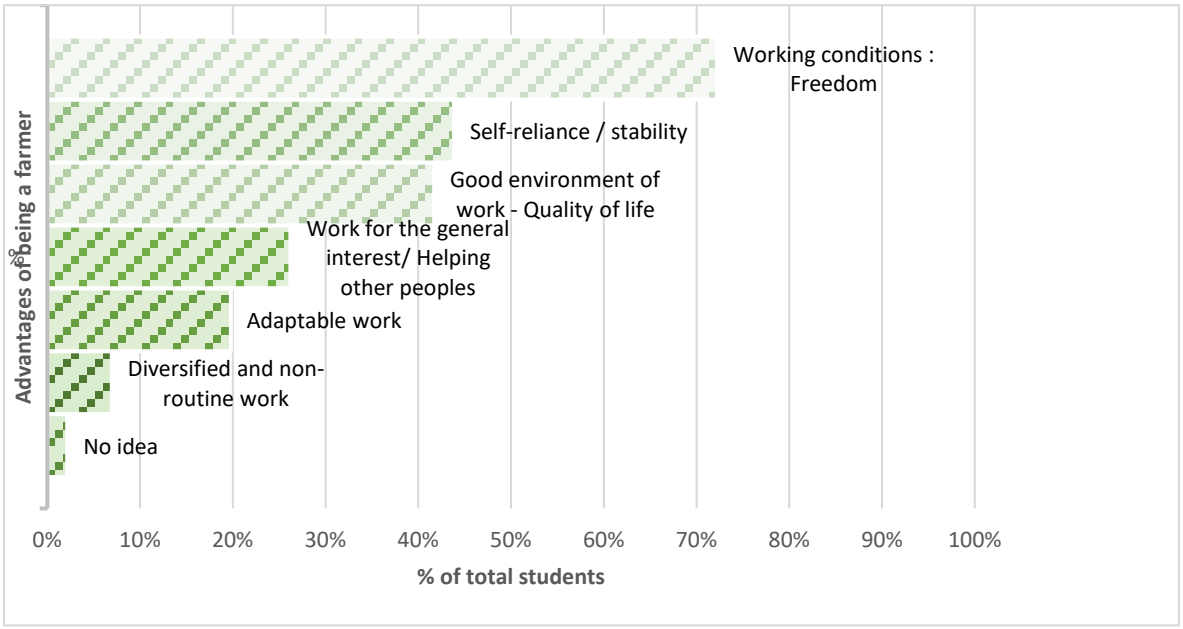


Figure 11: Advantages of being a farmer according to colleges and faculty students (Total is higher than 100% as students could answer more than one ideas) – (N = 187)

The main idea students have in mind is that farmers are" free", that they have no boss and can work when they want. The second is that a farmer can provide everything he and his family would need (mainly food but not only). Then, they envy that farmers live with their families, produce/eat healthy food and live close to nature without the stress of city life. The main aspects that could attract students are the "lifestyle" of farmers more than the economic characteristics (that is logical as farmers' economic situation is not good, especially in other people mind) or anything else. Students' answers were homogeneous, and no differences in rates were highlighted between students from the three different colleges and from the faculty of Natural Resources and Agro-Industry (Kasetsart). One student said "Being a farmer permit to work close to family, to be self—employed and also permit to have a second occupation" and another said "It permits to be with the family, to live in a natural environment, away from the crowded city". These are representative examples of what most students mentioned.

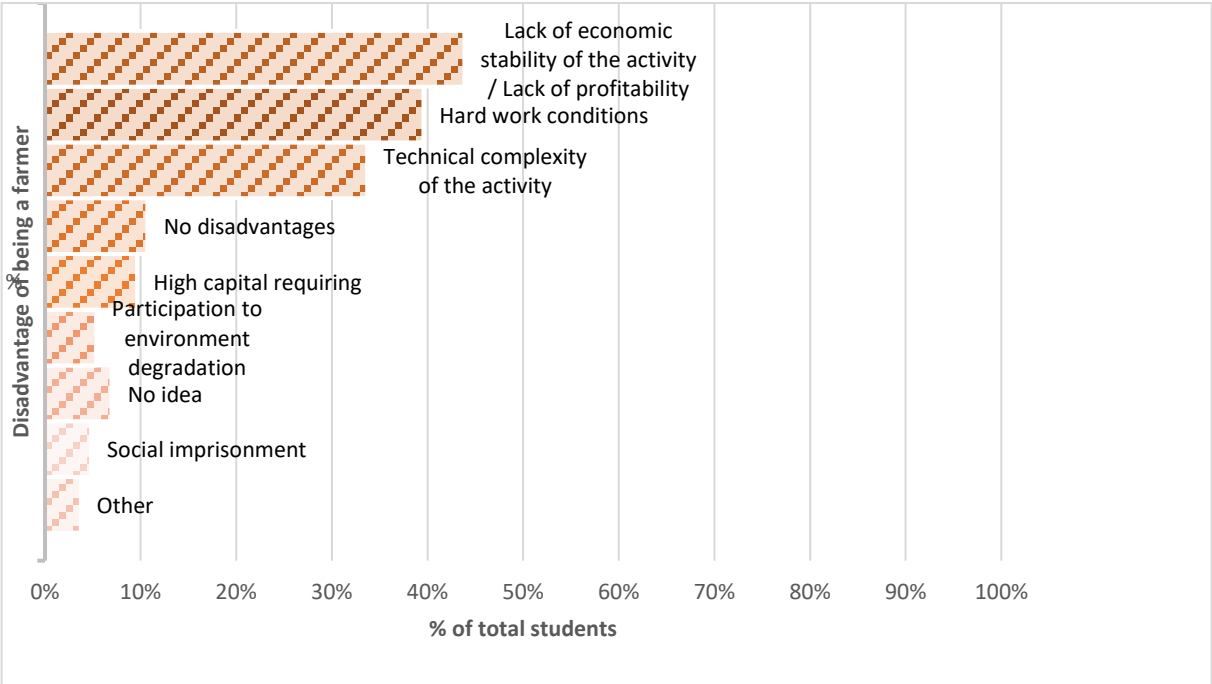


Figure 12: Advantages of being a farmer according to colleges and faculty students (Total is higher than 100% as students could answer more than one of these ideas) – (N = 187)

There are three main farming disadvantages in the mind of the students. First, the hard work conditions, mentioned by almost half of the students, who considered farming as an exhausting work or a work involving contacts with heat, chemicals or pollution. Then the students mentioned the lack of profitability of the activity and the unsteady prices of products, what was acknowledged in the last chapters. This is a widely shared view, not only students' specific view. "Technical complexity of the activity", which means the dependence on climatic conditions and natural factors, the high amount of work required or the many parameters to manage in being a farmer were also highlighted as a disadvantage. To illustrates this, a college student said: "It means living a difficult life, doing a tiring job, it needs a lot of patience and farmers are people who tend to be taken advantages". Another student from the faculty said, "It is really difficult to start farming activity because it requires a lot of knowledge and a lot of funds".

11% of students said that there are no disadvantages in farming activities, contrarily to the general opinion that would probably consider it as the most tiring and less profitable activity in Thailand. There is no large difference in answers between colleges and faculty students. For Chachoengsao and Sa Kaew colleges students, the main difficulty is the "Hard work conditions" (60% and 63% of students) and for Roi Et (college) and Sakon Nakhon (Kasetsart University), it is "lack of economic stability of the activity / Lack of profitability" (48% and 44%). Regarding faculty students, it is probably because they have more possibilities to find jobs with better and more stable income with their Bachelor degree. According to these plots, farming is considered by students as a difficult and risky activity providing quality of life and freedom but not permitting to earn a comfortable income.

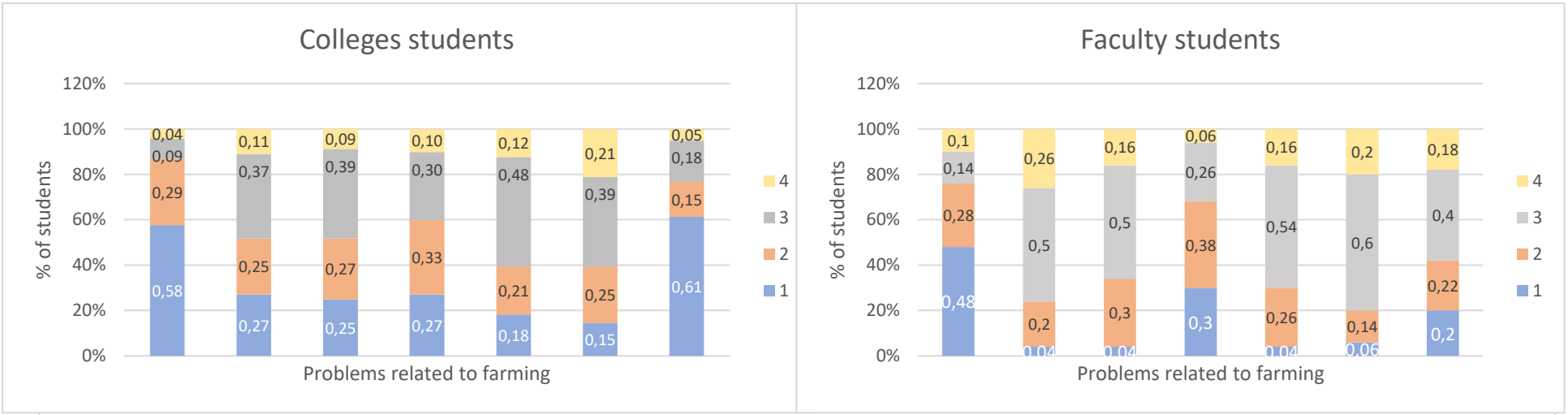
The next figure considers the opinion of students on a pre-established scale from 1 to 4 (see the description of each rank above) of 7 disadvantages of farming activity frequently found in farmer's mind.

Definitions:

1: Not a problem at all, I don´t see this as an issue; **2:** Small inconvenient

3: I consider it a major problem

4: Due to this fact, I am not interested in farming at all



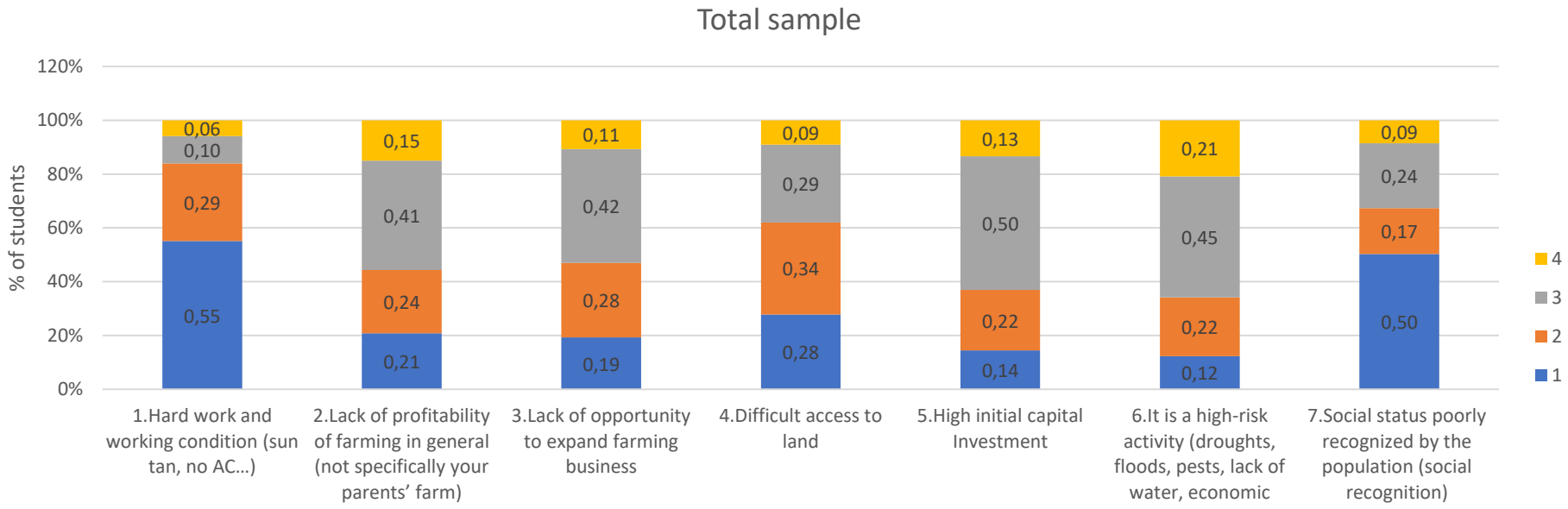


Figure 13: Charts representing the importance for students of different problems generally encountered by farmers (in % of total sample – N=187)

These results are different from those found in the previous part. Previously, students were free to say the main advantages and disadvantages they had in mind. Here, we bring ideas of difficulties to them and ask what they thought about these ideas. Contrarily to what they indicated previously, students paid less importance to the hard farm work conditions. The poorly recognized social status of farmers was not a problem at all for 50% of them. The High farm risks was considered by more than 20% of students an insuperable problem that led them not considering farming as a future. Then, lack of profitability and of opportunity to expand the business were considered as big difficulties at least by more than half of the students. Access to land is still recognized as a big difficulty at least for almost 40% of students. Another difficulty which was mentioned by a few students in the previous part is the High initial capital investment required for farming activities. Here, this difficulty was considered a big problem at least by more than 60% of students.

A comparison of the three plots indicates differences between colleges students and faculty students in their evaluation of difficulties. With regard to hard work conditions, high capital requirement and access to land, no large difference could be seen. Then, for the 4 other difficulties, results differ depending on respondents' organisms of study. Faculty students were more worried about the lack of profitability, the lack of opportunity to expand the business, the high risk of farming activity and the poorly recognized social status. For these 4 difficulties, the rate of "3: I consider it a major problem" and "4: Due to this fact, I am definitely not interested in farming at all" are higher in faculty students' answers than colleges students' ones.

Faculty students feel more the difficulties of agriculture and especially with regard to the poorly recognized social status of farmers. This explains why some students chose to register in an agriculture faculty with a good reputation instead of vocational college with a bad reputation (Pimpa, 2007). They were no major differences between these two groups of students in term of socio-economic characteristics and background. Next figure presents a global vision of the distribution of students' answer, regarding the number of each "1, 2, 3, 4" they answered.

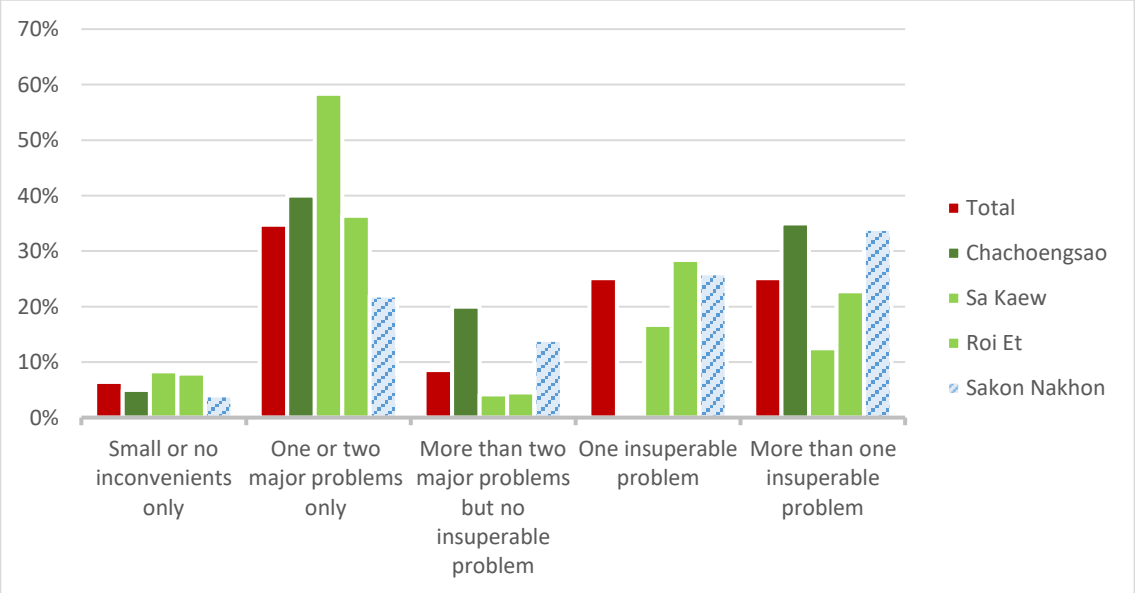


Figure 14: level of difficulty of farming activity in students' mind based on the answers of each student displayed in the previous chart (in % of total sample)

Definitions:

Small or no inconvenient only: Students who answered only by "**1:** Not a problem at all, I don´t see this as an issue" or "**2:** Small inconvenient" to the questions 1 to 7 (problems saw in the previous chart)

One or two major problems only: Students who answered 0 time "**4:** Due to this fact, I am definitely not interested in farming at all" and maximum two times "**3:** I consider it a major problem" to the questions 1 to 7 (problems saw in the previous chart)

More than two major problems but no insuperable problem: Students who are not in the two previous categories but never answered "**4:** Due to this fact, I am definitely not interested in farming at all" to the questions 1 to 7 (problems saw in the previous chart)

One insuperable problem: Students who answered exactly one time "**4:** Due to this fact, I am definitely not interested in farming at all "to the questions 1 to 7 (problems saw in the previous chart)

More than one insuperable problem: Students who answered more than one time "**4:** Due to this fact, I am definitely not interested in farming at all "to the questions 1 to 7 (problems saw in the previous chart)

The previous figure highlights the differences between students in their perceptions of agriculture and the problems related to agriculture. Most students (89%) can be distributed in 2 groups:

- 1. Students who feel confident about farming. They think that problems could be solved thanks to their motivation = They identify a maximum of one or two big problems and only small or no problems or other difficulties (**Group D1 – 41% of total students**)
- 2. Students who feel farming as a goal at the end of a path covered with difficulties which may discourage them during their progress = They find at least one insuperable problem and often more (**Group D2 – 48% of total students**)

A Khi² test indicates significant differences in the distribution of students between these two groups depending on the education institution. The trend here is that Sa Kaew students see fewer difficulties and Sakon Nakhon students (Kasetsart University) see more difficulties in farming activities.

X^2	Chachoengsao	Sa Kaew	Roi Et	Sakon Nakhon
Group 1	0,34	2,66	0,00	2,42
Group 2	0,29	2,30	0,00	2,09

Khi² Obs	**10,11**
Khi² Treshold	9,84
ddf	3
s	0,02

Table 23: Distribution of students who have insuperable problems with farming or not compared with their organisms of training

5.2.5 Kind of farming students would dream to do

This section describes students' answer to the questions: "Imagine that the problems encountered by farmers today do not exist and that you could establish the farm of your dreams, would you be interested in being a farmer?" and (in the case they answered yes to the previous question) "Then which kind of farm would you settle?"

a. Overview :

95% (178 students) of the students answered yes to the first question and would like to farm if current constraints in farming were not existing. For the following analysis, we will use only the answers of these 178 students. According to the next tables, students' dream farms appear very diversified in term of annual income obtained and the total area of the farm.

	Area of dreamfarm	Annual income
Mean	46,17	2321521
Median	20,00	480000
SD	117,16	6574665
Minimum	1,00	24000
Maximum	1000,00	60000000

Table 24: Descriptive statistics of students' dream farm: Area of land (rai) and annual income (baht)

ANOVA	Sig.	Test
Area (College/Faculty)	0,731	Anova1Way
Income (College/Faculty)	0,948	
Area (Organisms)	0,29	Games-Howell
Income (Organisms)	0,278	

Table 25: Results of 1Way Anova for area of students' dream farm and annual income from this dream farm depending on organism (College/Faculty: Difference between college students and faculty students; Organisms: Difference between each organism)

Next table shows details about species of plants and animals that students would like to grow/raise in their dream farm. It shows that most popular plants are fruits (mango and banana) and vegetables and that most popular animals are fishes and chicken, species that half of the students want to have in their dream farm. The most mentioned types of farming for students' dream farms were Integrated/mixed farming (63%), Sufficiency/ New theory farming (24%) and Organic farming (12%); (85% of students who had a dream farm in mind mentioned at least one of these 3 characteristics). Students are interested in small diversified farms according to previous results and seem not interested in the large-scale monocrop farms.

A non-negligible part of them declared being inspired directly by the farming new theory (24%) proposed by the late king of Thailand, Rama IX, in their dream farm plan. To summarize the theory[20], the farmland (that should be of approximately 15 rai) is divided into 4 parts. The first 30 percent is meant for a pond to support cultivation. The pond may also bring in additional income from aquatic animals and plants. The second and third parts, 60 percent of the area, are for crop planting, 30 percent for rice and another 30 percent for cash crops, that can be diverse (cassava, fruit trees…) according to the soil condition and market demand. This result can be extended to 54% of students having a dream farm, including the previous 24% who directly mentioned it as their future dream farm philosophy and those who said they would like to do mixed/organic farming and who also mentioned the late king (and the new theory of agriculture) as role model or indicated as an advantage of agriculture to have the opportunity to produce food for the household (30%).

[20] https://www.raktamachat.org/

Both previous assumptions (general model of a small integrated farm and the strong influence of the new theory of agriculture) can be supported by the high rate of small farms in students dream farms (60% of the dream farms are about 20 or less rai). Even if self-consumption is not the only aim of students, as less than 25% of them plan to grow rice, they are seeking to grow cash crops such as sugarcane, corn, rubber trees, palm trees and focus on plants that can be eaten or sold.

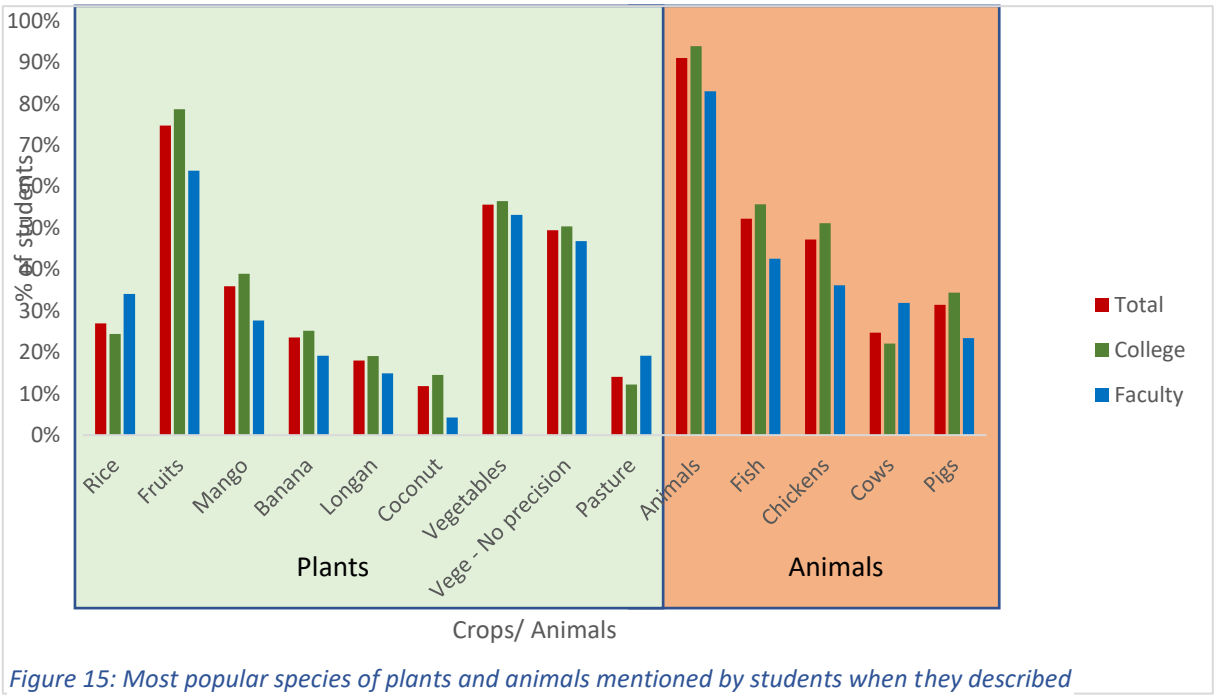


Figure 15: Most popular species of plants and animals mentioned by students when they described their dream's farms (in % of 178 students who have a dream farm); "Fruits" and "Vegetables" include all the fruits and vegetables that are presented after; Vege – No precision indicates when students don't give details about the vegetables they wanted to grow

		Integrated Farming / Mixed farming	Organic farming / No chemical farming	Sufficiency agriculture/ New theory	Commercial farming	Specific farming	Irrigation farming	No precision / no idea
Total	NB	112	22	42	12	12	4	4
	%	63%	12%	24%	7%	7%	2%	2%
College	NB	84	18	39	11	0	4	3
	%	64%	14%	30%	8%	0%	3%	2%
Faculty	NB	28	4	4	1	12	0	1
	%	60%	9%	9%	2%	26%	0%	2%

Table 26: Distribution of « farming philosophy » mentioned by students in the description of their dream farm (N = 178)

Notwithstanding their education philosophy that is quite different, colleges and faculty students have a quite similar farming ideal. Considering that these students have already close background and ideas about agriculture and farming activity, this result is logical. It can indicate a strong influence of New farming theory in Thai education, what is sure in agriculture college but less evident in agriculture faculty, that intend to train more "business" farmers. Moreover, as it was pinpointed in previous part by Khao Kwan staff, a professor from Kasetsart faculty of agricultural education…. the "sufficiency agriculture" theory is now a flexible concept, considered as a way to farm with limited risks but most of the time complemented by a commercial activity on the farm.

Then, all students except one indicated they would like to get an income from their farming activity, which means they plan to have a commercial activity and sell some of their products. To

		Location: Family's place	Location: Not far from family place	Full time (1st occupation)	Half time (2nd occupation)	Week end (only on the week end)
Total	NB	133	18	93	73	13
	%	75%	10%	52%	41%	7%
College	NB	95	18	66	53	13
	%	73%	14%	50%	40%	10%
Faculty	NB	38	0	27	20	0
	%	81%	0%	57%	43%	0%

Table 27: Distribution of location where students would like to settle their dream farms (only choices with more than 5% of responses) and the time they would like to allow to the dream farming activity

illustrate this trend, we can compare what one representative student from faculty and one representative student from college said about their dream farm: "I would like to do mixed farming on 10 rai on family land and to grow vegetables and have a fish and shrimps pond. I would sell products at local market and online and earn 30 – 40 000 baht/month"; "I would like to grow vegetables, mango, and banana and raise pigs, cows, and fish on 20 rai and earn from it 20 - 30 000 baht/month. The dream farm would be on family land and I would sell the product to middlemen". The previous table displays the answers of students concerning the location where they would like to settle their farm and the time, they would allow this dream farming activity. Results are homogeneous between colleges and faculty students. According to **chapter 4**, most of the students would like to have their farm close to their family.

An important part of students dreams of a part-time farm (some students want to have another first occupation and others just want more free time). As one of the main farming disadvantages was the hard conditions of the work, students who would like to work part-time or only during the weekend. They probably dream of spending less time in hard work but still hold the farm to live a traditional life, produce their own food for their families, earn a complementary income and transmit later the farm to their children.

b. Categories of dream farms

Following categories were created considering the description of student's dream farm. The main details considered were: area of the farm (rai), type (or philosophy) of farming, diversity of activities, specific plant farming practiced, specific animal farming practiced, the time allowed to farm work and way of selling. All the 187 students interviewed were considered in this part.

Definitions:

No farming: Students who do not have a dream farm

Weekend farming: Students who would allow less than 3 hours/day or less than 3 days/week to their farm, any kind of farming

Specialized farming: Students who would have an eco-tourism-based farm/a fishery farm/ a specialized animal farm (only animals' activity, no plant growing activity)/ a monocrops plant farm (except pasture and without animals)

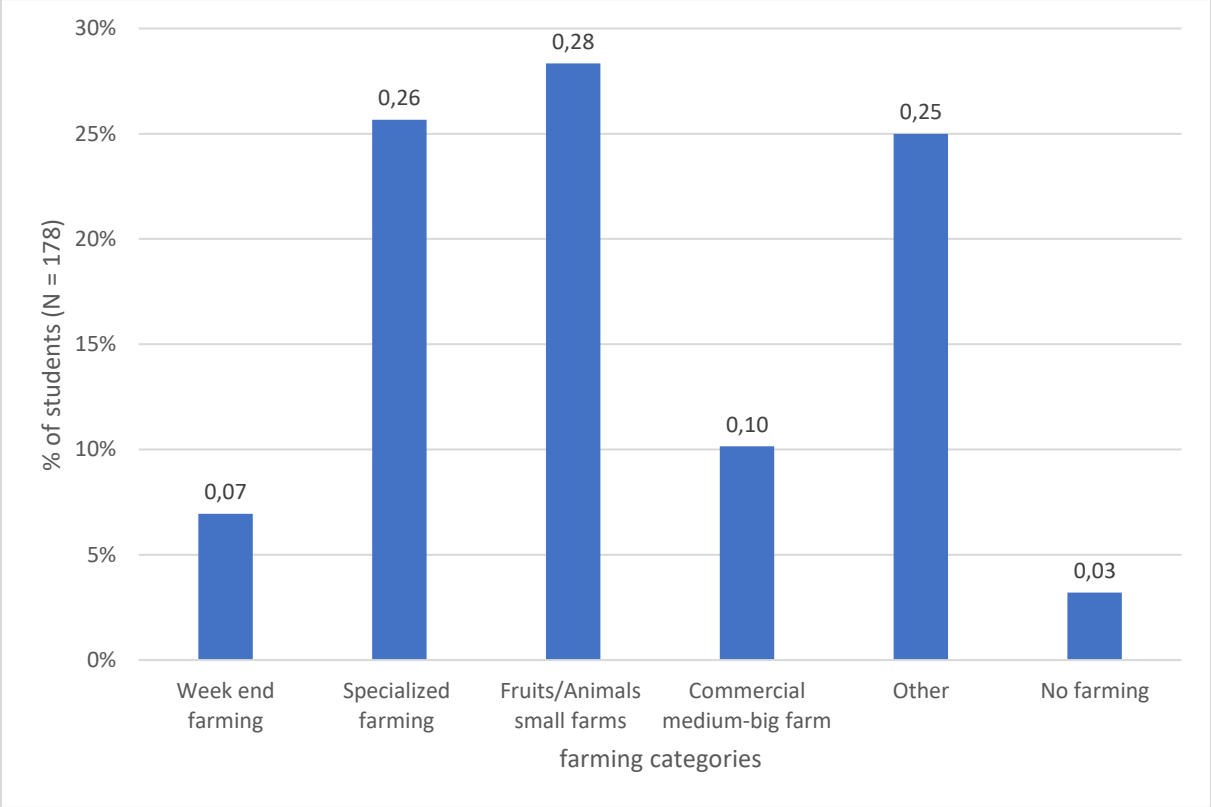
Fruits/Animals small farms: Students who would have a farm smaller or equal than 20 rai with a farming philosophy indicated corresponding to "integrated farming/ mixed farming", "Organic farming / No chemical farming" or "Sufficiency agriculture/ New theory" with at least one fruit farming activity and one or more animal raising activity. Dream farms already classified in the previous categories could not appear in this one

Commercial medium-big farm: Students who would have a farm bigger or equal than 30 rai with a farming philosophy indicating anything except "Sufficiency agriculture/ New theory" and a willingness to sell products to the middlemen. Dream farms already classified in the previous categories could not appear in this one.

Other: All the dream farm not corresponding to the previous categories.

As expected previously, some students who want to have a small diversified farm with the very represented category of Fruits/Animals small farm that describe a farm with mainly fruits trees and small-scale animals on a small land (>20 rai). We can find then students who dream to have commercial large-scale farms, most of them based on the model Fruit crops/Pasture/Cattle (then some will add poultry, other will add fish or rice). Then we find those who want to settle a business of fishery or an animal farm and those who want to have a farm with an eco-touristic activity based on farm visiting/hosting. Among this category, 31 students dream to have an eco-tourism activity, six students dream to have a fish and shrimp activity, 11 students dream to have an animal farm (mainly cattle, poultry or swine) and 11 students dream to have a monocrop farm (fruits or vegetables.

Figure 16: Distribution of dream farms categories between total number of students (N= 187)



X²	Week end farming	Specialized farming	Fruits/Animals small farms	Diversifed small-medium farm	Commercial medium-big farm	Other	No farming
College	1,27	1,90	0,45	0,01	0,08		
Faculty	3,48	5,20	1,23	0,03	0,23		

X² Obs	**14,29**
X² Treshold	13,39
ddf	6
s	0,02

Table 28: X² test performed on categories of dream farm between colleges and faculty students (N=187)

The last table highlights a small difference between faculty and college students in the kind of farm they dream to have. Among faculty students, no one mentioned he/she wanted to have a weekend farming activity, and much more were interested in specialized farming (42% against only 20% among college students - a significant difference according to our Khi² test).

We assume that this difference is the result of the business/marketing orientation advocated by the staff of this curriculum (Bachelor) and of the numerous visits they did among specialized farmers.

c. Influence of parents' farming activity on dream farm

To have an idea of the influence of parent's farming activity on children's dream farm, we compared their farming activity with the ones that students would have in their dream farms. To compute this index of similarity between parents existing farm and students dream farm, we regrouped farm activities into the following categories:

- Rice
- Field crops (Corn, sunflower, cassava, sugarcane)
- Tree crops (Rubber tree, palm tree)
- Vegetables
- Fruit crops
- Pasture
- Cattle
- Swine
- Poultry (chicken, layer hen, goose, duck, quail)
- Fish/Shrimp (Fish, shrimp)
- Mushroom

We described the similarities for these categories between students' dream farm and their household farm (Positive = if parents and students both have one activity in this group).

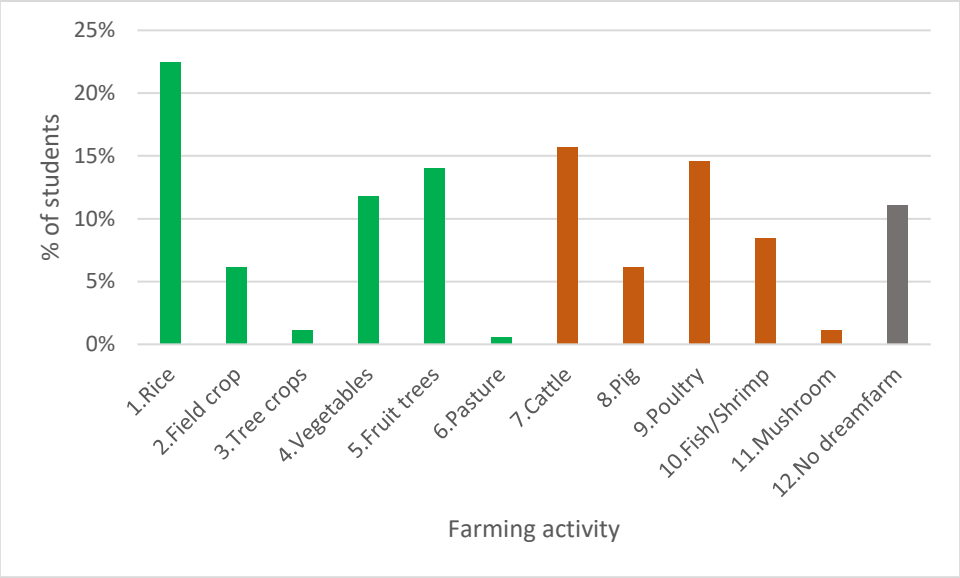


Figure 17: Distribution of similarities between parents' farms and students dream farm depending on different activities; For animal and plants (From 1 to 11), we considered students who have a dream farm (N = 178); For No dream farm (12), we considered students who don't have a dream farm

22% of students among those who have a dream farm plan to grow rice as their parents. Fruit crops and vegetables are also activities for which a non-negligible part of students dream to do it and have parents doing this activity, as cattle and poultry. Since all these activities are popular in students' minds (as depicted in all this section), it is not possible to know now if it is really due to parent's influence, to academic or new agriculture theory influence or to real popularity of these crops. These results need to be completed with the number of similar activities that the dream farm of each student has in common with the parents' farm.

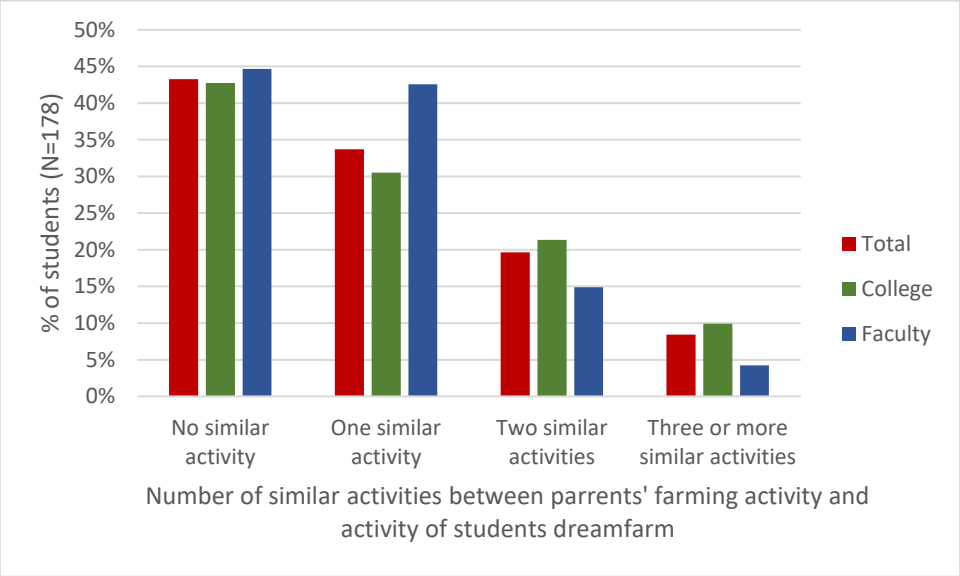


Figure 18: Distribution of number of similar activities between parents' farming activity and activity students would like to do in their dream farm for total sample, colleges students and faculty students

We will consider here that "No similar activity" means no inspiration from parents' farming activity and that "One similar activity" means a small inspiration from parents' farming activity. The majority of students is obviously not or lightly influenced by their parents' farming activity. among interviewees, 53% of students (N = 178) are included both in the previous category and dream to farm

in their parents' place, the dream of these students would be then to diversify, adapt or turn parents' farming activities according to their academic knowledge.

Students who had "Two similar activities" and "Three or more similar activities» in their dream farm can be considered as obviously inspired by their parents' farming activity. Then, 28% of students were inspired by the parents' activity in their dream farm plan. For these students, parents' farming activities are distributed as the following figure describes:

Crop	NB	% (N=178)
1.Rice	39	22%
2.Field crop	9	5%
3.Tree crops	6	3%
4.Vegetables	21	12%
5.Fruit trees	16	9%
6.Pasture	3	2%
7.Cattle	22	12%
8.Pig	10	6%
9.Poultry	21	12%
10.Fish/Shrimp	13	7%
11.Mushroom	1	1%

Table 29: Distribution of similarities in farming activities between parents and students dream farm; Only students that have 2 or more similar activities in their dream farm with their parents farming activities; Rates on whole students who have a dream farm (N = 178)

No trend comes out of these results, the majority of students who dream to have a farm close to their parents' one dream to have a mix-farm system with fruits or/and vegetables or/and field crops and cattle or/and chicken or/and fish. No relation between students' dream to have a farm close to their parents' ones and parents' agriculture income or area of land was found (ANOVA one way) which mean we cannot prove parents' agriculture income or area of land have an influence of students' choice to dream of doing similar farming activities.

5.3 Willingness to do farming

5.3.1 Future plan step 1 - Right after current curriculum

The following figure describes the distribution of answers to the question "what do you want to do right after studies?". It shows what students plan to do after the end of their current curriculum (Bor Wor Sor or Bachelor).

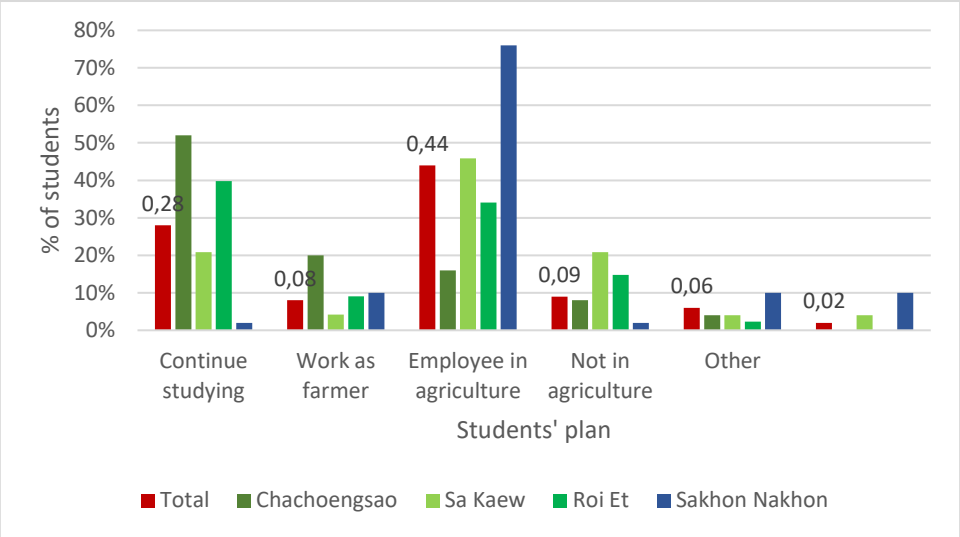


Figure 19: Distribution of what students plan to do right after their current curriculum

	College	Faculty
Continue studying	39%	2%
Work as farmer	10%	10%
Employee (agriculture sector)	33%	76%
Employee (other sector)	15%	2%
Other	4%	10%

Table 30: Differences between College and Faculty concerning students' plan right after their current curriculum

The rate of students who plan to become a farmer, what means "settle a farm" or "work in parents' farm", is low: only 10% of students. The rate is higher in Chachoengsao college compared to other organisms. Few students plan to continue studying after their Bachelor in Sakon Nakhon because studying further is probably not essential for their professional plan as they are expecting to do farming and, in a more realistic and short-term way, be an employee in agriculture for a large part of them. Results are different for colleges students as 39% of them want to continue studying. Among this 39 % students, 64% want to continue in university (mainly Maejo university), 31% wants to continue in local Rajamangala (Mainly Karasin or Bangpra) and 5% want to change of major, to study another field than one related with agriculture.

Previous results are just planned for the moment; it is not possible to be sure that it is what students will really do. We compared what students planned to do right after their graduation with staff and student's representation of what all the students do after graduation.

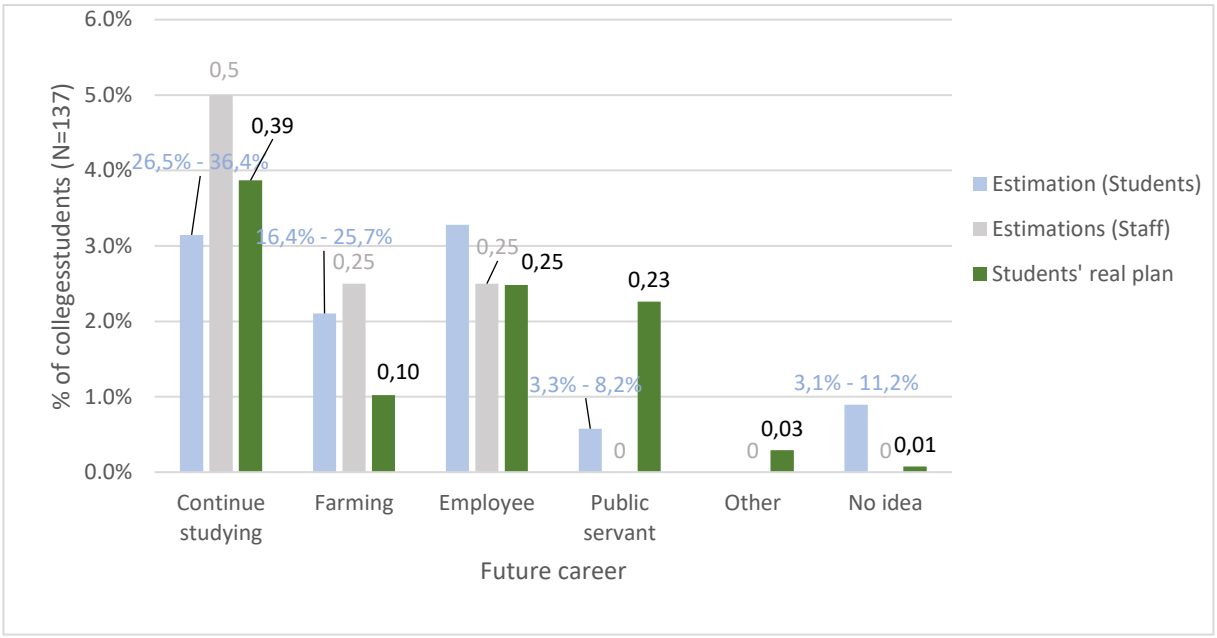


Figure 20: COLLEGE - Comparison between distribution of students' plan right after studies and estimation of this distribution by educational staff and students themselves (N=137)

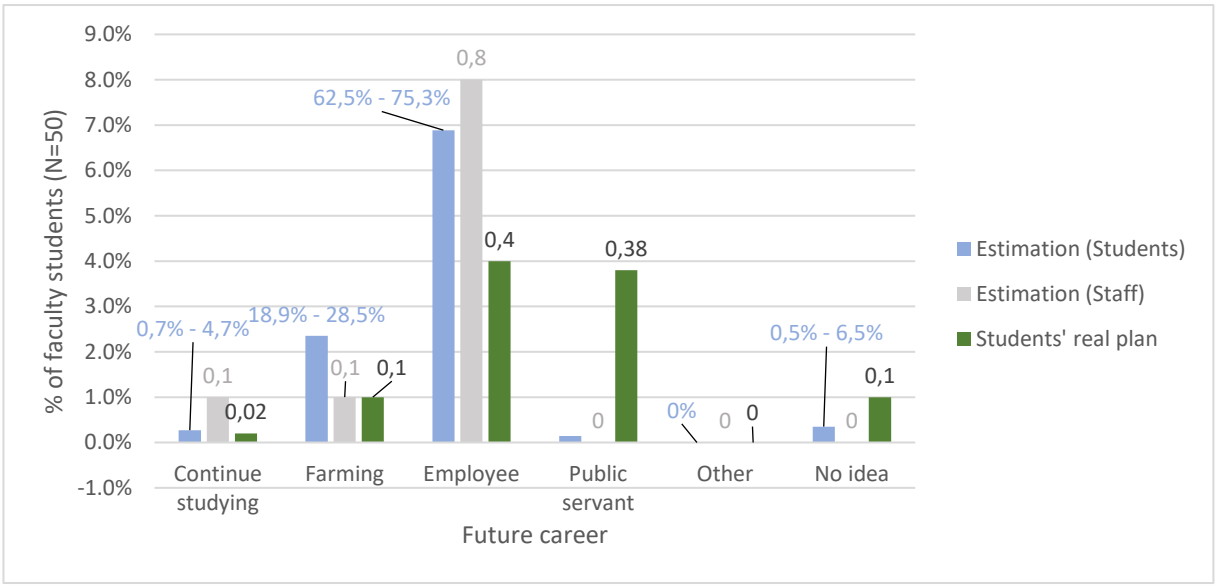


Figure 21: FACULTY - Comparison between distribution of students' plan right after studies and estimation of this distribution by educational staff and students themselves (N=137)

Previous figures enabled to distinguish 3 types of result:

- Estimation (Students): We asked each student: "What students usually do right after the end of their curriculum?" and they indicated the rates of students/career according to the image they had in mind about it (example of students' answer: "I think 20% continue studying in bachelor each year, mostly in Maejo university, 10% work in their parents' farm, 50% work as farm laborer and 20% work in the factory"). As results vary a lot from one student to another, we use the 95% confidence interval found in Excel as rates.

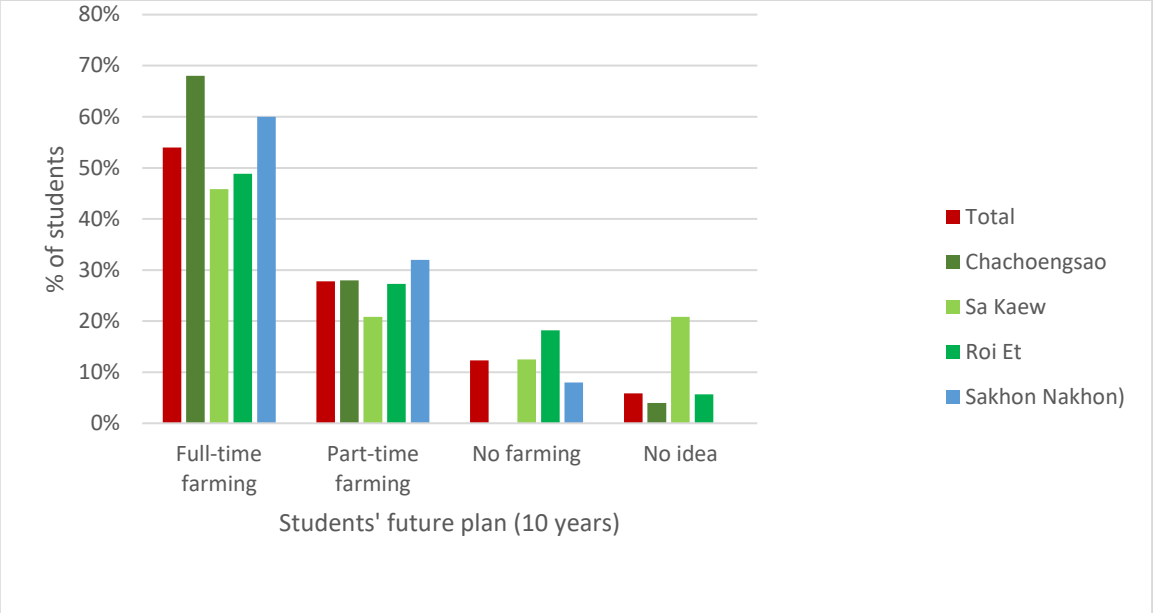
- Estimation (Staff): We asked the same question to educational staff during our qualitative interviews (directors and teachers from college, dean and professors from university) and this rates summarize the general idea of what they think about future of their students (As the Bachelor curriculum proposed in Sakon Nakhon is really new, educational staff has no precise idea of what their students do after the curriculum. Rates presented here should be considered less reliable than colleges rates then). Numbers are associated with different interviews except for Sa Kaew college, in which only one professor was interviewed.
- Students' real plan: Results than were presented previously about what students plan to do right after their current curriculum.

Even if some notable differences between these three indicators exist, a general trend is highlighted: only 10-15% of students plan to do farming right after graduation (mostly in their parents' farm according to educational staff), even less than what students were thinking. Most of them will study further (Bor Wor Sor -> Bachelor) or work as an employee (Bor Wor Sor and Bachelor). A large part of students indicated they wanted to become an officer, probably because it is generally considered as "security job" stable and providing a better income than an employee in a factory or a farm laborer. Students and staff idea about the share of students who will become an officer are not similar to the rate of them who plan to do it. Most of them will probably have difficulties to find this kind of job and become an employee instead. It is not surprising to find so few students wanting to become a farmer right after their studies as they are still young, inexperienced in farming work and maybe are not confident in their farming capacities. To illustrate the fact that office work is generally the most wanted kind of activity, one college student said "I will apply to the exam for being an officer, then if I fail I will try to find a job in a private company, and if I can't, I will go work in parents' farm".

5.3.2 Future plan step 2 - 10 years later

In the following part, we had a look at what students plan to do in ten years to see the evolution they have in mind for the first years of their professional life. The following figure displays the distribution of answers to the question "what do you want to do in 10 years?". 49% of total students plan to own a farm and 5% plan to work with their parents on the family farm (Full-time farming). 28% of them plan to have a part-time farming activity and another occupation, 16% in being an officer (in agriculture for most students), 7% in being a private employee and 5% in being a self-entrepreneur (shop, restaurant… - Part-time farming). 12% of students do not plan to do farming at all. Among them, 9% plan to be an officer and 4% plan to be self-entrepreneur.

Figure 22: Activity students want to do in ten years (link with farming activity)



Concerning the high rate of students who plan to become an officer/farmer in Roi Et, for instance, most of them mentioned during the interview that one of their teachers was a role model because he was doing farming, preserving the ownership of family land, and had a stable income from the teaching job. This idea fits well the general attitude of students who plan to do part-time farming as they want to do farming but do not feel secure about the profitability of the activity. This goal exists in many students' view as the following quotes show: "In ten years, I would like to be officer at land department and own a farm as the second occupation" (College) ; "In ten years, I would still be a forest ranger but have my own farm as a second activity" (College) ; "In ten years, 2 choices are possible: If I have not enough capital, I would continue Government job (or CP job if I fail the appliance) and if I have enough capital, I will start my own farm as a part-time activity and continue my Government job as first activity".

	College (N=137)	Faculty (N=50)
Full-time farming	52%	60%
Part-time farming	26%	32%
No farming	14%	8%
No idea	8%	0%

Table 31: Differences between College and Faculty concerning students' plan (in 10 years)

In both types of education institutions, more than half of the students want to be a full-time farmer 10 years after the end of their curriculum. This result was expected concerning faculty students as the aim of the curriculum is to train agriculture entrepreneur. The differences between this table and the previous one highlight that an important part of students plans to do farming later: They are interested in farming but need time before settling a farm.

5.2.3 Future plan step 3 - Willingness to do farming one day

This part is the presentation of students answer to the question "Do you plan to become a farmer?". This question was asked after the two previous one and aimed to find students who also plan to do farming one day but later than in 10 years. This question also aims, in a different but complementary way with the section 5.2.5 about the dream farm (which aimed to understand the farming ideal of students), to assess the willingness of the student to do farming in the real world, with

real constraints. Then, it will permit to find the conditions in which students would agree to do farming and the reasons why some are not interested in.

a. <u>Yes</u>

93% of students answered "yes" to this question and intend to become a farmer one day. Following results were computed using only these 173 students who answered "yes".

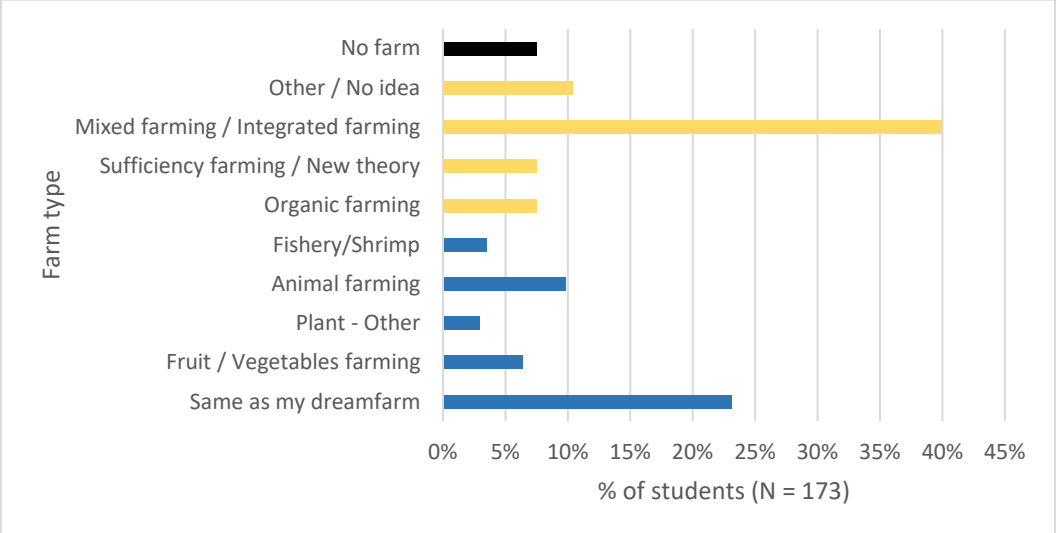


Figure 22: Kind of farm type students who plan to do farming one day want to have (Yellow = Farming philosophy; blue = Farming activity – N = 173 except for "no farm" that is computed on total sample)

A large part of students is interested in having a farm doing mixed or integrated farming or similar than their dream farm, corroborating the general results (5.2.5) about their interest in small-scale mixed farming. These results confirm the previous trend that these students are interested to become farmers, but they just need time before it happens. To understand why students, want or think they should wait before starting their farming activity, and how they will use this time, we first need to know what are the farming prerequisites that students have in mind. Following plot answered partly to this question and other elements were added in the next part.

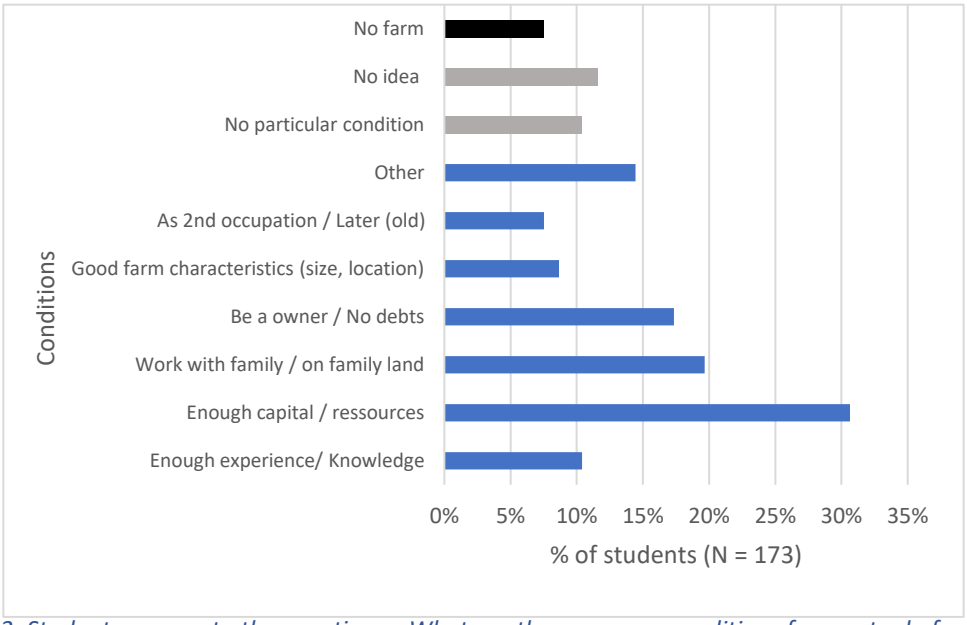


Figure 23: Students answer to the question: « What are the necessary conditions for you to do farming? » (N = 173; except for "no farm" that is computed on total sample)

24% of students mentioned that they wanted to work with their family, a result that can be extended to others as 75% of students' dream a farm would take place on family land (5.2.5) and no student said here he/she wanted to farm in other places. This first result confirms the attachment of these students to their families and way their families do farming, as well as their willingness to become a farmer to 1. Help the family and 2. Continue the farming tradition. **22%** and **21%** of students respectively mentioned that having enough capital and own everything on the farm was the main prerequisite to start their farm activity. Regarding the large part of students who plan to work before starting their farm, we assume that they plan to acquire capital to start their activity in working as an employee, officer… These two trends are highlighted by the following quote: "If I do farming work, I will do it at home to take care of family and with enough money to invest and improve farming work and profitability". 11% of students said that they would need enough experience/knowledge, both elements that can be sought and found in studying further, as some students plan to do. It can also be purchased in working on other farms, as some students plan to do. Finally, a small but non-negligible part of students plans a farm settlement when they are old or just as a second occupation. This trend concerns many farmers in Thailand who are tired of city life, factory work and would go back on their family land around 50 years old (Rigg, 2014) but only a few interviewed students in our sample expressed this plan.

b. <u>No</u>

14 (7%) students are not interested in farming activity at all.

Organism	NB
TOTAL	14
Chachoengsao	1
Sa Kaew	1
Roi Et	12
Sakon Nakhon	0

Figure 24: Distribution of students who don't plan to do farming at all during their life, among different organisms

Among these students, 5 are not interested in agriculture, 4 consider it as a too exhausting, too tiring, 2 consider it as a financially risky activity and 2 have parents who do not want them to do farming. Also, 4 would be ready to change their mind if they could have better access to capital, a higher income and 2 would be ready to do farming as a 2nd activity. To look further what could have convinced them not to be a farmer, in these 14 students, 4 came here as default choice, 6 wanted to study in another education institution, 3 mentioned financial reasons as motivation to come here, 3 mentioned practical reasons, one had a professional project not related to agriculture, 3 want to do work non-related with agriculture after their studies and 4 are from non-farming families. They have no farming background and they chose this kind of studies for job and bachelor access opportunities (some students are included in various of these groups).

5.3.4 Steps global vision/ Categories of students' willingness to do farming

The two next figures summarize all previous information and permit to observe flows of students (according to their plan) between different career choices. We established categories of students from these trajectories. These categories will permit to do more analysis in the next parts. They are based on a student career plan (his/her plan of trajectory), what he or she plans to do right after the current curriculum, in 10 years and later:

- **“Direct Installing” students:** Students who will directly work in parents’ farm or settle their own farm after Bor Wor Sor or Bachelor.
- **“Farming knowledge seeking” students:** Students who plan to study further before settling their own farm (full-time farming) to have more knowledge about farming. Some of them also plan to work between the end of future curriculum and the moment they will settle their farm. They plan to install their farm in not more than 10 years
- **“Capital/Experience seeking” students:** Students who plan to work before settling their own farm (full-time farming) to acquire some capital and, to a lesser degree, acquire some experience. The kind of works they want to do can be various, from private farm manager to factory worker. They plan to install their farm in not more than 10 years
- **“Belated installing” students:** Students who plan to do full-time farming one day but in a long time. They plan to study, work or both in this period. This category regroups students that are less confident or less interested than previous one but still attracted by farming activity, some of them just want to start farming later to have experienced first and other just estimates they will need 20 years of work to get enough capital to start farming activity.
- **“Part-time farming” students:** Students who plan to do part-time farming and never switch to full-time farming.
- **“Non-farming” students:** Students that don’t plan any farming activity in their life

	"Direct intalling" students	"Farming knowledge seeking" Students	"Capital/Experience seeking" Students	"Belated installing" students	"Part-time farming" students	"No farming" students
NB	17	21	56	20	59	14
%	9%	11%	30%	11%	32%	7%

Table 32: Distribution of total students among willingness to farming categories (N = 187)

In the following parts, we performed statistical analysis to find out if students’ willingness to do farming was influenced by the training organism and the academic and professional experiences background. In the previous categories, it is possible to separate students who plan to do full time farming (sooner or later) which are: “Direct installing” students, “Farming knowledge seeking” students, “Capital/Experience seeking” students and “Belated installing” students, from those who do not: “Part-time farming” and “No farming” students.

The next table present rates of each of two previous groups, the “yes” group includes students who plan to do full-time farming sooner or later and the “No” group who plan to do part-time farming (and never turn to full-time farming) or no farming at all. Then, when it was possible, we separated part-time farmers from no-farmers to find any differences between these two groups.

	Yes	No
NB	114	73
%	61%	39%

Table 33: Distribution of total students among willingness to do farming categories – Simplified version (N = 187)

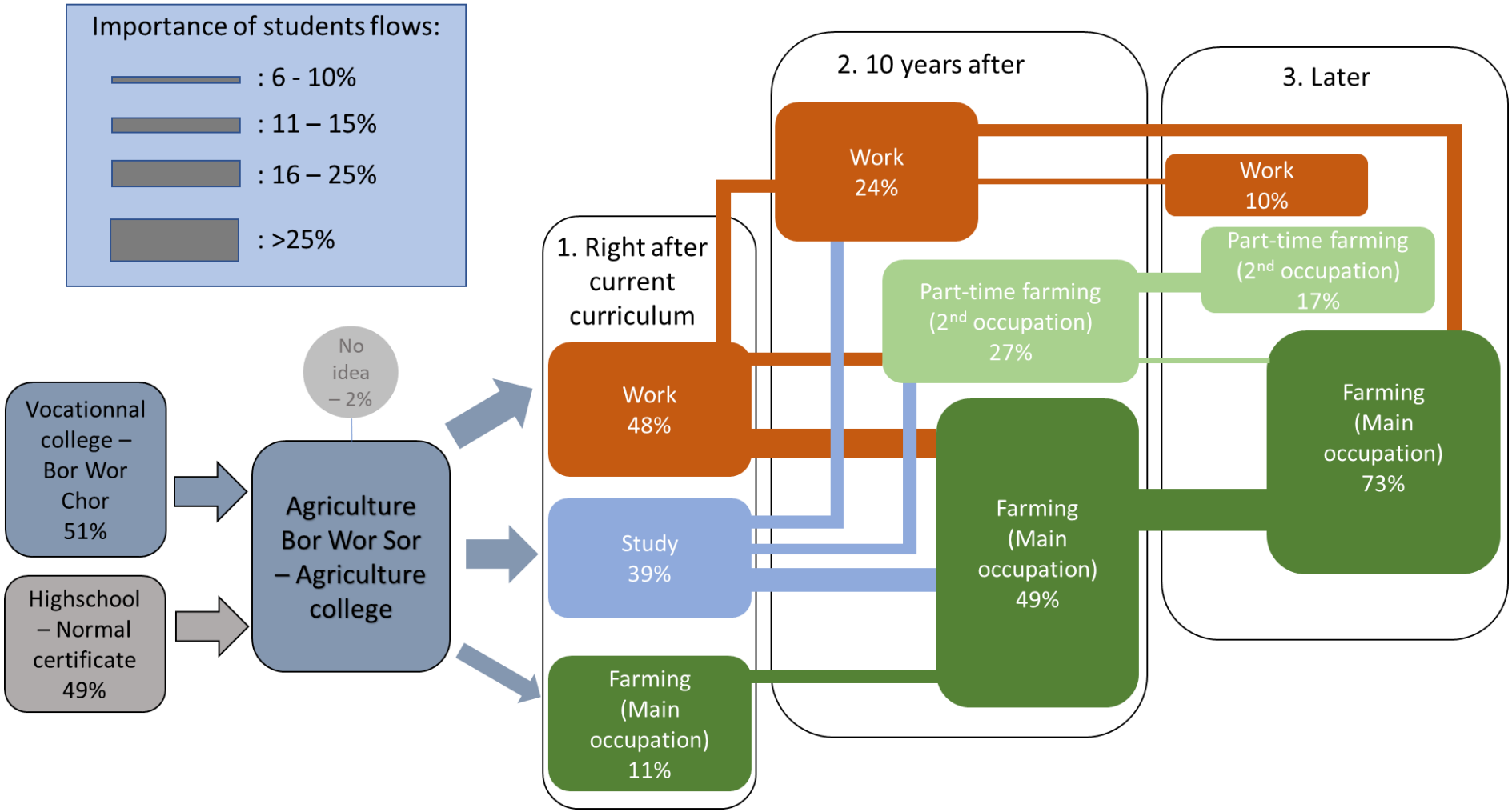


Figure 25: COLLEGE - Summary scheme of student's previous curriculum and future at 3 different steps of their life (N = 137)

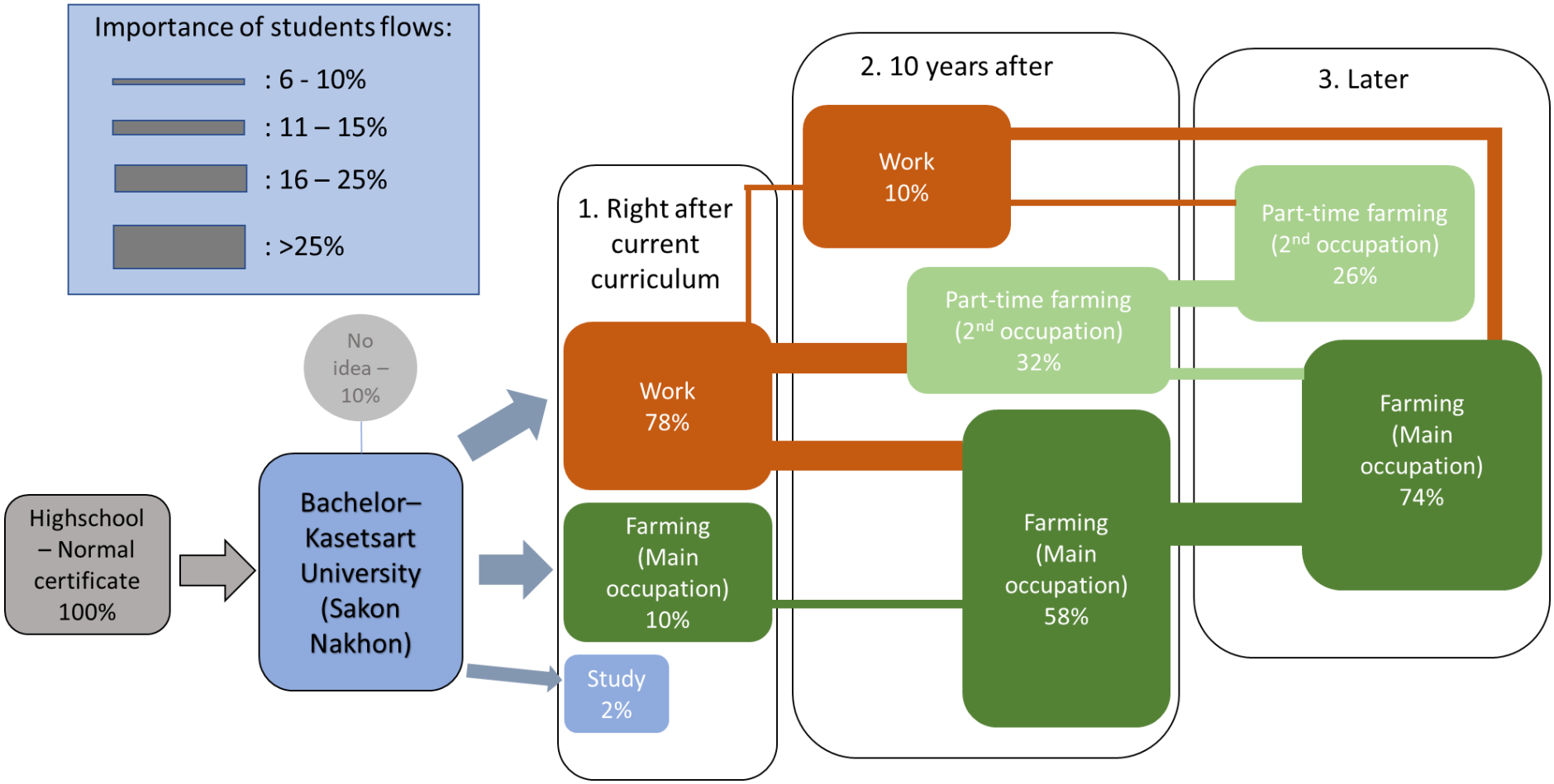


Figure 26: FACULTY - Summary scheme of student's previous curriculum and plan at 3 different steps of their life (N = 50)

5.3.5 Background influence on willingness to do farming

a. Education institution

Training organisms can have different characteristics, geographical context, way of teaching, networking or training aim. As it was described in **chapter 4**, some college directors indicated they were training future employees although others indicated they were training farmers. It can create a difference in the way the education institution is managed, and the way students are trained. This difference exists between colleges and faculty but also among colleges. The first aim here was to determine if there was any influence of the organism on students' "willingness to do farming" group. With regard to the differences among colleges, no significant effect of the college on students' plan was found according to the X^2 test that was performed.

Organism	"Direct intalling" students	"Farming knowledge seeking"	"Capital/Experience seeking"	"Belated installing" students	"Part-time farming" students	"No farming" students
Chachoengsao	1,1	2,6	0,0	0,3	1,8	0,9
Sa Kaew	0,7	0,8	0,6	4,0	0,0	0,9
Roi Et	0,0	0,2	0,1	1,8	0,6	1,0

Table 34: Results of X^2 performed for distribution of « willingness to do farming » categories among students' organisms – COLLEGE (N = 137)

X^2 OBS	**17,3**
X^2 Treshold	18,3
Ddf	10
s	0,05

There are significant differences in student's future plan distribution considering inter-organism differences according to the Khi² test we performed hereafter:

Organism	"Direct intalling" students	"Farming knowledge seeking" Students	"Capital/Experience seeking" Students	"Belated installing" students	"Part-time farming" students	"No farming" students
College	0,0	2,0	0,9	0,5	0,0	1,4
Faculty	0,1	5,6	2,4	1,3	0,1	3,7

Table 35: Results of X^2 performed for distribution of « willingness to do farming » categories among students' organisms – COLLEGE/FACULTY (N = 187)

X^2 OBS	**18,1**
X^2 Treshold	15,1
Ddf	5
s	0,05

There are two main categories that increase the value of the Khi²: "Farming knowledge seeking students" and "No farming students". Then, these differences are partly created by colleges students who plan to continue studying in bachelor contrarily to Bachelor students that already have one and do not plan to study further. Concerning those who do not plan to do farming, there are no students of this kind in bachelor, probably because these students are selected according to their willingness to do farming (educational staff probably do not ask if they plan to do full-time or part time farming).

We Performed a Khi² test between faculty and colleges students on the "yes" and "no" possibilities about future full-time farming (See Table 27). No significant difference was found (s = 0.05). It implies that, despite the curricula characteristics differ, the part of students who plan to do full-time farming is not significantly different depending on the organism in which they are studying.

b. Family

We tried to find out the influence of parents farming income and size of farm land on student's willingness to do farming later. We first performed a one-way ANOVA on SPSS for 5 different household characteristics: the income that parents get from farming (N = 159); the total area of land they own (N = 187); the total area of cropland (including owned and rented land = cropland); the number of members in the household; the age of parents. A Levene test was performed for all these factors and all of them validated the hypothesis of variance homogeneity except the "Parents farming income". Then, for this factor, results from the Games-Howell test are presented instead of the results of the Scheffé test.

	Willingness to do farming (groups from part 5.3.4)	Full-time farming / Part-time farming / No farming
Parents farming income	*0,17*	**0,07**
Area owned	*0,95*	*0,72*
Area farmed	*0,90*	*0,65*
Nb of family members	*0,71*	*0,58*
Parents Age	*0,98*	*0,98*

Table 36: Results of one-way ANOVA performed on SPSS for different students' household characteristics

Descriptive statistics

Dependent variable: Parents Income (Farming)

FarmingPlan2	Mean	SD	N
Full-time farming plan	111146,3	156698,1	90
Half-time farming plan	54743,2	56131,3	55
No-farming plan	70699,2	79180,9	14
Total	88074,4	127045,8	159

Table 37: Descriptive statistics performed with SPSS for income parents get from farming depending on students' plan (Do full-time farming, half-time farming or no farming)

The income parents get from the farming activity is the only factor that is significant. It is then the only factor that is related to students' willingness to do farming. However, Games-Howell test permits to know exactly which groups have an income value that is significantly different. There is a significant difference in the income parents get from farming between students who plan to do full-time farming and students who plan to do part-time farming. No significant difference exists between students who do not plan to do farming and other groups.

Then a Khi² test was performed to check the influence of family reliance on farming activity (cf. *Part 5.1.3*) but no significant difference was found between families of students who plan to do full-time farming and families of those who do not (p = 0.05).

The only family factor that affects students' willingness to do farming is the income that parents get from farming activity. According to SPSS Descriptive statistics and one-way ANOVA, the students from families having the lowest income from agriculture (it could mean they get more from another job or they are poorer) will prefer go on a "part-time farming plan" with a first activity providing income

security (like officer, employee…) and still do part-time farming to complete the income, produce food and keep parents' land. No significant difference was found with those who do not plan to do farming, possibly because their number is low.

5.3.6 Academic and personal experience on student's willingness to do farming

In this part, we determined the influence of academic and personal experience on their willingness to do farming. This influence factor is based on 3 factors:

- Internships realized during their curriculum
- Farming personal experience
- Experience in marketing

a. <u>Internship</u>

19% of the students never did any internship during their studies. Most of them were in the first year of Bor Wor Sor and were in normal high school before or in the third year of Bachelor and will do a 2-month internship on their last year of studies. 46% of students did only 1 internship, 25% did 2 internships and 0.5% (one student) did 3 internships during their studies. Only 38% of faculty students already did an internship against 83% in College of agriculture and technology.

Lenght of internships (days)	NB	% of students
No internship	54	39%
1 months	13	9%
2 months	29	21%
3 months	35	26%
4-5 months	45	33%
More than 5 months	11	8%

Table 38: Distribution of internships students did during their curriculum length

Colleges students usually did internships in the field of their major in some private crop farms /campus farms/mushroom farms for plant science students, animal farms for animal science students. In other curricula such as fisheries or agriculture industry, students often did internships in public office or research centers.

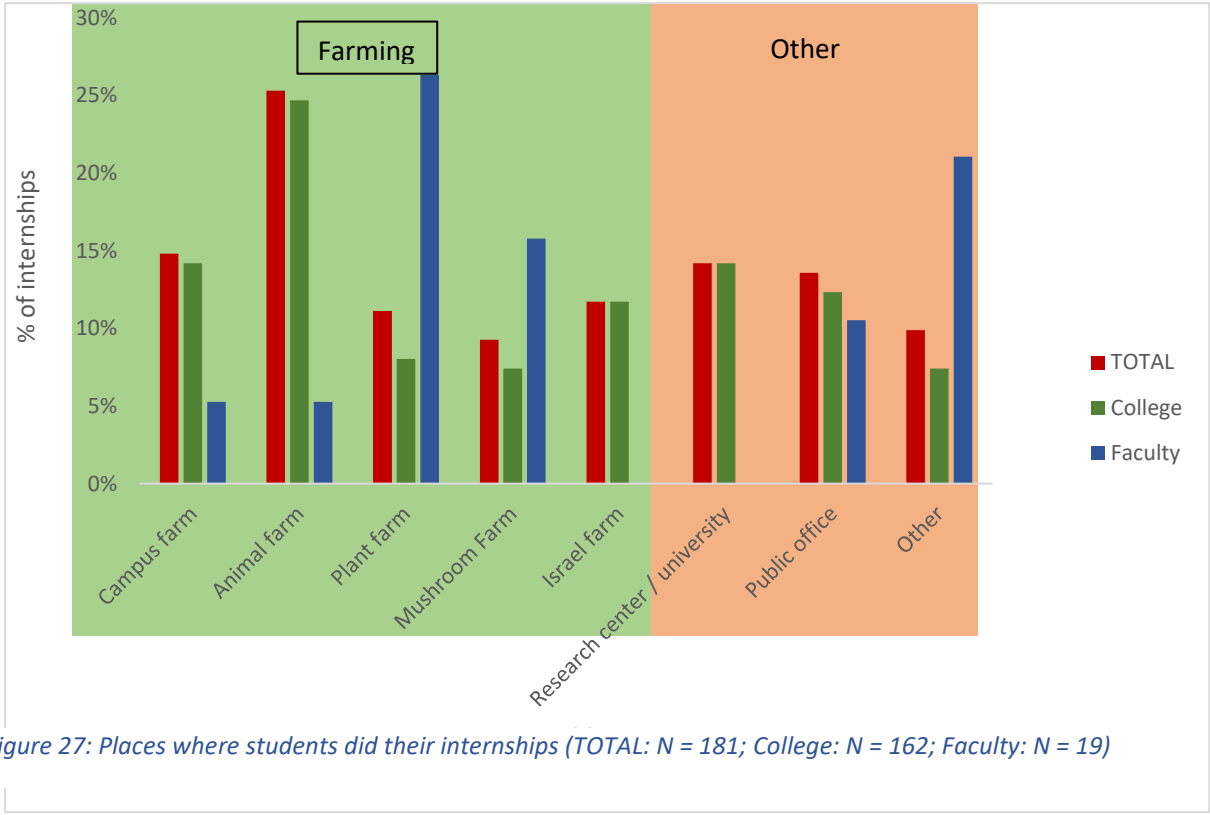


Figure 27: Places where students did their internships (TOTAL: N = 181; College: N = 162; Faculty: N = 19)

Two groups of students can be extracted from this data. The first includes students who did no internships or one short internship (2 months or less of internship length, most of the bachelor students are in this category) and those who did one long or various internships (most students). 20 students in Roi Et did a special internship of one year in Israel (ARAVA program).

The next table display results of one-way ANOVA performed on SPSS to find out any relation between total length of internship and, more specifically, of the length of internship in farms, and the willingness to do farming.

	Willingness to do farming (groups from part 5.3.4)	**Full-time farming / Part-time farming / No farming**
Total length of internship (days)	***0,05***	*0.13*
Length of internship in farms (days)	*0,31*	***0,03***

Table 39: Results of one-way ANOVA performed on SPSS on influence of internship length on students' willingness to do farming

As our data about length of internship (both lines) rejected the homogeneous variance hypothesis (Levene test), results presented here were computed using the Games-Howell test.

There is a significant difference between "Full-time farming" students and both "Part-time farming" students ($p = 0.03$) and "No farming students" regarding the time students spent as interns ($p = 0.05$) (Those two categories, "Part-time farming" students and "Full-time students", can't be differentiated using this data and this test). This implies that students who plan to become full-time

farmer are those who spent the most time on farms during their curriculum. For students who plan to do a different activity than farming, it could be logical that they spend their internships in different places as they are looking for different experiences and knowledge. Then a part of the difference between students who plan to do farming and those who do not is the length of internship. Different explanations can be provided. It is possible that, as part-time farmers want to get another non-farming main occupation, such as being an officer, an employee in factory…, they also want to get experience and networks in kind of places that provide these jobs and they aim to do few internships in farms. Also, it is possible that spending time working on the farm provides students more confidence and motivation to do farming.

Descriptive statistics

Dependent variable: Internship Farm

FTFarmingPlan2	Mean	SD	N
Full-time farming	90,4	130,2	108
Part-time farming	48,3	81,3	59
No farming	39,0	74,8	20
Total	71,6	113,5	187

Table 40: Descriptive statistics computed by SPSS on length of internships in farm (in days) by students depending on their willingness to do farming (big categories)

Descriptive statistics

Dependent variable: Internship Farm

Willingness Farming	Mean	SD	N
« Direct installing »	112,5	138,3	16
« Farming knowledge seeking »	122,4	163,7	21
« Capital/Experience seeking »	82,1	129,0	54
« Belated installing »	56,5	59,7	17
« Part-time farming »	48,3	81,3	59
« No farming »	39,0	74,8	20
Total	71,6	113,5	187

Table 42: Descriptive statistics computed by SPSS on length of internships in farm (in days) by students depending on their willingness to do farming (big categories)

We performed a last one-way ANOVA using detailed categories for students' willingness to do farming (5.3.4). According to the Games-Howell test, there is a significant difference between "Part-time farming" students and "Farming knowledge seeking" students regarding the time spent in internships in farms (p = 0.05).

b. Farming applied work & marketing experience

During the interviews, we asked students about the practical farming practices they participated in, if they had a personal farming activity (at home or in their organism) and if they already participated in selling some products. No significant difference was found between students who did a lot of agriculture applied for work in their training institutions and the others regarding their willingness to do farming. Concerning their personal farming activity, the farming activity students were doing at home or in the organism but for their own profit, we performed a Khi² test to see if there was any difference. The hypothesis of any influence of personal farming activity on a willingness to do farming was rejected (s = 0.05).

	Personnal farming activity	
FuturePlan	**Yes**	**No**
Full-time farming	1,10	0,53
Half-time farming	0,39	0,19
No farming	1,85	0,90

Khi² Obs	4,97
Khi² Treshold	5,99
Df	2
S	0,05

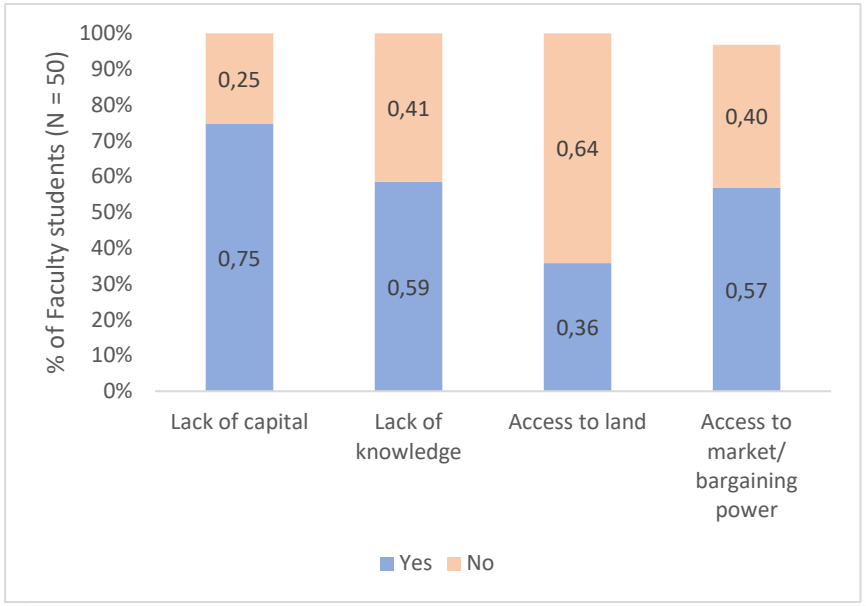
Table 43: Results of Khi² test performed on students' personal farming activity and their willingness to do farming

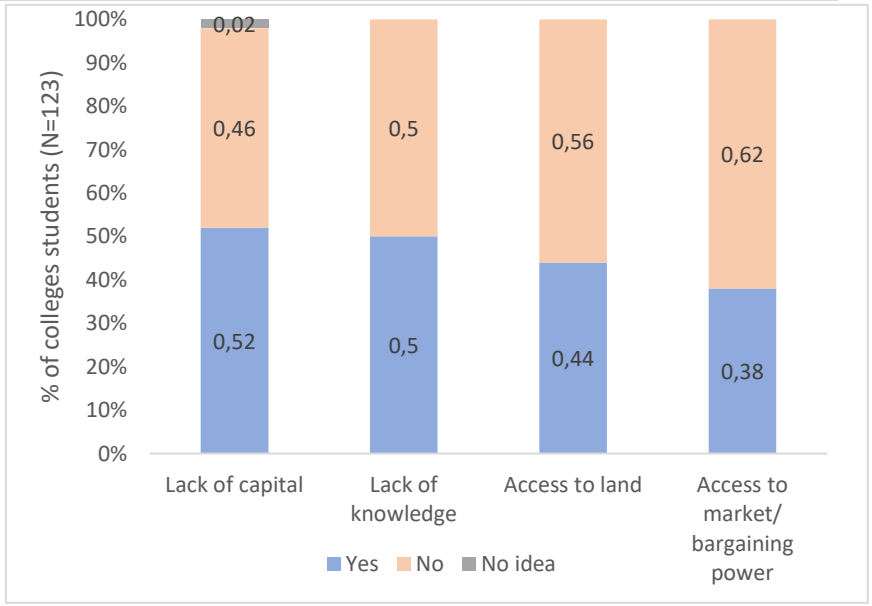
5.4 Constraints to farming and ways to overcome them

We depicted previously the difficulties that students perceived about agriculture in general. We focused on this part on something close but different: We asked each student who planned to do farming one day about the four difficulties farmers usually face: Lack of capital, lack of knowledge, access to land and access to the market. That was the basis and students could also add any difficulties they had in mind. The aim here is to understand why, even if many students plan to do farming, a big majority of them think they need much time to spend in preparing their farm plan before. What could block or delay students who plan to settle a farm to do so and what could be done to solve these constraints?

5.4.1 Overview

The next charts permit to make a ranking of the main difficulties that students consider they will face to set up their farms. As it was already assumed during the previous part, the biggest difficulty in students' mind is the lack of capital. It will be a problem for 68% of them according to them. We can see that a lack of knowledge and access to the market would be a problem for 56% and 53% of students respectively. Finally, the lack of land is a problem for 38% of students who plan to settle a farm later. This rate is lower because most of the students' parents own lands and students consider it is enough for their farming activity.





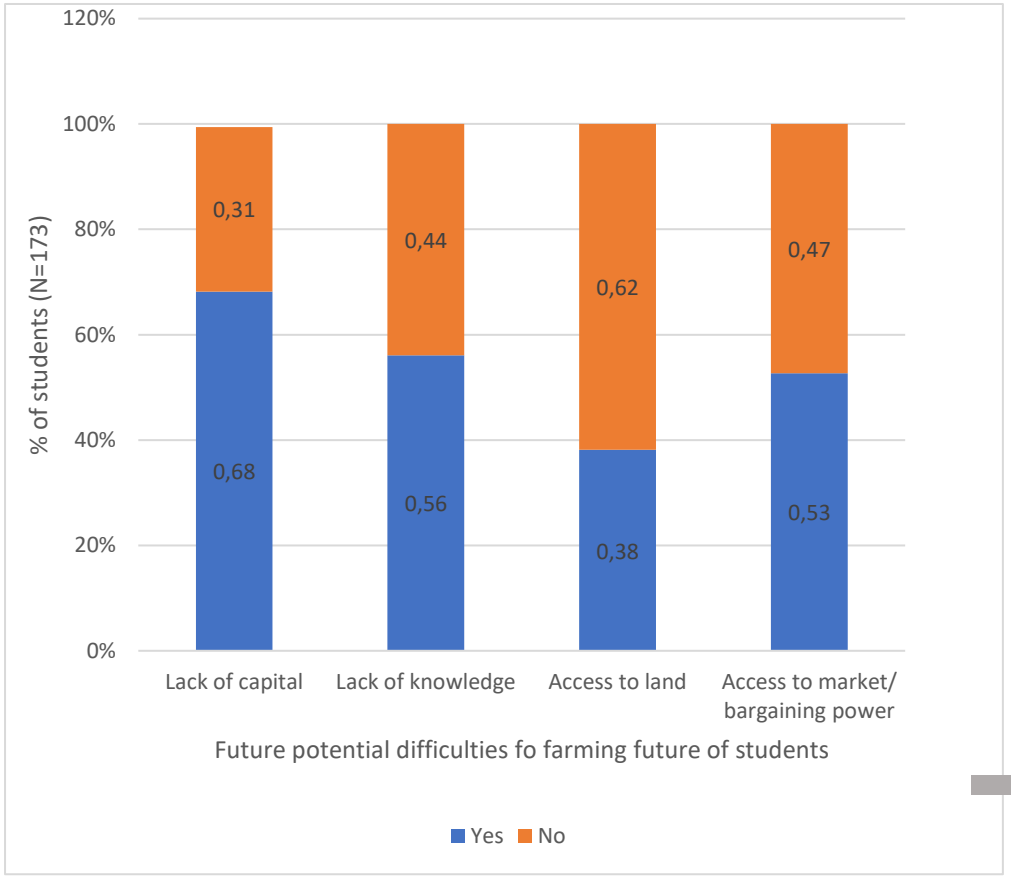


Figure 28: Plots representing students mind about problems they could face in settling their farm

Regarding this last point, among the 151 students who plan to do farming and who have parents who do farming, 67% think they will not have a problem of land and 33% think they will. Then, 35% of them thought spontaneously about "natural risk" (what includes natural disaster, pests, flood…), 8% about unsteady prices of products and flooded markets and 6% about lack of farm laborers as a constraint for their farming plan. Results are different for colleges and faculty students. Faculty students are less sensitive to such problem. Much of them are less preoccupied by a potential lack of capital or access to the market problem, probably because an important part of their curriculum focuses on management, accounting, and marketing.

If we consider all their answers, 10% of students think they will face none of these four difficulties, 20% think they will face one of these difficulties, 28% think they will face two of these difficulties, 32% think they will face three of these difficulties and 10% think they will face all these four difficulties. According to a Khi² test performed with the previous data for colleges and faculty students, no significant difference exists between these two samples.

5.4.2. Lack of Capital

About **lack of capital**, 57% of the students who plan to have a farm later said it could be a problem as agriculture was a high capital requiring activity, 12% said the problem was the high cost of inputs/tools. Their solutions to overcome these problems are described in the following table:

	Start with a little size farm	Credit from private bank	Credit from GVMT bank	Other job (Previously or in the same time)
NB	29	9	44	29
%	17%	5%	25%	17%

Table 44: Distribution of students' plan to overcome lack of capital difficulty (N = 173)

By contrast, those who think they will not face this kind of problem said they will save money from previous job/parallel job (31%) or will have a family support/ family's farm continuing (10%).

College students see more farming as a high capital requiring activity than faculty students and twice more of faculty students are ready to get a loan to start their farming activity. Then, they are more confident in their ability to acquire capital from their previous job. All these results are linked with the basic differences of both training institutions that are: 1. The reputation and 2. Management/Accountancy/Marketing. This two differences will probably permit faculty students to get a loan more easily, firstly because of their diploma and then because they can probably bring a convincing farm plan, thanks to their management skills. Then they will also find better jobs after graduation (for those who plan to work before start farming). Most of them mentioned for instance working as farm manager jobs. Then it is possible that they would get more capital easier, and that is why they are more confident about it.

5.4.3. Lack of knoweldge

Considering the **lack of knowledge**, 27% said they would face a lack of marketing knowledge, 18% would face a lack of farming skills and 16% would face a lack of accounting knowledge. Their solutions to overcome these problems are described in the next table.

Studying in bachelor / Follow trainings	Hire experienced people	Self learning (internet / books / experiences)	Learn from experiecned farmers/alumnis	Other	No idea
15	7	29	29	5	27
9%	4%	17%	17%	3%	16%

Table 45: Distribution of students' plan to overcome lack of knowledge difficulty (N = 173)

Those who thought they would not face this kind of problem said they already had enough knowledge from school/parents/Internship (28%), or they could learn by themselves in the future (10%) or would get supported by family (6%).

College students thought they would face a lack of farming skills and accountancy knowledge and faculty students were less confident in marketing skills. It is curious as one particularity of this curriculum is the focus on marketing/accountancy/management training according to educational staff. None of them were especially interested in learning from other farmers to solve this lack of knowledge.

5.4.4. Access to land

Regarding the problem of **access to land**, 22% said they would not have enough land and 14% said they would have a problem with their parents' land (soil poverty, pollution…). To overcome this difficulty, 6% planned to obtain a loan, 6% planned to save money from another job and 15% had no idea.

Contrarily, those who thought they would not face this kind of problem said their family owns already enough land (60%).

Even if it is the constraint with the lower number of students, faculty students are less confident in it than colleges students. A higher rate of student think they will face problems of land and they are also a larger group who feel parents land constraint, because of small land or suitability constraint.

This situation could be the consequence of the important capital constraint that college students feel, even if they could have a problem of land, they may not pay importance to this problem and plan to solve it later as they have now bigger problems to face. For faculty students, that are more confident about their ability to acquire capital from a previous job or a loan, they can start to think about this kind of difficulties.

5.4.5. Access to market/Bargaining power

With regard to the **access to market/bargaining power** difficulties, 30% of students considered that Thai markets are flooded, 17% thought they would have difficulties to access to market/ customers, 9% thought they would face decreasing price proposed by middlemen/ customers and market fluctuations.

Try new ways of selling (own shop…)	Surveying market before selling	Improve the quality/the value of the product	Learn from succesful farmers / Experts	other	No idea
37	20	20	8	10	13
21%	12%	12%	5%	6%	8%

Table 46: Distribution of students' plan to overcome access to market difficulty (N = 173)

By contrast, among those who thought they would not face this kind of problem, 21% said that they would be able to do good marketing and good management, 12% had already safe outlets installed (that confirmed some students planned to do exactly the same kind of farming as their parents) and 12% would improve the quality of their products to be sure to find buyers.

With regard to this difficulty, results are similar between college and faculty students. A small difference is that the faculty students tend to be more convinced about flooded markets of Thailand and so they are a little bit more aware of the importance of the quality of products according to our results.

5.4.5 Student's assessment of difficulties to start farming

X^2	X^2	Treshold	ddf	s
Lack of capital/Willingness to do farming	*6,6*	11,1	5	0,05
Lack of knowledge/Willingness to do farming	*7,1*	11,1	5	0,05
Access to land/ Willingness to do farming	**12,7**	11,1	5	0,05
Access to market/Willingness to do farming	*7,8*	11,1	5	0,05
NB of difficulties	*16,8*	31,4	20	0,05

Table 47: Results of Khi² performed on students' willingness to do farming (from part 5.3.4) and if they think they will face one of previous constraints (N = 173)

The link between perception of difficulties and willingness to do farming is not obvious. The only combination that is significant is the relation between a student's mind on access to land and his or her willingness to do farming. This result is mainly due to a higher rate of students who plan to do farming right after graduation who answer more "I think I will not have difficulty to have access to land" than what was expected according to Khi² test. Then students who plan to settle directly after graduation are those who feel less constrained in terms of land access. Then, even if this difficulty is the less represented in previous parts, this is the only one that can be linked with students' willingness to do farming, as a proof that is still a non-negligible parameter.

5.5 Support from the government

The final question we asked students was about the policies they would like to see settled to support young people with farming plans. Students proposed some supports they would like to receive to help them settle their farms but also to make the farming activity more interesting. It means that some policies presented here intend to ease the access to farming, while others intend to increase the sustainability and profitability for farming activity, without any clear differentiation between these two categories. These ideas permit to have more information about the problems that students have in mind and the supports that are the most important for them.

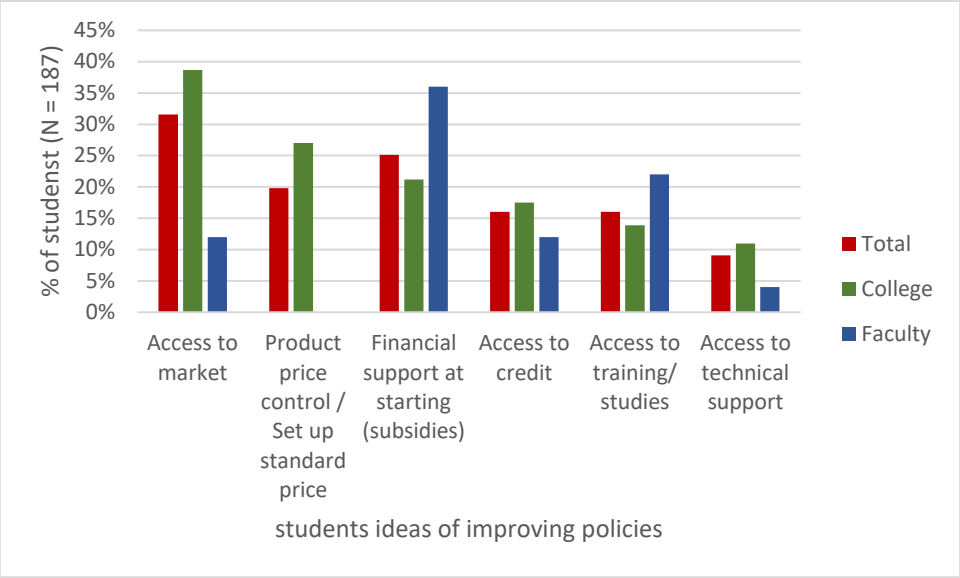


Figure 29: Distribution of students' ideas of policies to improve their access to farming for total sample and each organism

	Access to market	Product price control / Set up standard price	Financial support at starting (subsidies)	Access to credit	Access to training/ studies	Access to technical support
NB	59	37	47	30	30	17
%	32%	20%	25%	16%	16%	9%
NB	53	37	29	24	19	15
%	39%	27%	21%	18%	14%	11%
NB	6	0	18	6	11	2
%	12%	0%	36%	12%	22%	4%

	Access to plant varieties and animal breed	Encourage exportation	Access to farm machinery	Access to land	Control the influence of the middlemen on price products	No idea
NB	13	12	12	8	14	17
%	7%	6%	6%	4%	7%	9%

Table 48: Detailed distribution of students' ideas of policies to improve their access to farming for total sample

Some ideas, such as price control or middlemen control, would be difficult to implement but the fact that students mentioned them shows that students are paying high importance to the issue of low selling prices. The previous table indicates that, even if it was not their first choice during previous sections, more students would like to have support to have better access to the market ("access to market", "standard price"). If we consider students' education institution, there are differences between what college students are expecting (more oriented on the marketing side and sustainability of sales) and faculty students are expecting (more interest about support to access capital and knowledge).

The next chapter analyses workshops conducted with students about possible support policies in order to find out which one could help these students (and other young people who want to do farming) to settle a farm.

Chapter 6: Policies to improve the link between school and farming

6.1 Workshop organization

6.1.1 Introduction

This section describes the information obtained during four workshops organized in Chachoengsao and Roi Et colleges of agriculture and technology. In each college, one workshop was organized with a part of Bor Wor Sor students we interviewed previously, and one was organized with teachers and educational staff of the college. The aim of the workshops was to discuss results found in **chapters 4 and 5** with concerned people to discuss our interpretations and to discuss the kind of public policies that could be relevant to support the installation of graduates in agriculture as farmers in Thailand.

Each workshop was divided into three parts. The first part included a presentation of the results of both quantitative and qualitative surveys to participants (*results from **chapter 4 and 5***). The second part dealt with a question session first, a roundtable of answers then, and statements by teachers and students about issues raised in the previous part finally. These issues were mainly:

- The purpose of the college of agriculture and technology about students' career: does the college system intend to train more farmers, employees/laborers or both?
- The time in a student's life when it is best to settle a farm (in term of age or accomplishments)
- The assets (capital, knowledge, experience…) students are expecting to acquire in study/work before settle farms (for those who plan to do it one day)
- The specific purpose of the capital that students want to acquire before starting their farm
- The pieces of knowledge they would miss at the end of Bor Wor Sor/Bachelor to be able to start their own farm.

The third part was a review of some policies implemented in foreign countries to help young people to settle their farm. These policies were divided into categories depending on which difficulty they were supposed to solve. The five categories are Lack of capital, Lack of knowledge, Access to land, Access to market and Other issues. For each category, three to eight ideas of public policies currently used in other countries were presented. The aim of this part was to find out which policy could be relevant, which policy could not, in Thailand context, according to the viewpoints of students and teachers from colleges. For teachers, we presented briefly each policy and we did a roundtable at the end of each category of policies. We did the same for students, but we also asked them to fill out a form about their answers, a form that permitted to run a small quantitative analysis. We asked students to fill out this form "imagining they were a policy maker in agriculture field in Thailand" and that they should allocate a budget (composed of points) into different policies in the better combination to support young farmers' settlement. The form is presented in **Appendix 2.**

6.1.2 Public policies

Here are listed public policies and private initiatives intending to support farmers we chose to present during the workshop. It can be found in "The installation of young farmers in other countries: situation of young farmers and support policies" (Faysse, 2018), "Youth and agriculture: Key challenges and concrete solutions" (FAO, 2014) and in the section "Young farmers" of the official website of European Commission (https://ec.europa.eu). It was presented to students (enclosed by quotes), with some additional information: the country where the policy is implemented, the complete name and more details about it.

a. <u>Lack of capital</u>

➔ **1. "**Subsidies to buy a piece of land, equipment and to pay for farming costs during the first years"

Installation aid (European Union): This policy includes three financial components: an installation grant, a special loan at reduced interest rates, tax and other types of benefits. With regard to the process to obtain land, a young farmer has the priority in getting access to land when land is available for sale, has the right to a reduction of registration fees when he acquires it. The applicant should be under 40 years old and draft a customized professionalization plan and a business plan covering a five-year period.

Youth Socio-Economic Empowerment Project (Moldovia): This project provides technical and financial support to rural and peri-urban young women and men between 18 and 30 years old. The aim is to help them develop a business. It consists of training them in "business development", support them to work out business plans an also achieve a post-realization follow-up and financial help.

➔ 2. "Loans at a reduced rate, no need to pay back during first 3 years"

Public-private investment fund (Canada): The Canadian Government provides a special loan to young farmers in Quebec Province since 2011. This aims to support them in acquiring shares or assets for the farm business, such as equipment, buildings, agricultural land or even a complete farm. If a loan is received, the repayment must be initiated three years after, and a progressive interest rate is applied. The fund is available for farmers aged between 18 and 40.

➔ 3. "Subsidies to set up new infrastructures in family farm"

See Installation aid (European Union)

b. <u>Lack of knowledge</u>

➔ 1. "Training on farming practices, on the type of farming the young person wants"

Personalized professionalization plan (France)[21]: The French government provides a scholarship to young people who plan to become a farmer, to permit them to do internships, courses… They have the opportunity to do internships in farms in France or abroad for a length of 1 week- 6 months. It also permits to do an internship in companies in France or abroad for a length between 1 week and 1 month, continuous training courses in the presence of a trainer or as part of distance learning or even actions to obtain a diploma of agriculture.

➔ 2. "Working one year with chosen experienced farmers as mentorship before settling a farm"

Personalized professionalization plan (France)

Agri-enterprise development and management (Cambodia): This project aims to encourage out-of-school youth in rural areas to pursue professional careers in agriculture. During the five first months, young people follow basic training, visit successful commercial farmers and do an internship combined with fieldwork and additional training sessions; internships are hosted by experienced farmers and entrepreneurs. Then, they follow training which focuses on farm management and business plan

[21] https://www.service-public.fr

development. During the subsequent five months, the business plan is implemented, accompanied by seminars and further training.

➔ 3. "Training on accounting skills"

Personalized professionalization plan (France)

Agri-enterprise development and management (Cambodia)

➔ 4. "Training on marketing and communication skills"

Distance learning for young farmers (Brazil): The government provides free online training courses developed especially for young farmers aged between 16 and 32 years old. Courses are about diverse subjects such as family farming management, health, labor laws, and associations and cooperatives.

➔ 5. "Support for preparation of a business plan before installation"

Personalized professionalization plan (France)

Agri-enterprise development and management (Cambodia)

➔ 6. "Visits to support accounting/management decisions during the first five years"

Installation aid (European Union): For young people involved in the farming implementation procedure of the European Union, monitoring is proposed to the farmer during the first years after installation.

Support to young qualified farmers (Tunisia): The Tunisian government provides a long-term loan to qualified people to facilitate their access land. They also support young people in the design of a business plan and visit the farms during the first years for counseling about management.

➔ 7. "Visits from experts to give advice on farming technics and risk management (such as climate-related risks) that will occur during the first year"

Technical support (France): Public organisms and cooperatives technicians visit the farm and give advice to farmers about the technical end of agriculture (sewing dates, fertilization, climate-related risks).

c. <u>Access to land</u>

➔ 1. "Drafting a new land rent contract for at least ten years"

Rural lease (France)[22]: It is the typical farmer/landowner French contract by which the landowner makes agricultural land or buildings available to a farmer for the purpose of exploiting them in exchange for rent or sharing of the crop. It has a minimum duration of 9 years and can be extended to 25 years.

[22] https://www.service-public.fr

➔ 2. “Providing pensions to old farmers who retire and transfer their farm to a young farmer”

Small landlords and large tenants’ policy (Taiwan): The main purpose of this policy is to encourage elderly farmers to lease their land on a long-term basis to young farmers and to farmers’ organizations. It facilitates matching between land buyers and leasers, provides support for retired farmers and encourage them to lease their lands and provides low-interest loan for new farmers to encourages them to start farming and buy the land.

➔ 3. “Implementation of a maximum price for a rai of agriculture land at district level”

Land development and rural settlement societies – SAFER (France)[23]: SAFER society regulates land purchasing in France and has the possibility to buy rural land with priority in case of assignment. They sell it then at a normal price. This system permits to avoid land price increasing and speculation on agricultural land and ease young farmers access to a normal price land.

d. <u>Access to market</u>

➔ 1. “Support to organize online marketing”

“We deliver taste” (Southern Europe): It is a web platform aiming to improve the link between customers and young smallholder farmers, in order to encourage them to respect local traditions, conservation of the soils, enhancing of biodiversity… while producing food products. “We Deliver Taste » buys the products from farmers and sell them in high-value markets all around the world, through a webshop. They also organize gastronomic events in order to present products to consumers and promote this way of farming.

➔ 2. “Support to participate in agricultural fairs

➔ 3. “Support to get involved in networks of farmers selling the same products”

“We deliver taste” (Southern Europe)

➔ 4. **“**Support the access to certifications (Organic products, Good agriculture practices…)”

➔ 5. “Providing information on delivery channels, selling products both in their provinces and others”

“Youth trade” project (USA): The company makes the link between young entrepreneurs and major companies and permits these entrepreneurs to sell their products easily to companies.

Connecting farmers (Kenya): The project aims to address the farmers’ lack of market information, concerning both products and inputs, via new technologies. Information on normal market price is sent to farmers using mobile phones, as now many farmers in Kenya have access to one.

[23] http://www.safer.fr/

➔ 6. “Supporting the shipping cost for the product distribution”

e. <u>Others</u>

➔ 1. “Full scholarship for agricultural Bor Wor Sor, including living costs”

➔ 2. “Farm production insurance (crops and animals)”

Natural Disasters Regime/ Insurance/ Agricultural Disaster Fund (France): In France, most of the farmers are covered by an agricultural multi-risk insurance (private) and for those who do not, there is the agricultural disaster fund (national) that provides financial compensation in case of natural disaster (flood, loss of crops…).

➔ 3. “Organize a pension system for farmers”

Agricultural social welfare (France): Public fund to which farmers contribute during all their farming career. When they retire, they receive a monthly pension for the rest of their life.

6.2 Assumption testing

6.2.1 Role of the college of agriculture

During the four workshops, the role of colleges of agriculture and technology was questioned with students and teachers. The aim of the questions was to determine if colleges curriculums are designed to train farmers or agriculture employees, as no clear answer was found neither in literature nor during qualitative interviews.

Teachers and students agreed that colleges roles aimed both to train farmers and employees/farm laborers. Students said they expected to learn academic knowledge like science, technology, practice and do their own choice then, afterwards. Teachers shared the same opinion as they mentioned college should provide student with basics, moral and ethical knowledge and then let students do what they want. Then, even if the curriculum is identical for all students, it is supposed to be a flexible curriculum, adapted to the student's situation. This last information was mentioned by a teacher who said: “Our role is to train farmers for students who own lands and train employee for those who don’t have land. The main aim is to provide a sustainable activity for them “. However, teachers from both colleges agreed that the curriculum emphasizes knowledge and practical skills to be a farmer.

6.2.2 Students late installation as farmers

We already knew from the literature review that few young people are settling farms in Thailand at present. We also know that most of the students we interviewed plan to prepare themselves during some years before starting their own farm. During the workshop, some questions were asked to students and teachers for the purpose of understanding this situation and the reasons why students prepare themselves for so long before starting their farming business.

For one teacher at Roi Et college, the best age to settle a farm in Thailand would be around 45 years old or more. According to him, starting at an advanced age means having much experience and enough knowledge to have a prosperous farm. Teachers said that people's attitude toward agriculture tends to change after passing 50 years old. They use as a demonstration the current situation: "when graduates have been working long enough, like more than 10 years, they tend to get bored with the constraints and orders in government system/private system and retire early to flee from the limitation and constraints and choose to become farmers to be independent".

The opinion of teachers at Chachoengsao college was completely different. They considered that graduates in agriculture who plan to do farming should settle their farm during their 20s, and that 8-10 years of experience would be enough to do farming. One teacher even said that "the best age to settle a farm is just after university but it depends on students' readiness". Even if there is an important difference between the answers of teachers depending on the colleges, most of them argued that students should work during some time (at least 8 years), or, at least, complete university before starting farming. The teacher's ideas about the perfect age to settle a farm correspond, for Roi Et teachers' idea, to the current situation of late installing pinpointed in **chapter 4**, and for Chachoengsao teachers' idea, to students plan we gathered in **chapter 5.** Finally, all teachers agreed that this "age question" will depend mainly on student's readiness, which means his/her lack of resources and practice.

Many ideas were mentioned regarding the reasons that justify this "preparation stage". In the teachers' minds, the main reason is that parents would like their children to get a diploma, a bachelor's degree, or higher degree in order to get in a high position in their occupation and gain high salary/income. Furthermore, they think that parents would not like their children to do a job that requires a lot of physical effort and energy. Most parents who currently are or formerly were farmers have realized how exhausting the farming activities are and they would just push them off from the hard work they suffer all their life. Accordingly, the children absorb this kind of belief and witness the reality that doing farming activities is really exhausting. Then they do not want to do these activities and, certainly, keep themselves distant from farming. However, the last part of this explanation, already faced in **chapter 4,** is unlikely to be realistic considering that 86% of our students plan to be farmers one day.

Another explanation was that students would not be confident in the knowledge taught by the college, which would not be enough to settle a farm. The student's aim in this "preparation step" would be to study further to gain more pieces of knowledge to increase their chance to start a well-functioning farming business. One teacher from Chachoengsao said "young people plan to study further because they want more experience and knowledge. For example, they want to know how to use chemicals". Students said they wanted to acquire more specific knowledge, to make more connections and to get more job opportunities during this "preparation step". Then, studying would be in the same time a stepping stone toward farming, but, for a non-negligible part of students, a stepping stone toward an employee/farm laborer work, which would then give them access to capital and thus to farming activity. As it was discussed by Roi Et teachers, students work first to collect money as capital to invest later on their farm. Then, their desire to continue in University is motivated by the possibility to get more job opportunities.

We asked teachers and students about the main expenditure items required for starting a farm. The aim was to have an idea of what students had in mind and why they were planning to work a long time before installing their own farm. In their minds, the capital should be used to buy/rent lands, to set up a water system and buy machinery (tractors) for the greatest items, and then to buy all inputs required for production (seed, breeders, animal food…) and wages for their farm laborers. Chachoengsao students estimated that the amount of capital they would need was about 500 000 bath. The importance of this amount highlights students' emphasis on the years of work before starting their own farm. In Chachoengsao college, among 26 students who participated to the workshop, eight

would be ready to take out a loan, eight would prefer to earn money by themselves and 10 did not have any idea. Even if some of them were ready to get a loan, banks are unlikely to provide easily this kind of loan to young graduates, especially if they are still young and from poor families. Finally, teachers mentioned that if students had capital and enough knowledge, most of them would start farming directly but others would still continue in bachelor and others would still be an officer.

Regarding students who plan to be employee/farm laborer before farming, teachers mentioned that it was also a good way to gain knowledge in a more practical and direct way as it is providing experience as well. According to teachers, students would work before starting their farm also because some of them may want to seek more experiences in life. Part of students intends to use this experience time to continue to support the farming sector in giving advice to villagers for instance. Concerning jobs that students plan to do, it is mainly animal husbandry, the public services in agriculture, farm managing, teaching, factory working or marketing… Some of these jobs are providing farming experience, such as animal husbandry or farm manager, but others, like officers, factory workers or company employee are unlikely to provide farming experience as there are no similarities with farming activity, what implies this is only a way to get capital.

6.3 Policies improvement (Educational staff)

This part presents teachers' mind about public policies we presented previously (6.1.2 Public policies).

6.3.1 Lack of capital

Roi Et colleges teachers mentioned spontaneously the importance of providing to students with some capital, for example, 10,000 bahts, to invest in what they need.

Concerning the policies presented in his part, **"**Subsidies to buy a piece of land, equipment and to pay for farming costs during the first years" was considered by Roi Et teachers as a wrong solution. One of the teachers said during the workshop that it "might not work or last long because it is […] an ineffective solution to make the farmers who have already lands stay on their lands and keep doing farming. Also, other people might abandon their given land and give up on farming." None of the three solutions appear to them as a relevant one.

Chachoengsao teachers were more convinced by two other ideas, **"**Subsidies to buy a piece of land, equipment and to pay for farming costs during the first years" and "Subsidies to set up new infrastructures in family farm". According to them, the first solution would work for young graduates who do not have land and the second for farmers' children. Regarding the third proposed policy, "Loans at a reduced rate, no need to pay back during first 3 years", teachers mentioned the risks of a difficult life for students, a thought probably influenced by numerous cases of debts in Thailand rural area.

6.3.2 Lack of Knowledge

According to teachers, college students will lack some marketing, communication, and accountancy skills and knowledge at the end of their studies. Moreover, farm management general principles, how to plan, how to schedule productions, how to make decision… are also pinpointed by teachers of both colleges as subjects in which students' skills will be limited. To solve these problems, two solutions emerged spontaneously from the workshops with those teachers. The first was to do more field trips with students, to meet more successful and unsuccessful farmers. The second was to hire only Bor Wor Chor students in Bor Wor Sor, based on the thought that students who did a Bor Wor Chor before their Bor Wor Sor were more confident in their knowledge. However, this assumption was not validated by results in **chapter 5** indicating no differences between students' self-perception

of their lack of knowledge between those who did a Bor Wor Chor and a normal high school certificate previously.

Teachers noted that two of the policies already existing abroad were also promising in Thailand. The first one is the "Training on farming practices on the type of farming the young person wants, by the college of agriculture" and then the "Visits to support accounting/management decisions during the first 5 years". It is a paradox that these two policies were applied in an efficient way and that the lack of accountancy, management and marketing pieces of knowledge of students was highlighted so often by so much different people (Cf: **chapter 4,5 and 6**). We can doubt that some visits to support farmers are often realized by technicians among all young farmers in Thailand. We can also doubt that most students know about the policy and we can doubt about the relevance of accountancy/management courses proposed by colleges considering the part of students who said that they would face a lack of accountancy and management skills in the future. Furthermore, teachers mentioned it would be relevant to set up "Training on accounting skills", which points out the inefficiency of two previous policies.

Then, teachers considered as a relevant proposal to make students "Work one year with chosen experienced farmers as mentorship before settling a farm" because they could derive from it all the knowledge and experience that they would need in a short period of time.

6.3.4 Land access

According to Roi Et college teachers, some solutions already exist concerning land access in Thailand, but they were not effective because of the lack of promotion. Another problem is that these solutions do not supply farming inputs such as seeds and plants. Then, teachers pinpointed that "Thais want to stay in their hometown, it is hard to make them move to another free land in other provinces". The teachers suggested, for a potential next project, to focus such type of project on young farmers that already have land in their own place. Finally, the lack of continuity in this kind of project was also stressed as a major problem.

Every international policy inspired the teachers. The first, "Possibility to sign a land rent contract for at least 10 years: the owner cannot put the lessee out as long as the lessee pays", because the land tenant would become more secure. This solution was also considered as a small investment which would provide a big return. The second one, "Providing pensions to old farmers who retire and transfer their farm to a young farmer", was considered as a good incentive for old farmers who do not want their children to do farming to sell their lands to young farmers who would like to expand parents' land. The third one, "Implementation of a maximum price for a rai of agriculture land at the district level (buying or renting)" was acknowledged as there is a lack of law enforcement in zoning the land and controlling the land selling price for farming purpose. However, this solution was considered by some teachers as hard to apply in Thailand. In the case of applying any of these policies, teachers pointed out the importance of promotion and/or engagement between colleges and students.

6.3.5 Market access

Regarding market access, teachers said that the government should have a strict policy about price guarantee and control more the products flow to avoid that a bunch of products coming into the market at the same time. Furthermore, another suggestion made was that the government could support the farmers in being directly the middleman and buy their products. One teacher from Chachoengsao college said that a lot of organizations were already working on online marketing, but most online-selling farmers had problems with the tax and fees through this way of selling.

Teachers at Chachoengsao college positively considered the idea of "supporting farmers to participate in agricultural fairs". To have access to big fairs, farmers must pay expensive fees and reach important distances. Then, there is a selection and big farming companies would get into the fair more easily while often the small one can't afford and don't have a chance to do so. To "Support to get

involved in networks of farmers selling the same products" would be relevant in Thailand according to Roi Et teachers. One said that if the farmers would form a group, they would be able to bargain better with middlemen and to have more chances to settle fair outputs. Teachers estimated that government should support more farmers grouping, help them financially to spread information, to promote packaging… Then college could participate to advise students to join the group/network of each farming type. To "Provide information on the market channels available at the local and national level" and to "Promote local products" was also pinpointed as a relevant solution by Chachoengsao teachers. Furthermore, they said that it could be interesting to support a policy of protection of farmers right to grow/raise/produce their unique products in their own area only.

6.3.6 Others

In this category, all suggestions were relevant in Roi Et teachers' mind. They estimated that "Farm production insurance" was the most important and that a combination of the three ideas, the previous one with "Full scholarship for agricultural BWS, including living costs" and "Organize a pension system for farmers", could have a beneficial effect on farming attractivity and farmers' quality of life. However, teachers doubted the effect it could have on the young/students' attitude towards farming, especially on the picture of a physically dirty, exhausting, and risky job they have in mind.

Chachoengsao teachers added some elements to the debate such as setting up more steps to select who is suitable and in needs of scholarships, to promote successful farmers as agriculture representatives, to set up a TV program to promote this occupation… A selection, especially in colleges of agriculture, would not be possible as not enough students are candidates to these organisms each year. It would be possible only if the number of places strongly decreased. About the second, the intention is similar than the government's one with the "smart farmers" project that intends to make successful farmers inspire and teach other people. However, this kind of project has already demonstrated its limits as promotion without support will not change the image of farming and then not all the farmers have the same resources and conditions.

6.4 Policies improvement (Students)

This part includes a presentation of students' mind about public policies we presented in the previous part. Firstly, are presented results of the roundtable and then statistics on students' answer from the form they filled out during the workshop (**Appendix 2**). 48 students participated in the workshop and fulfilled the forms that we used in this analysis.

6.4.1 Lack of capital

During the roundtable, students mentioned that they should have easier access to loan, subsidies to apply sufficiency philosophy regarding problems of capital access. They should also have more financial help from private companies in order to keep farming work at a sustainable level and prevent the loss of Thai farmers. As presented in **chapter 5**, the demand for a price control exercised by government is also strong amongst students and this fact was also pinpointed by some of them during the workshop.

	Subsidies to buy a small piece of land and equipment and to pay for farming costs during the first years	*Loans at reduced rate, no need to pay back during first 3 years*	*Subsidies to set up new infrastructures in family farm*
Mean	2,21	1,46	1,73
Mean confidence interval (95%)	1,8 - 2,6	1,2 - 1,73	1,35 - 2,11
NB "Yes"	41	38	42
NB "No"	7	10	6

Tableau 49: Descriptive statistics of workshop results concerning policies to improve access to capital for young farmers

Students then distributed a fictional "budget" between three propositions to improve access to capital of young who plan to do farming and the most important expenditure item in their mind was to provide **"**Subsidies to buy a piece of land, equipment and to pay for farming costs during the first years". The expenditure item mentioned the more times was "Subsidies to set up new infrastructures in family farm". 71% of students included the three policies in their choices, demonstrating that in their mind, there is a complementarity between all of them, that each deserves a specific aim. Even the policy with the lower mean, "Loans at a reduced rate, no need to pay back during the first 3 years", was mentioned by 80% of students.

Some students proposed other ideas of policies but most of them were really similar to the second policy proposed, "Loans at a reduced rate, no need to pay back during the first 3 years". They said for instance "Loan without interest that can be repaid when a profitable farming activity is started" or "Provide more loan possibilities", and other ideas were about a product price control exercised by the government.

6.4.2 Knowledge access

As teachers, students felt that they were missing some pieces of knowledge to become wealthy farmers. They said they would like to follow more training in marketing, technology, and language (Chinese, English, Japanese). Students preferred the idea of "Training on farming practices on the type of farming the young person wants, by the college of agriculture" and the idea of "Visits for supporting accounting/management decisions during the first 5 years". Roi Et students were also convinced by "Working one year with chosen experienced farmers as mentorship before settling a farm", as teachers, and by "Training on marketing and communication skills". Chachoengsao students were not confident about the relevance of "Visits to support accounting/management decisions during the first 5 years" as, with limited capital and high natural disaster risks, visits could not really help them to solve their problems.

	Training on farming practices on the type of farming the young person wants, by college of agriculture	*Internship in farms where the young person wants to farm and mentorship by an experienced farmers*	*Training on accounting skills*	*Training on marketing and communication skills*
Mean	1,88	2,00	2,23	2,00
Mean confidence interval (95%)	1,4 - 2,3	1,6 - 2,4	1,8 - 2,7	1,7 - 2,3
NB "Yes"	37	40	43	42
NB "No"	11	8	5	6

	Support for the preparation of a business plan before installation, to discuss the hypotheses	*Support for accounting / management decisions (people come to farms) during the first 5 years*	*Support for technical farming (plant and animals disease management, climate management…) (people come to farm)*
Mean	2,08	1,21	2,33
Mean confidence interval (95%)	1,7 - 2,5	0,9 - 1,5	1,7 - 2,9
NB "Yes"	43	33	39
NB "No"	5	15	9

Tableau 50: Descriptive statistics of workshop results concerning policies to improve access to knowledge for young farmers

Results here are balanced and indicate that students thought most of these policies could be relevant in the case they would settle their own farm. The only result which has a clearly lower score than others is the "Visits to support accounting/ management decisions during the first five years" but it was still mentioned by 69% of students. Also, 69% of the students choose at least six of these seven choices in their answer and almost half of them (48%) choose all of them. Lightly distinguished from the others, the most important policies, those in which students allocated the more points, were: "Training on accounting skills" and "Support for technical farming (people come to farm)". The first one, regarding the fact that teachers said it was already existing in Thailand, demonstrates us that the students' need for accountancy skills is obvious. Furthermore, accountancy courses and support already existing are either not enough or not well-promoted amongst students.

No other relevant proposition was given by students regarding access to knowledge.

6.4.3 Land access

Students did not express many ideas concerning this category. One student mentioned the relevance of the idea of a "Possibility to sign a land rent contract for at least 10 years".

	Possibility to sign a land rent contract for at least 10 years: the owner cannot put the lessee out as long as the lessee pays.	*Providing pensions to old farmers if they retire and they give their farm to a young farmer*	*Definition and implementation of a maximum price for purchasing agricultural land at district level, and the same for renting land*
Mean	2,42	1,63	1,67
Mean confidence interval (95%)	2,1 - 2,7	1,3 - 2	1,3 - 2
NB "Yes"	45	39	43
NB "No"	3	9	5

Tableau 51: Descriptive statistics of workshop results concerning policies to improve access to land for young farmers

Results regarding access to land are better differentiated than the previous ones, even if most of the students selected each of them (73%). Policy in which students allocated the biggest part of the "budget" was the "Possibility to sign a rent land contract for 10 years". It shows that even if access to land is the less important problem in a students' mind, regarding the results of **chapter 5**, they still fear the inequality between lessor and tenant.

Students also added ideas of new policies like an increase of arable land used for agriculture decided by the government.

6.4.4 Market access

Students from both organisms considered unfair exchanges between farmers and middlemen as the main problem. Their solutions regarding this situation would be to promote more direct selling.

They all agreed with an example of foreign policies which consist to "Support to organize online marketing" and to "Support to participate in agricultural fairs". They also said that increasing Thai agriculture exports would improve farmers access to the market. They mentioned it would be possible in "decreasing export tax and transportation fees" and promote and support the improvement of the products' quality.

	Support to organize on-line marketing	Support to participate in agricultural fairs	Support to get involved in networks of farming selling the same products
Mean	2,90	1,56	1,83
Mean confidence interval (95%)	2,4 - 3,4	1,2 - 1,9	1,5 - 2,2
NB "Yes"	44	35	39
NB "No"	4	13	9

	Help in getting certification	List the selling points in a district (i.e: create an information database…)	Support transportation to selling place
Mean	1,94	1,90	1,33
Mean confidence interval (95%)	1,6 - 2,2	1,5 - 2,3	1 - 1,7
NB "Yes"	43	41	33
NB "No"	5	7	15

Tableau 52: Descriptive statistics of workshop results concerning policies to improve access to market for young farmers

69% of participants chose at least five ideas amongst proposed policies, which demonstrates complementarity between these different policies in students' minds. They would allow more points of the "budget" to "Support online marketing", the most important policy in their mind, and less to "Support transportation to selling places."

Students also proposed in their forms to support some agricultural field trips abroad for farmers to learn techniques from other countries, what "smart farmers" already do, and propose a policy to increase the number of direct selling places (markets, fairs…)

6.4.5 Others

During the roundtable, students ranked the ideas of policies in the following order: The best would be “Farm production insurance (crops and animals)”, then “Full scholarship for agricultural BWS, including living costs “and finally “Organize a pension system for farmers”.

	Full scholarship for agricultural BWS, including living costs	*Farm production insurance (crops and animals)*	*Organize a pension system for farmers*
Mean	1,85	2,02	1,46
Mean confidence interval (95%)	1,5 - 2,2	1,8 - 2,3	1,2 - 1,7
NB "Yes"	39	45	39
NB "No"	9	3	9

Table 53: Descriptive statistics of workshop results concerning policies to improve farming in general for young farmers

98% of students included each of the three choices in their answer. The ranking is the same that the one they agreed on during the roundtable. The “farm production insurance” is the most important policy in this category because of natural hazards, pests, and floods are presents in students’ mind and represent a big risk in their plan to have a farm later.

Other ideas mentioned by students in this part were about advertising population and youth about the current phenomenon of agriculture work’s ease with the use of new technologies, to improve farmers’ health and promote more good practices in using chemicals and offer an agricultural camp trip for youth in junior high schools or schools to sensitize them to agriculture early in their life.

6.4.6 Statistical analysis

We performed a one-way ANOVA for each category on SPSS to try to separate policies in which students would generally allow more budget from those in which they would generally allow less budget. On the second line, the results of the Levene test are presented. These results permit to test the variance homogeneity assumption. If the assumption is validated, we used then a Tukey HSD post-hoc test to create the groups (based on mean’s differences). If the assumption is rejected, we used a Tamhane T2 test to create the groups. Numbers in the following table refers to the number presented at the beginning of this chapter (6.1.2 Public policies).

	Lack of capital	**Lack of knowledge**	**Access to land**	**Access to market**	**Other**
Levene test (variance homogeneity)	**0,14**	**0,01**	**0,47**	**0,091**	**0,029**
Post-hoc used	Tukey HSD	Tamhane T2	Tukey HSD	Tukey HSD	Tamhane T2
			Policy		
Group 1	2	6	2,3	2, 3, 4, 5, 6	3
Group 1-2	3				1
Group 2	1	2, 3, 4, 5, 7	1	1	2

Tableau 54: Results of statistical analysis concerning students’ distribution of budget points among policies to improve youth installing as farmer

It is important to not forget that a large majority of students chose a combination distributed among each, or almost each, policies proposed for each category. The main message here is first that all ideas of policies are relevant but need to be implemented together.

With regards to results from the previous table, we separated the ideas of policies into two groups, according to the ANOVA result based on the points students distributed to each idea of policy. The first group included policies that are considered either less important (but still important, as we said previously all policies seems important in students' mind here) or less expensive (requiring a smaller part of the fictive budget), "**minor policies**", and the second group included policies that are considered either the most important or the more expensive by students, "**major policies**". The third group includes policies that can fit both previous groups according to our ANOVA results. Then, they can be either considered as major or minor. This table permits to determine which policies are those in which students would spend the most important budget in each category, it does not permit to compare policies with other policies from different categories.

Group 1: "Minor policies":

- 2. "Loans at a reduced rate, no need to pay back during first 3 years" (**Lack of capital**)

- 6. "Visits to support accounting/management decisions during the first 5 years" (**Lack of knowledge**)

- 2. "Providing pensions to old farmers who retire and transfer their farm to a young farmer" (**Access to land**)
- 3. "Implementation of a maximum price for a rai of agriculture land at district level" (**Access to land**)

- 2. "Support to participate in agricultural fairs" (**Access to market**)
- 3. "Support to get involved in networks of farming selling the same products" (**Access to market**)
- 4. **"**Support the access to certifications (Organic products, Good agriculture practices…)" (**Access to market**)
- 5. "Providing information on delivery channels, selling products both in their provinces and other provinces" (**Access to market**)
- 6. "Supporting the shipping cost for the product distribution" (**Access to market**)

- 2. "Providing pensions to old farmers who retire and transfer their farm to a young farmer" (**Other**)

<u>Group 2: "Major policies"</u>

- 1. **"**Subsidies to buy a piece of land and equipment and to pay for farming costs during the first years" (**Lack of capital**)

- ➔ 2. “Working one year with chosen experienced farmers as mentorship before settling a farm” (**Lack of knowledge**)
- ➔ 3. “Training on accounting skills” (**Lack of knowledge**)
- ➔ 4. “Training on marketing and communication skills” (**Lack of knowledge**)
- ➔ 5. “Support for the preparation of a business plan before installation” (**Lack of knowledge**)
- ➔ 6. “Visits for supporting accounting/management decisions during the first 5 years” (**Lack of knowledge**)
- ➔ 7. “Visits from experts to give advice on farming and risk management (such as weather risk) that will occur during the first year” (**Lack of knowledge**)

- ➔ 1. “Land rent contract for at least ten years” (**Access to land**)

- ➔ 1. “Support to organize online marketing” (**Access to market**)

- ➔ 2. “Farm production insurance (crops and animals)” (**Other**)

Group 1-2, Unclassifiable policies:

- ➔ 3. “Subsidies to set up new infrastructures in family farm” (**Lack of capital**)

- ➔ 1. “Full scholarship for agricultural Bor Wor Sor, including living costs” (**Other**)

Chapter 7: Discussion and conclusion

7.1 Discussion

The aim of this section is to summarize a general picture of agricultural education in Thailand, to assess the vision of farming and the professional aims of students in agriculture curriculum, to evaluate students' perception of the efficiency of support policies and how to improve their access to farming.

The agriculture education system includes different types of organisms with different aims, different tools, and resources. The two models studied here clearly intend to train farmers and have characteristics that can be summarized briefly as:

- College of agriculture and technology – Agriculture Bor Wor Sor: Low registration fee, no selection, intend to train both farmers and employee, low reputation
- Faculty of agriculture – Bachelor of farm management: High registration fee, selection, intend to train farmers, high reputation

Despite a continuous decrease in the number of students in all these educational institutions, these institutions still train a non-negligible number of students who could become potentially future young farmers. Curricula set up in these organisms have changed to more and more general training according to educational staff. It can be linked with the fact that few students will become farmers right after the curriculum, according to them and their educational staff. Then, the curriculum may have been adapted to better prepare students to be also a farm laborer, employee, officer… This multiple objective of agricultural training are put forward by college staff and students because of the important constraints that block students to become farmers. This multiple objective is less put forward by faculty specialized in farm management because they intend to train only farmers.

The educational staff and policymakers do not have an explicit questioning about the content of training and current policies to support young to settle a farm. All faculty students and at least a part of college students intended to become farmers after their studies but no follow up was done by organisms. Then educational staff did not know which part of students became farmers and when, which makes it difficult to evaluate the efficiency of the training in supporting the installation of farmers. This is especially true in faculty as in college, educational staff do not have accurate data but estimates that few students become farmers in the first 20 years after the end of their training. This is an important issue as a large part of students we interviewed indicated they were limited by a lack of knowledge in their aim to become farmers, demonstrating that the content of curriculums could be improved and deserve a real discussion to improve it.

Both kinds of organisms regroup the same kind of young people: they come from the same province or surrounding provinces, and they are generally children of farmers. Even if their family has a farm, most of these farms do not provide a sufficient livelihood from it and household members are engaged in other activities (farm laborer, shop employee, officer…). Despite the good reputation of the faculty of agriculture, due to it belonging to Kasetsart University, it seems to be considered by students as "second class" study as most of them had planned to study in another faculty of agriculture. Students do not differentiate this curriculum, which intends to train farmers, and curricula provided by other faculties which intend to train specific workers in the agriculture sector. The part of students doing different choices is significant but less important for colleges students. These agriculture colleges are generally considered as second-class training compared to faculty but also compared to other colleges (i.e.: mechanics, electronic…). However, students' main motivations to study these curricula were their professional prospects and their personal values and personal interest in agriculture.

According to the survey, students had a positive attitude toward agriculture but considered it as a difficult job. Students were attracted by the lifestyle that characterizes farming. They were especially attracted by the possibility to work for themselves without any hierarchy. They mentioned concerns about the lack of profitability, the hard work conditions and the complexity of farm management. For the students who came from a farming family, this vision comes from their parents' activity as most of them knew agriculture by means of their parents. Even if students were aware of "bad sides" of farming work, most of them planned to do farming at some moment of their life. Moreover, almost all of them would be ready to have a farm in a world without farming constraints (Dream farm). Regarding our students' answers, the main obstacle is not the lack of interest in farming or the bad attitude but the constraints existing in the agricultural context as they are represented in students' mind.

The most important constraints to start farming that were identified in this study by both educational staff and students are the lack of capital, the lack of knowledge and the difficult access to the market. Students are also embarrassed by the lack of profitability and the high dependence on climatic risks. As a result of this perception of constraints, most students planned to start their farming activity after a preparation time, a time used to work or study in order to get capital or knowledge. This phenomenon of "delayed installation" explain the lack of young people settling farms in Thailand as these students are a part of the population of potential future Thai farmers. Among the 58% of students who plan to do farming after a preparation time, another phenomenon can appear and stop them in their farming plan. For instance, educational staff mentioned a willingness of parents to push their children out of the farming activity to be sure their children will earn a better income and support the family. As access to land is difficult in Thailand, children depend on their parents to have access to a farm. Parents can block their children to do farming in occupying the land or selling it. A student who has a stable job (employee in a company, officer…) can finally choose to stay in this way of life and never come back to agriculture. An important part of the students planned to do farming as a part-time activity, as a way to protect family land and traditions, and have another main activity to get a sufficient livelihood.

This phenomenon is a problem because it leads to many students who eventually do not become farmers. It encourages training to be more and more generals as students can go anywhere after getting their diploma and the time students spend in preparation is not necessarily efficient. From a general viewpoint, it is necessary for students to get professional experience during years before settling their farm. Then, no differentiation is done by students or educational staff among real agriculture experiences (i.e.: farm laborer, farm manager…) and other kinds of works (factory worker, officer). We doubt here that a factory or office work can bring to the student the skills required to manage a farm later. Moreover, the importance of the time dedicated to farming activity has a direct influence on settling readiness according to Krajangchom (2015). According to our results also, the length of the internship was linked with the full-time farming readiness.

As students' reasons to wait to settle a farm or to do farming as a second activity are mainly the rough constraints of farming activity, that they know through their parents' work for most of them, it seems essential to support more those students to permit them to settle as soon as possible. This better access to farming could enable a renewal of agriculture sector with many advantages described in **chapter 2**. Then, authorities and educational staff have tended to be convinced of the sufficiency and efficiency of the currently used policies to support young people to settle a farm despite low or not existing results and no idea of improvement came from it. According to our results, students would benefit from diversified supports to solve diverse problems like capital access, knowledge access, land access, market access, and natural disaster constraint. Among the ideas of policy that they considered as useful, the main were:

- Support to get a piece of land and necessary equipment (Government)

- Increase the time dedicated to farming practices in curricula (Training organisms)

- Increase the time dedicated to teach about marketing, communication and business plan (Training organisms)

- Technicians to check decisions and support natural risk management (Government)

- Safe land contracts (Government)

- Support to organize online marketing (Government)

- Farm production insurance (Government)

This last point demonstrates that, contrarily to an idea expressed by educational staff or policymakers, students can imagine what they would need to start a farming activity according to the aim they have in mind. Furthermore, they estimated they would need on average 500,000 baht to start their farming activity.

Although agriculture employs 40% of the Thai population, the sector is under-represented in vocational studies (e.g. Nb of Bor Wor Chor students in 2016 depending on the major; Industry: 34 123; Business: 24 686; Agriculture: 1724). The same trend can be observed in Universities (e.g. Nb of Bachelor students in Kasetsart University – Bangkhen, depending on their major; Science: 2 175; Engineering: 2 399; Administration: 1671; Agriculture: 1397). Furthermore, a continuous decrease in the number of students in both kinds of organisms continues to increase this gap each year. These students are expected to have at least a part of the knowledge required to do farming and could be designated "good candidates" to become the next generation of farmers, despite nobody in Thailand consider this issue for now. Most of them are farmers' descendants. They have a good attitude toward farming and are interested in becoming farmers. They have a sharp vision of constraints that characterize the settling steps and farm management. Due to the very difficult access to capital and land for these students who are generally from poor families, their only perspective to do farming is to wait to inherit of their parents' farm, which implies a delay of at least 10 years before owning a farm.

In comparing our results with the study of Ruiz Salvago (2018) about Thai rural young willingness to do farming, we can observe that difficulties of farming activity of both samples are similar: the lack of profitability, the high-natural risk and the high initial capital investment except they would face more land access constraints and lack of knowledge about agriculture. The current situation of rural areas does not enable them to become the successful farmers they would dream to be. Young people feel reluctant to make farming their main occupation to support their families since they perceive farming as a fragile and unstable source of income. On the other hand, farming is becoming an occupation of elder people that is hampering the entrance of new technologies an innovation.

This study provides some indication about how to "tap" the potential of current students in agriculture to become the farmers of tomorrow. First, there may be an evolution in the agricultural curricula. Some vocational curricula could be explicitly focused on training young people to become farmers and curricula of this kind proposed by universities could reinforce their support and control in this aim. This would encompass an increase in practical experiences in farmers (e.g., farm visits and internships). It could also involve more capacity-building in terms of marketing and accounting. Second, support could also be provided to help young graduates start their farming activities, in terms of getting access to capital, land, and markets. Third, the involvement of graduates in the already existing farming network should be improved.

7.2 Conclusion

In a nutshell, most students in agriculture curriculums are interested to become farmers. However, due to their lack of resources, they plan to start farming only much later after completing these studies. At the origins of this situation, there are some important constraints characterizing Thai agriculture, especially the lack of support regarding access to capital, access to pieces of knowledge and experience, especially to new technologies used in farming, accountancy, marketing, and business plan creation, and to land. The interest of students in agricultural training for farming was not challenged here, they clearly indicated an interest in being their own boss as farmers.

The objectives of Thailand 4.0 plan to develop agribusiness and turn farmers into 'smart farmers' during next years shall be difficult to reach without an important flow of young people who get involved in the farming sector in the next years. Thailand owns some of the biggest worldwide farming companies (e.g. Charoen Popkand, Mitr Pohl) which can perform in terms of "economic competitiveness". However, the "stability", "equality", and "fairness" of the Thai society, as it is the fourth aims presented in Twenty-year agriculture and cooperative strategy from the ministry of agriculture and cooperatives, need a development of the Thai agricultural sector at human scale, passing through supports to farmers and people who plan to become farmers and have a relevant plan.

Thus, as they have usually limited resources from their family or anything else, a limited number of graduates in agriculture will get involved in farming activity earlier without specific supports created specifically for them. The condition in which students would be ready to do farming is clear: To do a kind of farming more profitable than their parents, with enough capital to settle a sustainable activity and face any constraints usually faced by farmers. Proper public policies at different levels, more cooperation between the ministry of agriculture and ministry of education and more clarity about what it is expected from them could support these students in their farming plan and permit them to settle earlier in life. As characteristics of students are similar to other rural young people, solutions proposed here could be extended to them as the capacity of agriculture training programs could be increased, creating a virtuous circle of farmers training and settlement.

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Appendix 1 – Questionnaire used during students' interview

Trajectories of Thai students in agricultural training and willingness to become farmer

แบบสอบถามงานวิจัยเรื่องแนวโน้มของนักศึกษาเกษตรไทย และความสมัครใจที่จะเป็นเกษตรกร

This interview aims to understand your mindset and view on farming. Based on your experience and point of view, we would like to assess the factors that are important for you in choosing a professional orientation after your studies. The results will be anonymized before being presented and as our goal is to have your point of view, no answer is "bad answer". Following these interviews, an exchange with all the students will be organized in order to reflect on the ideas gathered during this survey. Also, if you are interested in having a brief summary report, we can provide it to you by mail or line at the end of the study.

แบบสอบถามนี้มีจุดประสงค์หลักเพื่อให้เข้าใจความคิดและมุมมองของผู้ตอบแบบสอบถามต่อการเกษตรกรรม คณะผู้จัดทำต้องการประเมินปัจจัยต่างๆที่ส่งผลต่อการเลือกแนวทางอาชีพหลังจบการศึกษา โดยอิงจากประสบการณ์และมุมมองของผู้ตอบแบบสอบถาม ขอย้ำว่า เราต้องการคำตอบที่มาจากมุมมองของท่าน จึงไม่ได้มีคำตอบที่ถูกหรือผิด ข้อมูลจะเก็บเป็นความลับก่อนที่จะนำเสนอต่อไป เมื่อสิ้นสุดการสัมภาษณ์เก็บข้อมูล ทางคณะผู้จัดทำจะจัดประชุมเพื่อสะท้อนให้เห็นความคิดต่างๆที่ได้จากการทำแบบสอบถามนี้เป็นการตอบแทน ซึ่งหากผู้ตอบแบบสอบถามมีความสนใจในหัวข้อวิจัยนี้ สามารถให้ข้อมูลติดต่อ เพื่อให้คณะผู้จัดทำจัดส่งรายงานสรุปไปให้ทางอีเมล์หรือไลน์

Interview number	
Date of interview	
Name	
Organism	
Line/Tel/Mel	

Section A - Personal informations (ข้อมูลส่วนบุคคล)

1. **Respondent's information (ข้อมูลส่วนบุคคล)**

Gender	
Age	

2. **Curriculum information(ข้อมูลหลักสูตร)**

(1) Curriculum(หลักสูตรที่กำลังศึกษา):

(2) year:

(3) Major/Minor (สาขาเอก สาขาโท):

3. Household information (ข้อมูลที่พักอาศัย)

(1) Area of household residence(บริเวณที่พักอาศัย):

Province	
Amphoe	

(2) N. of household members (จำนวนผู้พักอาศัย):

(3) Distribution of activity of family members (ประวัติครอบครัว):

Relationship ความสัมพันธ์	Age (parents) อายุ (เฉพาะผปค)	Main occupation อาชีพ	Second occupation อาชีพเสริม

(4) Are your parents' farmers? (ผู้ปกครองเป็นเกษตรกร ใช่หรือไม่):

(5) If so, what are they doing (crops + animals)? (ใช่ ทำสวนและเลี้ยงสัตว์อะไรบ้าง)

Plot แปลง	Size (raï) ขนาด	Rented /owned เช่า/ของตัวเอง	Crops ปลูกอะไร	Animals เลี้ยงอะไร

Section B- Choice of agricultural studies (สาขาที่เลือกเรียน)

(1) What curriculum did you follow before your current curriculum? In which institution?
เรียนสาขาหรือแผนอะไร จบจากสถาบันอะไร

(2) Why did you choose this organism? This Curriculum/Major/Minor?
เพราะเหตุใดจึงเลือกเรียนที่นี่และสาขานี้ ทั้งสาขาเอกและโท

(3) Did you encounter any difficulties to get accepted and enroll? If yes which difficulties?
พบเจอปัญหาใดๆในการสมัครเข้าเรียนที่นี่หรือไม่ ปัญหาเรื่องอะไร

(4) What were the organisms that you applied, in order of preferences? สมัครเรียนที่ไหนบ้าง ไล่ตามลำดับแรกถึงลำดับสุดท้าย

Rank ลำดับ	Organism สถาบัน	Curriculum หลักสูตร	Reason เหตุผลที่เลือกเรียน
1.			
2.			
3.			

(5) Was this choice a part of a personal plan to work in agriculture? Other employment?
ลำดับที่เลือกเป็นส่วนหนึ่งของอาชีพที่ตั้งใจทำหลังเรียนจบใช่หรือไม่ หรือเพื่อสมัครงานอื่น

Section C –Vision of agriculture (มุมมองต่อการเกษตร)

1. Inspiration and knowledge (แรงบันดาลใจและองค์ความรู้)

Where do you get knowledge about agriculture? Please class your choices in order of importance.
เรียนรู้การเกษตรจากที่ไหน ให้เรียงตามลำดับความสำคัญ

Rank อันดับ	Source of information type เรียนรู้จากช่องทางใด	Specific source วิชา
1.		

2.		
3.		

2. The situation of farmers สถานการณ์เกษตรกรไทย

(1) What aspects of the farmer's profession attract you? What are the advantages of this activity for you? สิ่งที่ดึงดูดให้อยากเป็นเกษตรกรคืออะไร ข้อดีของอาชีพนี้คืออะไร

(2) What aspects of the farmer's profession do you dislike? What are the disadvantages of this activity for you? สิ่งที่ทำให้ไม่ชอบอาชีพเกษตรกรคืออะไร ข้อเสียของอาชีพนี้คืออะไร

(3) Now, in considering agriculture in a global way (not only the way your parents or your neighbors practice it but whole Thai farmers way), range from 1 to 4 the following problems that, in your opinion, are related to farming:
หากมองการเกษตรกรรมในภาพรวม (ไม่ใช่แค่แบบที่ที่บ้านหรือเพื่อนบ้านทำ แต่เป็นที่เกษตรกรไทยทำๆกัน) คิดว่าปัญหาที่เกี่ยวข้องกับการเกษตรดังต่อไปนี้มีความรุนแรงระดับใด เริ่มตั้งแต่ 1 ถึง 4

Score	Description
1	Not a problem at all, I don't see this as an issue ไม่เป็นปัญหา
2	Small inconvenient สร้างความลำบากเล็กน้อย
3	I consider it a major problem มองว่าเป็นปัญหาใหญ่
4	this fact, I am definitely not interested in farming at all. เพราะสาเหตุนี้จึงทำให้ไม่สนใจทำงานเกษตร

1. Hard work and working condition (sun tan, no AC…)
งานหนัก และสภาพการทำงานที่ต้องตากแดด ตัวดำ ไม่มีแอร์ หรือ อื่นๆ

1. ☐ 2.☐ 3.☐ 4.☐

2. Lack of profitability of farming in general (not specifically your parents' farm)
ไม่ค่อยได้กำไร ไม่ใช่แค่เพียงสวนของที่บ้านแต่เป็นงานการเกษตรโดยรวม

1. ☐ 2.☐ 3.☐ 4.☐

3. Lack of opportunity to expand farming business ขาดช่องทางขยายธุรกิจการเกษตร

1. ☐ 2.☐ 3.☐ 4.☐

4. Difficulties to have access to land เข้าถึงที่ดินทำกินยาก

1. ☐ 2.☐ 3.☐ 4.☐

5. High initial capital Investment ต้องใช้เงินลงทุนสูงเมื่อเริ่มต้นธุรกิจ

1. ☐ 2.☐ 3.☐ 4.☐

6. It is a high-risk activity (droughts, floods, pests, lack of water, economic crisis…)
การเกษตรมีความเสี่ยงสูง (น้ำแล้ง น้ำท่วม ศัตรูพืช ขาดแคลนน้ำ วิกฤตเศรษฐกิจ หรือ อื่นๆ)

1. ☐ 2.☐ 3.☐ 4.☐

7. Social status poorly recognized by the population (social recognition)
ไม่ค่อยเป็นที่ยอมรับในสังคม (การเป็นที่ยอมรับในสังคม)

1. ☐ 2. ☐ 3. ☐ 4. ☐

3. Dream farm งานเกษตรในฝัน

(1) Do you have role models concerning agriculture, people who inspire you, make you want to do this job (farmers, teachers, TV, internet…)?
มีแบบอย่างที่ดีในการทำการเกษตร หรือบุคคลที่เป็นแรงบันดาลใจอยากทำอาชีพนี้หรือไม่

(2) Imagine that the problems encountered by farmers today don't exist and that you could establish the farm of your dreams, would you be interested in being a farmer?
สมมติว่าการทำการเกษตรไม่ได้มีปัญหาที่ประสบกันอยู่ แล้วสามารถทำสวนได้อย่างที่ฝันไว้ จะสนใจเป็นเกษตรกรมั้ย

(3) Then which kind of farm would you settle (in term of crops, farmed area, income, location, type of agriculture, time is given to the activity)?
อยากทำสวนแบบไหน ทำสวนอะไร พื้นที่เท่าไหร่ ตั้งอยู่ที่ไหน เป็นการเกษตรรูปแบบใด ใช้เวลาทำสวนอย่างไร

Categories	1	2	3	+
Plants				
Animals				
Area				
Income				
Location				
Type of agriculture (philosophy followed)				

เกษตรกรรมแนวใด	
Time gave	
Selling way	
Other details	

Section D – Relation to study & Professional insertion

1. Training การฝึกอบรม

(1) Did you participate in some applied work at the college/Faculty? If yes which kind?
เคยทำงานร่วมกับทางวิทยาลัย หรือคณะหรือไม่ เป็นงานแบบไหน

(2) Are you involved in a personal farming project (college land, faculty land, personal)? If yes which activity, which selling way?
ตอนนี้ทำโครงการการเกษตรบ้างหรือไม่ เช่นทำสวนที่วิทยาลัย ที่คณะ หรือ ทำเองที่บ้าน ทำออกมาวางขายที่ไหน

(3) Did you do some internship during the curriculum? If yes which kind?
ระหว่างที่เรียนได้ฝึกงานหรือไม่ ฝึกงานอะไร

Year ปี	Length of time ระยะเวลา	Type of farm งานสวนอะไร	Type of work งานประเภทใด	Feeling ความรู้สึก

(4) What knowledge and techniques learned during your course will be most useful for your future career? คิดว่าที่เรียนมา มีความรู้หรือเทคนิคไหน ที่มีประโยชน์เอาไปใช้ทำงานในอนาคตได้มากที่สุด

(5) What do students do after finishing the curriculum according to you?
คิดว่านักเรียนส่วนใหญ่ทำอะไรเมื่อเรียนจบแล้ว

2. Professional environment สภาพแวดล้อมเรื่องการทำงาน

(1) Do you know company or organism likely to hire or support you in your professional plan? รู้จักบริษัทหรือองค์กรใดที่อาจจะว่าจ้างหรือให้การสนับสนุนแผนอาชีพที่วางไว้หรือไม่

Section E – Professional plan แนวทางอาชีพ

(1) What do you plan to do just after finishing your current curriculum? Please give details
หลังเรียนจบแล้ว วางแผนทำอะไรต่อ

☐Continue your studies, details เรียนต่อ

☐Work in your parent's farm รับช่วงต่อที่บ้าน

☐Establish your own farm ทำสวนของตัวเอง

☐Work in the field of agriculture, details ทำงานที่เกี่ยวข้องกับสาขาการเกษตร

☐Work in other sector, details: ทำงานสาขาอื่น

☐Does not know yet ยังไม่แน่ใจ

☐Other, details: อื่นๆ

(2) What would you like to do in 10 years? อยากทำอะไรต่อในอนาคต 10 ปีข้างหน้านี้

(3) Do you plan to become a farmer? วางแผนจะเป็นเกษตรกรหรือไม่

a.☐ **Yes ใช่,,**

(3.1a) Which kind of farming? จะทำการเกษตรด้านใด

(3.2a) Under which conditions? โดยมีเงื่อนไขอะไรบ้าง

(3.3a) Now I will present you 4 categories of difficulties farmers can face. For each, tell me if it could be a real difficulty for your farm plan or not and why (why yes or why not)

ต่อไปจำพูดถึงอุปสรรคทั้งหมด 4 เรื่อง คิดว่าเรื่องไหนจะเป็นอุปสรรคปัญหาที่น่าจะเจอ เมื่อทำสวนของตัวเอง เพราะอะไร หรือคิดว่าจะไม่เจอ เพราะอะไร

☐ Capital เงินลงทุน จะหาจากไหน รู้เรื่องสินเชื่อรายย่อย หรือเงินกู้ดอกเบี้ยต่ำหรือไม่ (microfinance, low interest credit)

☐ Knowledge องค์ความรู้อะไร เช่น การทำการเกษตร (Farming skill) บัญชี (accountancy) การตลาด (marketing) หรืออื่นๆ (etc.,) หาจากไหน (which support?)

☐ Land ที่ดิน

☐ Access to market and bargaining power มีช่องทางขายของ มีอำนาจต่อรอง
(How) What do you need to improve your access to the market? จะเพิ่มช่องทางเรื่องนี้อย่างไร

(3.4a) What are the other difficulties you think you could face? คิดว่ามีอุปสรรคอื่นๆไหม

(3.5a) What is your plan to overcome these difficulties? จะเอาชนะอุปสรรคนั้นๆอย่างไร

b. ☐ No ไม่:

(3.1b) What are the personal reasons why you reject farming? เพราะเหตุใดจึงไม่ทำการเกษตร

(3.2b) Could you change your mind under specific conditions? สิ่งใดที่จะทำให้เปลี่ยนใจได้

(4) If Government was creating tomorrow a support program for young farmers, what kind of support would you need to make your professional plan happen and be successful? Please give details สมมติว่ารัฐบาลจะจัดทำโครงการสนับสนุนเกษตรกรรุ่นเยาว์ คิดว่าต้องการการสนับสนุนด้านอะไรเพื่อทำให้แผนอาชีพที่วางไว้เกิดขึ้น และประสบความสำเร็จ

☐No idea

☐ Access to land เข้าถึงที่ดิน

☐ Access to credit เข้าถึงการกู้ยืม

☐ Access to training/studies เข้าถึงการศึกษา การอบรม

☐ Access to farm machinery เข้าถึงเครื่องจักรกลทางการเกษตร

☐ Access to technical support เข้าถึงการช่วยเหลือทางเทคนิค

☐ Access to plant varieties and animal breed เข้าถึงสายพันธุ์พืชและสัตว์ที่หลากหลาย

☐ Access to market เข้าถึงตลาดกระจายสินค้า

☐ Enhance the heritance system ปรับปรุงระบบการรับช่วงต่อกิจการให้ดีขึ้น

☐ Social reforms (in order of enhancement of healthcare? education, etc. in rural area) ปฏิรูปสังคม (เพื่อปรับปรุงการศึกษา ระบบอนามัย หรืออื่นๆให้ดีขึ้นในพื้นที่ชนบท)

☐Financial assistance to farmers เงินช่วยเหลือเกษตรกร

☐Others (specify) อื่นๆ (โปรดระบุ)

Do you have any question concerning our work? มีข้อสงสัยเกี่ยวกับงานของเราอยากสอบถามหรือไม่

Appendix 2: Actions to support the installation of young farmers

Imagine that you are Minister of Agriculture (or a representative at Provincial level, and that you have a limited budget to provide support so that graduates of agricultural colleges/universities start soon after work.

Please assess the importance you would give to each action.

For young people that would like to farm but who have difficulties doing so

Lack of capital

- ☐ Subsidies to buy a small piece of land and equipment and to pay for farming costs during the first years
- ☐ Loans at a reduced rate, no need to pay back during the first 3 years
- ☐ Subsidies to set up new infrastructures in a family farm, "farming transition subsidies" (i.e.: setting eco-tourism project, investment in hydroponic material...)
- ☐ Others: _____
- ☐ No idea

Lack of knowledge

- ☐ Training on farming practices on the type of farming the young person wants, by the college of agriculture
- ☐ Internship in farms where the young person wants to farm and mentorship by an experienced farmer
- ☐ Training on accounting skills
- ☐ Training on marketing and communication skills
- ☐ Support for the preparation of a business plan before installation, to discuss the hypotheses
- ☐ Support for accounting/management decisions (people come to farms) during the first 5 years
- ☐ Support for technical farming (plant and animals' disease management, climate management…) (people come to farm)
- ☐ Others: _____
- ☐ No idea

Accessing land

- ☐ Possibility to sign a land rent contract for at least 10 years: the owner cannot put the lessee out as long as the lessee pays.
- ☐ Providing pensions to old farmers if they retire and they give their farm to a young farmer
- ☐ Definition and implementation of a maximum price for purchasing agricultural land at the district level, and the same for renting land
- ☐ Others: _____
- ☐ No idea

Getting initial access to market

- ☐ Support to organize online marketing
- ☐ Support to participate in agricultural fairs
- ☐ Support to get involved in networks of farming selling the same products
- ☐ Help in getting certification
- ☐ List the selling points in a district (i.e.: create an information database…)

- ☐ Support transportation to selling the place
- ☐ Others: _____
- ☐ No idea

1. <u>Other actions to help make farming more attractive</u>

- ☐ Full scholarship for agricultural BWS, including living costs
- ☐ Farm production insurance (crops and animals)
- ☐ Organize a pension system for farmers
- ☐ Others: _____
- ☐ No idea