

The Comparison of Organizational Structure and the Context of Rural Development by Agricultural Extension System at Grassroots Level between Thailand and China

Patana Sukprasert¹ Ming Zhan² Anan Lila³ Navarat Narapiromsuk⁴
and Boonrat Sookmark⁴

ABSTRACT

This study focused on comparison of rural development by agricultural extension system at grassroots level and their contexts between Thailand and China. Difference in contexts such as ecology, society, economy and policy has made Thailand and China differentiate in setting up of agricultural extension system at the grassroots level. Agricultural Technology Transfer and Service Center (ATTC) at sub-district level, the lowest level of extension institution in Thailand, was established in 1999 to fulfill the policies of decentralization, participation, bottom-up to top-down direction, and provide the integrated service to farmers through “one-stop service”. The core structure of ATTC is the steering committee, who is elected from local farmers and other sectors that represent the community to make developing plans in a participatory way under the help of facilitators from governmental institutions and volunteer groups. ATTC is the center not only for technology transfer, but also for integrated service, coordination and information. To the large extent, ATTC represents the broader socio-economic, people-centered agricultural extension. Meanwhile China has Township Agricultural Techniques Extension Station (TATES) at the grassroots level of extension institution. TATES, compared with ATTC in Thailand, is a conventional extension agency that adopts technical-driven development methodology. Organizational structure of TATES was set up by the classification of different agricultural sectors, like field crop, fishery, animal husbandry, agricultural machinery and agricultural economy, which are called “five stations”. In addition most of the TATES have the input sales branches.

¹ Department of Agricultural Extension and Communication, Faculty of Agriculture, Kasetsart University, Bangkok 10900, Thailand.

² Agronomy Department of Huazhong Agricultural University, Wuhan, China 430070.

³ Development of ATTC Section, Department of Agricultural Extension, Ministry of Agriculture and Cooperatives, Bangkok, 10900, Thailand.

⁴ Department of Agricultural Extension, Ministry of Agriculture and Cooperatives, Bangkok 10900, Thailand.

The extension agencies in TATES are mainly the same responsible for transfer technology through direction to and cooperation with the demonstration farmer households as in ATTC. It is noticeable that China has advocated multi-faced extension approaches, so should the extension agencies, education, research institutions, and private sectors can jointly play roles on the arena of rural development by non-profitable or profitable manners.

Key words: rural development, agricultural extension, Agricultural Technology Transfer and Service Center, Township Agricultural Techniques Extension Station

INTRODUCTION

The term rural development is a comprehensive and multidimensional concept, connoting overall development of rural areas with a view to improve the quality of life of rural people. It encompasses the development of agricultural and allied activities, village industries and crafts, socio-economic infrastructure, community services and facilities, and, above all, the human resources in rural areas, which is the end-result of interactions between various physical, technological, economic, socio-cultural and institutional factors (Singh, 1999). In this sense, rural development can not be carried out by any one independent entity. It needs a network of connecting and coordinating every relevant entity and sector to serve and drive rural development. Undoubtedly, the system of agricultural extension is one of necessary choice to address this issue. This could be testified by the multifaceted goals and various functions of agricultural extension which have been developed gradually. Agricultural extension is generally recognized as an essential mechanism for formulating and disseminating knowledge, and teaching farmers to be competent decision makers (Swiss Agency for Development and Cooperation, 1997). In some Asian countries like Indonesia,

Philippine, Thailand, Singapore, etc, where farmer-centered extension is advocated, agricultural extension is described as ‘a form of non formal education for farmer and farmers-households to develop their dynamics and capacity to increase the quality of life and their role in and control over agricultural development’ (Dinamis, 2002). Although it is acceptably difficult and complex to evaluate the impact of agricultural extension on rural development, positive changes are proved that, there have been brought out by agricultural extension in aspects of awareness, knowledge, adoption, productivity of farmers (Swanson *et al.*, 1997; Rola *et al.*, 2001). These results undoubtedly addressed the issues of rural development and thus pushed it forward.

Point out that either a narrow technical-driven development or a broader socio-economic and client-oriented development has been brought out under dissimilar extension policies, approaches and philosophy in different countries. Agricultural extension has continually adjusted itself to adapt the changing environment driven, especially nowadays, by the forces of globalization, democratization, information technology breakthrough, environment concern and sustainable development. Qamar (2002) summarized the global trends and challenges in agricultural extension in the near future which have

just appeared in some countries. Those trends and challenges include broadening roles of extension, decentralizing extension services, privatizing extension work, participation, applying electronic information technology to extension work, etc.

Out of question, it is significant and meaningful to share the experience of rural development between Thailand and China facing the same challenges.

Both Thailand and China are the Asian agricultural countries, though both of them are striding forward to the industrialization. Agriculture and the rural economy have been highlighted and regarded as an important part of the national economy. Undoubtedly, agriculture has redounded upon to the whole nation development with great contributions, and will go on the way.

Since the very beginning of 1980s with policy reform launching, China has entered the take-off period of economy, and made great achievements in economic and social development. Agriculture and rural economy have not been neglected while the industrialization ran forward fast. In China, agriculture has always been regarded as an important part of the national economy. For the past 40 years agricultural policy has been drafted in accordance with the principle that ‘agriculture is the basis of the national economy and “grain” is the basis of that basis’. Deep reforms have taken place in the agriculture and rural areas since 1980. Now the rural people in China have transformed from the landless to the land-contracted owners, from the starvation plight to the sufficiency of food, from the administration-ordered worker to the free-will producer. Agricultural productivity has been promoted dramatically so that China can

support the livelihood of 22% of the world population with only 7% of the world’s total arable land.

Thailand began to introduce modernization in the early of 1960s, which was about 20 years earlier than China. After that Thai economy has grown rapidly with approximate 10% growth rate of GDP, only except the interruption by economic crisis in 1997. Thai agriculture also obtained rapid development. Benefited from the rich and diversified natural resource, Thai agriculture has not only made great contributions to meet the necessities of domestic consumers, support industries, but also devote a lot to the world. Now, Thailand is taking the lead in the world in terms of exports of rice, rubber, Black Tiger Prawn (National Identity Board Office of the Prime Ministry, 2000). In the same time, Thailand is the region’s largest exporter of chicken meat. It feeds some four times its population from less intensive agriculture than its neighbors.

The background of Thailand and China’s rapid improvement on agriculture and rural economy, it can not deny and replaced the great functions in agricultural research and agricultural extension. The history has proved that sustaining high levels of agricultural production and income is not possible without an effective agricultural extension service supported by agriculture research to diffuse the technologies to farmers widely and duly. Grounding on this point, it is possible and necessary for Thailand and China to share the experiences from their similar via different in each cases including basic conditions.

Moreover, both Thailand and China are nowadays confronting and should not shirk the

common task of sustainable development of the world especially in agriculture and other common challenges as described above. The common tasks and challenges make it necessary for both of the countries to learn, communicate and cooperate in many fields, especially how to develop the rural area by agricultural extension.

Beside being WTO member, China is facing the big competitive challenge from the international market. It is also necessary for China to learn the experience of Thailand agricultural extension how to serve the export-oriented agriculture.

Objectives of the study

(1) To Comparatively study in the context of agricultural extension between Thailand and China, to find out the reasonable explanation for the existence of agricultural extension in Thailand and China, including their constraints.

(2) To Compare the agricultural extension system at grassroots level in Thailand and China.

METHODOLOGY

This report was finished by adopting the following methods within the scheduled by eight-month study period during Nov, 2002 to Aug, 2003:

- Documentation by extensive literature review of relevant concepts, facts. The literature includes books, official reports, documents, journal articles, research reports, and conference and seminar papers.

- Collecting and analysis the statistical data from the trusty institutions, such as national and international special statistical institutions

- In-depth interview with officials, professionals in governmental agencies (Department of Agricultural Extension, Agricultural Extension Offices in Ayuttaya, Nonthaburi Provinces and ATTC at sub-district level), Subject Matter Specialists in Kasetsart Universities.

- Systematical observation to the work of ATTC and its training course

RESULTS AND DISCUSSION

Comparison of context in agricultural extension between Thailand and China

1. Agro-ecological context

The kingdom of Thailand is located in the heart of the southeastern Asian mainland, and covers an area of 513 thousand square km², extending from north 5°30' to 21°, and from east 97°30' to 105°. The topography of Thailand is quite diverse, comprising mountains, plateau, plains and peninsulas. Thailand is a warm and rather humid tropical country. Under the influence of monsoon climate, the majority of Thailand experiences average annual rainfalls between 1100 to 1500 mm (National Identity Board Office of the Prime Ministry, 2000). Temperature variations among seasons are mainly small. Cool season temperatures in January range from around 26°C to 28°C for most of the kingdom. During the hot season, The temperature ranges from 28°C to 32°C. March and April in Thailand is considered to be fortunate for having few natural disasters when compared to neighboring countries. Apart from an occasional flood and drought, typhoons originating from the southern China Sea rarely are against the country. Thus it can be seen that Thailand is

endowed with rich natural resource in terms of water and heat which foster the fruitful and diverse agriculture. Thailand is affluent in forest resources under nourishment of monsoonal climate. However, area of forest is increasingly dwindling due to excessive utilization through illegal logging, land encroachment, and shifting cultivation. From 1975 to 1998, the agricultural land increased from 18 million hectares to 21 million hectares (41 percent of the total land, figure 1), and meanwhile forestland decreased from 21 million hectares to 13 million hectares (25 percent of the total land). This may reflect forestland encroached by agriculture. In 1998, of the total agricultural land accounts for paddy land

50.55%, while 22.28% is field crops land, 19.23% is fruit trees land and the rest 8 percent is all other land(Figure1).

China is the third largest country in the world, locating in the east of the continent of Eurasia, extending from 4°15" to 53°31" of north latitude, and 73°43" to 135°5" of eastern longitude, with total territory of 9.6 million km². Topography of China is various and complex, including mountainous land, possessing 33 percent of the total area, plateau land 26%, hilly land 10%, basins 19%, and plains merely 12%. Basins and plains, which mostly distribute in the eastern region, are principal farming land, only holding 31 percent of the total area (Xu and Peel,

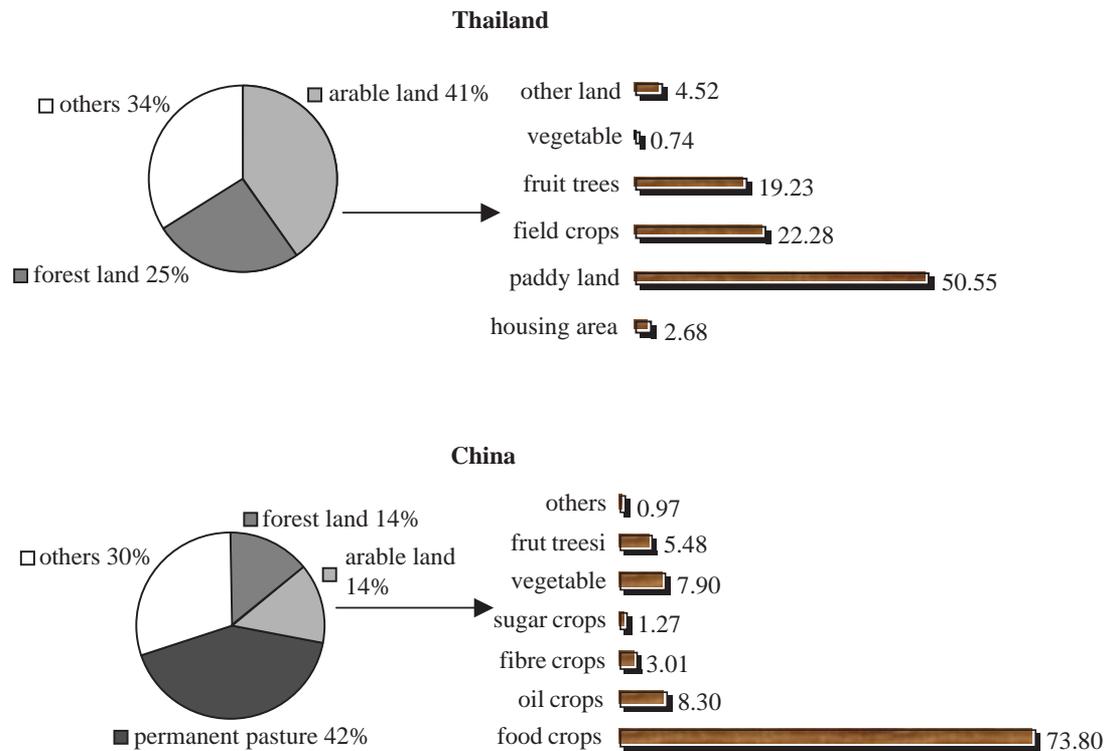


Figure 1 Land use and utilization of arable land (1998).

Source: Agricultural Statistics of Thailand Crop Year Book; Statistical Yearbook for Asia and the Pacific.

1991).

Under the influence of its geographic location, both monsoon climate, and continental climate prevail in China. The specific climate in China is characterized by being warm- humid in summer and south-eastern region, but cold- dry in winter and north-western region. The mean annual rainfall all over the country is 630mm, but gradually decreases from south-east coastal region of 1500-2000mm to north-west of even less than 200mm. The seasonal distribution of rainfall in most parts of China shows a concentration of the rains in humid summer. Often one-half of the year's rainfall, or even two-thirds in some places, fall in the summer. Serious spring droughts are therefore common in northern China. Except its spatial and temporal regularity, the rainfall in China varies quite significantly from year to year. Such variations incidentally cause droughts and floods in most of China. The territory of China is mainly covered with three larger groups of land resources, forest land, grassland and arable land. Because of encroachment of agriculture and other uses, area of forestland and grassland has been decreasing in recent three decades. In 1998, area of forest accounts for 13.9 percent of the total land, arable land of 14.1 percent, permanent pasture of 42 percent, and other uses of 30 percent (Figure1). Most of the arable lands distribute in the eastern and north-eastern plains, and some basins in central-western regions. Arable land is lack, with only 14 percent of the total land area—about 135 million hectares—being used for agriculture. In 1998, the area of agriculture, arable land is mainly occupied by food crops of 73.08 % to the total, oil crops 8.30 %, fiber crops 3.01 %, sugar crops 1.37 %, vegetables 7.90

%, and fruit trees 5.48 % (Figure1).

Both Thailand and China are confronting the common ecological problems, such as deforestation, biodiversity losses, depletion and deterioration of natural resources, environment pollution (United Nations Development Programme, 1999; National Report---China, 2002). Therefore, both of the countries attach importance on sustainable development, and have taken actions, from which agricultural extension can not be excluded. It is necessary for both of the countries, even other countries all over the world, to share the experiences in any sector of sustainable development.

2. Socio-economic context

(1) Per capita arable land

Under the modern monarchy society of Thailand, the land is legalized to the private, which results three existing types of farmers, namely farm-owned farmers, farm-rent farmers and labour farmers. In 1999, the average per capita arable land in Thailand maintained to 0.29 ha, higher than that of world average of 0.24 ha per capita, and almost three times of that of China (Table 1). On the contrary, China has implemented the socialist public ownership of land since the establishment of People's Republic of China. Farmers hire the field from the nation and collectives by the household contract responsibility system which has been implemented for more than two decades (Deininger and Jin, 2002). As a consequence, the distribution of land in China is more egalitarian than the distribution of income. Even though the land area cultivated per capita averaging 0.11 ha, is small by international comparison of 0.24 ha per capita. The shortage of land resource

is the major constraints for agricultural and rural development in China.

(2) Agricultural production

Agricultural production in Thailand has witnessed the increasing trend, with 7.09 billion \$ of 4.7% growth rate in the beginning of 1980s, up to 13.8 billion \$ in the end of 1990s (Table1). Field crop production is the leading sector of agriculture, though its contribution to the total production has decreased slightly during the past 20 years, with accounting for 51.77% of the total in 1999. Another important sector in Thailand is fishery production, whose contribution to the total mounted up rapidly from 6.51% in 1981 up to 21.13% in 1999.

Comparatively, agricultural production in China has gone up fast with 5.9% growth rate in 1980s and 4.1% growth rate in 1990s. Similarly, field crop production is also the leading sector in China; its contribution to the total decreased from 75.6% in 1981 down to 57.5% in 1999. It is different that the second important sector in China is livestock production, with contribution of 18.4% in 1981 up to 28.5% in 1999.

As for the productivity of agriculture, China has lead ahead far to Thailand in terms of per arable land agricultural production and index number of per capita food production during the recent two decades (Table 1, Figure2).

Table 1 Socio-economic factors of Thailand and China.

Country			Thailand			China		
			1979-81	1989-91	1998-2000	1979-81	1989-91	1998-2000
Per capita arable land (hectare)			0.39	0.36	0.29	0.10	0.11	0.11
Total value (billion US dollars)			7.09	11.91	13.80	110.11	150.11	296.12
Agricultural production	Shares by different	Field crops	64.88	57.37	51.77	75.64	63.09	57.53
		Livestock	9.71	11.80	9.66	18.42	26.47	28.54
	agricultural activities	Fishery	6.51	13.60	21.13	1.71	5.93	10.31
		Forestry	5.87	2.24	1.01	4.23	4.51	3.61
	(%)	Agricultural/ processing service	13.03	14.98	16.43	/	/	/
Per hectare agricultural production (\$/ha)			379.34	574.71	766.48	792.98	1,142.47	2,187.66
Contributions of agricultural production to GDP (%)			21.44	12.65	11.20	31.80	24.47	17.63
Contributions of agriculture to total export (%)			66.34	35.29	24.85	22.81	15.87	7.84
Index numbers of per capita food production			100	112.5	130	99	135.2	209.9
Per capita net income of farmers	Cash (US\$)		129.74	254.73	589.54	125.05	131.43	261.14
	Share of farm income		47.33	32.88	32.43	78.20	74.44	57.24
	Share of non-farm income		52.67	67.12	67.57	21.80	25.56	42.76
Rural Population	Number (million)		32.40	37.89	34.37	795.65	852.80	818.61
	Shares of the total population (%)		72.3	67.3	56.7	80.61	73.63	64.2

Source: Agricultural Statistics of Thailand Crop Year Book; Statistical Yearbook for Asia and the Pacific; statistical book China.

Agriculture and rural economy has taken on the important role in the scope of national economy both in Thailand and China. This can be testified by its contributions to the GDP and foreign trade. During the past four decades, agriculture sector's contribution to GDP declined steadily from about 40 percent in 1960, to 21.44 percent in 1981, then to 9.12 percent in 2000 (Table1, Figure3). This change is due primarily to the rapid expansion of other sectors of the economy, and does not mean that agriculture in Thailand is retrogressing. Instead, Thailand agriculture has developed steadily, and being a major source for export and balancing the international trade. Prolific land has presented Thailand to rank ahead among the agricultural exporting countries. Its rice, rubber, shrimps, etc. are exported to many countries. In 1999, exports of agricultural products amounted to only about 24.85 percent of total exports compared with the share of 66.34 percent in the beginning of 1980s (Table1, Figure4). Compared with Thailand, China agriculture's share of GDP is quite higher than that of Thailand, about 31.8 percent in 1981 and 17.63 percent in 1999. However, agriculture's contribution to export in China is far lower than that of Thailand, basically due to meeting self-consume by large population and increasing industrial products export. During 1981 to 1999, agriculture's share of total exports declined from 22.81 percent to 7.84 percent.

(3) Rural population

National Population Policy was adopted in Thailand as early as 1970; it set out to achieve a rapid reduction in rate of population growth. The rate of population growth has now fallen to below 1.1 percent per annum, less than a third of the 1960

figure (United Nations Development Programme, 1999). During the recent two decades, rural population has increased slightly. The percentage of rural population to the total declined from 72.3 percent of 1980 to 67.3 percent of 1990 and 56.7 percent of 2000, due to rural labor gradually shifting to the other sectors (Table 1).

China ranks top in terms of large population, though Chinese government has pushed strongly population control policy from the beginning of 1980s, whereas this lagged behind 10 years to Thailand. In recent decades the proportion of population in rural areas has been decreasing as to the country has become more industrialized in 1980, 80.6 percent of the population worked in agricultural sectors, by 1990 this figure had fallen to 74 percent, and by 2000 was 64 percent (Table 1). Although the proportion of the population engaged in agriculture is falling, the actual numbers of people so engaged are still so large that the serious problem of surplus labour in the rural areas began to emerge. This is a thorny obstacle to rural development, and forces a big challenge to Chinese government. Restrictions on the activities of the labour force were abolished, and the government permitted and even encouraged the peasants to work in non-agricultural sectors in the rural areas. As a result a part of the agricultural labour force has shifted into other sectors in the cities. Two ways of urbanization and booming township enterprises are thought effective and necessary to solve rural labour surplus in China, which have been guaranteed by the policies (China development gateway, 2003; National Development and Reform Commission, 2000).

(4) Farmers' income

Nowadays both of China and Thailand can feed their population at basic needs level and still have surplus. That how much profit is obtained from the farmland has become the first of all concerns in both of the countries. Although China agricultural productivity is far higher than that of Thailand, farmers' per capita income of China is dramatically lower than that of Thailand compared in the same period, mainly due to the large population base (Table 1, Figure 5). In terms of income sources, China is utterly different from Thailand. Farming is the crucial channel for farmers' income in China,

despite its shares of the total income has declined in recent two decades. On the contrary, non-farm income in Thailand has prevailed over the on-farm income since the beginning of the 1980s. So raising farmer's income is the pivot of China government work and longstanding goal of agricultural extension in China.

3. Policy context

Policy is one of the key factors to determine the direction of agricultural and rural development through allocation of natural, economic, manpower

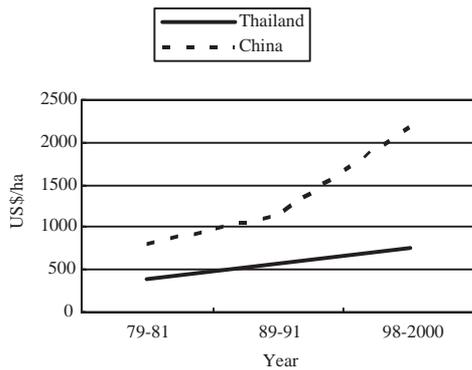


Figure 2 Per hectare agricultural production of Thailand and China.

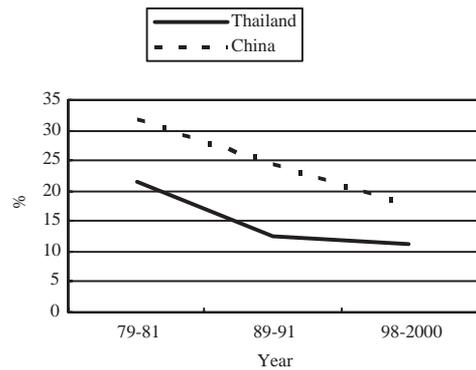


Figure 3 Contributions of agricultural production to GDP.

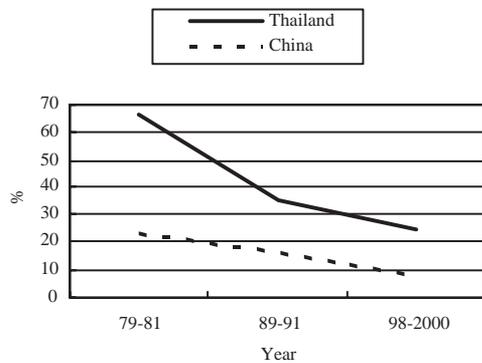


Figure 4 Contributions of agriculture to total export.

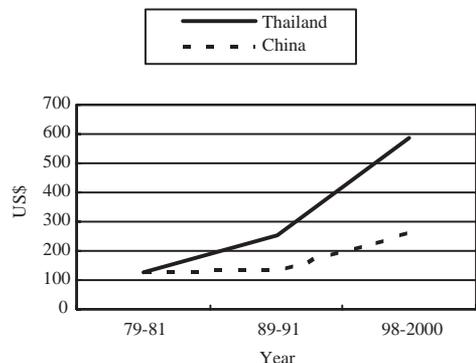


Figure 5 Per capita net income of farmers.

resources and guarantee the developmental priorities. All without exception, both Thailand and China have launched the policies to pursue the goal of increasing agricultural production and improving rural living standard. The difference has only existed in the aspect of strategies (Figure 6).

Thailand has made enormous strides in the general area of governance in the past three decades. After embarking on the first Economic and Social Development Plan (NESDP) in 1961, the Thai government has so far launched nine such plans. Thai government has placed great emphasis on

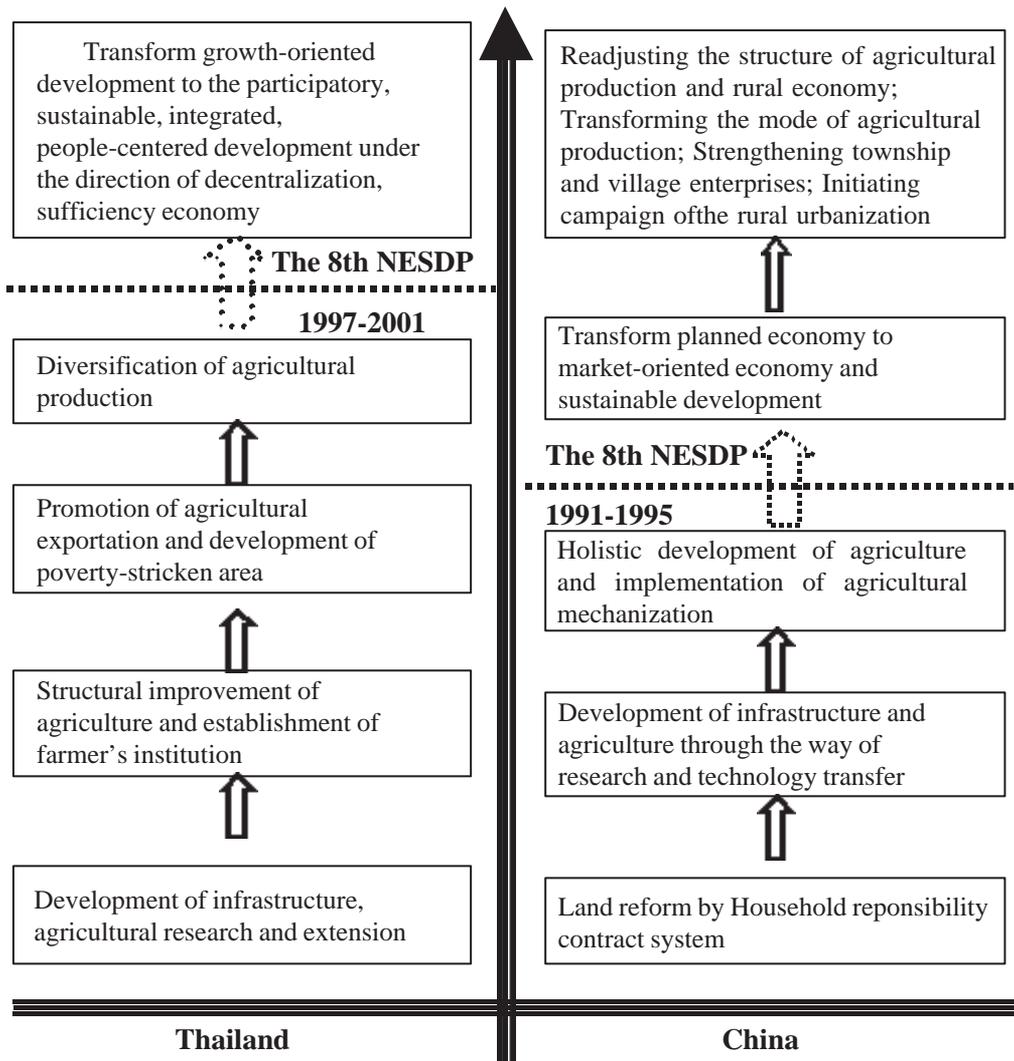


Figure 6 Policy reform of National Economic and Social Development Plan for Agriculture and Rural Area in Thailand and China.

Source: adapted from *The National Economic and Social Development of Board of Thailand, 2002*; *National Development and Reform Commission, China*.

agricultural and rural development since the time prior to the commencement of the first NESDP. Prior to the Eighth NESDP period (1997-2001), the policy commenced on emphasizing agricultural infrastructure development such as construction of irrigation, formulation and implementation of programs and projects, and improvement of agricultural research and extension services, then undergone the agricultural structural improvement and establishment of farmer institution, adjusted agriculture for export-orientation after entering 1980s, and then readjusted agricultural structure for diversification purpose in the early half of 1990s.

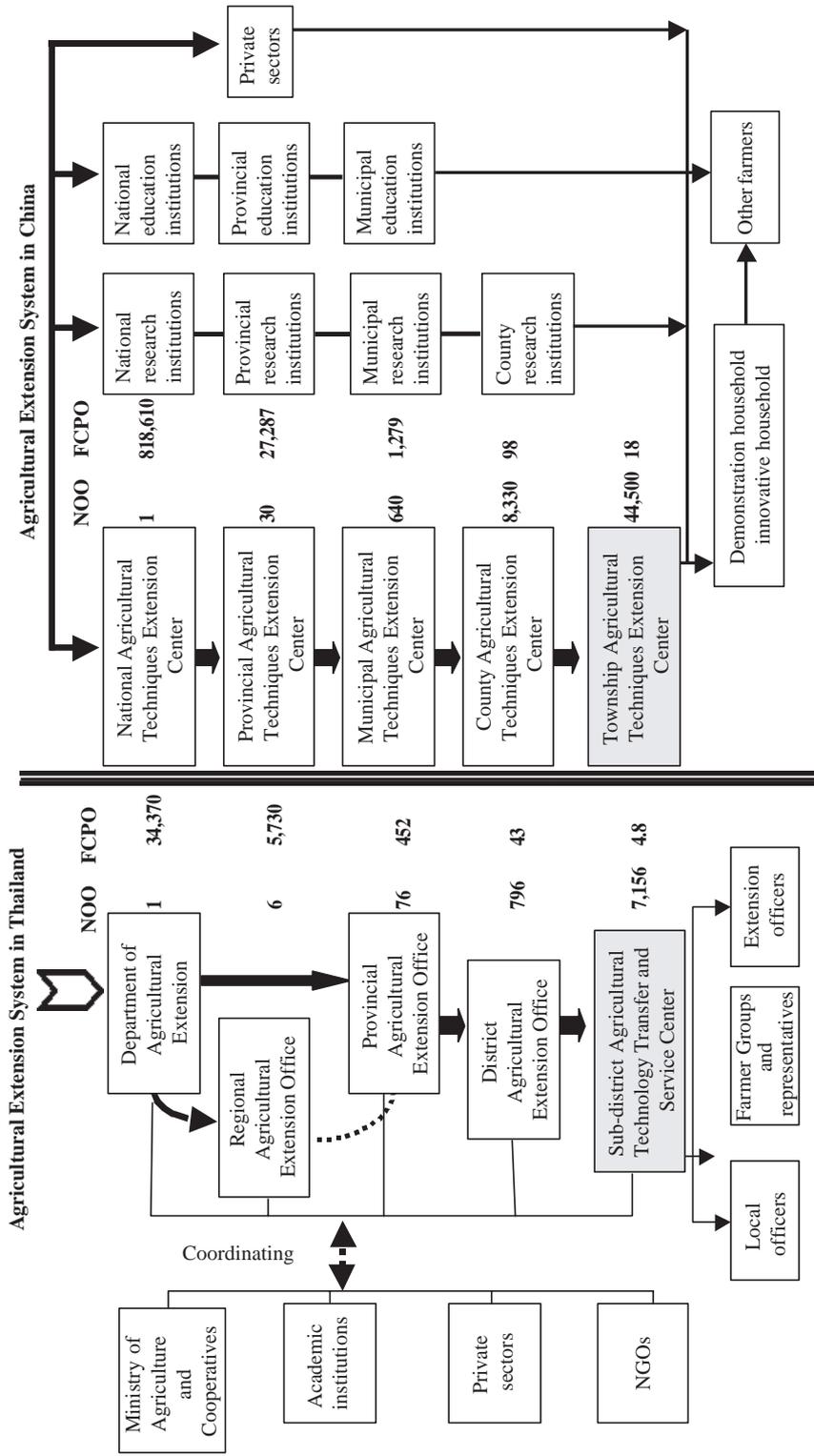
From the Fifth Plan, the clear policy on rural development has just come on, and the special project of poverty-relief has been campaigned. Since the Eighth NESDP period, Thailand has transformed itself with the new philosophy and vision of development, shifting from the growth-oriented, environmental-unfriendly, top-down direction to people-centered, sustainable, decentralized and participatory development on the basis of sufficiency philosophy. Deep reforms of the institution have been witnessed in recent years, including agricultural extension system.

Since 1949 China has launched ten National Economic and Social Development Plans (NESDP), which have always followed out the theory to Marxism, "Agriculture is the basis of national economy". These specific policies have made great achievements in terms of agriculture, rural economy and farmers' development, through implementing the reform of land tenure, the strategies of depending on technology and education to prosper agriculture and rural areas, agriculture industrialization,

development of township and village enterprises, and sustainable development of agriculture. Prior to the Eighth NESDP period (1991-1995), the policy accentuated increasing food production and reviving rural economy by developing infrastructure, agricultural research and technology transfer, later focused on holistic, all-around development of agriculture. Like Thailand, China has undergone the deep reform as well since the Eighth NESDP period. The system of economy has been transformed and gradually pushed deeply from the planned mode to the market-oriented one. Deep reforms have continued to be made in terms of readjustment of agricultural and rural economic structure, the mode of agricultural production increase, strengthening township and village enterprises, initiation of rural urbanization and sustainable development.

4. Institutional context

Both Thailand and China have a long history of agricultural extension of more than 50 years. On their developing road, deep reforms for agricultural extension systems have taken place aiming to adapt changing environment which existed in and carry out their new missions endowed by the nation. The current agricultural extension systems in Thailand and China are the offspring of heritage from the old ones and fruit from the various reforms. The systems of agricultural extension in both countries are divided into 5 levels from the government to villages, from top to bottom in line with the administrative division system (Figure 7). Lowest level, namely grassroots level, extension institution in Thailand goes to Agricultural Technology Transfer and Service Center at sub-district level (ATTC), well



Note: NOO: number of offices; FCPO: thousand farmers covered per extension office
Figure 7 Comparison of agricultural system between Thailand and China.

Source: adapted from foreign relations sub-division, DOAE, Thailand.

Township Agricultural Techniques Extension Station in China. They will be highlighted to discuss in this paper.

However, the agricultural extension system in Thailand is apparently distinguished from that of China. Differences can be identified as follows:

1) Agricultural extension system in China is many-headed, except the major extension institutions of National Agricultural Techniques Extension Center (NATEC) and its mirror organs at different level, education, research institutions and private sectors also conduct extension activities independently. Especially, private sectors are playing more and more important role in technology diffusion and rural development. So sometime it appears disorder and effort-repetitive. But in Thailand, the extension is mainly operated by Department of Agricultural Extension (DOAE) and its operating organs at different levels through coordination with other institutions and private sectors by coordinating committees. Such institutions as education, research, NGOs run very few extension projects or services independently in Thailand.

2) In China, the number of farmers covered by every office at different level is remarkably higher than that of Thailand, due to its vast land and large population. Especially at the grassroots level, every extension center at township level burdens 18,000 farmers, while only 4,800 farmers for every ATTC in Thailand. But Thailand has higher ratio of extension agent to farmer families as 1:1,000, than that of China with 1:610.

3) The organizational structure of Chinese National Agricultural Techniques Extension Center is devised more detailed in specific agricultural

sectors (Table 2). The structure of DOAE in Thailand is more comprehensive with correlative units merged into one division or bureau, which is the outcome of Bureaucratic Restructuring Reform on October 3, 2002 (Foreign Relations Sub-division, DOAE, Thailand, 2002). This embodies the integrated work style of Thai agricultural extension system. Besides, DOAE of Thailand has some unique organs, like Agricultural Extension Research and Development Division, Bureau of Technology Transfer Development, Bureau of Farmers Development. These organs are the corresponding organizations to implement the policy of promoting farmer's participation and developing farmer's capacities. But in NATEC of China, such organizations have not been established to follow out the new policies of farmer's participation and capacity-building.

4) Thailand has a quite long history of development of the farmer's organization which could be traced back to 1928. Prior to the Ministry of Agriculture and Cooperatives, cooperative activities were the responsibility of various government agencies. In 1972, farmer's cooperatives were initiated by Ministry of Agriculture and Cooperatives, and developed rapidly after that. There are two important types of farmer's organization: agricultural cooperatives and farmer groups; both of which receive support from the Ministry of Agriculture and Cooperatives (Falvey, 2000). Nowadays farmer organizations in Thailand almost cover half of farmers. They are not only the objects of agricultural extension service, but also the important facilitators for agricultural extension and rural development.

Farmer organization in China is still in the sprout period because of Chinese history, culture and

Table 2 Comparison of organizational structure at top level in Thailand and China.

	Thailand		China
Identical functions	Office of the Secretary		Office of the Secretary
	Personnel Division		Personnel Division
	Finance Division		Finance Division
	Information Center		Computer Division
	Bureau of Seed Multiplication		Training Division
	Specific Areas Agricultural Development Division		Socialization Service Division
	Bureau of Agricultural Product Quality Development	==	Soil Division
	Bureau of Agricultural Commodities Promotion and Management	==	Fertilizer Division
	Agricultural Extension Research and Development Division		Breeding good Strains Division
	Bureau of Technology Transfer Development		Seed Test Division
			Grain and Cooking Oil Division
			Crop cultivation Division
			Pest and Disease Information Division
			Pest and Disease Control Division
Different Functions	Bureau of Farmers Development		Plants Quarantine Division
			Chemical and Equipment Division
			Economic Cooperation Division

politics. In the late of 1980s, Small-scaled agricultural technology associations such as a sericulture association and duck-raising association, a new strand of rural economic organizations, were set up by peasants in order to exchange professional skills in some regions. Some of these associations later developed into unions of processing and sales, prospering in early 1990s. The groups were promoted by provincial science and technology societies and supported by the agricultural sectors, local government and academic circles. (Li Qian, 1996) Despite the early success, a variety of factors prevented the associations from gaining mainstream recognition and they remained under-developed in the countryside. Even today, there is still no agricultural association at a

national level in China. But these Technical Associations have no strict organizational system, diversified functions, only focusing on the techniques exchange. They are quite different from the farmer organizations in other countries. It is more impending and necessary to develop farmer's organizations only which can really represent and protect farmer's interests in domestic and international competitions in new economic era after entering WTO.

Comparison of agricultural extension sub-system at grassroots level between Thailand and China

It could be drawn from Figure7 that agricultural extension systems both in Thailand and China nearly compare to the hierachical pyramid on the broad

ground of extension units at the grassroots level. The substrate organization is called **Agricultural Technology Transfer and Service Center at sub-district level (ATTC)** in Thailand, which was just established four years ago. Whilst in China the bottom organ is known as **Agricultural Techniques Extension Station at Township level (TATES)**, it is still the remainder of the extension system formed 20 years ago, though it has been changed in some extent. The ATTC is evidently distinguished from the TATES. The differences are to be elaborately explored in the following text.

1. Comparison of development of ATTC and TATES

Development of ATTC

The formation of the Agricultural Technology Transfer and Service Center (ATTC) could not be separated from the campaign of UNDP project. In 1999, the UNDP project, “capacity building in sustainable agriculture” was carried out in 8 provinces. This project required one center to develop the learning process of the farmer about agriculture, to motivate and facilitate farmers to participate in the development of the community through sharing the ideas and making plans based on the data of the community. Those centers generated some enlightenment and became the prototype of ATTC. Meanwhile, the development of ATTC also benefited from, even was the result of the New Constitution which promulgated in 1997. The constitution of 1997 endorsed the principle of decentralization and participation of the people in more explicit terms than ever before. To keep with the Constitution, the Ministry of Agriculture and

Cooperatives has reformed its mandates. The change in policy directives was to encourage the participation of local communities in formulation of plans and projects that are consistent with the needs of the communities. Under such background, Tambon Agricultural Technology Transfer Centre came into the world with the legislative guarantee. On Nov 21, 2000, under the suggestion of the committee of ministries, 8 ATTC were set up for pilot projects in different regions. In 2001, 107 ATTCs were founded for main units in 76 provinces and 23 sites of UNDP project, and in 2002 ATTC was developed in 867 districts for extension scale that increased the number of ATTC to 974. In 2003, ATTC is planned to expand to 7125, almost covering all the sub-districts in Thailand. Now ATTC is getting under way, though it still needs to be perfected.

Therefore, The ATTC is deemed as an effective tool designed by the MOAC in response to the directive of the Constitution to involve local communities in the formulation of natural resource management, agricultural production and marketing plan formulation. It is generally anticipated to play a functional role in developing networks and in facilitating exchange of information and experiences among communities. Its mission is stipulated to transfer agricultural knowledge and provide one-stop services to local farmers through the concept of farmer’s participation in the process of systematic thinking, making decision, formulating and managing their own farm plans. The implementation of ATTC is carried out on the basis of community-centered development by providing opportunity to farmers in the community to analyze and solve existing problems by themselves.

Development of TATES

The current extension system in China was formed in 1995 on the basis of former one established in 1979. The notable result should go to the changes in structure of the National Agricultural Techniques Extension Center (NATEC) with merging the National Plant Protection Center (NPPC), the National Soil and Fertilizer Center (NSFC), the National Seed Management Center (NSMC). Hence, the system of extension became more concise on administration with the same function. But the organizational structure of TATES has changed slightly. By the end of 1998, the number of the agencies of agricultural extension on crop planting at township level had reached 44,500 agencies with 221,000 staffs. The staffs per extension agency average to 6. Even though the number is tremendous, 30% of the total townships still have not covered by the TATES (National Agricultural Techniques Extension Center, China. 1995). Due to the flexible extension policies in China, the structure and extension approaches of TATES slightly vary in different regions according to their respective agro-ecological, administrative, social-economic context. Here just pick up the conventional one to compare with ATTC in Thailand.

2 Comparison of philosophy and principle of ATTC and TATES

Philosophy and principles of ATTC

Sukprasert (2002) defined the philosophy and principles of ATTC were

- ◆ Stick to the philosophy of sufficiency;
- ◆ Participation of all stakeholders from the community in every step of development, including

potential, problem and needs analysis, community development planning, plans implementation and monitoring, evaluation;

- ◆ An integrated working unit at sub-district level characterized by One-stop service;
- ◆ Stress on human resource development via reforming and strengthening the learning process;
- ◆ Decentralization according to constitution
- ◆ Work from Bottom-up to Top-down direction
- ◆ Both transferring technology to and learning from farmers

Philosophy and principles of TATES

- Stick to the Marxism of “agriculture is the basis of the national economy”.
- Regard “increasing agricultural production and upgrading rural welfare” as the ultimate goal.
- Emphasis on technology-oriented development.
- Work under the Top-down direction.
- Attach importance to the farmer’s feedback

3. Comparison of organizational structure between ATTC in Thailand and TATES in China

Structure of ATTC

1) Location: The offices are located in community areas which are easily accessed and are scattered in every Tambon all the whole county.

2) Office facilities: working spaces; meeting room; relevant information, technical document and publication to serve farmer’s inquiry or self-study center.

3) Steering committee: The steering committee is appointed from community

representatives and state officials whose duties are to manage the center implementation. Currently, in the communities with higher potential and readiness, the steering committee usually consists of 14 members, 7 from government organizations and 7 from farmers of the community, which come from the following scopes:

- *Chairman: At present, chief of district agricultural extension office has been assigned to be a chairman of the committee.*

- Five more representative from farmers and farmer groups

- *Representative from sub-district administration board*

- *Representative from agricultural district office*

- *Representative from community development district office*

- *Representative from animal husbandry district office*

- *Representative from co-operatives district office*

- *Representative from fishery district office*

- District permanent secretary

- Director of the center: Extension agents in responsible for sub-districts acts as the director, and coordinate with the steering committee and representatives from various government agencies in carrying out relevant activities

The main tasks of the steering committee include the followings:

- Analyze problems and needs of the communities through farmer's participation in the process of information analysis and decision-making for their farm plan.

- Draw up community plans that can respond to farmer's need in such sub-districts.

- Propose projects which are formulated from the community plans to working groups at district and provincial levels for consideration and financial support.

- Map out sub-district action plan; resource persons training plan; arrange training and farm visit; extend farmer's access to other areas; and oversee all works as planned.

- Publicize the information of ATTCs, so farmers can gain knowledge on crops, animals, fisheries or other related farm occupation continuously and increasingly including the agricultural product farm price.

- Develop the potential of farmers to improve their activities and living by participatory learning process.

- Coordinate with superior committee and other organizations.

With the capacity developing of farmers, the responsibility of management of ATTC will be transited to farmers, which is in line with the ATTC principle and ultimate goal of self-management by farmers. The representatives from the government (*italic label*) will be withdrawn from the steering committee. The chairman will be selected from the farmers. But the director of the center will be kept for the extension worker in sub-district. In 2003, in some early-developed and ready ATTC, the composition of steering committee was changed as above statement. For example, the steering committee of Bangraknong ATTC in Monyang district, Nonthaburi province, which is one of eight pilot units of ATTC, changed to be composed of 13

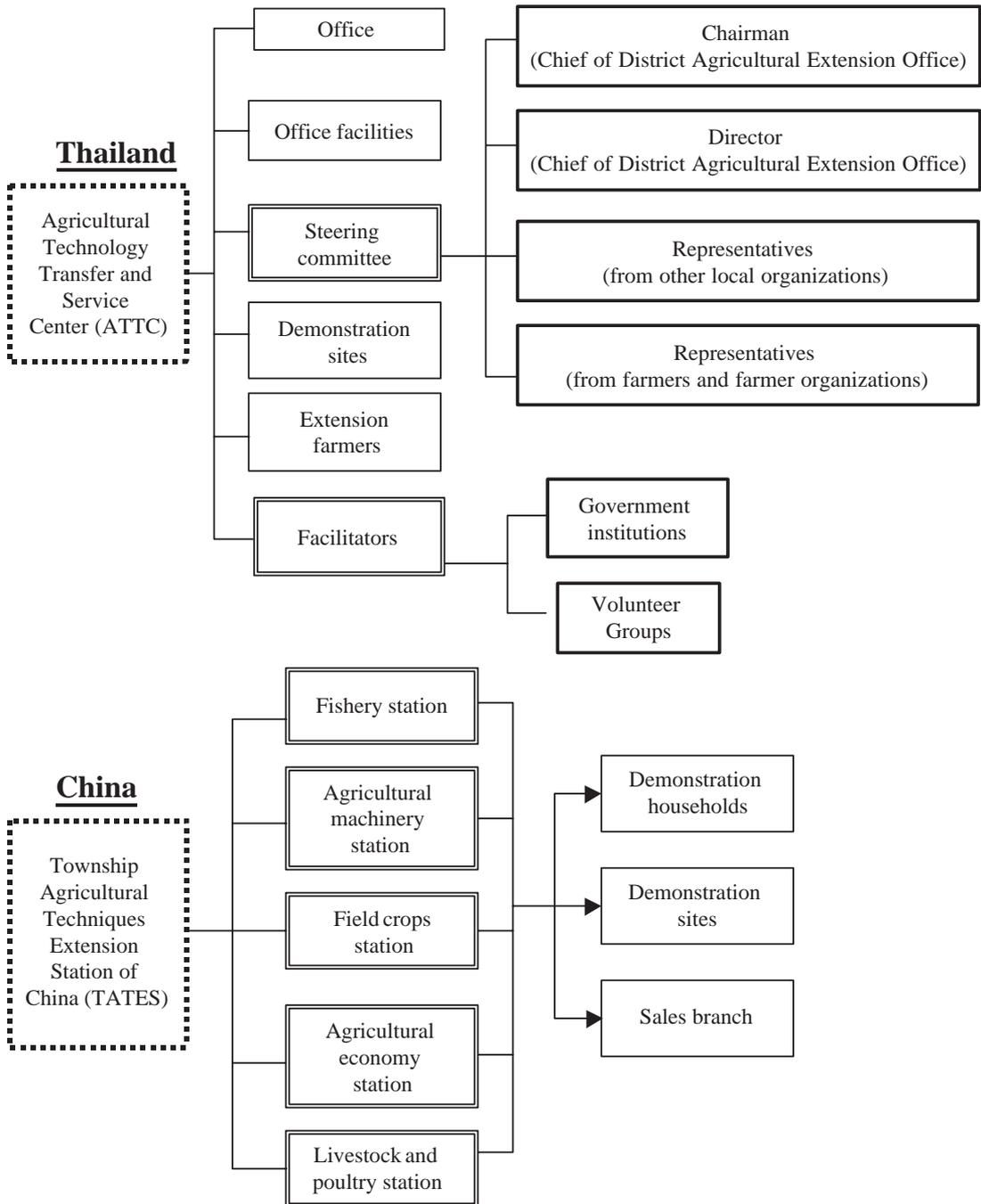


Figure 8 The structure of ATTC and TATES.

farmers and one extension worker as the director of the center. Bangraknong Tambon is near to Bangkok, farmers mainly produce horticulture products, herbs and vegetables. In this Tambon, the farmers have good knowledge and high ability of production management and trade. By interview the director of the center about the work of steering committee was found that the steering committee can work well in terms of sharing the information, situation analysis, decision-making and planning.

4) Demonstration sites: Outstanding sites/farms located in sub-districts are selected to be demonstration sites where government organizations provide supports and conduct on-field training courses. For example, in Pattalung province there are 3-6 demonstration sites in every Tambon. Owners of the demonstration farms often act as resource persons to transfer knowledge and skills to other farmers. In some ATTC, demonstration sites are the main bases for farmer field school.

5) Extension farmers: Extension farmers are those in that area who were chosen to attend the training implemented by centers, and have a potential to utilize their knowledge and skills to assist their neighbors and communities.

6) Facilitators:

- Governmental institutions: support and develop the work of ATTC in terms of policy, finance, human resource training, information, materials, technology etc. One of the important facilitators is Bureau of Technology Transfer Development under Department of Agricultural Extension. It was just set up during the reorganization of DOAE in 2002, and was mandated to be responsible for developing and supporting the work

of ATTC.

Volunteer group: for example, in Pattalung province there are volunteers from different farmer groups and other sectors to help the steering committee work in terms of planning, information and data collection, accounting etc.

Structure of TATES in China

1) “Five stations”: Since 1979, five types of Agricultural Techniques Extension Station were established at township level, namely ¹⁾Field crops Station, ²⁾Fishery Station, ³⁾Livestock and Poultry Station, ⁴⁾Agricultural Economy Station and ⁵⁾Agricultural Machinery Station. In some diversified regions where fishery, animal, fruit and field crop productions coexist, usually these five stations had been synchronously set up in order to transfer technology for every agricultural sector. However, in some regions where only one or two agricultural production sectors are highlighted, maybe only one, two or three stations exist. In spite of any type of the station, it averagely has six staffs, four of which are identified as the “technical extensionists”.

2) Demonstration sites: Extension work in China is chiefly driven by the momentous national agricultural extension programmes and projects, such as the Spark Project, the Harvest Project, the “Vegetable Basket” Project”, etc. Under these projects support, almost every TATES has the experimental and demonstration sites, on which the adaptive research of new agricultural technology is conducted and demonstrated to farmers. Other demonstration sites can be set up on the farmer’s field through negotiation or other approaches.

3) Demonstration households: The TATES

usually seeks the voluntary and skillful farmers as the demonstration households. Under the guidance of extensionist, the demonstration farmers apply the new technology to their field production. Consequently, their success will attract more farmers to learn and adopt new technology.

4) Input Banks or Sales Branch: Suffering from the financial pressure, the agricultural extension institutions at the county and township level are allowed to run the profitable entities. A quite great number of TATES had opened the Sales Branch, like seeds, fertilizer, pesticides, and agricultural machines repair. This module of agricultural extension system is called “combination of techniques and substance”. This way really makes for raising income of extensionists and stabilizing the extension team, as

well providing to farmers inputs with good quality and convenient access.

4. Comparison of functions of ATTC and TATES

Functions of ATTC (Figure 9)

Information center: ATTC offer the following information service:

- u Data base of the resource, environment and social condition in the community;
- u Forecasting information of natural disaster, crops pests and diseases protection, etc;
- u Data and information of agricultural technologies, marketing and other knowledge in forms of books, periodicals, brochures, etc.

Participation center: ATTC are like the

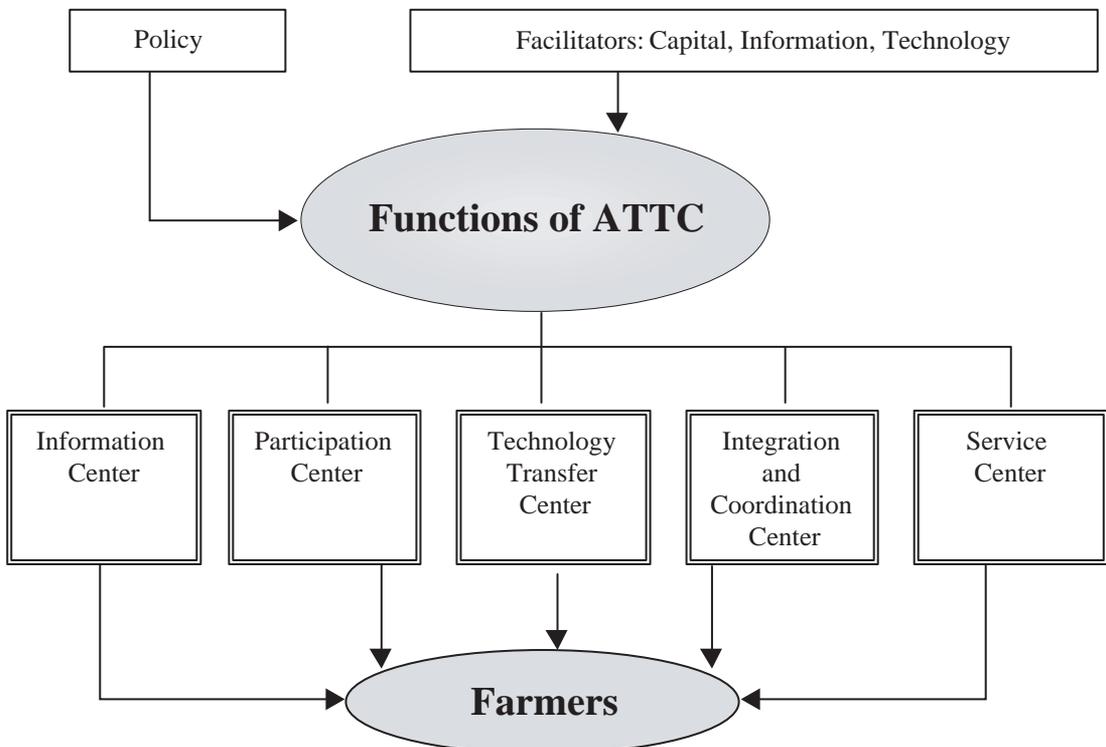


Figure 9 Functions of Agricultural Technology Transfer and Service Center at sub-district.

stages where farmers and other stakeholders get together to participate in the community development in the following aspects through the management of steering committee:

- ◆ Discuss and analyze community potentials, problems and solutions;
- ◆ Formulate community development plan;
- ◆ Propose specific agricultural development projects of the community;
- ◆ Form the action plans;
- ◆ Coordinate the implementation activities among the farmers.

Technology transfer center: ATTC are responsible for organizing activities of technology transfer.

- ◆ Collect and definite the farmer's technology needs;
- ◆ Determine the demonstration site at farm level for specific technology;
- ◆ Organize the training and learning activities.

Integration and coordination center:

- ◆ Integrate efforts from different departments under Ministry of Agriculture and Co-operatives to develop community efficiently and entirely;
- ◆ Coordinate involved GO and NGO agencies to support farmers.

Service center: ATTC integrate all the service relating to agriculture under the direction of one-stop service. Services that ATTC offer are as the following:

- ◆ Offer input service in terms of purchasing/ordering production inputs (such as seeds and fertilizers) and their distribution;
- ◆ Offer market service by providing the

information of agricultural production contracts, and agricultural products trade/sale;

- ◆ Offer law consultation service.

Functions of TATES

The township station is the agent at the grassroots level who is working directly with farmers. The township station focuses on:

- On-site advice, training and supervision for new technology transfer to farmers
- Providing information and developing technical handouts for farmers
- Assisting village farmer's associations

CONCLUSIONS AND RECOMMENDATIONS

Thailand and China both regard agriculture as one vital part of their national economy, as discussed above, the ways to agricultural and rural development by agricultural extension tracked by the two countries are evidently distinguished from each other.

Thailand introduced modernization in 1960s, 20 years earlier than China, meanwhile, has steered its agriculture to be export-orientated also is prone to be impacted by the international market. This situation deeply affected to agricultural extension system in Thailand. China agricultural production has increased markedly, nevertheless mainly been consumed in the domestic market. But from the second half of 1990s, China has strived to break loose of planned economy and projected the way of market-oriented economy, which is being accelerated by the push of entrance to WTO. However, China

still needs to go a long way to adapt international market well. Thailand implemented population control policy in 1970s, 10 years earlier than China. So Thailand has no as serious population pressure as China that resulting in resource shortage. Just as discussed above, per capita arable land of Thailand (0.29 ha in 1999) is almost 3 times that of China (0.11 ha in 1999). Though China has pushed strict population control policy, surplus of rural labor has been foremost constraint to further rural development, due to the large population and a larger portion of that living in rural area compared with Thailand. This is the root cause for other problems, like shortage of land resource, low income in reverse high land productivity. In Thailand per capita arable land is larger as approximate 3 times as that of China, which is possibly an important reason for higher income of Thailand farmers than China farmers, other than the factors of policy direction, natural resources, etc. Moreover, the conceptual of development in Thailand has shifted from technology-base, resource-base to human resource-centered one, and rural human resource has been attached more importance through participation in various trainings and farmer's organizations. Now China began to pay attention to develop the capacity of farmers.

Differentiated in social, economic, and ecological contexts have shaped different agricultural extension system and its roles, approaches, extended content in Thailand and China. This is mainly embodied agricultural extension at grassroots level in both countries.

In Thailand, the key body of agricultural extension system is Department of Agricultural Extension and its subject organs, which conducts

extension work through cooperation with other institutions by coordinating committee at different level. ATTC, as the lowest level extension institution in Thailand, was just established in recent 4 years to operate the community-centered development policy of decentralization, bottom-up to top-down direction, participation and integrated service. It can be concluded that ATTC is just a place where farmers represented by steering committee to join together to make their own development plans and received any help by one-stop service. Here, the extensionist became the important facilitator of organizing farmer's activities and linking farmers with various sources. In this sense, ATTC is no longer the conventional extension agency which focuses on technology transfer.

Comparatively, Agricultural extension system in China is marked with multi-faced scene of co-acting by National Agricultural Technique Extension Station (NATES), research institutions, education institutions and private sectors. Although NATES is the major extension institution, research and education institutions are mandated to independently conduct the extension activities. TATES, as the grassroots level extension institution under NATES in China, is a conventional extension institution shouldering the main task of technology trial and extension. The structure of TATES is set up by classification of different types of agricultural sectors, such as field crops, fishery, animal husbandry, agricultural economy, agricultural machinery, which are called "five stations".

No matter what types of agricultural extension system in Thailand and China, both of them can adapt to their context to a large extent, moreover

have made great contributions to rural development. It is widely accepted that developing rural human resource by agricultural extension is the necessary and ultimate way to rural prosperity. China has attached importance and still needs more efforts to develop rural human resource. If in order to suit for this transformation, it can not be avoided to reform the extension system, especially at grassroots level. Out of question, ATTC in Thailand is a good example for China on how to adjust the organization of extension institution at grassroots level to better build up the capacity of farmers.

Meanwhile, the multi-faced of agricultural extension system in China could offer useful reference to Thailand. Especially since economic crisis in 1997, agriculture extension in Thailand has confronted financial pressure. To some extent, it will ease the situation up to explore other agricultural extension approaches in Thailand.

In addition, both Thailand and China should realize and have realized that the agricultural and rural development have come into a new stage of economic globalization and sustainable development. The policy, the setup of agricultural extension system, and extension activities should be adjusted in line with this trend.

LITERATURE CITED

- China development gateway. 2003. *Rural surplus labor destined for towns to aid urbanization*. Available source: <http://www.chinagateway.com.cn>
- Deininger, K. and S. Jin. 2002. *Land rental markets as an alternative to government reallocation?: Equity and efficiency considerations in the Chinese land tenure system*. World Bank Policy Research Working Paper 2930.
- Dinamis. 2002. *Improving Agricultural Extension*. Decentralized Innovation and Action for Managing Improved Services, cooperative Programme between the Indonesia and the British.
- Economic and Social Commission for Asia and the Pacific. 2002. *Statistical Yearbook for Asia and the Pacific, (1985, 1991, 2001)*.
- Falvey, L. 2000. *Thai Agriculture Golden Cradle of Millennia*. Kasetsart University, Bangkok, Thailand.
- Foreign Relations Sub-division, DOAE, Thailand. 2002. *Introduction to Department of Agricultural Extension*. Department of Agricultural Extension, MOAC, Thailand.
- Ministry of Agriculture & Cooperatives. 2002. *Agricultural Statistics of Thailand Crop Year Book (1980-2001)*. Bangkok, Thailand.
- National Agricultural Techniques Extension Center, China. 1995. *Construction and Management of Agricultural Techniques Extension Center*. Chinese Agriculture publishing house. (Chinese)
- National Development and Reform Commission. 2003. *China: The Tenth Five-Year Plan for National Agriculture and Rural Economy Development (2001-2005)*. Available source: <http://www.sdpc.gov.cn>.
- National Identity Board Office of the Prime Ministry. 2000. *Thailand into the 2000's*. Kingdom of Thailand. Bangkok, Thailand.
- National Report---China. 2002. *Make Green Development A Choice*. United Nations

- Development Programme, 2002.
- National Statistical Bureau. 1999. *Statistical Yearbook China, 1999*. China.
- National Statistical Office, Office of Prime Minister, Thailand. 1999. *Statistical Yearbook Thailand, 1999*. Thailand.
- Qamar, M.K. 2002. *Global Trends in Agricultural Extension: Challenges Facing Asia and the Pacific Region*. Paper presented at the FAO Regional Expert Consultation on Agricultural Extension, Research-Extension-Farmer Interface and Technology Transfer, Bangkok, Thailand.
- Rola, A.C., J.B. Quizon and S.B.Jamias. 2001. *Do Farmer Field School Graduates Retain and Share What They Learn?: An Investigation in Iloilo, Philippines*. Available source: <http://www.workbank.org>.
- Singh, K. 1999. *Rural Development: Principles, Policies and Management*. Sage Publications India Pvt. Ltd.
- Sukprasert, P. 2002. *The Development of Agricultural Technology Transfer and Service Center for Improving of the Pending Farmers*. Department of Agricultural Extension, MOAC, Thailand.
- Swanson, B.E., R.P. Bentz and A.J. Sofranko. 1997. *Improving Agricultural Extension: A Reference Manual*. Food and Agriculture Organization of the United Nations.
- Swiss Agency for Development and Cooperation. 1997. *Agricultural Extension*. Swiss Agency for Development and Cooperation Agricultural Service, Switzerland.
- The National Economic and Social Development of Board of Thailand. 2002. *The Development Study on Human Resources Training/Development in the Context of Economy in Rural Areas*. International Development Center of Japan (IDCJ).
- The Operating Center for Agricultural Technology Transfer Promotion. 2002. *Sub-district Agricultural Technology Transfer Center*. Brochure of Department of Agricultural Extension, MOAC, Thailand.
- United Nations Development Programme. 1999. *Human Development Report of Thailand 1999*. United Nations Building, Kingdom of Thailand.
- Xu, G.H. and L.J. Peel. 1991. *The Agriculture of China*. New York: Oxford University Press.