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Role of Cottage Industry in the Rural Community "A Case Study in Bane Tonhene, Saybuly District, Savannakhet Province"

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Abstract

A local blacksmith that consists of skilled artisans at making traditional farming tools in Laos has been studied regarding manufacturing system, regional features, the structure of an operating space, and the transmission of technology. In and around a study site, it could be found that only two to three artisans engaged in the workplace, and faced difficulties to keep their successors, relying on the traditional manufacturing skills. Conventionally, two kinds of air blowing system have been adopted among local blacksmiths. It is assertive that an Indo-China style technology secured faster manufacturing process and less number of defective products, while a single-cylinder type blower followed by a Chinese style technology is used at the shanty prepared temporally nearby their home place or paddy field.

Keywords: *Farm mechanization, cottage industry, local blacksmith, technology transfer, Laos*

1. Introduction

Cottage industry is an essential component that leads to the industrial revolution taking place in a certain areas of developing countries. This is a term that was used prevalently since the eighteenth century to describe the home-based system, rather than factory-based one, of manufacturing. The income per capita in 2005 was estimated to be 463US$ in Laos. Agriculturally, subsistence rice farming is its major economic activity, employing an estimated 85% of the population and producing 53% of the GDP (Ministry of Agriculture and Forestry (MAF, 2000); Government and Public Administration Reform (GPAR, 2004). As a means of industrial development, some small-scale businesses have been created, such as sugar cane industry, noodle industry, paper-making industry, salt industry, and other industries. In regard to the manufacture of farming tools, there existed only a few domestic farm machinery manufacturers which provide their own distributors in region level. Their products are produced at small factories such as garages or tiny machine shops with modest facilities (MAF, 1999). These small-scale enterprises have been operated by at most thirty to sixty workers and artisans, but unfortunately their manufacturing skill has stagnated at premature level due to less chance in absorbing higher technology and inadequate institutional supporting systems. On a parallel with it, since the supply volume of products is physically limited, considerable amount of tools and implements are imported from Thailand, China and Japan in the form of replacement (Hopen, 1969; Koike et al., 2005; and UNDP, 2002). Another noteworthy trait of this enterprise is the capability to implement a side-effect which may activate the people's mobility moving from one community to another. The purpose of this research: This study intended to

investigate the following issues in conjunction with the possible rural development. 1). To identify the engineering characteristics of a manufacturing skill used at the blacksmith in Laos. 2). To discuss the interrelationship between local blacksmithing business and mindset of artisans that might be led to possible development of cottage industry.

2. Methodology

At first, the manufacturing information regarding local blacksmithing industry has been collected from relevant literatures (Jinno, 2006; Bealer, 1995). These literatures are informative in dealing with indigenous manufacturing process, technical know-how for fabrication, historical development, social and business interactions requiring entrepreneurship. As a study site is decided in Bane Tonhene, Saybuly District, Savannakhet Province (Sackbouavong et al., 2007), one blacksmith artisan is considered as a respondent. Then, a certain amount of technical data based on individual experiences of another, two artisans have been gathered in January 2005. Afterwards, these data were discussed in part together with the questionnaire survey that was conducted to local farmers. Items of a questionnaire sheet include family structure, family tree, education record, number of employees, selling price of each product, monthly manufacturing volume, availability of raw materials, annual income, institutional support, the way to acquire new skills, and so on.

As it is believed that the facility of workshop varies depending on the ethnic groups, a literature survey has been conducted covering both mountainous and plain areas of Laos. This is a reason why this study dealt with the blacksmiths stretched in wider areas in addition to a study site.

2.1 Indigenous manufacturing method

In Laos, local blacksmiths are not allocated in every rural community, but availed merely several workshops somewhere within neighboring communities. For example, in Japan, it is not too much to say that blacksmiths had been operated at almost all communities as many as 20,000 or more in the early 1940s (The Agricultural Society of Japan, 1979). At these workplaces, the repair work of hoe's share were done cutting off its abraded edge, and added a soft iron by forging for reproduction. This repairing process was regarded as one of most important skills of Japanese blacksmith. On the contrary, an artisan of a study site was apt to treat such an abraded hoe's share as a scrap iron, not a repairable item. In other words, whenever any customer brings in a worn-out hoe to the blacksmith, this item is destined for refining into an iron, and is subjected to serve for the reuse as a hoe or use for making a different items. In this manner, the technical concept in terms of reuse or reproduction of a worn-out item seems to be common in Laos and Japan, but its machining process is obviously different as described above.

2.2 Institutional supporting systems

In this area, the needs of sickle and machete are immense. To cope with such a marketing demand, skills related with blacksmithing practice acquired mainly by artisan's relatives. This narrow network of technical information seemed to hamper the enhancement of manufacturing skills.

Currently, a formal educational system in the form of training program is getting popular at various training facilities provided by both public and private sectors. For the cottage industry, professional individuals are not yet organized in establishing a professional association for skill development. In fact, some manufacturers for agricultural farm tools could be found in Vientiane Municipality but these are still limited in provinces (Table1).

3. Results

3.1 Material Procurement

Since iron is not produced at all in the scale of industry base in Laos, both farming tools and household utensils have carefully been used and manufactured with the concept of recycling as much as possible. This technical service provided more or less minimum

practicality in utilizing several recycling materials on hand. Figure1 demonstrated a punching and forging operations of a machete at a study site.

In fact, as the key manufacturing materials, a leaf spring is mainly used for a machete, a steel bar removed from ferroconcrete structure, and a wheel disk are preferably applied for making a sickle. The wheel disk, leaf spring and scrap iron are dismantled from the truck, jeep and bus. These materials are procured from a dealer of used automobile or a scrap shop that deals with construction materials.

3.2 Manufacturing process

The machining process of a sickle follows somewhat specific procedures as the following detailed explanations.

(1)At the forging stage, the wheel disk was heated at a furnace, and hammered it on an anvil before cut into approximately 60 pieces or more. A prototype or mold of a sickle could be prepared repeating hammering and heating process several times. In the case of a steel bar (Figure2), it comes heating process first then cutting into appropriate size of fragmented pieces prior to succeeding hammering process.

(2)Next step requires another heating, hammering and sharpening arrangement in this sequence. A portion of handgrip is duly provided.

(3)Each tooth of the blade is sharpened by using an electric, polishing grinder.

(4)The serrated teeth along a curved blade were made by using a small, firm chisel. To keep an upright position of a sickle, a temporarily-hired worker supports it by hands for stable work.

(5)The stamping to coin a trademark is to be done manually.

(6)Immediately after heating the whole sickle, it will be taken out and places on the ground. It can be customarily clear that the annealing is not applied in this step.

(7)To remove strains which took place inside a distorted sickle after hardening process, a hammering action applied it by using a steel mallet. A sickle is now ready to polish using the rotating steel brush of an electric grinder. No particular measures are taken to facilitate a rust-proof effect. However, in Japan, a mixed liquid of varnish and thinner is applied for this processing. Since the blade is serrated, it does not be sharpened on a whetstone any longer. The business-based distribution of farming tools is generally in the hands of private traders. There are no large manufacturing factories in Laos, and hence little design engineers exist because of the small number of skilled and qualified engineers working in this area. Generally, most agricultural parts are imported from abroad. After the machines are assembled domestically, they are sold in private shops.

3.3 Technical features and mindset of an artisan

In rural Laos, blacksmiths numbered in the thousands. Because of remote location fairly far from the community, a blacksmith probably kept traditional craftsmanship. The function and social influence of cottage industries, particularly blacksmith shops, could be described as follows.

Like other craftsmen and artists, a blacksmith artisan is seemingly devoted to engage in this professional job, being one in body and spirit. Unlike other artists and craftsmen, however, an artisan is unique in being able to make his own, practical tools. As the circumstances of his trade have changed over the centuries, so did his tools. Old designs were adapted to new uses, or new designs were proposed and fabricated as needed. Consequently, as any well-equipped workshop was likely to have a wide variety of tools, some mysterious in shape and construction, the uses of which could be explained only by the artisans who made and used them. Despite the variety of individual tools, however, there were only five or six categories of tools and equipment, all of which were necessary to the smith down through the ages. Forge and bellows, anvil and slack tub, hammer and tongs, swage and cutter,

chisel and punch, file and drill. These were the basic categories of equipment (Bealer, 1995).

3.4 Receding production volume and its cause

Up to 2000, a blacksmith business was still operated in Bane Venneua, in the neighboring village of Bane Tonhene. In fact, since infrastructure including rural roads has been gradually improved, and some small-scale traders also emerged, most farming tools were imported from Vietnam, China, and Thailand. When import products were strongly dominant, most blacksmith operations faded away. However, even though this enterprise no longer appeared in society, its technology collected from the experience of past generations could be summarized as follow. To make one tool was very hard and difficult work, and it required both charcoal and strength. The blacksmith is precisely capable to identify the quality of a piece of iron. There are two sorts of iron, one is rather soft and the other is hard. When the blacksmith was going to harden a knife, for example, he must know the exact composition of the iron he will use, for he had to accordingly prepare the correct water to harden the knife. If the knife was made of soft iron, he must use cold water to harden it. On the other hand, if the knife was made of hard iron, he must use warm water to harden it. If he used cold water to harden a knife that was made of hard iron, the knife would be prone to break because it may be too hard. Therefore, knowledge about how to make knives and understanding on the engineering characteristics of iron was required to artisans. However, the importance of the blacksmith gradually declined as the industrial business has been advanced. The disappearance of this primitive technology might be due to the following reasons.

Firstly, the fame of each blacksmith propagated in and outside community by word-of-mouth after the sales of products to customers. This is one reason why this business has not been expanded beyond the region. In fact, it was little to hear that an artisan paid some efforts in collecting new technical information for quality improvement. Secondly, severe perspective of business doomed an artisan's hope for future development. At a certain period after ending of the Vietnam War, an artisan relied on the debris of bomb casings to make farming tools whether people likes it or not. Such a reliant attitude toward wartime remaining gradually discouraged youth's participation. This resulted in abundance of the aged at the workplace of blacksmithing which symbolized possible consequence of the shortage of successors. Thirdly, less competitive capability of local products against imported ones caused stagnant entrepreneurship among the people concerned. Once one group of artisans has been tried to organize a labor union or collaborative association quite few years ago, but it failed because of weak economic basement among artisan's members.

4. Discussion

4.1 Two kinds of blacksmithing technology

There are numerous studies of the two kinds of blacksmithing technology in the Indo-China area. Jinno (2006) advocated that, the northern part of Laos has been an area in which these two types have become merged and this technology also spread to the southern part of Laos.

One type of air blower is characterized by a dual-cylinder in which a piston is allocated for each of both cylinders. Each piston is forcibly pushed by hand to send air continuously through an extended tube running from the bottom of the cylinder to the furnace. An artisan sits on a stool while a furnace and an anvil are allocated nearby. This particular set of equipment is tentatively termed "Indo-China style technology" as can be seen in (Figure 03). This is widely adopted by the people of the local community.

Another type of air blower consists of a single cylinder lying on the ground. Two holes at both sides of the cylinder send pressurized air by hand to a single air tube. In this case, an artisan works standing beside the furnace and an

anvil which is firmly inserted into the hard wood. This is referred to as "Chinese style technology" which is widely used among the people of the Northern Part of Laos and also used in study site (Figure 04). They are categorized as the ones who used to practice the shifting cultivation from agronomic standpoint.

4.2 Manufacturing space

Every community does not always have a blacksmith. However, the spatial distribution of artisans is influenced by the recent decrease of the crop acreage under shifting cultivation practices. If the services of an artisan are not available, people is likely to make a manufacturing or repairing request to artisans who live in a neighboring community. As a matter of fact, the so-called "migrant artisan" has not appeared in the past two decades.

The space provided for manufacturing workplace can be as small as roughly 10 m^2. This space is divided into two sections including one for private use and one for on-the-job use.

1) Private use: This space is provided independently to work on forging and successive series of manufacturing processes. Jinno (2006) pointed out that, in the shifting cultivation area, this space is likely to be established on the boundary of a local community, and thus in the neighborhood of the shifting cultivation field. Either noise avoidance or fire prevention might be a possible reason in selecting this site for a blacksmith shop. In fact, accidental blacksmith shop fires are very seldom heard of. Therefore, it can be assumed that noise is the primary reason for such site selection. In recent years, some blacksmiths have been found to be located in the midst of a community. This was assumed to be due to the site of the blacksmith being further surrounded by the developing community year by year.

The structure of an independent working space is supported by plain pillars in the manner of a shanty. In the case of hilly terrain, it is constructed on a flat, terraced area excavated out of a hillside. While a workshop using Chinese style technology is adopted by the northern tribes and is prepared by erecting a wall inside its working space, another type of Indo-Chinese style technology is pursued by local people such as in study site they utilize an open space concept without a wall. In other words, the presence of a wall is related to the color tone of the inside of the furnace and the iron materials used during the forging or welding operation.

2) On the job use: A smithing shop attached to main house consisted of a living room or storehouse at second floor with a smithing shop at first floor. A specific space provided under the eaves or on the bamboo-made balcony is designed to use for an additional blacksmithing working space. It is of interest to note that this space may be widely found either Indo-China, Chinese or inter-mingled type technology. In particular, this space is used to place a furnace and an anvil on the ground while an artisan works sitting on a stool. The manners of manufacturing operation under different working spaces surely varied with both community and architectures structures corresponding to the local people.

4.3 Marketing

Speaking of the selling price of each farming tools (Table 05), a local made product tended to be more expensive than an imported one. It is suggesting that the presence of external competitors in the local market will be inevitable. It can be considered that smaller entrepreneurs, such as individual farmers, could still find it difficult to afford expensive capital equipment, so additional enterprises renting equipment and providing service facilities also need to be encouraged.

In addition, it suggests that one scheme is to implement the blacksmithing enterprises into orbit to help alleviate current stagnant socio-economic situations. Further rooms of communal improvement could be emphasized in view of the public investment program. This is probably another viewpoint in demanding more public support to secure self-reliance for the infrastructure enterprise like a blacksmith.

The Practical features of blacksmithing workshop is that the iron products typically available in the local marketplace include axes for farming use, traditional hoes, plows, machetes, weeding hoes, sickles, digging hooks, saws, cooking knives, and so on (Figure 05). Their morphological characteristics apparently differ according to each ethnic group that produced them. However, despite their variations, they tend to show common engineering features based on lifestyles which can be differentiated in terms of shifting and lowland cultivation. It is likely estimated that the tools' production methods are also affected by the intensification of rice growing practices and the plan for relocating the rural community advocated by the Government of Laos as well.

An artisan who settled in a rural community can produce most of the items described above excluding a plowshare and a hand hoe. People said also that each ethnic group has traditionally produced specialized products. In other words, the combination of manufactured items reflects the inherent manufacturing skills of each ethnic group. This is the matter to be discussed in the future.

The repair of iron products is regarded as a major role of an artisan, and his technical skill level could be said to correspond to the levels of transformation that he can impose on, for example, a machete. Currently, the leaf springs and wheel axles of an automobile or truck, a piece of used rail, a piece of building material, and an iron rod for reinforced concrete are commonly used as the raw materials of iron products. Of these, a machete was made out of a leaf spring. Its manufacturing process required that the leaf spring is to be cut off by using a cold chisel that fashions the initial shape of the machete. After polishing the edges, quenching is applied as the finishing process. And hence, in order to compensate for the mechanical loss of the quenched portions due to the abrasion or breakage at the edges, it is necessary to perform hammering and quenching operations once again. By repetition of the repairing process, both size and shape are transformed, causing the change of cutting quality. For example, a long, thick machete for bush cutting is gradually transformed from a middle- to small-sized one suitable for general purpose cutting whenever recycling. Further use may lead it to become a kitchen knife, or a small knife for bamboo work or shaving, or a sickle for harvesting, after which it is finally discarded as scrap.

5. Conclusions

This field study dealt with the engineering features of Laotian blacksmiths as a part of cottage industry. Selected findings can be described as follows.

1) One of major functions of a blacksmith is to make use of abraded parts in the form of recycling practices.

2) It can be emphasized that the manufacturing process kept traditional skills that resulted in less incentive to attract prospective successors.

3) The production quality has been demonstrating its stable reputation in the market while was impaired by inferior market competitiveness with imported products

4) Features regarding two kinds of blacksmithing technology; i.e. an Indo-China style technology and a Chinese style technology, were discussed and confirmed their dominance for indigenous blacksmithing systems.

5) Necessity to reinforce institutional systems was pointed out in harmony with implementation of well-organized capacity building program.

6. Conflict of Interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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Table1 List of manufacturers for agricultural farm tools

No	Name of manufacturer	Number of workers
1	Repair and Maintenance of Agricultural Farm tools Manufacturer, Thagon (State Enterprise), Vientiane Municipality	30
2	Agricultural Farm Tools Manufacturing and Distribution Co., Thaghon (Private firm), Vientiane Municipality	25
3	Agricultural Farm Tools Manufacturing Co., Lackpat (State Enterprise), Vientiane Municipality	40
4	Vocational, School, Pakpasack, Vientiane Municipality	80
5	School of professional teacher training, Lacksarm, Vientiane Municipality	60
6	School of Technical and Professional School, Savannakhet Province	80

Source: Ministry of Agriculture and Forestry, Lao PDR, 1999

Table 2 Selling price of each farming tools

Items	**Price (kip)**
Machete	30000
Knife	18000
Hoe	12000
Weeding hoe	20000
Digging hook	35000
Sickle	12000
Harrow	15000
Axe	40000
Chisel	25000