

THE ROLE OF LABOUR IN PADDY CULTIVATION OF HINTHADA TOWNSHIP

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Abstract

Hinthada Township is located in Ayeyarwady Region with more than 60 percent of the population living in rural areas. Rural population is engaged in agriculture and it is the main pillar of the economy. But, the role of manual labour force in agriculture changed due to mechanization. The working period of manual labour decreased, because agriculture machineries are being used from land preparation to harvesting. It also affects income of the people living in rural area and it is also one of the causes in rural urban migration. The objectives of the paper are to explore changing working period of manual labour in agriculture, to examine the impacts of mechanization on agriculture labour and economic return, to predict future prospect on the role of labour and to find out alternative ways for local people. Primary data was mainly applied and it was collected through field observation, interviews and questionnaires survey and focus group discussion to get thorough understanding on the role of labour. Quantitative qualitative mixed method will be applied in presenting paper.

Keywords: manual labour, agriculture, mechanization, alternative ways, economic return

Introduction

About 70% of Myanmar's households are rural and rely on agriculture and it is the backbone of the Myanmar economy: the sector accounts for about 30% of GDP, over 50% of total employment and approximately 20% of exports.

In agriculture, although the permanent employees who usually have year-round jobs, and seasonal worker who worked for in the whole growing period of a crop are found in 2000, daily workers or who worked during peak periods have appeared since 2010. After starting mechanization in Myanmar, most farmers reduced the number of workers because heavy works were done by machines. The use of hired labour in rice cultivation shows a proportionate reduction and this indicates the lowering of demand for hired labour. There has been a reduction in total labour usage in rice cultivation (Karunagoda, 2004).

Unemployment and agriculture machinery uses are inter-related to each other. Agriculture provided employment opportunities for rural population in Myanmar. After introducing mechanized agriculture in Myanmar, job opportunities decreased and the role of labour in agriculture reduced.

Paddy is a major crop grown in Hinthada Township occupying large area of agriculture land. Unemployment particularly rural unemployment is a major and worrying problem. Therefore, to present the role of labour in agriculture, labour worked in paddy cultivation is stressed and Hinthada Township was selected as the study area.

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Study Area

Hinthada Township is located in the northern portion of Ayeyarwady Region and the total area of the Hinthada Township is 980.81 square kilometers. Being located on Ayeyarwady Deltaic Area that is known as Myanmar Granary, most of the population engaged in agriculture. In the area, urban population was 28 percent and rural population was 72 percent of total population.

Objectives

The objectives of the paper are

- to explore changing working period of manual labour in agriculture,
- to examine the impacts of mechanization on agriculture labour and economic return,
- to predict future prospect on the role of labour and
- to find out alternative ways for local people

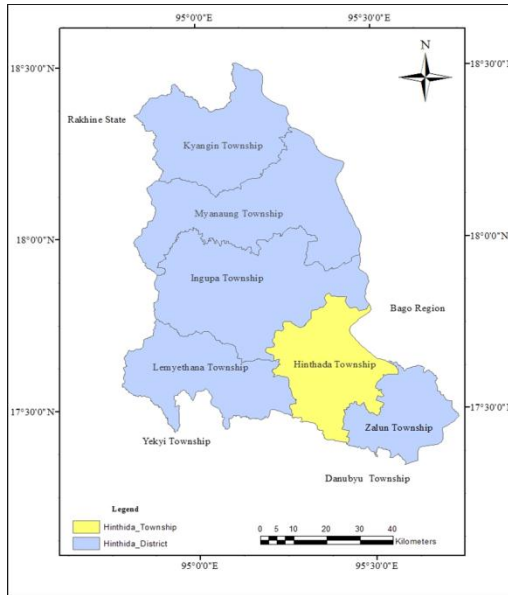
Material and Methods

To present the paper, primary and secondary data were used. Primary data such as types of work, working period, income etc were collected and interviews were done with local authorities, farmers and authorities of the departments concerned. Among 103 village tracts located in Hinthada Township, 10 village tracts were chosen as sample village tracts by random sampling method and 15 questionnaires were distributed to selected households of each village tracts who have experienced more than 20 years. Total 150 questionnaires were applied to present the paper interviewed to get detailed understanding on workforce.

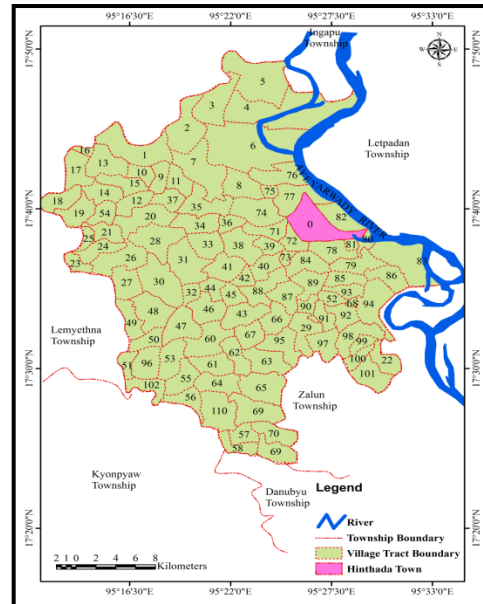
The secondary data were collected from the departments concerned. GIS Techniques were used in portraying maps for crop cultivated areas and productivity.

Description of Study Area

Hinthada Township lies between from North latitudes $17^{\circ} 26'$ and $17^{\circ} 48'$ and also between East longitudes from $95^{\circ} 11'$ and $95^{\circ} 33'$. It is situated on the deltaic plain of Ayeyarwady Region and southern part of the Hinthada District. This township is made up of 21 wards and 103 village tracts that include 820 villages.



Source: Agriculture Atlas, 2000
Figure 1 Location of Hinthada Township in Hinthada District



Source: General Administrative Office,
Figure 2 Village Tracts of Hinthada Township

This township has a large low-lying plain with the mean elevation of more than 10 m (44.3 feet) above sea level which is suitable for cultivation.

Maximum temperature is 38.25°C in April and minimum temperature 13.75°C in January. In 2018, the average total rainfall is 2252.71 mm. According to Köppen’s system of climate classification, Hinthada Township experiences Tropical Monsoon climate (Am).

The soil types of Hinthada Township are as follows: Alluvial Soils (*Fluvisols*), Gley and Gley Swampy Soils (*HumicGleysols*), and Meadow and Meadow Alluvial Soils (*Gleysols*). Existing soils support paddy cultivation because of meadow soils.

Results and Findings

Major agriculture practices are land preparation, plowing, planting and harvesting.

Traditionally, farmers used equipment such as Mattock and chopping holes in land preparing. Then, large tractors have been introduced since 1970s. Farmers rarely used them because these tractors are large and heavy. At present, hand tractors and tractors are applied in land preparation and the role of human labour was changed.

Role of Labour in Hinthada Township (2000)

In 2000, only one labour is needed in land preparation and plowing for an acre of farm land. To finish complete tillage, it took 10 days and labour cost in land preparation and plowing was about 20,000 ks per acre.

In the second phase, farmers broadcasted the seed to germinate and to get young plants in the farm. A family member or a rental labour was used in broadcasting seeds in the nurseries. Then, to uproot the nurseries from the field for the purpose of transplanting in other farm, two labourers were needed and it took 2 days. Therefore, labour cost is about 8,000 kyats.

Last 20 years, most of the farmers practiced transplanting method because of labour availability and high production. At that time, many female labours are mainly used in transplanting and it needed 8 female labourers which took two days. Therefore, the cost of female in transplanting is more than 30,000 kyats 0.4046 hectare (per acre). At that time, a male labour is applied to bring the uprooted young plants from nurseries to paddy field. It cost 8,000 kyats per basket 0.4046 hectare. Therefore, total cost for transplanting is nearly 40,000 kyats 0.4046 hectare.

Weeds in the farm were removed by manual labour who was seasonal labour. Most farmers' household rent seasonal labour for 6 months. The cost of seasonal labour was 150,000 ks for a growing season. Family members also worked in removing weeds. Some farmers use rental farmers in weed removing and it is done 4 times in growing period. Only Urea was used in paddy cultivation at that time and seasonal labourers was used in the time.

Table 1 Working period and Labour cost in Monsoon Paddy cultivation (2000)

		Working period	Labour cost
land preparation and ploughing	2 labours * 5 days	10	20000
broadcasting seeds	1 labours* 1 days	1	2000
uproot	2 labours* 2 days	4	8000
transplanting	8 female labours* 2 days	16	32000
Plant carrying	2 labours* 2 days	4	8000
weed removing	2 labours* 4 days	8	16000
harvesting	6 labours* 1 days	6	12000
Carrying	2 labours* 1 days	2	4000
		51	102000

Source: questionnaires' results

Harvesting was also done by manual labour and it needs 6 persons in harvesting and it took 1 day 0.4046 hectare (per acre). Therefore, labour cost on harvesting is 12,000 kyats 0.4046 hectare (per acre).



Plate 1: Harvesting with manual labour (traditional method)

Date: 21.11.2010



Plate 1: Winnowing with manual labour (traditional method)

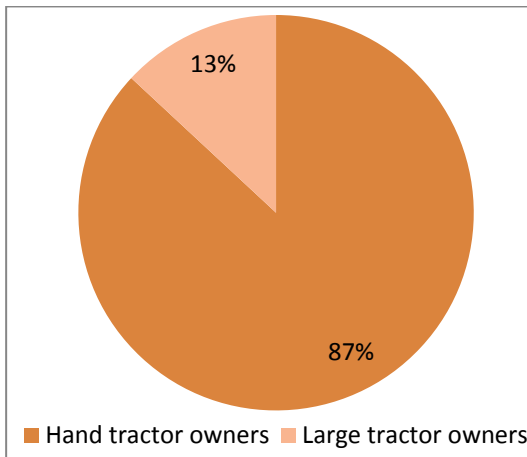
Date: 21.11.2010

In threshing and winnowing, 2 labour was needed and total cost was 8000 kyats for 0.4046 hectare an (acre) of paddy. Then, farmers carried the paddy produced from their field to home with the help of seasonal labour.

Role of Labour in Hinthada Township (2018)

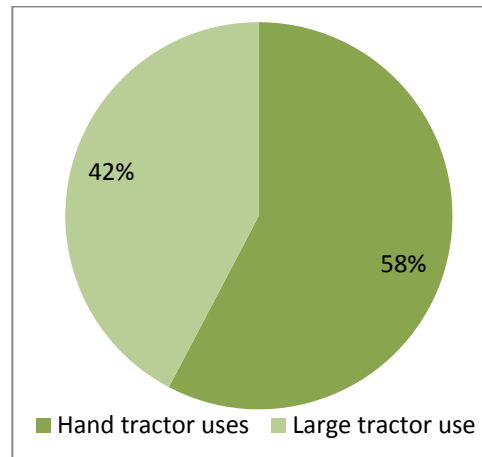
At present, like other rural area, agriculture machineries are being used. Therefore, work that is done by manual labour decrease and the role of labour in agriculture also declines.

In 2018, agriculture machineries are used because of easy availability of agriculture machineries and spare parts, labour shortage, etc. All farmers use hand tractors or large tractors in land preparation and plowing.



Source: questionnaires' results

Figure 3 Machinery ownership in Hinthada Township



Source: questionnaires' results

Figure 4 Machinery use in Hinthada Township



Plate 3: land preparation with large tractor
Date: 17.5.2019



Plate 4: Plowing with large tractor
Date: 17.5.2019

According to questionnaires' results, 42 percent of the farmers use large tractors but only 13 percent of the farmers own large tractors. It was due to some farmers who rent large tractors from Agriculture Department and they use them although they do not possess large tractors.

By using large machineries, working period is shortened and it only takes 3 hour 0.4046 hectare (per acre). The farmers who do not have these large agriculture machineries rent them from agriculture department and famers cost 30000 ks0.4046 hectare (per acre). When famers use their own hand tractor, only one labour or a family member is used and it takes 2 days. Therefore, labour cost is 8000 kyats 0.4046 hectare (per acre).

In planting, more than 90 percent of the farmers practice broadcasting method. By using broadcasting method, time span used in planting decrease and some steps such as uprooting, carrying, transplanting, etc are skipped. Moreover, number of labour use and labour cost decrease. A labour is applied for an acre of paddy cultivated area and labour cost is 4000 ks 0.4046 hectare (per acre). In the area, labour cost is higher from about 2000ks in 2000 to 4000 ks in 2019 due to labour shortage caused by rural- urban migration.

Nowadays, weedicide use is very common in all rural areas. Weedicide is applied in ploughing period of 20 days or 30 days after broadcasting. Therefore, some farmers use a rental labour to remove weed and labour cost was 4000 ks per day. Most of the farmers do not rent seasonal labour for paddy cultivation.

Chemical fertilizer is applied three times in paddy cultivation where rental labour and family members are used in the work.



Plate 5: Winnowing with small machines
Date: 11.11.2018



Plate 6: Harvesting with modern machine
Date: 16.11.2018

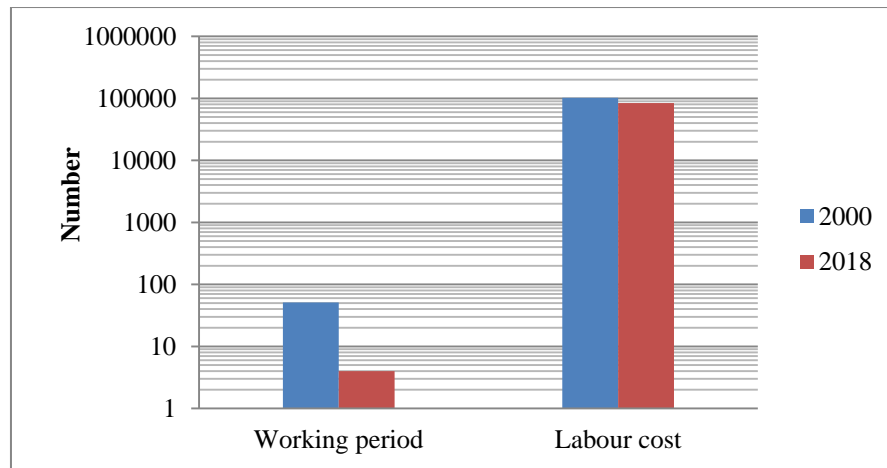
Large machines such as Kubota did harvesting, threshing and winnowing. Therefore, farmer can reduce labour cost and working period. At that time, the paddy is ready to be sold out and small amount of paddy is carried to their home for family consumption with the help of rental labour. Labour cost is 4000 ks per day.

In general, not only working periods but also labour cost is reduced by using agriculture machineries in paddy cultivation. In 2000, total working period was 51 days 0.4046 hectare (per acre) and total cost was 102000 ks 0.4046 hectare (per acre). However, in 2018, total working period reduce to 4 days and total cost to 84000 ks 0.4046 hectare (per acre). It shows that the role of labour changed in paddy cultivation of Hinthada Township.

Table 2 Working period and Labour cost in Monsoon Paddy cultivation (2018)

		Working period	cost
land preparation and ploughing		3 hours	30000
broadcasting seeds	1 labours* 1 days	1	4000
weedicide using	1 labours* 1 days	1	4000
fertilizer using	1 labours* 3 days	1	12000
harvesting		3 hours	30000
Carrying	1labours* 1 days	1	4000
		4	84000

Source: questionnaires' results



Source: Questionnaires' results

Figure 5 Change in working period and labour cost

Although most people in Hinthida Township depend on agriculture in 2000, machineries use in agriculture reduce the role of labour in paddy cultivation and most people who depended on agriculture are faced with unemployment.

Consequences of changes in role of agriculture labour

Farm mechanization changed the role of labour and it made remarkable impacts in creating unemployment opportunities for both male and female rural labourers that affect the farming activities, employment, and household income of rural labourers. Islam (2000) reported that landless and tenant farmers employed in part-time manufacturing shops earned higher income, compared to their previous occupation.

According to interview with 5 local farmers who is more than 25 years experiences, Rural unemployment, Rural urban migration, Low job opportunity, low income for local agriculture workers, socioeconomic difficulties and poverty are consequences of changing role of labour caused by agriculture mechanization.

Low cost on cultivation

It is one of the advantages of using agriculture machineries in paddy cultivation although the role of labour in agriculture decreases. Cost of agriculture machineries use in cultivation is lower than cost of agriculture that use manual labour. According to interviews, cost for buying agriculture machineries in the starting period is high, but, later years, cost for paddy cultivation is low.

Rural unemployment

According to interviews with local people, they said as working period for land less and small holder farmers decreased, unemployment problem became distinct in the area. Therefore, some local people earns as non- farm workers and some works in urban area as seasonal migrants.

Rural urban migration

Given the low earnings and growing disinterest of youth in agriculture and the lack of persuasion of other rural sectors to absorb youth, particularly in Asia and Africa, these factors

contribute to joblessness, migration and the associated risks of social instability (Lochner and Moretti 2004; Kakwagh & Ikwuba 2010; Emeh et al. 2012).

In Myanmar, rural population was 73 percent of the total population in 2000, and it decreased to 65 percent in 2015 (World Bank, 2015). It shows decrease in rural population due to low job opportunity and low income. World Bank (2014) expressed that the Ayeyarwady Region have high levels of migration in recent years where one in four households in Ayeyarwady has a family member living as a migrant away from home.

According to interviews, young migrants in Hinthada Township move to other urban area to get better job and higher income. Migrants from Hinthada Township mainly moved to Yangon Region because of nearness to the area and existing industrial zones.

Low job opportunity and low income for local agriculture workers

As most of the works are done by agriculture machineries, low job opportunity for manual labour is found. According to questionnaire's results, even small holder farmers want to use agriculture machineries for the purpose of reducing working periods and to finish agriculture works in time to reduce crop loss caused by climatic irregularities such as untimely and irregular rain.

Socioeconomic difficulties and poverty

Rural families mainly depend on income obtained from agriculture. As the working period is short, agriculture income is low and it is insufficient for family survival. Therefore, it is clear that farmers suffer from on-going debt cycles and insolvency.

Conclusion

In Hinthada Township, although major economy is agriculture, working period and labour cost decrease due to agriculture mechanization. Last 20 years ago, job opportunities in agriculture are high because of slow pace of mechanization. The advantages of using agriculture machineries in paddy cultivation although the role of labour in agriculture decreases.

Agriculture mechanization is gaining momentum and even small holder farmers use agriculture machineries to finish their work in time. Therefore, the role of labour in agriculture decreased and consequences such as migration, low job opportunity appeared. Like, other developing countries, low job opportunities for agriculture labour and migration will be a distinct problem. Young labour migrants in Hinthada Township move to other urban area to get better job and higher income.

To get alternative income that support local people and to reduce the speed of migration, it is necessary to establish local raw material based small and medium enterprises, as well as cottage industries using local raw material and goods produced from nearby areas. Moreover, it is also necessary to upgrade existing roads to get better accessibility supporting local economy. On the other hand, further researches on migration, job opportunities, raw material availability should be done to upgrade socioeconomic conditions of the area.

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