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Research Paper

Contribution of Handcraft Ulos Weaving to Farmer Household Income of Meat Village, Sub-district Tampahan, North Sumatra, Indonesia

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ABSTRACT: Multiple employment, where at least one member of the farming household works off-farm, has become a global phenomenon. In developing Asian countries (especially Southeast Asia and South Asia), off-farm employment is a necessity because small farms can no longer support the subsistence needs of farming families. The purpose of this study is to analyze the role of ulos handicraft weaving for the farming community of Meat Village. Utilizing primary data from interviews with 30 farmers who in addition to cultivating paddy rice also earn income from ulos weaving handicrafts. The results showed that: (i) by relying on agricultural products as the only source of income, the Meat Village farmers will fall into the poor category with a per capita income per day of less than US\$ 1, (ii) Off-farm income significantly increases farmers' household income and contributes 80% to total household income, and (iii) there is a link between ulos weaving handicraft and farming, where the higher the income from ulos weaving, the more farmers' ability to purchase external agricultural inputs increases. In line with the study results, several recommendations were formulated.

KEYWORD: Off-farm employment, Rural industry, Handicraft and Agricultural Linkage, Lake Toba Tourism, North Sumatra

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I. INTRODUCTION

Multiple employment in farming communities, with various terms such as part-time farming or part-time farmer has been a topic of study since 1900, and was raised as the theme of a dissertation at the University of Jena, Germany in 1903 [1]. The phenomenon of multiple employment is found in almost all farming communities around the world. In industrialized countries, the multiple employment pattern can be in the form of off-farm employment as a side job pursued to supplement income from farming or farming as a side business to supplement income from off-farm activity as the main job or through subsistence farming to reduce household expenditure, especially for food. Whereas in developing countries, especially South Asia and Southeast Asia, off-farm employment (OFE) is a necessity due to the severe limitations on the capacity of the agricultural sector of most countries in these regions to absorb the existing supply of rural labor and to satisfy even the minimum subsistence requirements of a large proportion of the rural population. It derives partly from the seasonality of agricultural operations, which has always been a feature of Asian monsoon agriculture. To these has been added growing underemployment owing to the declining size of operational holdings, and thus of the needs of rural households for family and hired labor agriculture.

Due to the seasonal nature of the agricultural sector in Southeast Asia and South Asia, off-farm employments dominate the agricultural sector (hired labor when labor demand is very high for planting and harvesting activities that must be completed in a short time). Whereas in industrialized countries (e.g. USA, Canada and Japan), off-farm employment as hired labor in the agricultural sector is not recognized. In these countries, OFEs are mostly in the industrial and service sectors on a part-time basis, for example as blue-collar workers in the industrial sector in winter when farming activities are very limited.

Technological advances in agriculture are increasingly opening up opportunities for intensive farming communities to run multiple employments as more and more labor-intensive jobs are taken over by machines. Meanwhile, developing Asian countries are also increasingly dependent on OFEs to maintain food security, which in terms of production cannot be met by narrow land agricultural products [2].

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In general, multiple employment is becoming increasingly important and diverse in diversifying smallholder household income, albeit with different determinants and patterns across regions. [3] reported on the development of OFE in the non-farm sector in Ethiopia, that several factors determine the propensity of smallholder farmers' participation in non-farm activities. Better-off households, households led by literate and younger household heads, having access to microfinance, having extension services, and having social responsibility create engagement in non-farm economic activities. Whereas in Laos according to [4], livelihood diversification at the household level is associated with higher wealth status and ownership of various assets as part of a progressive accumulation livelihood strategy or those with fewer constraints. Diversification strategies across all socio-economic groups generally include a combination of agricultural and non-agricultural activities as well as migrant remittance; however, the type of activities undertaken depends on wealth. Improved household asset status enables higher income-generating migration opportunities and can facilitate transitions into non-agricultural work, as well as into a wider range of agricultural work activities. This further strengthens livelihoods through reinforcing complementarities across livelihood activities and reducing the risks associated with each. [5] illustrate the current importance of multiple employment in Africa, where households with greater farm diversity are more successful in meeting their consumption needs, but only up to a certain level of diversity per ha of farmland and more often if food can be purchased from off-farm income or income from farm sales. More diverse farming systems may contribute to household food security; however, the relationship is influenced by other factors, for example, household market orientation, livestock ownership, employment opportunities in agriculture, and available land resources.

In North Sumatra, OFE activities vary depending on the agricultural system and economic development of each region. In the highlands with a rainfed agricultural system, farms are managed with a multiple cropping pattern with a cropping index reaching up to 300% where the agricultural area is planted with various vegetables with a harvest age ranging from 1 month to 5 months, so that farm management is very labor intensive. Multiple employment is therefore sporadic, with temporary abandonment of the farm. Other OFE opportunities available in the agricultural sector include informal trade, such as opening a stall at night after returning from the fields, or division of labor between family members, where the mother and children take care of the farm while the father becomes a rural transportation driver. Meanwhile, in lowland areas with monoculture rice farming patterns, the allocation of labor in the agricultural sector is very seasonal in a short period of time (planting and harvesting) outside of this production stage, farm family members can engage in activities outside of farming even by temporarily migrating out of the area, for example as construction workers. In addition, lowland areas (especially the East coast of North Sumatra) can still be divided into those that are far from industrial areas and those that are close to industrial areas, which provide more diverse OFEs as shown in table 1 [6].

Table 1: Off-Farm Employment in Paddy Raised Area of North Sumatra

Sector of Employment	Industrial Village			
	Main Occupation (%)		Second Occupation (%)	
	HH Heads	Wives	HH Heads	Wives
• Plantation	4.5	-	-	-
• Construction	4.5	-	-	-
• Transportation	7.5	-	3.0	-
• Industry	11.9	1.4	-	-
• Petty trader	-	4.2	4.5	2.8
• Home industry	6.0	9.9	4.5	7.0
• Agricultural worker	9.0	11.3	38.8	32.4
• Others	1.5	2.8	-	-
Population (n)	67	71		
Sector of Employment	Non-Industrial Village			
	Main Occupation (%)		Second Occupation (%)	
	HH Heads	Wives	HH Heads	Wives
• Plantation	4.9	-	12.4	2.4
• Construction	8.6	-	2.5	-
• Petty trader	11.1	8.3	11.1	3.6
• Home industry	2.5	1.2	1.2	3.6
• Agricultural worker	1.2	-	29.6	39.2
• Others	2.5	-	8.6	-
Population (n)	81	84		

Source: [6].

Handicrafts that require specialized skills (indigenous knowledge) rarely receive attention as OFEs. In some places, the role of this sector is very important in terms of income diversification of non-farm employment [7], which contributes to rural poverty alleviation through employment and income generation, and through generating economic growth rooted in rural areas, separate from efforts directed at agriculture and farming [8] and a tool to eradicate unemployment in rural economies and a source for economic development in both rural

and urban areas [9]. One of the unique rural handicraft products in North Sumatra is ulos weaving (ulos is a typical textile material of the Batak community that has many functions and is used in various traditional and cultural activities).

The Meat Village is a ulos weaving center in North Sumatra besides Tarutung [10]. This village is located on the south-southeast side of Lake Toba with a beautiful panorama, but the tourism sector has not developed because the infrastructure to the village has not developed. Tourism activities are sporadic with camping (tents) due to limited lodging (homestay). The main livelihood of Meat Village residents for generations is farming, by cultivating rice fields without irrigation so that they can only plant once a year. Multiple employment at the household level shows a pattern of labor allocation where men (fathers) will go to the fields while women (mothers) when planting rice will go to the fields and the rest are busy with ulos weaving activities.

This study aims to analyze; (i) farm income, (ii) handicraft income and its contribution to household income and (iii) the relationship between off-farm income and investment in farming for purchasing of external inputs.

II. METHOD

This study uses primary data from interviews using questionnaires with households that manage farms and at the same time pursue OFE handicrafts of ulos weaving. The population of households with this multiple employment pattern was 90 households and 30 households were randomly selected as respondents. In addition to the characteristics of farming households, respondents were asked information related to farm management (area of land, use of seeds, use of labor (household labor and hired labor), use of fertilizers and pesticides, use of capital factors as well as production and output value) and ulos weaving production (raw materials used, equipment, labor expenditure, production and output value).

III. RESULT AND DISCUSSION

3.1 General Description of Research Area

Meat Village has a beautiful panorama, but has not been managed as a tourist destination for Lake Toba, although it has been named a Tourism Village since 2017. The heyday of Lake Toba tourism was in 1996, with nearly four million tourists visiting, including both local and foreign tourists. However, a case of thick haze that disrupted air traffic in 1997 has resulted in a decline in the number of visits to Lake Toba. This further declined after the economic crisis, which was then followed by the political crisis in Indonesia in 1998. Since then, the number of visits to Lake Toba has gradually decreased [11]. The revival of Lake Toba tourism began with the declaration of the development of 10 priority tourist destinations out of 100 inventoried tourist destinations [12]. These 10 tourist destinations are referred to as the "new Bali", referring to Bali as a global tourist destination. Along the way, of the 10 priority destinations, there are five super priority national tourism strategic areas (NTSAs) and Lake Toba is one of them [13]. As a Super Priority NTSA, tourism is expected to be a driver of regional growth, improve welfare through the creation of business opportunities and employment, increase local revenue, create added value for natural and cultural resources. To achieve these goals, various infrastructures have been, are being and will be built, including the construction of highways to tourist destinations, the construction of airports in the Lake Toba area.

So far, the center of tourism development in the form of infrastructure development still seems to be centered on Samosir Island with the construction of road and bridge construction and the provision of rolling in and rolling out ferries [14]. Figure 1 shows the panoramic beauty of Pakkodian Beach, Meat Village and its rice paddy farming area.



Figure 1: View of Meat Village Beach and its Agricultural Area

The Meat Village has an area of 3 kilometers squared with a population of 170 families consisting of 766 people (383 men and 383 women). The area of agricultural land (paddy fields) is 202 ha. Of the 170 households 90 of them farm while weaving ulos.

3.2 Farm Household Characteristic

Farming households in Meat Village are classified as smallholder farmers with an average farm size of 0.28 ha, which is the basis of existence for 3 household members. The characteristics of respondent farmer households are summarized in table 2.

Table 2: Respondent Characteristic

10	Discription	Mean	Range
10	of Household's Head (year)	50	32 – 72
	Education of Household's Head (year)	9	2 – 12
	Farm Size (Ha)	0.28	0.20 – 0.40
	Household Size (people)	3	1 – 6
	Farming experience (year)	23	5 – 50
	Weaving Craft Experience (year)	21	– 50 4

Source: Author Calculation.

3.3 Description of Farm Management and Weaving Crafts

3.3.1 Farm Management

As an unirrigated paddy rice farm, rice planting in Meat Village is adjusted to the rainy season. The activities carried out include: nursery which is entirely done by family members (father and children), land preparation and processing (plowing and harrowing) where for plowing a hand tractor is rented while harrowing is done by family members, planting (done in gotong-royong by housewives who take turns planting in the farming area of the gotong-royong group), maintenance (embroidering, weeding and fertilizing) is done by family members and harvesting (done semi-mechanically, where for threshing rice seeds using a threshing machine while for other activities such as cutting, fanning and transporting the results in burlap to the house is done by hired labor).

3.3.2 The Stages of Ulos Weaving

Broadly speaking, there are four stages in weaving, namely: (i) *mengunggas* as the process of smearing the yarn with rice that has been pulverized and then rubbed using a round brush made of palm fiber, then the yarn will be dried before use. This process overall takes an average of 23 days, (ii) *menghul-hul*, which is rolling the yarn in the shape of a ball so that the dried yarn is not tangled, (iii) *meng-ani*, the making of strands of yarn to be used as warp in the *ani* tool. The yarn that has been *ani* will be tied at the end one by one and simultaneously rolled on the *tandaian* (*ani* tool), and (iv) weaving is the process of forming the yarn that has been *ani* into a piece of ulos or sarong. Generally, a craftswoman can produce 46 pieces of ulos or sarong per year. Figure 2 shows the weaving activity.



Figure 2: Weaving Ulos in Meat Village

3.4 Farm Business Analysis

Farm analysis revealed that farmers in Meat Village are very poor with an income of less than US\$ 1 per capita per day (exchange rate US\$ 1 = IDR 15,000) as income from paddy rice is only US\$ 125.8 per capita per year. The farm itself operates efficiently with an R/C ratio = 2.0. A summary of the farm business analysis is presented in table 3.

Table 3: Farm Business Analysis

Description	Paddy Farming
Farm size (ha)	0.28
Output (kg)	2,432
Price (IDR/kg)	4,500
Revenue (IDR)	10,944,000
Input (IDR)	1,429,430
Capital (IDR)	2,251,267
Wages (IDR)	1,602,000
Costs (IDR)	5,282,697
Gross Margin (IDR)	5,661,303

Source: Author Calculation

3.5 Contribution of Ulos Weaving Handicraft to Household Income

The ulos weaving craft fully uses intra-family labor so that the costs required in production include weaving raw materials and equipment depreciation. With an average output of 46 ulos per year, raw materials worth IDR 3,579,800 and equipment depreciation of IDR 1,169,533 are required, bringing the total cost to IDR 4,749,333. Every year a weaver can produce 46 pieces of ulos with an average value of IDR 600,000, so the gross margin of ulos weaving craft is IDR 22,850,667 (27,600,000 - 4,749,333). With this result, the farmer's household income becomes IDR 28,511,970 per year where the off-farm income contribution is 80,14%. Thus, in Meat Village, the OFE activity of ulos weaving has become the main livelihood (the main source of farmer household income).

3.6 Handicraft and Agricultural Linkage

As in previous studies ([1];[14]), in North Sumatra there is a link between off-farm income and farm management, especially the use of cash (off-farm income) to finance investment in the agricultural sector (farming) for purchasing external inputs such as fertilizers and pesticides. In Meat Village similar linkages were also found. The greater the household income from handicrafts, the more able the farm households are to finance external inputs such as fertilizers and pesticides as displayed by figure 3.

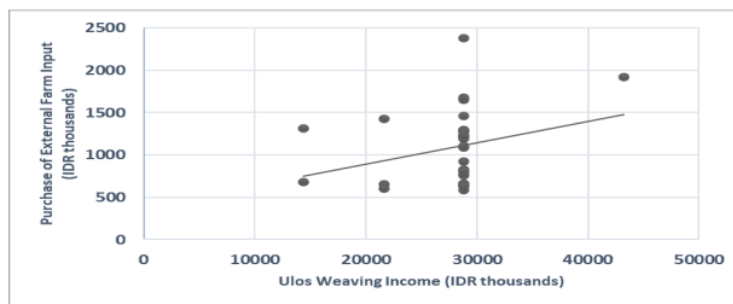


Figure 3: Linkages between Ulos Weaving Income and External Agricultural Input Purchases

IV. CONCLUSION

The following conclusions can be drawn as a result of this study:

- With an average farm size of 0.28 ha, agriculture in Meat Village is no longer able to support the population of the village. Rice paddy farming, which relies on rain as a source of irrigation, only allows farmland to be cultivated once a year, resulting in an average production of less than US\$1 per capita per year.
- Off-farm employment in the form of handicraft ulos weaving increases income to an average of US\$ 450 per capita per year and off-farm income contributes 80% to farmer household income.
- There is a link between handicraft ulos weaving and agriculture, where the greater the off-farm income, the higher the expenditure of farmers to buy external agricultural inputs such as fertilizers and pesticides.

In line with the above findings, it is suggested that Meat Village as a Tourism Village should be linked to the Lake Toba tourism industry by developing this village as a textile-based handicraft center for souvenirs. In addition, improving infrastructure such as roads, lodging and various water attractions will make Meat Village a tourist destination with a beautiful panorama of Lake Toba.

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