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ABSTRACT: The Lake Toba area is one of the five tourist destinations that receive development priorities within the framework of a national tourism strategic area (NTSA) in Indonesia. The region is agricultural area, almost three quarters of the workforce makes a living in this sector. Tourism has backward and downward linkages which can cause negative and positive effects on other sector such as agriculture, either directly, indirectly or induced. This study aims to find out the linkage of tourism and agriculture in Samosir Regency which is the heart of the Lake Toba area. By utilizing income analysis, both farm and off-farm income, the following results are obtained: (i) there is currently a symbiosis between the tourism and agriculture sectors at the farm household level, where one family member works seasonally (usually on weekends and religious holidays) in the tourism sector and in other days engaged in family farming, (ii) although they are part-time and seasonal jobs, the income from the tourism sector is already higher than farm income, (iii) 30-70% of the tourism sector income is invested in farming, especially the procurement of external inputs such as the purchase of fertilizers and pesticides. In line with the results of the research, it is recommended that certain steps should be taken by local governments to prepare farmers for the advancement of the tourism sector which will lead to income disparities between sectors with various negative effects.

KEYWORDS: Tourism and agriculture linkages, national strategic of tourism area in Indonesia, off farm income, Lake Toba, Geopark Toba Caldera, Samosir Regency, North Sumatra.

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I. INTRODUCTION

Tourism is accepted to positively contribute to economic growth [1]. In 2019, prior to restrictions on mobility between countries as a result of the outbreak of Covid-19, [2] noted that the tourism sector contributed 10.3% to global GDP and provided employment for 330 million people (10.4% of total employment in 2019). Over the past five years, one in four of all net new job created across the world has been in travel and tourism. In monetary terms, international tourism expenditure has almost tripled in the last two decades, from USD 496 billion in 2000 to USD 1,482 billion in 2019 [3].

Indonesia has more than 100 tourist destinations, the majority of which are based on natural beauty, culture and conservation areas. Since 2019 there have been 10 tourist destinations that are planned to be developed into "new Bali" and five of them have received special attention in their development so that they are called super priority national tourism strategic areas, one of which is the Lake Toba area in North Sumatra [4].

The Lake Toba area is basically an agricultural-based area, about three-quarters of the workforce is absorbed by the agricultural sector. The manufacturing industry did not develop so that apart from the agricultural sector, the economy was supported by public services such as government administration, trade and construction in the context of developing tourism supporting infrastructure [5].

Studies related to the relationship between tourism and agriculture are multi-faceted [1], [7], [8]. On one hand, tourism competes with agriculture for land, water and labor. On the other hand, tourism offers a potential to galvanize local agricultural development through backward linkages that allow local farmers to supply the food needs of tourism established.

This study aims to find out tourism and agricultural relationships at the farmer household level in Samosir Regency, which is the heart of the Lake Toba super priority national tourism strategic area. Specifically

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to disclose the contribution of off-farm income from the tourism sector to household income and whether off-farm income from the tourism sector is invested to improve farming.

II. LITERATURE REVIEW

In the macroeconomic context, tourism has been an integral component of economic strategic in developing nations because of the various characteristics attached to it, such as the multiplier effect of tourism relative income [9], the contribution of tourism to the creation of new employment opportunities, and the contribution of tourism to improvement in standards [10], so that [6] and [7] view tourism as an engine for economic development. On this basis, [1] introduce the tourism-led-growth-hypothesis (TLGH), which theoretically was directly derived from the export-led-growth-hypothesis that postulates that economic growth can be generated and statistically caused by expanding exports ([11], [12]).

In the stylized fact of development path ([13], [14], [15]), where development is marked by sectoral transitions from primary, industry and services, the politicians have found tourism to be a vehicle of transition in moving from an industry-based towards a service-oriented economy [10]. Furthermore, tourism is seen as an appropriate tool for poverty alleviation with the label pro poor tourism and because of its laborintensive nature, it provides small-scale employment opportunities, which also helps to promote gender equity ([6], [7]).

In general, the benefits of tourism in tourist destinations lie in the economic, environmental and social cultural aspects ([16], [10]). The most important positive economic effects of tourism are to increase in budget revenues, production expansion, stimulation of investments, and improvement in population's welfare [9]. However, according to [16], the economic impact of tourism is much greater, since many inputs are needed in order to produce tourism and leisure service, spanning the whole range of farm, agri-food and industrial production, including production of capital goods as well as construction and public works.

Furthermore, the economic benefits of tourism can be grouped into three, namely the direct, indirect and induced effects ([16], [18]). Direct effects concern expenditure within the tourism sector, based on a list of typical tourism products. Indirect effects concern intermediate consumption for the production of goods and services in the tourism sector. These are goods and services that tourism companies purchase from their suppliers, forming the tourism supply chain. Indirect effect can be particularly important for the production of local products so-called frontline companies take the initial purchasing decisions that determine what visitors consume. It is therefore important to be able to encourage the tourism sector to procure locally produced goods and services in order to maximize the economic impact of tourism revenue in a country or region. Induced effects also include the consumption of companies that have benefited directly or indirectly from initial expenditure in the tourism sector.

In addition to economic benefits, [7] takes an inventory of non-economic benefits of tourism including capacity building, training, improving access to services and infrastructure (such as healthcare, radio access, security, water supply, and transportation), and mitigation of environmental impacts and natural resource conflicts. [18] suggests downward linkages' tourism sector and other sectors in The Balearic Islands as following:

- Two sectors where non-resident demand explains over four-fifths of total production: "related transport activities" and "accommodation services".
- Five sectors where the production share accounted for by non-resident demand lies in the 25 – 50 %: "restaurant services", "transport services", "computer, R & D and other business services", "market services: education, health and cultural", "energy product".
- 10 sectors where tourist demand explains between 10 % and 24 % of production: "agriculture", "food and drink", "textile and shoes", "chemical product", "telecommunication", "financial services", "trade" and "real estate".

Sectors that improve their relative position as a result of exogenous injections into tourist-oriented sectors are: (i) product of agriculture, hunting, forestry and fishing, (ii) electricity, water and gas, (iii) energy product and petroleum, (iv) food and drinks.

Eight out of top ten countries in the world jobs created in the travel and tourism 2014 – 2019 are developing countries with a significant role for the agricultural sector in the formation of GDP such as India, Philippines, Indonesia, Thailand, Mexico and Vietnam [2]. On the other hand, food expenditure representing approximately one-third of daily tourist expenditures at destination [6]. Therefore, it is not surprising that many academic studies aim to uncover agriculture-tourism linkages in the developing world since the 1960s [8].

The macro-relationship between tourism and agriculture in the developing world is considered as multi-faceted, complex and variable, range across a spectrum from situation of conflict where tourism competes with agriculture for land, water and labor to symbiosis where the tourist industry purchases local agricultural products and uses the agricultural landscape for agro tourism [8]. Tourism offers a potential to galvanize local agricultural development through backward linkages that allow local farmers to supply the food needs of tourism establishments. Accordingly, strengthening the linkages between agriculture and tourism is central to

promoting symbiosis rather than conflict between the two sectors. The benefits of a closer relationship include decreased linkages through imports, improvement in tourism food supplies, and increased tourist access to local foods and improve sustainability for tourism ([6], [7], [8]). Furthermore, according to [6], the broader literature reports significant negative impact of tourism on agriculture. Prominent among these are competition for land and labor. In more detail, the positive and negative impacts of tourism on local agriculture are presented in table 1.

Table 1. Impact of Tourism on Agriculture

Negative Impact	Positive Impact
- Diverting land and water resources away from agriculture to support tourism or tourism-related urbanization.	- Development of vegetable and fruit enterprises to supply tourism.
- Competition for time (labor) between tourism and agriculture.	- The increased profitability of local agricultural production.
- Shifts toward less sustainable farming practices to increase production for tourism.	- Shift to more sustainable farming practices.
- Increased rural-to-urban migration to tourism poles resulting in abandonment of farming.	- Diversification of local farming.
- Increased consumption of imported foods that compete with local production and resulted in foreign exchange leakages.	- Investment of tourism earnings to improve local agriculture.
- Failure to stimulate local agriculture and triggering reduction or stagnation of production.	- Reduced dependency and vulnerability to agricultural crises.
- Lost of traditional jobs when workers move from farming into service jobs in tourism	- Reversal of out migration.
- Seasonal unemployment.	- The potential for tourism to foster agricultural development.
	- The potential to produce for tourism of fresh product and high value specialty foods unique to a given region.

Source: Compiled from [6] and [9].

So far there has been no research analyzing tourism and agriculture linkages in the Lake Toba Tourism Area, as has been widely studied in Bali, which is famous for the subak system in the agricultural sector ([19], [20], [21]). Various studies are more general in nature such as tourism development criteria [22], identification of problems [12] the development of the Lake Toba tourist area and solutions to overcome them [23], development of tourism facilities including accommodation, support facilities and tourism auxiliary facilities [24] and formulating a strategy for developing the Toba Caldera in Samosir Regency using the Analysis Hierarchy Process (AHP) to determine a priority strategy for regional development [25].

III. METHOD

This study uses a descriptive approach to analyse household income from farming and the activities of family members in the tourism sector. In farming analysis, special attention will be paid to explicit costs. By using graphical analysis (simple trend analysis) the relationship between tourism income and investment in farming will be revealed, namely explicit costs including the purchase of certified seeds, fertilizers and pesticides.

Primary data were obtained from interviews using a structured list of questions to 15 farmer households which in addition to managing corn farming, at least one family member is engaged in economic activity in the tourism sector. The field research took place in Cinta Dame Village, Simanindo District, Samosir Regency, North Sumatra. Respondents involved include all households that combine farming and off-farm activities in the tourism sector (census).

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IV. RESULTS AND DISCUSSION

4.1. General Description of Research Area

In the history of tourism in Indonesia, Lake Toba area has a quite strategic position. In the colonial period, some of the developing spots like Parapat had been made as resorts by the colonial authority. In the post-colonial period, these areas developed in some spots, oriented in foreign tourists, for example Parapat, Tomok, TuktukSiadong and the surrounding, marked by the presence of high-class accommodations. The heyday of Lake Toba tourism was in 1996, with the visit of almost four million tourists, including local and foreign tourists. Nevertheless, the thick smoke case which was disturbing the air traffic in 1997 had resulted in the decrease of the number of visit to Lake Toba. It decreased even more after the economic crisis, which was then followed by the political crisis in Indonesia in 1998. Since then, the number of visit to Lake Toba has been gradually decreasing [26].

The revival of Lake Toba tourism began with the declaration of the development of 10 priority tourist destinations from the 100 tourist destinations that were inventoried [27]. These 10 tourist destinations are referred to as "new Bali", referring to Bali as a global tourist destination. Along the way, from 10 priority destinations, there are five super priority national tourism strategic areas (NTSA) and Lake Toba is one of them [28].

As a Super Priority NTSA, tourism is expected to be a driver of regional growth, increasing welfare through the creation of business and employment opportunities, increasing local original revenue, creating added value for natural and cultural resources. To achieve this goal, various infrastructures have been, are being and will be built, including the construction of high-way to tourist destinations, airport development in the Lake Toba area, construction of roads and bridges and provision of rolling in and rolling out ferries [4]. The total budget allocated by the government for infrastructure improvement in 2020 reaches IDR 1.25 trillion. For comparison, in 2019 the total expenditures of local government of Samosir Regency were IDR 830 billion. The most prominent infrastructure development in Samosir Regency within the framework of the super priority NTSA is presented in Figure 1.



Fig. 1. Infrastructure Development in the Framework of NTSA Super Priority

4.2. Tourism and Agricultural Linkage

Samosir Regency, which is the location of the research, is essentially an agricultural-based area. In 2020, 71% of the population works in the agricultural sector. Although the contribution of the agricultural sector to gross regional domestic product (GRDP) has decreased continuously (from 64% in 2005 to 51% in 2019), this sector still recorded an annual economic growth of above 5% in the last five years.

Farmer households that combine agricultural activities and economic activities in the tourism sector are young people, with an average age of 37 years with a range of 25-45 years. Mastering farming land on average 0.376 ha with a maximum area of 1 ha. Farming that is run is corn production, while activities in the tourism sector include: selling souvenirs, renting water games, selling food and drinks and serving as waiters in restaurants. Tourism activities are seasonal (weekends or during holidays), so that family members who work in the tourism sector can still allocate their time to work on their own farms. This pattern of multiple employment at the household level is a common phenomenon in the peasant community of North Sumatra [29]. All households interviewed stated that only one family member worked off farm in the tourism sector. However, from the analysis of household income, the tourism sector accounts for 53% of total household income. Thus, tourism becomes the main source of income even though it is practiced seasonally.

Farm business analysis shows that farming activities are run efficiently and profitably with an R/C ratio of 4.07 and an annual gross margin of IDR 14.24 million. In table 2, a summary of the farm business analysis is presented.

Table 2. Farm Business Analysis

Description	Corn Farming
Area (ha)	0.376
Output (kg)	2 997
Price (IDR/kg)	3 150
Revenue (IDR)	9 440 550
Input (IDR)	1 209 950
Capital (IDR)	575 620
Wages (IDR)	534 700
Costs (IDR)	2 320 270
Gross Margin (IDR)	7 120 280
R/C Ratio	4.07

Source: Author's calculation.

Note:

Analysis for a single planting season (six months) with tourism sector income of IDR 1 347 500 monthly, then the income per six months becomes IDR 8 085 000 so that the contribution of farming income to total household income is 47%.

The income of family members who work in the tourism sector has increased the economic capacity of farmer households, which allows them to finance the farming they manage, especially for the procurement of external production inputs such as the purchase of fertilizers and pesticides. From the results of interviews, respondents stated that 30-70% (in average 50%) of income from the tourism sector is used to finance farming. Figure 2 shows the relationship between tourism sector income and farm financing.

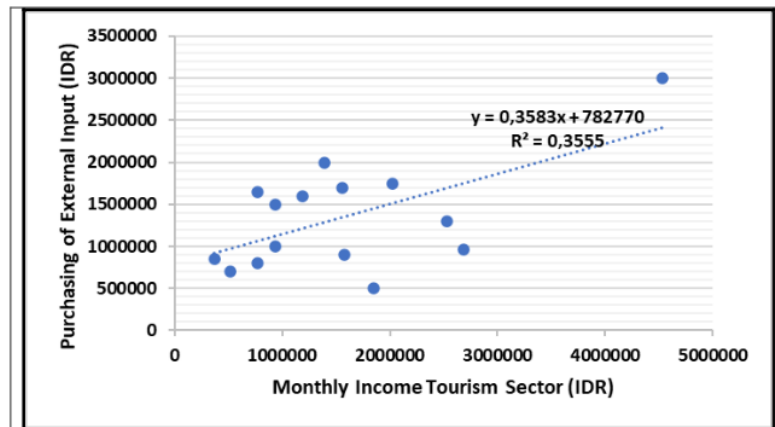


Fig. 2. Tourism Earning and Investment in Agriculture.

The description above shows that in the Lake Toba tourism area, the tourism sector and the agricultural sector are complementary. At the household level, the allocation of labor in the tourism sector does not interfere with the allocation of labor in the agricultural sector. Currently, tourist visits are still seasonal (domestic tourists) who vacation on weekends or during national holidays which are generally religious holidays. However, in the future, allocating one family member for farming activities and off-farm activities will be increasingly difficult if the development of the tourism sector makes the Lake Toba area a vacation spot for a longer period of time and activities in this sector are more permanent, so that household members who work in this sector will leave agriculture permanently (sectoral competition for labor). In addition, a growing tourism sector will increase the wage disparity between this sector and the agricultural sector, a factor that will encourage the shift of workers to the tourism sector and away from agriculture.

Currently, the condition of tourism in Samosir Regency is still dominated by local tourists with short visits, staying two or three nights. Therefore, the available jobs still revolve around informal jobs such as selling souvenirs and selling roadside food and soft drinks to visitors. Likewise, income from the tourism sector has exceeded income from farming. This means, when tourism is advanced, the available jobs will be permanent, such as tour guides, motor vehicle rentals, event organizers for arts and sports activities as well as hotel management. The income that tourism sector workers receive will be much greater, making agriculture's contribution to household income even less significant.

Regarding the negative impact of tourism, [6] have warned that, by competing for agricultural resources – both land and labor – tourism can cause significant harm to local agriculture and ultimately increase the poverty of rural people. At a regional level, a single focus on tourism, at the expense of local agriculture, can lead to patterns of dependent, uneven and spatially polarized development that results in great disparities in wealth between tourist space and rural agricultural space.

To prevent the negative impact of tourism on agriculture, local governments need to balance the infrastructure development carried out by the central government by strengthening farmers through education and training, to increase the capacity of farmers in tourism industry food supplies and increase tourist access to local food and improve sustainability. The reasons hotels import food include [8]: to ensure supplier quality and/or regularity of food supply, deficient quality of local food (particularly hygienic quality), and farmers lack information on the types and quantities of food needed by hotels. In addition, the local government together with

the farming community need to choose one or two commodities that are categorized as "authentic" locally produced food to be promoted as souvenirs typical of Samosir Regency.

V. CONCLUSION

From the results of this study, several conclusions can be drawn as follows:

- (i) In the Lake Toba area, the agricultural sector is in symbiosis with the tourism sector at the household level, where one member of the household works in the tourism sector on a seasonal basis (weekends or national holidays) and on other days participates in the management of family farming.
- (ii) Tourism has not developed with local tourist visits with short visits and therefore the available jobs are still informal such as renting water games, selling souvenirs and street vendor selling foods and beverages.
- (iii) Although activities in the tourism sector are still informal and seasonal (especially on weekends), the current income from the tourism sector is higher than farm income.
- (iv) Part of the income from the tourism sector is invested in farming, especially to finance the procurement of external input factors such as superior seeds, fertilizers and pesticides.

Facing the development of the tourism sector which will lead to sectoral disparities and potentially worsen agricultural sector and even increase poverty, local governments are advised to balance the infrastructure development carried out by the central government by increasing the capacity of farmers through education and training so that farmers can play a role in realizing upstream linkages of tourism by become a supplier of food for tourists and hotels and develop one or two commodities to be used as regional specialties that can also be used as souvenirs.

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