

Manufacturing Sustainability and Sustainable Community Development in Kampung Batik Laweyan Surakarta

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Abstract—This study aims to examine the influence of economic, environmental, and social factors on manufacturing sustainability, which subsequently affects community development as reflected by well-being and social capital. The research was conducted at Kampung Batik Laweyan, one of the oldest batik industry communities in Indonesia. Data were obtained using questionnaires and analyzed using Structural Equation Model (SEM). The results showed that economic, environmental, and social factors significantly influence manufacturing sustainability, community well-being, and social capital. It also shows that the presence of the batik industry largely determines the existence of the Kampung Batik Laweyan community as a manifestation of the stability of the Triple Bottom Line concept, namely, economic, environmental, and social factors. This study is expected to be a model for interested parties in preserving the existence of Laweyan as a batik village in Indonesia.

Keywords—*manufacturing sustainability, community development, well-being, and social capital*

I. SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT

The conception of sustainable development was motivated by the demand for economic growth. Studies on "sustainability" and "sustainable development" signify a new concept in literature because they are often intertwined and inseparable. This connection confirms that development concentrated on economic growth is an implicit component of sustainability [1]. Although a few of the literature investigated sustainability and sustainable development, a conceptualization of the Triple Bottom Line [2, 3], consisting of environmental, economic, and social stability, received extensive support. However, the lack of theoretical development posed a challenge. Sustainability and the Triple Bottom Line are two related concepts and can be used interchangeably in various studies [4]. Both are capable of being used as a

tool to examine, assess, and measure the impact of business activities on economic, social, and environmental security as the concept of "sustainable development."

The spectrum of community development includes a variety of concepts namely, economic development, health care, as well as the Millennium Development Goals (MDGs) and sustainable development goals (SDGs), which are world consensus. A comprehensive understanding of community development leads to the establishment of more extensive measurement practices ranging from quantitative indicator-based approaches to subjective experience-based qualitative [5]. Therefore, this study examines the relationship between manufacturing sustainability and the sustainability of local community development which is measured by well-being and social capital [14, 24, 17].

II. VALUES COMMUNITY DEVELOPMENT ARE IMPROVING WELL-BEING AND SOCIAL CAPITAL

Community development is a continuous process that aims to improve community well-being. It is about continuous improvement by the community itself to bring change in their lives [9]. Well-being in the direction of sustainability, [10] ensures that social and economic justice is defined as an integrated aspect of well-being and sustainability. Sustainability domain orientation must include; well-being, present, and future, justice, and equality of life within ecosystem boundaries. According to [11] sustainable community development is a process in which network capacity and various aspects of the environment are interrelated, this refers to the survival and adaptability of the community and the individuals involved. That society needs to focus on resilience and sustainability rather than current well-being to achieve future prosperity [12]. The interactional approach with the community has become a popular solution to meet the material needs of a fast-growing population while minimizing

environmental damage as [13] calls it a shift from sustainable development to sustainable community development.

Social capital can open up opportunities for the use of economic and human capital in creating well-being [14]. Studies of social capital, how social capital can be assessed, and then a list of key findings on the importance of social capital in understanding the social economy and community development have been carried out by [15] and [16]. It should be borne in mind that the social capital in question should not be separated from the capital in the literal sense of the economy and loss of power relations, and must be inspired by the assumption that social networks are mutually beneficial relationships because individual profits, interests, and benefits are identical to those of groups [17].

The sustainable community referred to in this study is the community in Kampung Batik Laweyan, Surakarta, which is a similar business group called the batik manufacture. The existence of the Kampung Batik Laweyan community company in Surakarta is inseparable from the journey of the community's life which is reflected in the social, environmental, economic, cultural, and political factors that occur [18]. Historically, Kampung Batik Laweyan is unique, and one of the oldest batik industry communities in Surakarta, Indonesia [19]. This study examines the relationship between manufacturing sustainability and local community development in Kampung Batik Laweyan as reflected by the well-being and social capital of the residents. The conceptual framework of this study is shown as follows:

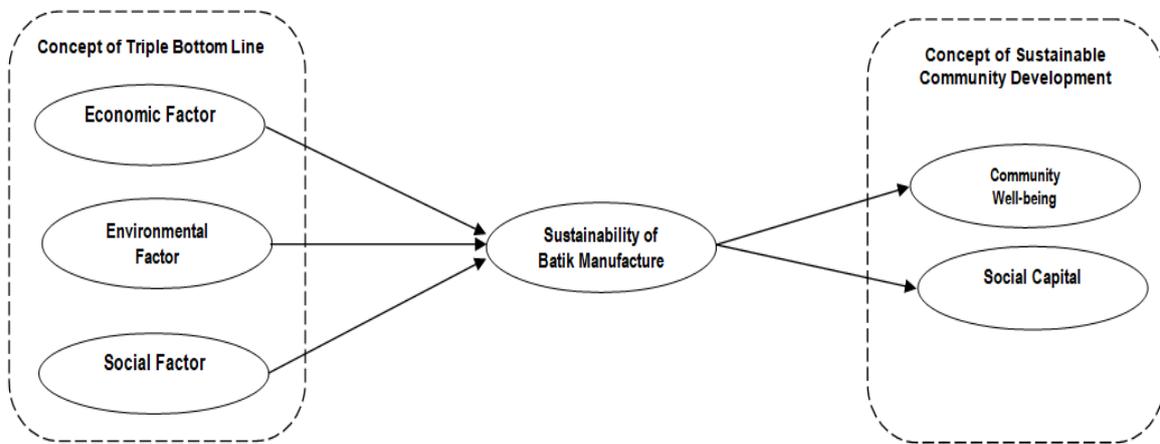


Fig. 1. Research Model

III. RESEARCH METHOD

A. Data collection

This is a survey research with data primarily obtained from individual respondents using questionnaires [20]. The study population comprised of samples of all batik entrepreneurs and residents living in Kampung Batik Laweyan, which were selected using the Stratified Random Sampling technique. The population was grouped from each cluster using the systematic sampling method, which is proportional to the total elements of each stratum. A total of 500 questionnaires were distributed; however, only 488 were completed and analyzed, thereby leading to a response rate of 97.6 percent. The data obtained were analyzed using the SEM.

B. Variable Measurement

Several indicators were used in measuring each variable which comprises a list of questions using the Likert scale (1-5). The variable of economic factors that affect sustainability in the batik industry was assessed using the constructs of [21-23]. In addition, the environmental factors used the construct of [21-24],

while the social variable used constructs of [22, 25, 24]. The sustainability variable of the batik industry was used [26], while the community well-being used the [27-32]. The social capital variable was assessed using the constructs of [16] and [21].

C. Data analysis

The data collected were analyzed in several stages, namely, validity, reliability, path analysis, and evidence level models. The validity test was carried out in two stages comprising of, convergent and discriminant validity tests, and after the indicator variables were declared valid, the reliability testing was conducted. After the instrument was proven to be reliable, path analysis was used to determine the relationship between variables as well as to measure the confidence level of the model by calculating the value of Q2 Predictive Relevance.

IV. FINDING AND DISCUSSION

The test results of construct validity and reliability, as well as discriminant validity, are presented in Tables 1 and 2. The construct validity of each variable was examined from the value of AVE above 0.5.

Meanwhile, the reliability is seen from the value of Cronbach Alpha & Composite Reliability. The discriminant validity in this study applied the Fornell-Larcker Criteria [34].

TABLE I. RESULT OF CONSTRUCT VALIDITY AND RELIABILITY

| Variables | Cronbach's Alpha | rho_A | Composite Reliability | Average Variance Extracted (AVE) |
|------------------------------|------------------|-------|-----------------------|----------------------------------|
| Economic Factor | 0,951 | 0,965 | 0,957 | 0,636 |
| Environmental Factor | 0,914 | 0,927 | 0,927 | 0,516 |
| Social Capital | 0,878 | 0,910 | 0,904 | 0,533 |
| Social Factor | 0,902 | 0,920 | 0,918 | 0,559 |
| Community Wellbeing | 0,936 | 0,958 | 0,949 | 0,667 |
| Manufacturing Sustainability | 0,943 | 0,945 | 0,951 | 0,661 |

^a Sources: Data Processed by smartPLS.3, 2020

Table 1 shows that all variables used in this study engaged the construct validity and reliable criteria, with AVE values above 0.5. This shows that the minimum requirements of construct validity were met. The

Cronbach's Alpha and Composite Reliability values are also above 0.6, and this means that all variables are declared reliable. Furthermore, discriminant validity is presented as follows:

TABLE II. RESULTS OF DISCRIMINANT VALIDITY BASED ON FORNELL-LARCKER CRITERIA

| Variables | EF | EnF | SC | SF | CW | MS |
|-----------|-------|-------|-------|-------|-------|-------|
| EF | 0,798 | | | | | |
| EnF | 0,258 | 0,718 | | | | |
| SC | 0,305 | 0,526 | 0,730 | | | |
| SF | 0,502 | 0,571 | 0,525 | 0,748 | | |
| CW | 0,396 | 0,525 | 0,513 | 0,625 | 0,817 | |
| MS | 0,548 | 0,688 | 0,667 | 0,813 | 0,770 | 0,860 |

^b Sources: Data Processed by smartPLS.3, 2020

Furthermore, Table 2 shows a higher FL-criterion value of the relationship between variables, assuming it is individually measured. Therefore, all variables in this

study are discriminatory valid. Table 3 shows that all hypotheses put forward in the study were statistically supported.

TABLE III. PATH ANALYSIS RESULT

| Path | (O) | (STDEV) | (O/STDE) | P V | Apposition |
|---------|-------|---------|----------|-------|-------------|
| EF→MS | 0,166 | 0,035 | 4,791 | 0,000 | Significant |
| EnF →MS | 0,299 | 0,023 | 12,757 | 0,000 | Significant |
| SF →MS | 0,606 | 0,039 | 15,590 | 0,000 | Significant |
| MS → SC | 0,667 | 0,029 | 23,028 | 0,000 | Significant |
| MS →CW | 0,770 | 0,025 | 30,361 | 0,000 | Significant |

^c Sources: Data Processed by smartPLS.3, 2020

The results of the path analysis in Table 3 show that economic (0.166; 4.791), environmental (0.299; 12,757), and social factors (0.606; 15,590) have a positive effect on manufacturing sustainability. These results also show that social factors in Kampung Laweyan batik influences sustainability manufacture

the most, compared to economic and environmental factors. Furthermore, manufacturing sustainability positively affects social capital (0.667; 23.028) and community well-being (0.770; 30,361). Figure 1 shows the path analysis.

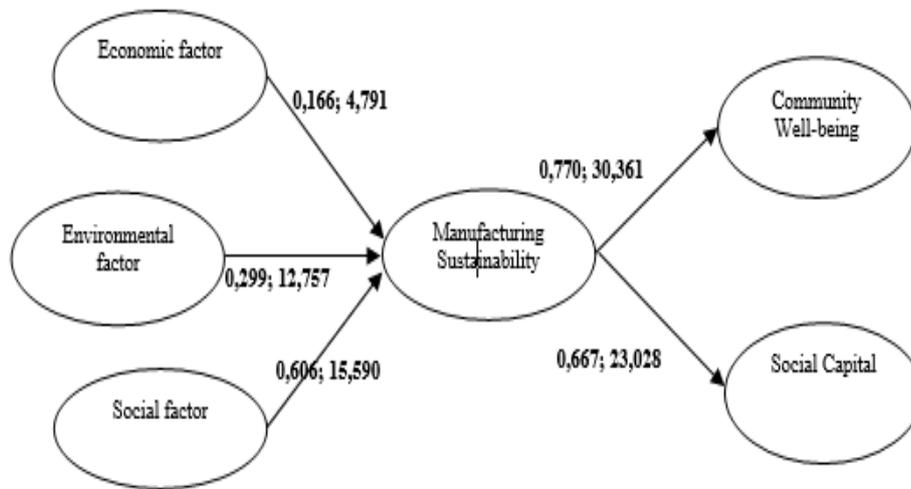


Fig. 2. Path Analysis Results

The level of model ability in explaining the dependent variable, i.e., community well-being and social capital are seen in the value of Q2 Predictive Relevance. This is calculated after the R-square value of each endogenous variable, namely; social capital, community well-being, and manufacturing sustainability are acknowledged.

TABLE IV. R-SQUARE VALUE OF ENDOGENOUS VARIABLES

| Variables | R-square |
|------------------------------|----------|
| Social Capital | 0,445 |
| Community Well-being | 0,593 |
| Manufacturing Sustainability | 0,818 |

^d. Sources: Data Processed by smartPLS.3, 2020

Calculation of Q2 Predictive Relevance, the Q value of 0.97922874 shows that the ability of the model to explain the dependent variable is 97.922%. Based on the R-square values presented in Table 4, the Q2 Predictive Relevance values are calculated as follows:

$$Q2 = (1 - (1 - 0,445) (1 - 0,593) (1 - 0,818))$$

$$Q2 = 0,95888893$$

$$Q = 0,97922874$$

In the context of the batik community in Kampung Batik Laweyan, the sustainability of the batik industry is determined by the existence of economic, social, and environmental support. In the context of Kampung Batik Laweyan, manufacturing sustainability is more strongly influenced by environmental and social factors than economic factors. Although economically unprofitable, the community at Kampung Batik Laweyan still maintains the sustainability of the manufacture. There are noble values that are believed by the Kampung Batik Laweyan community to maintain the sustainability of manufacturing in Kampung Batik Laweyan. For the majority of the Kampung Batik Laweyan community, the batik company is an identity for the community that must be maintained. This manufacturing sustainability

subsequently improves the community's well-being and social capital. This finding is in line with research conducted by [35] and [36].

V. CONCLUSION

The results showed that economic, environmental, and social factors influence the sustainability of the batik industry in the Kampung Batik Laweyan, which significantly affects well-being and social capital aspects. These findings reinforce the sustainability concept of the Triple Bottom Line, even though the coefficient values that indicate the relationship between the factors of sustainability in this study were varied. The smallest coefficient is associated with economic factors; therefore, this shows that it is not dominant in the batik industry in Kampung Batik Laweyan. The existence of this industry is more supported by natural preservation and social factors.

The study also stated that the sustainability of the batik manufacture positively influences community well-being and social capital as values in sustainable community development. This confirms the concept of sustainability as a prerequisite in achieving sustainable development [7]. It also reinforces the concept [36], which stated that "Sustainability" and "sustainable community development" as a collection of characteristics, including security and economic growth; environmental quality and integrity; social cohesion, and quality of life; empowerment and governance. The results of this study support the theory of sustainable community development, which stated that social capital with an interactional approach to community development is a useful alternative in many communities [37].

This study is in line with [35], which reported that social interaction is an element of sustainable community development. This reinforces the concept of community development as an effort to improve well-being by strengthening communities to be consistent with the core principles, namely, collective

action, empowerment, social justice, participation, and equality, anti-discrimination. In addition, community well-being is a combination of social, economic, environmental, cultural, and political conditions identified by individuals and communities as important aspects to develop their potential.

The results of this study can be utilized by practitioners, researchers, and policymakers in designing industrial-based community development. However, there are some limitations to this study as follows, and it was carried out on one object, namely Kampung Batik Laweyan. Therefore it is inadequate for generalization purposes. This study was also conducted in a very short period; therefore, sustainability and community development measurements were not carried out properly. Based on these limitations, further studies are recommended to be carried out in a broader scope so that the results are used for community development. Sustainability should also be examined longitudinally so that the achievements of sustainable community development as a result of business sustainability can be identified.

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