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Sorghum-Based Food Product Diversification to Enlarge the Market as Supporting the Entrepreneurship Product

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Abstract

This research briefly aims to—examine the opportunities for developing entrepreneurship from innovative and creative products to enlarge the market segment of sorghum products. Research method by quantitative and qualitative method with observations include exploration of materials and variations in entrepreneurial products, and after the data collected is analyzed. The results showed that all parts of sorghum plants could be used as raw material for entrepreneurial products (grains, stems, roots, leaves, rice, flour, and bran). Variations entrepreneur products produced are food products (various cakes, breads and cookies), functional drinks, and various fermented products, health products, cosmetic products, batik products, and souvenir products. The findings also proved that in the era industry 4.0 that have creative and innovative ideas in developing entrepreneurship especially various sorghum-based products.

Keywords: Entrepreneurship, Sorghum-Based Products, Era Industry 4.0

Introduction

The presence of the industrial revolution 4.0 indeed presents new business lines, new jobs, new professions that were previously unthinkable, which are expected to increase the competitiveness of national industries on the global scene and make it a gateway to spur job technology-based creation. The establishment of a healthy and sustainable technology-based entrepreneurial ecosystem can drive all sectors of the economy. Entrepreneurship can be an alternative solution to the problem of unemployment, the existence of entrepreneurs hoping to create new jobs in absorbing the workforce can be realized, as well as tips for entrepreneurs to have an influence on student opportunities for entrepreneurship, have high creativity and dare to innovate, and by giving a touch of creativity to the product , then the product will be of high value (Bortolini et al, 2017; Romero et al., 2016; Stăncioiu, 2017)

Entrepreneurship is an important element in economic growth in a country and is an important part in the development of countries around the world. Entrepreneurship also serves as an engine to promote innovation and sustainability (Behling & Lenzi, 2019). Therefore, entrepreneurship development becomes important as a step to understand the fundamental aspects of entrepreneurial growth (Baporikar, 2021). One of the tips for successful entrepreneurship is the selection of raw materials that have innovation value, where one of the potential ingredients is sorghum, which is one of the cereal crops that is easy to process, in the world the plant ranks fifth after wheat, rice, corn and barley. All parts of the sorghum plant are very useful, starting from grains, stems, leaves, and roots, which from seeds can develop by the process of seeding can produce rice, bran and bran, then sorghum rice can become flour, all

of which can be used as raw material for entrepreneurial activities. Every 100 g of sorghum contains 73 g of carbohydrates, also contains 11 g of protein, 3.3 g of fat, 0.38 g of vitamin B1, and 28 mg of calcium minerals, 4.4 mg of iron, and 287 mg of phosphorus. These figures indicate sorghum can be likened to rice, wheat, cassava, soybeans, or corn. Sorghum also has other health advantages, namely "gluten free", more fiber, contains antioxidants, and tannins. (Vanderlip & Reeves, 1972; Dykes & Rooney, 2006; Rooney, 2014). Originally the sorghum ingredient was only for animal feed, with these various advantages developing into one alternative food. This paper purposes innovative and creative products to enlarge the market segment of sorghum products. Research develops with various characteristics of excellence from sorghum, so research continues in the process of enhancing entrepreneurial education which must be aligned with creative and innovative activities aimed at analyzing sorghum-based entrepreneurial products by exploring all the potential of sorghum in the era industry 4.0.

Literatur Review

According to Drucker (1959) entrepreneurship is defined as an ability to create something new and different. Entrepreneurship also defined by Zimmerer (1996) is a process of applying creativity and innovation in solving problems and finding opportunities to improve life. The potential role of entrepreneurship in the literature is often overlooked, as an innovator in developing countries. An entrepreneur is often an innovator, bringing new goods and technologies to market, opening up new markets, processes, and ideas, and commercializing new knowledge. However, it is often mistakenly suggested that innovation by entrepreneurs is essential for more advanced economic growth (Cacciotti, & Hayton, 2015). The economic theory of entrepreneurship suggests that entrepreneurship brings broad benefits, including greater innovation, greater risk-taking and general improvements in the form of economic coordination (Harper, 1996). The concept of opportunity plays a central part in entrepreneurial theory. The theory of corporate growth in which the tendency to grow is inherent in the nature of the company to earn profits (Perose, 2009; Habersang et al, 2019)

Recently, synchronization for production and operations management in Industry 4.0 manufacturing environment is receiving increasing attention. The demand for increased productivity, flexibility, and resilience as well as reduced production costs is in sync with the business climate in Industry 4.0In order to maximizing the need for competence in the industrial era 4.0, it will bring up new efforts in developing ideas and procuring business opportunities that lead to the formation of new job opportunities (Ibarra, 2018; Pandey & Pandey 2019). This shows that entrepreneurial competence can actually be improved through entrepreneurship education learning, so that in the future it will be able to control job shifts and be a solution to the consequences of progress in the industrial era 4.0. The impact of changes in new technology needs to be responded to systemically in the form of, among others: (1) improving the skills and work habits of employees, (2) re-evaluating low-level positions to the managerial level, (3) structuring a hierarchy that is more oriented towards collaboration or collaboration, and (4) Observing the character of workers' lives in the industrial era 4.0 which is dominated by independent efforts to achieve career outcomes that are personally valued (Eriyatno, et al. 2019; Savitri, 2019).

The basis of study of American agriculture, Gupta & Khanka (2010) stated that entrepreneurs in the manner that at the initial of economic stages in development entrepreneurs whuch less initiative and driving the economic development proceeds, and become more innovating and enthusiastic. In fact, industrial era 4.0 also triggers progress in food product entrepreneurship innovation. In addition to functioning to maintain food stability and fulfillment of nutrition in various countries, it also seeks to improve the economy of the community. Opportunities and challenges for food security in developing countries, especially in Indonesia, are important to explore deeply (Banerjee, 2020; Wang, et al, 2020). Regarding to innovation and entrepreneurship in Shorgum product, Indonesia climed as national food strategy. Several things were done to support the strengthening of sorghum production clusters and sorghum production centers as an effort to strengthen the national food stock. In addition, the socialization of various sorghum products is carried out because not all regions produce

sorghum and not all communities understand the benefits and processing of it (Noerhartati, et al, 2020). In another country, like in India, the availability of inadequate qualitative feed and animal feed adversely affects livestock productivity. However, the production of sorghum as an alternative feed provides a solution to the shortage of animal feed and forage production that cannot be ignored (Singh Brar, & Kumar, 2020)

Method

The research method is quantitative and qualitative research methods in entrepreneurship with observations including exploration of sorghum-based raw materials namely grains, stems, leaves, and roots, while grains can be continued to be processed into rice, flour, soft bran and bran, while the variety of sorghum-based entrepreneurial products is based on its characteristics are food and non-food products, and after data is collected it is analyzed statistically (Fayolle, et al. 2014). The research was complemented by observations and in-depth interviews with business people and SME activists as a research method, which was then analyzed statistically. Business respondents who are respondents are members of the Sorghum Entrepreneurship Unit (SEU) network fostered from the Center of Entrepreneurship Sorghum-UWKS (CES-UWKS). Besides that, there is also an observation of product trends in the market and general level of consumer acceptance (Noerhartati, E, 2018)

Result

The exploration of sorghum-based entrepreneurship products in the era of the industrial revolution 4.0, is demanded to continue to be developed with innovative products and high creativity. This result also referring on previous research (Noerhartati, E & Rahayuningsih, T, 2016); Noerhartati et al. 2018; Noerhartati, et al., 2019, Rao, 2019). The results of the sorghum product exploration panel are as shown in Table 1.

Table 1 Exploration Sorghum Base Produtcs

No.	Items	Grain	Remarks	Stem	Remarks	Leaf	Remarks	Root	Remarks
A.	Products that are already on the market:	Grain	MA	Liquid sugar	R/BO	Compost	MA		
		Rice	MA	Soy sauce	R/BO				
		Flour	MA	Sapu Broom	R/BO				
		Various traditional cakes	MA						
B.	Creative Products:								
	1.Preparation of sorghum rice	Sorghum “Nasi”	T/A						
		Sorghum “Lontong”	T/MT						
		Packaging ready though	T/A						
		Fermented products *	T/A						

	2. Processed by sorghum flour	Various biscuits Gluten Free	T/A						
		Pizza GF	T/A						
		Breads GF	T/A						
		various cakes and cookies	T/A						
	3. Various traditional cakes	Label GF	T/A						
		Redesign packing	T/A						
	4. Soft brand Product								
	5. Brand Product	Feed (processed)	MA						
C.	Innovative products:								
	1. Food & drink:	Various rice products	T/A	Sorghum syrup	T/A				
		Functional drinks	T/A	Functional drinks	T/MT				
	2. Non-Food	Sorghum "Vas"	T/A	Feed (processed)	T/A	Feed (processed)	T/A	Pharmaceutical product	T/MT
		Sorghum Masker peell-off	T/MT						
		Sorghum soap	T/MT						
		Sorghum Ointment	T/MT						
		Sorghum hand sanitizer spray	T/MT						
		Sorghum "batik"	T/A						
		souvenir products	T/A						

Note: MA: Market Available
T/A: Trend products/Acceptable by consumer
T/MT: Trend products/Should be pass market test
GF: Gluten free
R/BO: Rare/By order
*) i.e tape, brondong etc...

The exploration of sorghum entrepreneurship products is examined based on the experience of SEU practitioners, market trends and the level of consumer acceptance. Products that are already available on the market are generally still in the form of raw materials. Only in some places are able to provide outlets for processed sorghum products, though not all year round is available. Most of the processed products available are by-products, not mass products that are available at any time. Products circulating in the market are whole grains, sorghum rice, flour and various cakes and soy sauce prepared from sorghum grain material. While the products circulating from the stems and other parts of this plant are drinks and brooms (Valeri & Danielis, 2015).

The overall glycemic index of products sorghum is classified as moderate, if food has a glycemic index of 56-69, so that it can be said that so gluten free products sorghum can be classified as an alternative to healthy food (Noerhartati et al, 2018). Sorghum food products also have growth due to this network of entrepreneurship and business people eager to improve their business. This is because the support for the sorghum trade system that has been running and the machine tools for processing sorghum seeds have now been used sophistically as well as information that is widely available to the public about the importance and advantages this commodity for consumers (Noerhartati et al, 2019)

Based on the finding, line with several previous research related sorghum as alternative food sources in entrepreneurship, it become the foundation in providing food needs besides rice. Sorghum is one that is consumed to prepare national food stocks in Indonesia. Sorghum is a potential an alternative food which is containing by its nutritional characteristics, Calorie content of rice 360 cal and sorghum 332 cal; The protein content of rice is 6.8 g and sorghum 11 g; rice fat 0.7 g and sorghum 3.3 g; carbohydrates rice 78.9 g and sorghum 73 g; Calcium rice 6 mg and sorghum 28 mg; Iron rice 0.8 mg and sorghum 4.4 mg; Rice phosphorus 140 mg and sorghum 287 mg; and vitamin B1 rice 0.12 mg and sorghum 0.38 mg. Another advantage of sorghum is gluten-free, more fiber, including policosanol & plant-sterols which can reduce LDL cholesterol, include tannin as anti-oxidant, and low glycemic index (Ardabili, et al. 2015; Noerhartati et al. 2018; Noerhartati, et al. 2019).

In order to direct this exploration of products, product selection is based on products that are becoming a trend or high level of demand and can be accepted by consumers. Some might include products with high demand, but market testing must be done first. The results of the product exploration panel are divided into two parts, namely food and non-food, as well as creative products as the development of available products and innovative products that are considered new to the market and consumers in general. Creative products are more on the development of a variety of similar products through improved packaging, highlighting information labels that give a stronger impression to consumers. While innovative products are more explored in the use of plant parts other than seeds, so they are of commercial value. (Besemer & Treffinger, 1981; Besemer & O'quin, 1986; Baer et al, 2004).

In addition to entrepreneurial orientation, product innovation is no less important. Products that displayed by business owners must have innovation Successful entrepreneurs have an idea and then look for ways to make it happen successfully solve a problem or satisfy a need. In a changing world faster than we can imagine, creativity and innovation are very important for the success and sustainability of the company (Zimmerer et al., 2008) and also product innovation affects marketing performance through the variable of excellence competitive advantage, competitive advantage is able to mediate the effect of Product Innovation on marketing performance. In relation to the industrial era 4.0, products produced with high innovation and technology have great potential to succeed in the industry national and international market. However, the weakness of new product innovation apart from access to banking and marketing is on the aspects of entrepreneurship and management. Courage to take risk in business is still low, ability to develop products (innovation) is still low and creativity to find new business ideas is still low. In the aspect of business management, it is necessary to master and apply it in business insight, so that they have high motivation in entrepreneurship (Knight, 2016; Yaseen Zeebaree, & Siron, 2017)

Conclusion

In the era of industrial revolution 4.0 must have creative and innovative ideas in developing entrepreneurship, especially various sorghum-based products, where all parts of sorghum

plants can be used as raw materials for entrepreneurial products (grains, stems, roots, leaves, rice, flour, soft bran and bran). Key important factors in product innovation reflected by discovery, development, duplication and synthesis has a significant effect on competitive advantage reflected by differentiation, and focus. In conclusion variations in entrepreneurial sorghum products produced are food products (various cakes, breads and cakes), functional drinks, and various fermented products), health products, cosmetic products, batik products, and souvenir products.

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