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Sustainable Aquaculture Ecosystem Solutions In E-Commerce Business

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ABSTRACT

Indonesia is a maritime archipelagic country with vast territorial waters. Currently, food security is a severe problem in the world. In 2020, after the COVID-19 pandemic, 811 million people experienced hunger problems. It is estimated that in 2030 this number will be higher and become a global problem. One of the opportunities to increase the amount of food production for food sufficiency is through aquaculture. Advances in technology and telecommunications support the development of online-based businesses such as e-commerce. By using e-commerce, manufacturers can market various products or services worldwide. This study aims to describe aquaculture solutions in the e-commerce business in Indonesia. The object of the research is eFishery, which is the first aquatech e-commerce company in Asia. This research method is exploratory with a prospective case study. Data collection techniques are primary data in the form of interviews and secondary data in the form of observation. The research results are expected to be a recommendation for companies and academics concerned about the development of e-commerce business and a reference for action research for further research.

INTRODUNCTION

The food problem is a comprehensive problem that threatens all humanity. After the COVID-19 pandemic came along, 811 million experienced hunger, and it is estimated that by 2030 this number will increase (eFishery). The increasing growth due to food conditions in Indonesia causes the supply conditions of foodstuffs to be smaller than the demand. In addition, the community is considered too dependent on agricultural products rather than aquaculture. If this condition is allowed, it will cause a lack of wiggle room for producers (Suryawati, 2019) said that food security is, resilience is the access of every household or individual to obtain food at any time for healthy living needs with food acceptance requirements following local values or culture. Meanwhile, according to the Badan Kementrian Pangan (BKP) of the Ministry of Agriculture, resilience is a condition for the fulfillment of food supply for the state up to individuals to be able to live a healthy, active, and productive life sustainably. The following table shows the food security index in Indonesia during 2021.

Table 1. Indeks Ketahanan Pangan (IKP) of Provinces in Indonesia in 2021

Ranking	Province	IKP	Ranking	Province	IKP
1	Bali	83,82	18	Banten	74,38
2	Central Java	82,73	19	Jambi	74,18
3	Special Region of Yogyakarta	81,43	20	Central Kalimantan	73,68
4	South Sulawesi	80,82	21	Bangka Belitung Island	73,22
5	Gorontalo	80,52	22	North Kalimantan	73,02
6	South Kalimantan	80,29	23	North Sumatera	72,25
7	East Java	79,70	24	Aceh	71,63
8	West Sumatra	79,55	25	West Kalimantan	71,32
9	North Sulawesi	78,30	26	Bengkulu	70,32
10	Jakarta	78,01	27	South Sumatera	69,55
11	Lampung	77,96	28	East Nusa Tenggara	67,35

Ranking	Province	IKP	Ranking	Province	IKP
12	West Java	77,79	29	Riau	66,84
13	East Kalimantan	77,46	30	Riau Island	63,26
14	South East Sulawesi	76,64	31	North Maluku	59,58
15	Central Sulawesi	75,73	32	Maluku	58,70
16	West Nusa Tenggara	75,67	33	West Papua	46,05
17	West Sulawesi	75,49	34	Papua	35,48

Source : http://repository.pertanian.go.id (Accessed at 15 September 2022)

West Java is known as a rice granary, but the irony was that the food security index was far below that expectation of 77.79. The best IKP score rankings are Bali 83.82, Central Java 82.73, Special Region of Yogyakarta 81.43, South Sulawesi 80.82, and Gorontalo 80.52. It shows that food fulfillment is not as good as in areas with high IKP. It is undoubtedly a big note in the implementation of achieving sustainable development goals, especially points 1 (without poverty) and 2 (without hunger) optimally. The pandemic condition in early 2020 caused a prolonged impact on food security. The issue of environmentally friendly and sustainable business is essential in the economy (Yudawisastra, 2021).

As a maritime archipelagic country, Indonesia has a large water area, so the water resources are relatively large (Nasruddin et al., 2013). Based on this, several companies have emerged that are engaged and conservancy to become solutions to increase production and food security in the water sector. One of these companies is eFishery, a social entrepreneur startup that has successfully reduced water pollution's impact on fish feeding patterns. eFishery helps fish farmers to organize fish feeding schedules and suppress fish deaths due to poisoning. The company is the first aquatech field in Asia, supported by technological advances in aquaculture to facilitate fish farming, access to capital, and easier sales of harvests.

Indonesia is the second contributor to the world's many fish farming productions. However, this higher contribution level must be balanced with the growth of abilities and knowledge. Besides the limited growth of fish farmers' ability and knowledge of technology, the climate is also one of the major influences (Fadlillah et al., 2021). Climate change is self-evident in the form of rising water temperatures, changes in rainfall and water availability, and increasing the frequency and intensity of storms. All of this has an impact on fisheries production and fish biodiversity. Currently, aquaculture development shows that rural areas' characteristics are filled with cultivators on a small business scale. These cultivators still use conventional technology. It makes it challenging to increase the productivity of fish farming because their accessibility is still not affordable for capital, technology, information, and markets (Fadlillah et al., 2021). Aquaculture itself plays a vital role in fish production in the world, where overall, aquaculture contributed as much as 44.1% of the total fish farming production in the world in 2014. This percentage is constantly growing every year. Countries in Asia have contributed 88.91%, and Indonesia ranks second with 5.77% of the world's many fish farming products (Pauly & Zeller, 2017). However, this higher contribution level must be balanced with the growth of abilities and knowledge. Aquaculture has been the fastest way to obtain the fastest source of animal protein food for more than half a century (an average growth rate of 8.1% per year since 1961), with total world production in 2007 reported as 65.2 million tons worth Rp 94,500,000,000. More than 91.1% of total global production is produced in Asia, with China alone producing 63.2% of the global total producing aquaculture fisheries (Rejeki, S., Aryati, R.W., dan Widowati, 2019).

In 2021 per capita fish consumption of the world's population will reach 19.6 kg per year. Although marine fish currently supply more fish consumption, in 2018, freshwater fish production has rapidly progressed compared to the production of capture fisheries. It is because the production of capture fisheries will decrease due to overfishing, making it more difficult for marine fish to be obtained. Even if there is no change in the production model, researchers predict that by 2048 there will be no more marine fish to catch. For this reason, it is necessary to increase the production of freshwater fish farming as a substitute for marine fish so that marine life has the opportunity to breed (Prihatini, 2019). However, aquaculture development is not as rapid as the development of agriculture because the food content in lakes, rivers, and seas is so abundant that it is considered unimportant to learn how to cultivate it. In addition, several factors can hinder aquaculture development, including the business and

administrative environment and structural regulations that create constraints rather than support further aquaculture development.

One is the existence of a budikdamber system that can overcome the problem of land limitations and decreased quantity and water quality in urban areas. Based on this, eFishery offers automatic fish feed tools that are directly connected to the internet. So that work is more efficient and effective, production of suitable feed for fish types, providing advice for farmers on how to understand the fish feed that should be given, and how to cultivate fish in cities with less water quality. eFishery has a mission as a company that grows a sustainable aquaculture ecosystem following sustainable development goals.

After the Covid-19 pandemic came at the beginning of 2020 has drastically changed lifestyles, including business activities in almost all humanity worldwide, unlike in Indonesia (Awaluddin, 2021). The habit of wearing masks when going outside, diligently washing hands to maintaining physical distancing to avoid transmission of the spread of the Covid-19 virus (Hasma et al., 2021). Even before the pandemic came, many small and medium-sized businesses faced the challenges of an increasingly competitive market with increasingly fierce competition because of the industrial revolution 4.0 that was delivered earlier, so the arrival of Covid-19 has caused conditions to get worse in uncertainty. However, eFishery can still survive even in such conditions because it uses a digital platform that suits these conditions. Sustainable aquaculture ecosystems have a longer-term concept, namely that there must be equal access and opportunities for future generations. The contribution of aquaculture can be helped by advances in the field of technology today. The technology-based business sector has the potential to maintain food security by building a systematic value chain. An integrated system can produce a sustainable ecosystem based on technology to strengthen global food security in the future.

Many ideas have emerged in the community as technology in this 4.0 era. Business people are asked to be more creative to survive in various conditions. In addition to the rapid growth of technology, the level of information has also experienced significant growth. Advance in the field of technology and information support the emergence of the development of online-based businesses such as e-commerce. E-commerce gives new ideas to the trading system in technological advances. This technology makes it easier for users to reach a broader market with a variety of information that is easy to access effectively and efficiently, especially for locations that are difficult to reach through the market to sell aquatic products. eFishery, as an aquatech company, can provide this through an application with a method of feeding catfish that is scientifically regulated in time and quantity via smartphones. In research conducted by (Hermawan et al., 2017), it was shown that the participation of fish cultivators in groups was at an apparent degree of participation with a high frequency of participation. The level of cultivator participation is already at the decision-making stage and acts together with the type of functional participation. Based on the above, we are interested in exploring the contribution of eFishery as the first company in Asia to use the aquatech system to maintain food security in Indonesia in particular and globally in general so that sustainable development goals can be achieved.

RESEARCH METHODS

The method we use for our research is a prospective explorative qualitative method, which, according to (Sugiyono, 2019), is often called a "naturalistic research method" because the research is carried out under natural conditions. The technique used is the collection of secondary data in the form of observations and data from various journals, books, and websites that support this research to provide an overview of the assessment and provide solutions to existing problems based on the results of the evaluation. According to Miles and Huberman in (Sugiyono, 2019) suggests that activities in qualitative data analysis are carried out interactively and continue continuously until complete, so that the data is saturated. Activities in data analysis are data reduction, data presentation, and drawing conclusions or verifying results.

RESULTS AND DISCUSSION

The primary mission of e-Fishery is to create a socially entrepreneurial and sustainable startup. Environmental and social issues a business affects are not new; experts have discussed this for many years. Global trends improve environmental and social performance (Yudawisastra, 2022). e-Fishery develops an aquaculture system with a mission to address the issue of hunger through the fisheries sector. It is not an easy thing for this achievement. The existing challenges prompted eFishery to create

systematic solutions to facilitate every step of the cultivation process. The e-Fishery products and services now available fully support the fishing business. e-Fishery's products and services exist to build an ecosystem where fish and shrimp farmers can increase productivity while creating a sustainable environment. e-Fishery is a company engaged in producing fish feeding equipment automatically employing scheduled feeding with the proper dosage and recording each feeding in real-time. This robotic fish feed technology can make it easier for business people in the field of fisheries, both on a home and large scale. So, e-fishery provides a desirable and valuable value proposition for its customers. As the world begins to recover from the Covid-19 pandemic, efishery continues to support farmers and fish farmers. Over the past eight years, from developing feeders to having a headquarters filled with hundreds of talented e-Fisheria. E-fishery has built more than 100 e-Fishery points in every corner of Indonesia to provide better assistance to fish and shrimp farmers.

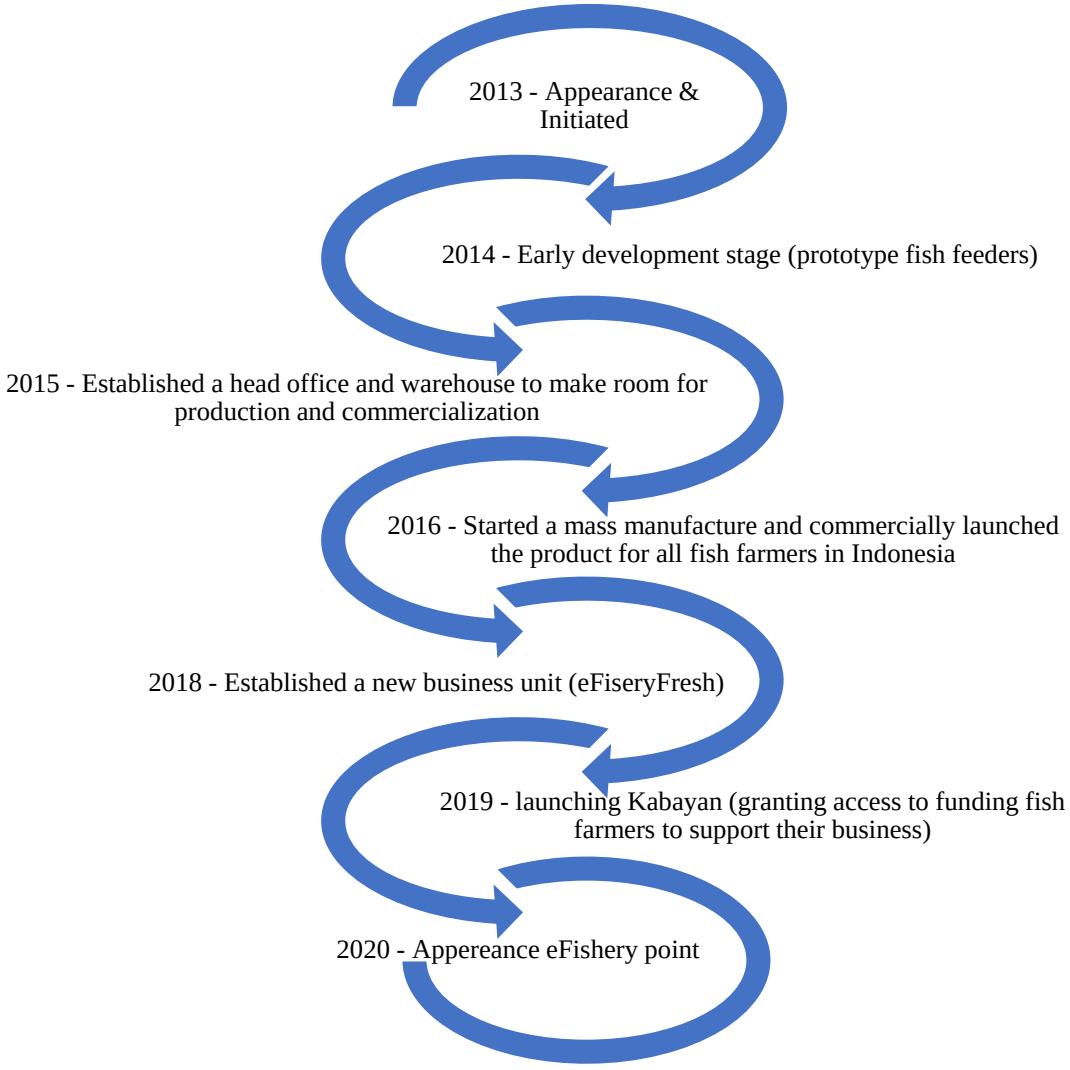

Figure 1. Transformation of e-Fishery
Source: (EFishery, 2022)

Digital applications for supporting business

Industrial Revolution 4.0 is one of the implementations of high-tech improvements in the manufacturing sector in the face of competition. The rapid development of technology makes it easier for humans to work and improve production efficiency in various fields such as cultivation, telecommunications, and other industry (Amarudin et al., 2020). Community empowerment is required to implement an e-fishery digitization system due to the Industrial Revolution 4.0. The advantage of e-Fishery is that it can feed fish automatically according to the chosen dosage and time, and farmers can

monitor pond water quality through the e-Fishery website (Prihatini, 2019). Since its establishment in 2013, there has never been an assessment of the usability or usefulness of the e-Fishery website. It is not known whether the extent to which this website is following what the community needs (Azzahra et al., 2022).

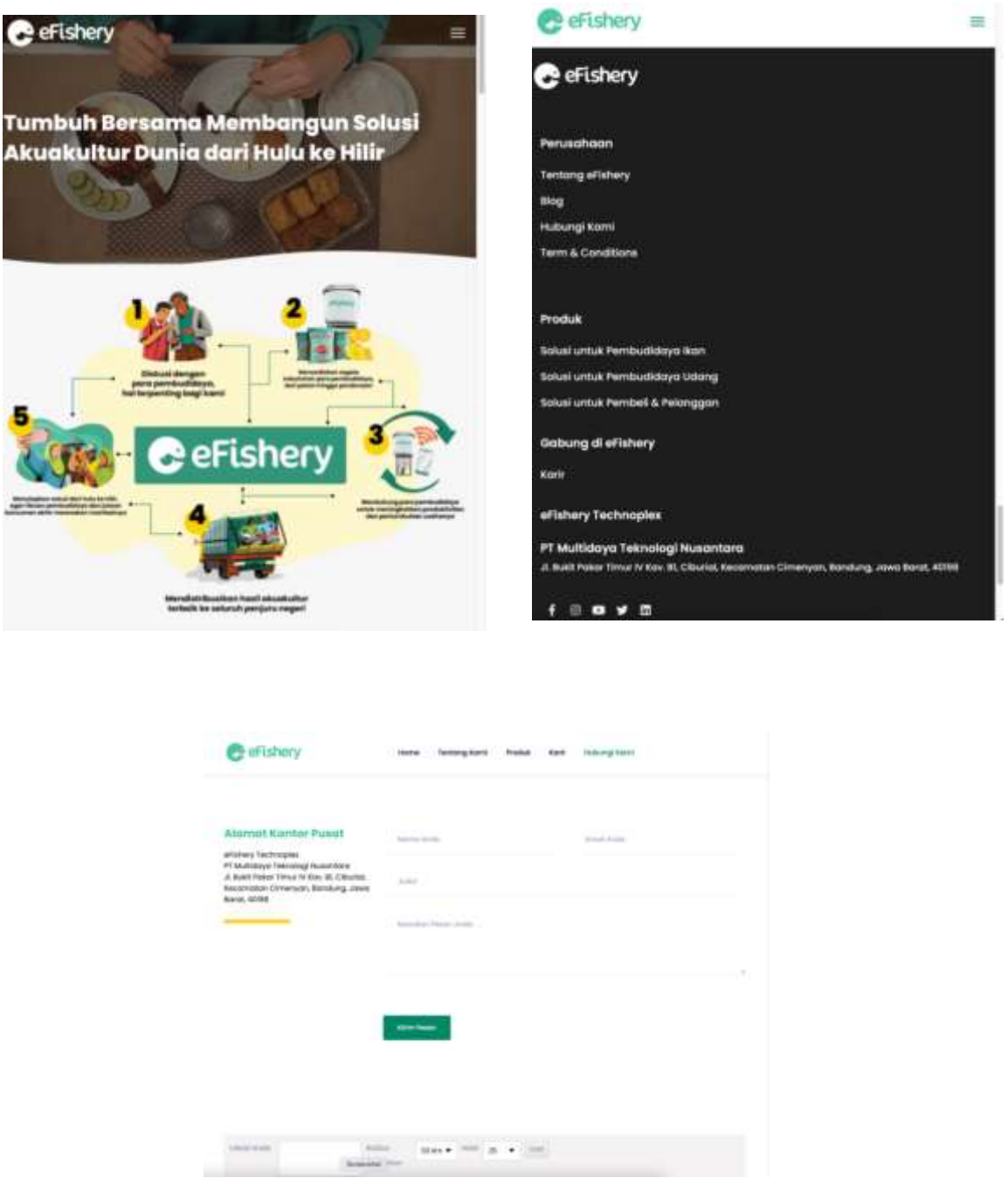

Figure 2. Website view
Source: eFishery.com

As a startup company with a sustainable concept, e-Fishery is very good at managing websites so people can easily access them. On the homepage, everybody can see the vision and mission of the company, its products, and the ease of joining as part of the sustainability program. The public has unlimited access to location, direct messages, and social media. The products offered by this company are solutions for cultivators and consumers. One of the sustainable goals of eFishery is to financially support farmers through financing programs, create technologies to improve feed efficiency,

accompany a variety of services to boost productivity, and channel crops for sustainable cultivation. The following picture describes the transformation of eFishery to achieve the goal of overcoming food catalysis in order to achieve sustainable development goals.

Solutions for fish farmers

The app allows automatic fish feed givers that can be controlled through a smartphone. With Fish eFishery Feeder, users can easily set a feeding schedule with a feed dose that suits the user needs. Every feed issued by eFishery Feeder is recorded automatically so that fish farmers can continue to monitor feed expenditure every day without having to record it manually. eFishery offers the convenience of providing fish feed anytime and anywhere accurately and recorded. Regular and maximally absorbed eFishery feeding will prevent the pond from the danger of overfeeding. Applications for fish breeders consist of eFisheryKu, efisheryFeeder Fish, Kabayan, eFisheyeed, and Lapak Ikan.

Figure 3. Website display for fish farmers
Source: eFishery.com

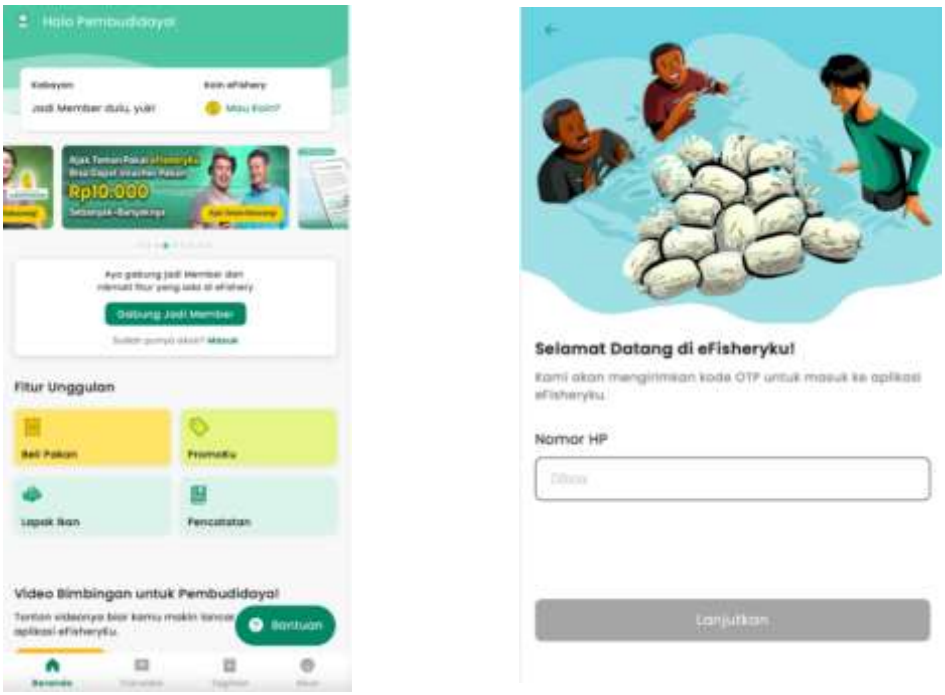

Figure 4. Application to join as a fish farmer
Source: eFishery.com

Figure 5. Information about member strategies and success stories
Source: eFishery.com

Solution for shrimp farmers

This application is used to increase productivity, maintain pond water quality, prevent outbreaks, and recommend a data-based pond management system, to support the ponds of shrimp farmers.

Figure 6. Website display for shrimp farmers
Source: eFishery.com

Figure 7. Application to join as a shrimp farmer

Solution for Buyers and Consumers

This application ensures buyers can access the best quality fish and shrimp products that can be enjoyed throughout the country with farmers' crops living, fresh, and frozen form.

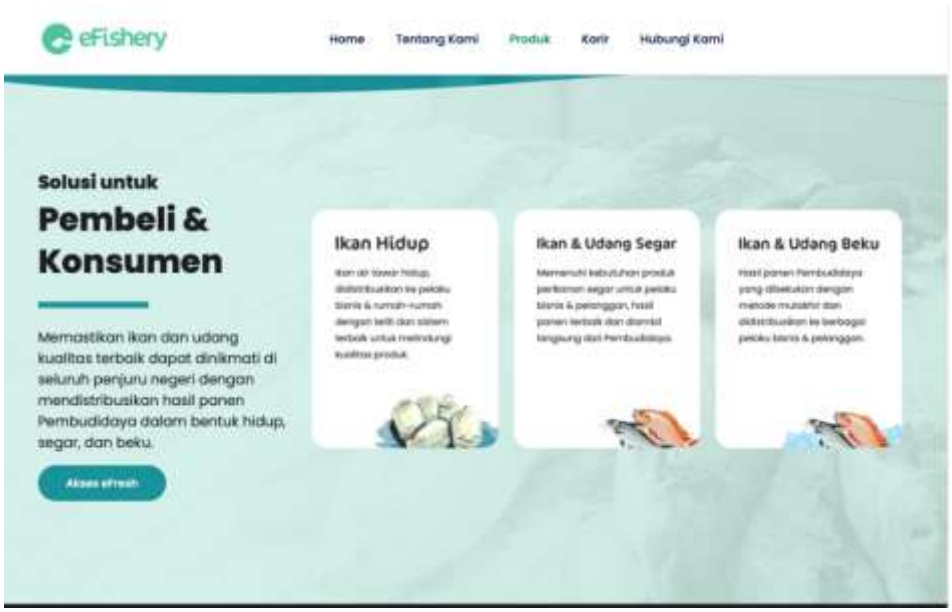

Figure 8. Website display for consumers

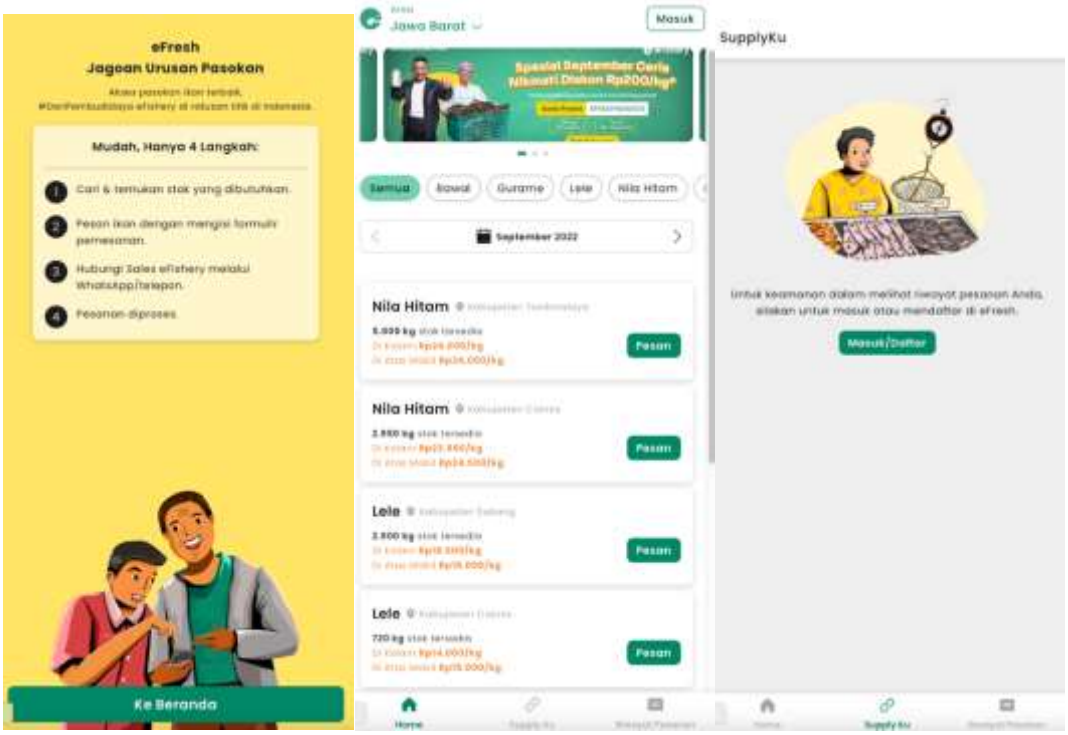

Figure 9. Apps for consumers

Solution for Sustainable

eFishery is committed to sustainability. The application was created specifically to access to capital support services for Indonesian Fish Farmers, providing aquaculture needs with a due payment.

Figure 10. Apps for consumers

Discussion

e-Fishery products and services exist to build an ecosystem where fish and shrimp farmers can increase productivity while creating a sustainable environment. e-Fishery is a company engaged in the production of automatic fish feed equipment using a feeding schedule with the right dosage and real-

time recording of each feeding. So, e-fishery provides a desirable and valuable value proposition for its customers. As the world begins to recover from the COVID-19 pandemic, e-fishery continues to support fish farmers and cultivators. Over the last eight years, from developing feeders to having a head office filled with hundreds of talented e-fisheries Community empowerment is needed to implement an e-fishery digitalization system due to the Industrial Revolution 4.0. The advantage of e-Fishery is that it can feed fish automatically according to the dose and time chosen, and farmers can monitor pond water quality through the e-Fishery website. This application is used to increase productivity,maintain pond water quality, prevent outbreaks, and recommend a data-based pond management system to support pond farmers. So it can be said that eFishery can find sustainable solutions and survive in the e-commerce business. Digitalization changes everything about fish, shrimp farming with its uses, automatic fish feed, pond water quality monitoring, and the way consumers get accurate information about the company's market products.

CONCLUSION

Based on the description and discussion above, it can be concluded that eFishery can find sustainable solutions and stay in the e-commerce business. Digitalization changes everything about fish, shrimp farming with its uses, automatic fish feed, monitoring pond water quality, and consumers getting accurate information about the company's market products. This digital-based sales system is expected to make it easier for employees to check product availability so that the sales process runs without a hitch. Buyers will benefit uuuubecause there is no indent or pre-order process. The application provided by eFishery makes it easier for farmers and customers because it can be accessed from anywhere without being constrained by space or time.

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