Building Entrepreneurship Based on Green Innovation to Promote Sustainable Development: A Qualitative Study Perspective

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ABSTRACT

Green innovation is growing in line with today's entrepreneurs' awareness of the crucial issue of sustainability development. The problem highlighted is that many green entrepreneurs cannot continue their business, as 98% of entrepreneurial initiatives to implement green innovation has led to failure. The failure is a gap that requires entrepreneurs to rethink the implementation of green innovation. This study raised the big theme of green management implementation, with the fundamental research question being focused on how to facilitate the presence of green innovation to survive in today's business environment. This research was a qualitative study with a research direction based on two main aspects. Firstly, conducting a qualitative study to explore case studies on green entrepreneurship that had successfully implemented green innovation. Secondly, formulating the factors that formed green innovation to encourage sustainable development. The informants of this research were companies engaged in algae cultivation that build commitment to green management. The data collection technique used interviews with managers as policymakers in recycling, reusing and reducing from the green concept. Triangulation of the suitability of interview results between managers and Chief Executive Officers (CEOs) was used to ensure validity. The findings of this study revealed how green entrepreneurship requires more additional costs than conventional entrepreneurship, where one of the keys is creativity and efficiency to survive. This study successfully proposed a green innovation framework that can be applied to green entrepreneurship in Indonesia.

Keywords: Green Innovation, Sustainability, Entrepreneurship, Knowledge, Green Management

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INTRODUCTION

The world economy is currently in the age of the fourth economic wave, called the knowledge-based economy (Phale et al., 2021). In this era, knowledge is considered a valuable asset and a vital material because it is used as a provision for entrepreneurs to create brilliant innovations in products and services (Phale et al., 2021). However, in its application, many innovations ignored the impact of causing environmental damage. Therefore, the concept of innovation that pays attention to the environment called green innovation, is needed (Kelliher et al., 2020). Green innovation in entrepreneurship is the meeting of environmental management and innovation (Dangelico et al., 2019). This concept encompasses new processes, equipment, systems, practices, products, and methods that add business value by minimizing negative environmental impacts and promoting sustainable goals (Aboelmaged & Hashem, 2019). Implementing green innovation includes recycle, reuse, eco-design, emission reduction, water and energy conservation, and optimized resource use, including human resource. Internally, green innovation can play an important role in the growth of entrepreneurship (Dangelico et al., 2019), as well as offer financial and natural security rewards derived from creating environmentally friendly products and services (Kelliher et al., 2020).

Indonesia is a country that has implemented a go-green policy in the field of entrepreneurship. Based on data from the Ministry of Industry, from 2010 to 2019, the Ministry of Industry has certified as many as 895 companies as green industries (Bappenas, 2022). Then, with the latest data from 2017-2023, the Ministry of Industry can certify 77 companies as green industries (Jayadi, 2023). The government has also realized the importance of implementing green management and responded by issuing Government Regulation Number 46 of 2017 concerning Environmental Economic Instruments. This aligns with global awareness of the importance of growing the world economy and saving the world's ecosystems. Indonesia ranks second in the world with the most significant number of forests (Dihni, 2022). However, according to the World Population Review, Indonesia became the second country in the world with the worst deforestation rate in 2024 after Brazil (Riani, 2024) even though this needs to be protected and preserved in line with Sustainability Development Goals (SDG) number 12 on Responsible Consumption and Production. Therefore, it is currently

urgent for entrepreneurs to apply green management to their businesses to reduce the negative impact of their operations on the environment (Dangelico et al., 2019).

This research has a problem gap phenomenon where 98% of entrepreneurs' initiatives to do green innovation had failed (Saphira, 2021). For example, The Body Soap and Mattel and many startup companies failed. It was because building green entrepreneurship requires a lot of effort, such as managing resources and creating innovations to survive, such as when facing the current green inflation phenomenon, so it is not uncommon to experience failure. However, interestingly, there were also many successful green entrepreneurs (Dangelico et al., 2019). This is an interesting study on strategies for building green-based entrepreneurship that can achieve sustainability development.

In this study, there were three essential points in building the sustainability development goals (SDGs) in the form of infrastructure development in creating sustainable, inclusive industrialization in the context of business innovation. The second point was maintaining supply and demand imbalances that ensured harmonious production and consumption patterns. The third point was realising globally sustainable consumption patterns and production processes, focusing on resource efficiency, reducing waste, and promoting environmentally friendly production practices.

Sustainability development is crucial, so it is necessary to know how entrepreneur as green human resource continues to survive even though it requires much effort. This was the question in this study. So, the purpose of this research was to conduct an exploratory study on green entrepreneurship that can sustain and identify the factors that build green innovation to encourage sustainability development.

LITERATURE REVIEW

A Natural-Resources-Based View (NRBV)

The Natural-Resources-Based-View (NRBV) Theory was first introduced by Stuart L. Hart where this theory is a development of the

Resources-Based View (RBV) theory. NRBV describes a conceptual framework comprising three strategies: pollution prevention, product management, and sustainable development (Caldera et al., 2018; Harts, 1995; Simmou et al., 2023). Pollution prevention aims to reduce pollution emissions caused by business activities, including entrepreneurship. Product management is used to guide the handling of products, especially in production, to minimize their negative impact on the environment. Finally, a sustainable development strategy relates to developing green-based innovations to achieve a competitive advantage in entrepreneurship (Harts, 1995).

Green Innovation (GI)

Green Innovation (GI) is a critical factor in maintaining environmental management (Yang et al., 2016) concerning the entrepreneurship process (Fu et al., 2022). GI can be defined as the process of creating new products and technologies to reduce environmental risks, such as pollution and negative impacts from resource exploitation (Castellacci & Lie, 2017; Karimi Takalo et al., 2021). GI as a strategy to maintain environmental sustainability and economic profitability (Fliaster & Kolloch, 2017). GI can drive entrepreneurship towards sustainable competitive advantage (Hur et al., 2013). GI is an interesting theme for entrepreneurs and researchers to continue to dig deeper into information, especially in friendly innovation studies.

Innovation studies are generally based on Schumpeter's Theory of Innovation. According to Schumpeter et al., (2013), GI helps meet consumer demands to protect the environment (Gürlek & Tuna, 2018) because its green value can be realized by balancing the value of innovation in products/services and processes. The ultimate goal of product/service innovation is to generate cost efficiency and entrepreneurial flexibility without abandoning green values (Albort-Morant et al., 2017).

Green Entrepreneurship (GE)

Green entrepreneurship (GE) is entrepreneurship that has a view towards environmental sustainability in the process of entrepreneurship activities (Muo & Azeez, 2020). The Green Project (Gibbs & O'Neill,

2012) defined GE as activities that consciously address environmental/social issues/needs by applying entrepreneurial ideas that support environmental protection and financial sustainability. Entrepreneurs as human resource start and run entrepreneurship designed to be green in process and product. Moreover, Sunny & Shu, (2019) suggested that green entrepreneurship should be defined in terms of production lines and technologies or entrepreneurial activities and argue that the only strategic solution to the sustainability problem is for entrepreneurs to build their businesses by relying on "going green" to survive to achieve sustainability development.

Sustainability Development (SD)

Sustainable development (SD) is the development of sustainability in entrepreneurship (Harts, 1995) and is the goal of entrepreneurship. Entrepreneurship that can achieve SD is entrepreneurship that has a competitive advantage. Competitive advantage is obtained from green innovation (Kelliher et al., 2020) coordinated by entrepreneurs from resource optimization and green knowledge. SD will provide positive opportunities for entrepreneurship in the future (Harts, 1995).

METHODOLOGY

The methodological choice used was the mono method (Eichsteller, 2022), using a qualitative study which employed interview instruments to explore green innovation in green entrepreneurship (Saunders, 1970). The qualitative approach was chosen because it is suitable for uncovering case studies of many entrepreneurship that fail to carry out green innovation, so this approach is relevant to the needs of exploratory studies (Kalu, 2017; Ponelis, Shana, 2015; Tellis, 1997) and the researcher's perspective on the object used an interpretivism approach.

This study used a case study of a green-oriented company. The company was chosen because of its existence as the biggest and integrated spirulina farm in Indonesia. It was a company that had successfully implemented green management. The company's production consumed electricity from nature through power converted from wind power. At the company, all main production elements in the form of algae plants had added value, including

water farming, thereby achieving zero waste production. Another aspect was its contribution to inducing society and the broader audience to develop new products based on green management. The company's location was in a rural environment in the Gunungpati area, Semarang City in Indonesia. This location was on the edge of the city, so it was strategic for setting up a large-scale factory, but still close to the market. It had already reached a global status with domestic and export markets.

This study involved the Chief Executive Officer (CEO), production manager, and finance manager as the informants. Informant criteria refers to their capacity as human resource to make decisions and determine the direction of sustainability in green management (Lammers, 2019). This study was related to a company that acquired the organization's direction built by its managers (Joseph & Gaba, 2020). The informants of this study were green entrepreneurs engaged in the manufacturing industry with complex business processes ranging from market sensing to innovation in market penetration. The selected green entrepreneurship object carried out the cultivation and production process of microalgae products such as supplements, medicines, beauty masks and others. The representative became an informant to explore how green-based entrepreneurship can be sustainable.

The context of this study was based on the themes referred to in previous studies. The concept of Green Innovation will be relevant to Natural-Resources-Based-View (NRBV). The NRBV is a conceptual framework composed of three pillars of green management: pollution prevention, product management, and sustainable development (Hart, 1995). Pollution prevention aims to reduce gas emission pollution caused by business activities. Business activities that ignore environmental factors, such as resource exploitation, will have a significant impact on damage. Activities that are not environmentally friendly pose a threat to human survival, including the economic sector (Han & Cheng, 2020). Green Innovation is an effective strategy to achieve economic growth and environmental protection. According to Schumpeter (1942), Green Innovation helps meet consumer demands while carrying out the mission of protecting the environment (Gürlek & Tuna, 2018). Green Innovation will reduce environmental risks, such as pollution and negative impacts from resource exploitation (Castellacci & Lie, 2017).

The interview process was conducted based on four primary constructs underlying the exploratory study: Green Entrepreneurial Mindset, Green Knowledge Capture, Green Human Resources, and Social and Economic Benefit. The list of question items used in the interview was as follows:

1. Green entrepreneurial mindset
   a) What makes entrepreneurs build green entrepreneurship?
   b) The risks are high and require large investments in carrying out green entrepreneurship, but what makes entrepreneurs remain committed to continuing?
   c) What is the entrepreneur's motivation in carrying out green entrepreneurship?

2. Green knowledge capture
   a) How do entrepreneurs search for information related to green regulation?
   b) How do entrepreneurs understand incoming information and then convert it into knowledge to obtain green innovation?
   c) How can entrepreneurs encourage employees to accept green regulations?
   d) What hinders entrepreneurs from receiving information?

3. Green Human Resources
   a) How can entrepreneurs improve green-based work processes?
   b) How do entrepreneurs encourage employees to create green innovation?
   c) How can entrepreneurs choose the right equipment and materials to create more economical and environmentally friendly products?

4. Utilization of green potential for social and economic benefits
   a) What is the impact of entrepreneurship on social aspect?
   b) What social and economic advantages does entrepreneurship gain in carrying out green entrepreneurship?
   c) How does profit grow when running green entrepreneurship?

The study employed a narrative analysis to understand the experience of informants. Data mining on informants focussed on the experience of

implementing green management or personal success stories of building green innovation among managers, which in line with the CEO. The software used was smartphone recording, which was inputted through NVIVO 12 Plus software. This study ensured the confidentiality of the data submitted by the informants. All interviews were automatically recorded. The study used open-ended questions to elicit respondents' thoughts, perceptions, and experiences regarding green entrepreneurial mindset, green knowledge capture, resource use optimization, utilization of green potential for social and economic benefits, and green sustainability. All audio recordings of the interviews were transcribed verbatim by the researcher. Keywords, declarative, and relevant sentences were classified into five main themes: green entrepreneurial mindset, green knowledge capture, optimizing resource use, utilizing green potential for social and economic benefits, and green sustain.

RESULTS AND DISCUSSION

This research used a case study of a company engaged in algae cultivation and acquiring advanced technology. This organization was a startup company oriented towards implementing green management, which was implemented in governance, such as the concept of recycle, reuse, and reduce.

Based on the coded qualitative analysis of each domain, the important aspects considered by green entrepreneurship for sustainability were narrowed down to five themes: green entrepreneurial mindset, green knowledge capture, optimizing resource use, utilizing green potential for social and economic benefits, and green sustain.

Green Mindset Entrepreneur

Green Preference

Green preference is the entrepreneur's view of green. Green preference consists of, first, green risk-taking, where entrepreneurs map out problems that may arise in green management and green innovation (Hermawan et al., 2021; Lades et al., 2021). Green innovation based on risk-taking in managerial concepts has implemented prudential principles (Busato et al.,

2023) where the resulting green innovation is tested in the Research and Development (RND) department, which ensures that the market can accept green innovation products or a product boom occurs (Long et al., 2022), by doing green risk-taking, entrepreneurship can anticipate problems that can endanger entrepreneurship.

> *"Green entrepreneurship is usually seen in terms of waste, but it is not only seen in terms of waste but also in terms of financial systems, management and others that must be sustainable." – CEO*

Second, entrepreneurial background, which is the background of the formation of a green mindset in entrepreneurs. Some things that become the background of the formation of entrepreneurs include beliefs, social associations, and education (Brieger et al., 2021). Strictly speaking, differences in educational background and social environment encourage the presence of social cognition in the context of green management through the growth of saving the earth. Another aspect is the emergence of millennials and Generation Z, who currently occupy many vital human resource positions in the company. This also provides a strong background in protecting the natural environment and reducing emissions per their personality.

> *"I was taught that we are khalifah fil ardh or the leader of all creatures, so we should not be selfish, not only humans who live on earth, but there are other creatures." – CEO*

> *"I am basically an environmental activist. I am aware of the world's condition, which is experiencing a green crisis. Besides socialising with the community, we must invest in our children and grandchildren; at that time in NTT, I saw the sea was so beautiful that I immediately loved Indonesia, but when I returned to Semarang, it was very different. I felt concerned." – CEO*

> *"Education, I studied biology, but it did not lead to the environment, but from biology I began to study plants." – CEO*

Third, Green operation, where the entrepreneur maps out the resources that ensure the company can run (Moosa & He, 2022). Green operations often refer to the presence of costs that arise (Zhang et al., 2022) in line with greenflation because green production processes are more expensive than conventional business processes (Ferrari & LandiNispi Landi, 2024), as well as the need for a product packaging design for green products refers to the nature of the need to be environmentally friendly, biodegradable so that it cannot use ordinary plastic or polymer materials and this certainly requires more costs when presenting new product innovations.

> *"There is a team that focuses on innovation. They have targets to complete, so we always have new innovations." – Production Manager*

Fourth is legal procedure. Entrepreneurs create documents in accordance with applicable regulations and procedures while still applying green aspects (Sabokro et al., 2021).

> *"Now, it has begun to be implemented. For example, we print documents using used paper (Green operational management), and it is legal." – Finance Manager*

Green Engaged

Green engaged is green thinking that binds the entrepreneur (Musona et al., 2020). Green engaged consists of zero waste, which means no waste is wasted in entrepreneurship activities (Healy, 2020).

> *"We also have waste, but we filtrate the waste so we use it for fertilizer, from the fertilizer later for plants, now we can eat the plants." – Production Manager*

Second, the balance of life and nature, building the balance of entrepreneurship needs to elaborate the 3P (People, Profit, and Planet).

> *"Sustainability to us is implementing the intersection of people, profit, and also planet because we are not only concerned with the human aspect, the environmental aspect, but we also need profit to support our company; everything must go together." – CEO*

Third, reuse is where entrepreneurship repairs and uses items that can still be reused for operations (Kabirifar et al., 2020).

> *"How do we think if something is broken, we say to employees, let's kaizen, let's use it again better, so that means damaged goods are not immediately thrown away but repaired first if it really can't be bought new." – CEO*

Green Responsibility

Green Responsibility is awareness of green. Green responsibility is built by several aspects, including moral hazard, save the world responsibility value, self-efficacy, and green awareness (Ali et al., 2023): (a) Moral hazard where entrepreneurs have a personal awareness of their responsibility to care for the planet (Hossain et al., 2021).

> *"Although it is not 100% free from plastic, its management is accountable." – Finance Manager*

(b) Save the world responsibility value, where the entrepreneur realizes the need for concrete steps to save the world as a form of business responsibility (Nuringsih, 2020).

> *"We remain committed to green entrepreneurship, first because we are aware of the world's green crisis." – Production Manager*

(c) Self-efficacy: Entrepreneurs are confident in driving green entrepreneurship to survive and grow (Q. M. Ali et al., 2023).

> *"We are not in business only for profit, because we are based on sustainability, how to protect nature and people while still making a profit from the 3 P's earlier. The investment is big but not for the future. Regulations in the world already support it." – CEO*

Islamic Ethic Mindset

Islamic Ethic Mindset is a religious value owned by entrepreneurship. Entrepreneurship applies Islamic values in its business activities. Such as the implementation of dhuha prayer before conducting business activities. This is done as a form of gratitude, peace of mind, and blessing (Ali et al., 2020).

"I am Muslim, I was taught that we are khalifah fii ard or the leader of all creatures, so we should not be selfish, not only humans who live on earth but there are other creatures." – CEO

Green Knowledge Capture

Ideas Mapping

Ideas mapping is the mapping of ideas to build innovation in green products. Entrepreneurs need to have idea mapping to have careful planning in the future so as to be able to face dynamic business conditions (Talmar et al., 2020).

"I map out ideas based on their potential in the market, of course, also based on employee input." – CEO

Knowledge Assembly

This indicator is built from aspects such as the first, active learner and entrepreneurial background, where entrepreneurs actively learn to assemble knowledge (Widodo, 2020) to create green innovation.

"I'm the type of person who likes to learn. I have been participating in seminars since I was in college. I have participated in many communities and seminars. Other than that, I am self-taught. I learn a lot from nature itself. I reflect a lot." – CEO

The next aspect of knowledge sharing means that entrepreneurship actively shares knowledge to assemble new knowledge, both internal and external to entrepreneurship. Knowledge sharing will strengthen the company's human resources knowledge and competence (Arsawan et al., 2022).

"I know credible regulations through the WhatsApp community group, where the group contains people who are basic environmental activists, entrepreneurs, professors and others, much information is shared there that we cannot get anywhere else, besides that for certain information also from other colleagues. If you are already in business, building a network is

important; we must build trust in others to get information and others. Now is not the time for competition but collaboration, so we help each other." – CEO

Knowledge-based Infrastructure

Knowledge-based infrastructure is the tool used in green entrepreneurship activities to support the formation of green innovation (Shahzad et al., 2020). Aspects in the indicator include: (a) team work agility, namely, the team in entrepreneurship has agility in seeking knowledge (Poth et al., 2023).

"All of us here are basic environmentalists, talking about innovation. We often get innovations from the media, not only in mass media books but also on Instagram. We also read a lot of journals and other media." – CEO

(b) Green technology support, entrepreneurship uses various environmentally friendly technologies that support the implementation of entrepreneurship activities (Trapp & Kanbach, 2021).

"We use a filtrate machine to convert waste into fertilizer for plants." – Production Manager

Knowledge-based experiment

Knowledge-based experiment is conducting experiments in the process of creating green innovation. This indicator includes aspects of trial and error wherein obtaining knowledge, trials are carried out on product prototypes (Wang et al., 2020).

"The latest is that we are currently in the process of researching making batteries from algae. We are intensely conducting tests." – Production Manager

The next aspect is problem-solving, where various problems are solved through conducting experiments, such as routine experiments within a certain time (Wang et al., 2020).

> *"Regulations that are difficult for us are regulations related to certification, such as hygiene. We researched and found alternatives to replace disposable suits that produce waste and then offered lab coats. Finally, we are allowed to wear white lab coats with a note that they must be washed daily." – Production Manager*

Internal Knowledge Deployed

Internal Knowledge Deployed is the deployment of knowledge within internal entrepreneurship (Amankwah-Amoah & Adomako, 2021). The building block of this indicator is openness for green regulation, meaning that both entrepreneurs and employees accept all applicable green regulations (Huang et al., 2020).

> *"We can accept all existing regulations, but sometimes we just need to adjust some." – CEO*

The next building block is positive interaction, where entrepreneurship has a culture of helping (Hernández-Chea et al., 2021).

> *"When the process of innovating fails, don't give up and keep trying. When something like that happens, we respect and must help each other." – Finance Manager*

Knowledge-Based Efficiency

Knowledge-Based Efficiency is a strategy for creating efficiency with knowledge (Hernández-Chea et al., 2021). The aspect in this indicator is reduce and reuse, in entrepreneurship used goods that are still suitable for use and reduce the use of paper. This knowledge creates efficiency in entrepreneurship.

> *"We think that if something is broken, we talk to employees, let's use it again better, so it means that if something is broken, we don't immediately throw it away but fix it first if it really can't be bought new. How do we manage finances for sustainability? For example, we have items that can be recycled, and we use paper again." – Finance Manager*

External Knowledge Access

External knowledge access is built on several aspects, namely, first, external information; entrepreneurs get knowledge induction from colleagues, social media networks, and feedback from the community (Zhao et al., 2022).

> *"We also get information from partners. Sometimes, we often have guests from everywhere, so we share information there. There are many opportunities for spirulina product development in the future." – CEO*

The second aspect, network collaboration, is that entrepreneurship can establish networks with various parties such as fellow entrepreneurs, suppliers, government, consumers and the surrounding community (De Bernardi et al., 2020).

> *"Relationships with colleagues are critical because now is the era of collaboration, not competition. If there are competitors, they should be embraced; for example, if they are both selling spirulina but don't have spirulina, we will work together." – CEO*

Resource Use Optimization

Price Product Optimization

Price product optimization is the maximization of product selling prices. Production costs influence competitive product selling prices. The lower the production costs, the more competitive the price will be, so the aspect of this indicator is supplier support (Gupta et al., 2021). Supplier support plays a role in determining production materials in terms of quality and price, which will certainly affect the green product price.

> *"When choosing suppliers, we make comparisons, of course, low prices and quality. For quality, we check using quality forms. There is a trial period, and product specifications must meet our standards, and then we choose the lowest price. The better the quality and lower the price of materials, the more competitive the selling price." – Finance Manager*

Business Co-Creation

Business Co-Creation is the creation of new markets with products that have never existed in the market before and are needed by consumers through collaboration with external parties (Hermawan et al., 2024). The aspect of this indicator is investor support; the investors needed are those with a vision in line with entrepreneurship and are mutually beneficial.

> *"I also make new green products in collaboration with big companies." – Production Manager*

The next aspect of the business alliance, entrepreneur collaborates with colleagues and maximizing human resource to create inimitable green products to create new target markets.

> *"In making new green products, sometimes we don't have the competence in the production, so we hire services, but the ideas and materials are ours." – Production Manager*

Market Sensing

Market sensing means entrepreneurs know the market conditions (Hermawan et al., 2024). The essential aspects of market sensing are market dynamics, which, firstly, enable entrepreneurship to identify market changes that continue to change. Entrepreneur can recognize upcoming market trends.

> *"Market, sometimes what consumers say they need is not necessarily true, it could be because it is viral or hype but quickly disappears in the market, so we look at the market that consumers really need, we look for products that can sustain." – CEO*

The next aspect is consumer mapping, where entrepreneurship maps the green values that consumers want. With this mapping, the potential for new green products created by entrepreneurship will be closer to consumer expectations.

> *"First, in general, we look at the consumer segment first. Consumers see products based on certification, are environmentally friendly, and green company. To know our*

consumer segments, we have a plan based on research and data." – CEO

Utilization of Green Potential for Social and Economic Benefits

Social Economic Advantage

Social economic advantage is the main contribution of social entrepreneurship in increasing the community's economic growth (Méndez-Picazo et al., 2021). Aspects of social economic advantage include: (a) Green social impact, entrepreneurship has fostered partners for green-based economic independence.

"We have a social program called microalgae saviour, a form of assisted village, so the aim is to transform knowledge about spirulina cultivation to help the community become independent. We have a spirulina village in Blitar and are also open to friends who want to train here. We also accept interns, which is also a form of our intelligence to the community." – CEO

(b) Local economic growth, the presence of entrepreneurship opens up new business opportunities for local communities (Buratti et al., 2022).

"The impact of social programs on the community is that the community has income, is healthier by consuming spirulina, can get cheaper fertilizer, and can buy good cosmetic products. Another impact of our existence on us the surrounding environment is a small example: here we accept interns, and the community finally opens boarding houses from there, we know that the surrounding economy is also growing." – Production Manager

Corporate Goodwill

Corporate goodwill is the reputation of green entrepreneurship. This indicator is built on aspects of corporate social responsibility, and social programs held by entrepreneurship build and improve the good reputation of entrepreneurship (Khuong et al., 2021).

"The entrepreneurship program has become better known both by the community and the business community. We are facilitated for regulations in the community, such as licensing, and we give donations to the village once a month. If they need something, we help facilitate it." – CEO

Green Sustain

Green Innovation Sustain

Green innovation sustain is where entrepreneurship can survive in the face of dynamic business conditions (Singh et al., 2022): (a) Trust capability, entrepreneurs can build trust from outside parties such as investors, suppliers, consumers, and the community.

"If you are already in business, building a network is important to get information and others. We have to build trust in others." – CEO

(b) Technology reduction process, the technology used by entrepreneurship can minimize costs in the production process.

"I use the Bayu Power Plant for electricity. It can cut electricity costs by up to 60%." – Production Manager

(c) Business anomaly, green entrepreneurship requires a significant initial investment but has a high Return on Investment (ROI) in the long term.

"Even though green entrepreneurship requires high costs at the start, we can show that the subsequent investment is small, so you must first be brave. The investment is large but then small." – Finance Manager

Green Market Accepted

Green Market Acceptance is market openness to green products (Singh et al., 2022). This indicator has three building aspects: (a) Product Standardization, the products produced are tested to be feasible and meet consumer needs.

"Ingredients must pass lab tests. We check the quality of the results using a quality form. There is a trial period, and product

specifications must comply with standards." – Production Manager

(b) Green Market Growth, entrepreneurship experienced an increase in product demand by 10%.

"Demand has increased in the past two years. In 2021, demand was 60%. In 2022, it increased to 70%." – Finance Manager

(c) Green Profit, green innovation in entrepreneurship increases profit margins by up to 300% and during the pandemic, it still has a positive growth rate.

"Our sales profit margin can reach 300%." – Finance Manager

Based on the results of qualitative coding from interviews conducted with informants, 37 themes were obtained, which indicated key terms in implementing sustainable green entrepreneurship. These themes were converted into 18 indicators in line with the theories in the body of knowledge, including green preference, green engagement, green responsibility, Islamic ethical mindset, ideas mapping, knowledge assembly, knowledge-based infrastructure, knowledge-based experiment, internal knowledge deployed, knowledge-based efficiency, internal knowledge access, price product optimization, Business co-creation, market sensing, social economic advantage, green innovation sustain, and green market accepted. The framework concept was confirmed with informants to explore critical aspects that build the overall indicators in line with the field techniques described in the table below.

Table 1: Critical Success Factor

Theme	Indicator	Critical Success Factor
Green Risk-Taking	Green Preference	Entrepreneurs map out problems that may arise in green management and green innovation.
Entrepreneurial Background	Green Preference	The green entrepreneur mindset is based on beliefs, social relationships, and education.
Zero Waste	Green Engaged	There is no waste wasted in entrepreneurship activities.
Balance of Life and Nature	Green Engaged	Building a balanced entrepreneurship requires elaborating on the 3Ps (People, profit and planet).
Moral Hazard	Green Responsibility	Entrepreneurs have a personal awareness of their responsibility to care for the planet.
Green Operation	Green Preference	Entrepreneurs map the resources that ensure the company can run.
Legal Procedures	Green Preference	Entrepreneurs create documents following applicable regulations and procedures.
Reuse	Green Engaged	Entrepreneurship repairs and uses goods that can still be reused for operations.
Save World Responsibility Value	Green Responsibility	Entrepreneurs realize that they need real steps to save the world as a form of business responsibility.
Self-Efficacy	Green Responsibility	Entrepreneurs have the confidence to drive green entrepreneurship to survive, let alone grow.
Green Ideas	Ideas Mapping	Entrepreneurs map out ideas to build innovations in green products.
Active Learner, Entrepreneurial Background	Knowledge Assembly	Entrepreneurs are active in learning to assemble knowledge to create green innovation.
Team Work Agility	Knowledge-based Infrastructure	Teams in entrepreneurship are active in seeking knowledge.
Trial and Error	Knowledge-based Experiment	Gain knowledge by conducting trials on product prototypes.
External Information	External Knowledge Access	Entrepreneurs receive knowledge induction from colleagues, social media networks, and feedback from the community.
Network Collaboration	External Knowledge Access	Entrepreneurship can establish networks with various parties such as fellow entrepreneurs, suppliers, government, consumers and the surrounding community.
Openness for Green Regulation	Internal Knowledge Deployed	*Entrepreneurship accepts all applicable green regulations.*
Reduce and Reuse	Knowledge-Based Efficiency	In entrepreneurship, used goods are used that are still suitable for use and reduce paper use.
Problem-Solving	Knowledge-Based Experiment	Various problem solutions were resolved through conducting experiments, and in one month, the experiments were carried out twice.

Theme	Indicator	Critical Success Factor
Supplier Support	Price Product Optimization	The suppliers that entrepreneurship needs are suppliers with products that meet predetermined standards and at the lowest prices.
Investor Support	Business Co-Creation	The investors needed are those with a vision aligning with entrepreneurship and mutual benefit.
Market Dynamic	Market Sensing	Entrepreneurship can identify market changes.
Green Social Impact	Social Economic Advantage	Entrepreneurship has built partners for green-based economic independence.
Local Economic Growth	Social Economic Advantage	The presence of entrepreneurship opens up new business opportunities for local communities.
Corporate Social Responsibility	Corporate Goodwill	Various social programs build a good name for entrepreneurship in the surrounding community.
Business Alliance	Business Co-Creation	Entrepreneurship collaborates with colleagues to create inimitable green products to create new target markets.
Religious Value	Islamic Ethics Mindset	Entrepreneurship applies Islamic values in its business activities.
Positive Interaction	Internal Knowledge Deployed	Entrepreneurship has a culture of mutual help.
Consumer Mapping	Market Sensing	Entrepreneurship maps the green values that consumers want.
Knowledge Sharing	Knowledge Assembly	Actively sharing knowledge to assemble new knowledge.
Green Technology Support	Knowledge-Based Infrastructure	Entrepreneurship uses various environmentally friendly technologies that support the implementation of business.
Trust Capability	Green Innovation Sustain	Entrepreneurs can build trust from outside parties such as investors, suppliers, consumers and the community.
Technology Reduction Process	Green Innovation Sustain	The technology used by entrepreneurship can minimize costs in the production
Business Anomaly	Green Innovation Sustain	Return on investment (ROI) is high in the long term.
Product Standardization	Green Market Accepted	The resulting products are tested to be feasible and meet consumer needs.
Green Market Growth	Green Market Accepted	Product demand increased by 10%.
Green Profit	Green Market Accepted	a. The company has a profit margin of 300%. b. The company has a growth rate, including during the pandemic.

Conceptual Framework of Green Innovation on Green Entrepreneurship

The aim of the study was to reveal how green entrepreneurship can survive in industry. Based on the framework by (Kelliher et al., 2020), which consists of four construct, this study extends the model by identifying one additional construct to achieve green sustain, as the ultimate objective. As a result, the framework was refined into five main dimensions, as illustrated in the figure below.

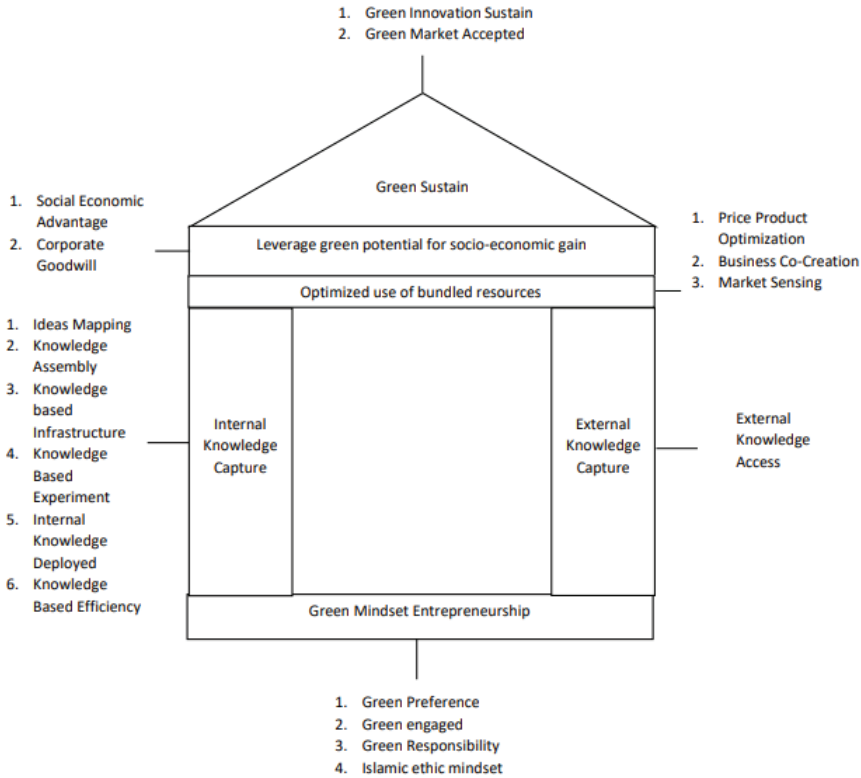

Figure 1: Conceptual Framework

The challenge of green entrepreneurship is how to survive in an increasingly competitive industrial era. Entrepreneurs need to observe information in the market and convert it into knowledge as strategic resource. Figure 1 is a green innovation framework in green entrepreneurship

consisting of five domains, namely (a) green entrepreneurial mindset, a strategic tool that is the foundation for green entrepreneurship. In building sustainable green entrepreneurship, the main requirement is the existence of human resource with a green mindset from the entrepreneur as a decision maker and determiner of direction in the sustainability of entrepreneurship. The stronger the green mindset in entrepreneurship, the more influence it will have on efforts to maintain green entrepreneurship. Entrepreneurs who want to survive will continue to carry out green innovation. This domain has four indicators: green preference, green engagement, green responsibility, and an Islamic ethical mindset.

(b) green knowledge capture: this dimension refers to the process of capturing knowledge to obtain green innovation in green entrepreneurship. Internal and external factors must support the green knowledge capture process. The question support refers to the availability of access to external information for the knowledge that the entrepreneur will capture. This domain is divided into two factors: internal indicators, which include idea mapping, knowledge assembly, knowledge-based infrastructure, knowledge-based experiment, internal knowledge deployed, and knowledge-based efficiency. Meanwhile, the external factor for this domain indicator is external knowledge access. (c) Optimizing resource use. This domain aims to reduce production costs by allocating resources according to needs and minimizing costs in the production process. In minimizing these costs, entrepreneurs must be able to look for more profitable alternatives and continue to innovate to create green innovation products at competitive prices. Creating green innovation requires strong human resource in market sensing to identify existing potential factors. Green innovation requires a large investment at the start of its implementation. However, green innovation can provide a high return on investment in the long term. This domain consists of three indicators: price product optimization, business co-creation, and market sensing.

(d) The utilization of green potential for social and economic benefits is based on two indicators: social-economic advantage and corporate goodwill. This domain is directly related to activities to maintain reputation and attract consumers and other parties to support green innovation in green entrepreneurship. (e) Green sustainability is the pinnacle of entrepreneurship, where entrepreneurship can realize its business goals, such as obtaining high

profits while contributing to maintaining natural balance. This domain has two indicators: green innovation sustainability and green market acceptance.

CONCLUSION

To build green innovation in entrepreneurship it was found that the development of the green innovation requires five main aspects, including (1) Green entrepreneurial mindset serves as a foundational element in building green entrepreneurship. Since entrepreneurs as decision-makers, this mindset becomes a strategic component in implementation green management. (2) Green knowledge capture, as a process of how entrepreneurship can capture knowledge to obtain ideas in the green innovation process. (3) Optimizing the use of resources aimed at reducing production costs and creating green product innovation at competitive prices. Even though it requires a high initial investment, it provides a high return on investment in the long term. (4) Utilizing green potential for social and economic benefits is a form of social entrepreneurship's contribution to society and also as branding to build entrepreneurial goodwill. (5) Green sustainability is the pinnacle of entrepreneurship, where entrepreneurship can realize its business goals, increase value in the long term, and maintain all of this.

The managerial implications emphasized in the study include: first, the green mindset of entrepreneurs, where the mindset is the basis for entrepreneurs to act. This is related to their responsibilities as human resource who play a role in making decisions and strategies in entrepreneurship so creating green innovation will only work if the entrepreneur has a strong green mindset. Second, it is crucial for entrepreneurs to impart their knowledge to employees so that employees have new ideas that are in line with green entrepreneurship. This can be done through regular discussions. In this way, green entrepreneurship will grow and be sustainable. The limitation of this research is that the discussion is only based on few informants. However, it is still sufficient to achieve information saturation. In future research, it is recommended that the number of informants in the same industry be increased to add an in-depth understanding of the findings.

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