

The Innovation in Business Model for Sustainability in Biotechnology Start-ups in Indonesia

Lely Trianti Anggarini^{#1}, Melia Famiola^{#2}

[#]School of Business and Management, Institut Teknologi Bandung
Jl. Ganesha 10, Bandung, Indonesia

¹lely_trianti@sbm-itb.ac.id

²melia.famiola@sbm-itb.ac.id

Abstract— This study explores sustainable innovation in five biotechnology start-ups in Indonesia. We use business model innovation concept to elaborate how the start-ups are driving their business to be more socially and environmentally aware. As an explorative study, this research uses a qualitative approach and identify three drivers of sustainable initiatives: 1) market demand; 2) value chain productivity; and 3) the owner's individual concern. These three drivers create different characters in three approaches of innovation in business model: content, structure, and governance.

Keyword - business model innovation, sustainability, biotechnology, start-up

I. INTRODUCTION

Sustainability development is considered as a solution of the many social and environmental problems that challenge today and future society, such as the high gap of prosperity, climate change, ecosystem degradation, and the scarcity of natural resources ([26], [28]). Today, the entire world's society is driven to contribute in Sustainable Development Goals including business sectors regardless of their size, large or small enterprises. Business is encouraged to view sustainability challenges as an opportunity to spread their impact to the society as well as their competitive advantages ([11], [23], [29]).

Accordingly, the discussion on sustainability in business practices is one of the contemporary growing research agendas [29]. Nevertheless, most case studies are dominated by large businesses with little attention on the practices in small business as well as in newly established businesses [18] despite the fact that small businesses are covering around 90% of global business ([12], [21]). A study in MIT stated that 80% of sustainable businesses could maintain their sustainable performance when sustainable issues are incorporated into the business from its young age [19]. It indicates that sustainable initiatives should be considered from the initial development process of a business [15].

This study focuses on exploring sustainable practice among biotechnology start-ups, a promising sector to support the sustainability mission. Biotechnology could provide us with many solutions to combat diseases, protect the environment, produce foods we eat, create new potential energy as well as make other useful products [17]. We intend to explore factors affecting sustainable innovation within this industry and how it works particularly in their business model. Our concern to innovation in the business model is motivated by an interesting finding that revealed business model is more considered among business practices nowadays rather than doing innovation through their products. Innovation regarding product requires more resource intensive both financial and other physical facilities. As a small business, start-ups should be more flexible in designing the business system due to the simple organizational structure. So, we assume that business model innovation is a natural adaptation of this type of business. Integrating this concern with the issues of sustainability, we believe this research could provide us new insights on how to motivate small businesses to work with sustainability since its young age and adopt the sustainable principle as a nature of the business growth.

This study is structured as follows. The next section describes the literature review. It will discuss the definition of business model innovation for sustainability and the characteristics of biotechnology start-ups. The third section will elaborate on the methodology of the research and introduction to the sample start-up companies. The fourth section shows the findings and discussions of the data analysis. Finally, the last section concludes the finding and the contribution of this study.

II. LITERATURE REVIEW

A. Business Model Innovation for Sustainability

There is no consensus on the definition of a business model. However, in a business model, we could identify how a company develop its organization [22] and deliver the value to its consumers. Principally, there are four essential dimensions of a business model. First, consumer segment, it explains individuals who are served by the company. Second, value proposition; it describes product or service offered to the consumer. Third, key activity; it explains the way the business creates the value proposition, it describes a holistic description of how a business handles the products or services. Fourth, it explains the way business creates the revenue, how the company generate the money as well as describes the cost structure.

Today, a successful business tends to do innovation through business model. Innovation is often expensive and time-consuming with uncertain future returns when it focuses on new products and services [2]. So, new business models are getting more favored than new products and services as a source of future competitive advantage. Lindgardt et al. (2009) empirical study showed that business model innovations created earnings more than four times greater than products or process innovations and the returns were more sustainable than in products or process innovations.

Spieth et al. (2014) concluded that the current perspectives on business model innovation (BMI) lies on a combination defining firms' respond to generate profit, the operational roles assigned to business models, and addresses the strategic function of the business model. Business model innovation can occur when more than one of business model elements are recreated to deliver value in a new way [22] or by adding new activities in novel ways or changing which party performs an activity [2]. Bocken et al. (2014) defined the elements of business model are value proposition, value creation and delivery, and value capture. As a whole system innovation, BMI benefits business owners as it is difficult to imitate by competitors.

Amit and Zott (2012) mention three elements of how innovation is generated in the business model of a company. First, *Content*, it refers to the activities conducted to fulfill perceived market's demands and is commonly represented by the primary products or services offered by companies. *Structure* refers to the way to achieve the goal of the content. *Governance* is the specified actors in carrying out the structure.

This study will work more detail how the three elements of business model innovation work for the main target of sustainability. Previous study had tried to convince us that business model innovation could support the sustainability innovation. The question is how does it work? ([6], [7]). Perhaps, the most integrated integration of this argument link to the other scholar statement that sustainability could become a competitive advantage of a corporation [8].

In many studies, the practice of sustainability practices in corporations is associated with the term eco-innovation [7] that is always identical with the use of clean(er) technology in order to create a low ecological impact of products and services. Other also associate it with company's CSR program, even though there are still growing debates of this argument with the main motive of company's CSR programs. If we try to refer to the concept of sustainability as three bottom line, sustainability definition is an integrated understanding of three aspects economic, environmental, and social facets [14]. So, it could be defined as "the balanced economic performance, social inclusiveness, and environmental resilience, to the benefit of current and future generations" [16]. Our study will explore of the sustainability practices with this concept. We will identify what social and environmental initiatives made by biotechnology start-up and how the initiatives appearance in their business model as an innovation in term of content, structure, and governance.

B. Biotechnology start-ups and its challenges

Biotechnology can be defined as the application and practical use of technology in living organism to benefit society. Biotechnology process is common and has long been practiced in the food and agricultural sector with the fermentation process that produce products such as cheese, yogurt and other traditional drinks made of fruit fermentation and milk [33]. More advanced biotechnology method is used in healthcare-pharmaceutical industry for vaccines development.

According to Greenwood (2014), there are three major streams of the biotechnology industry: health biotechnology, food and agricultural biotechnology, and industrial and environmental biotechnology. Industrial biotechnology is one of the most promising new approaches to help meet the global challenges of preventing pollution, conserving energy and natural resources, and reducing manufacturing costs. Industrial biotechnology uses natural biological processes, such as fermentation and the using of enzymes, yeasts, and microbes to produce useful products, e.g., biodegradable plastics, multivitamins, and biofuels.

The biotechnology industry is experiencing remarkable development today. Studies in many countries revealed the growth is mainly concentrated in cluster locations [24]. The industry is proved to be sustained by the linkage existence of five essential elements within ecosystems, which are academic research, experienced biotechnology entrepreneurs, funding sources, technically skilled workforce, and laboratory space and specialized facilities ([24], [30]).

This study focuses on exploring sustainable innovation for biotechnology entrepreneurs. We use the term start-up for biotechnology entrepreneurs because we believe that they have the character of the organization that is arranged to explore repeatable and scalable business model [4]. They are also grown with novel ideas delivered to the market and transformed to achieve economically sustainable phase. Its scale tends to be small thus they are unable to endure a sustained poor performance period [1].

Biotechnology start-ups usually have some characteristic since their early stage development. First, they develop with many alliances [35]. Different from other technological start-ups, they depend on external relations, at least work with farmers who provide their resource of raw material. Second, this business develops with intensive research and development and spend the majority of their investment fund of this field [3]. This indicates that many potentials of bio and chemical resources will be used to create a new biotechnology business. Those aspects explain that biotechnology start-ups work with many social and environmental issues. These could be challenging issues for sustainability.

III. METHODOLOGY

A. Data Collections

This study is developed using qualitative approach with a multi-case study strategy. Qualitative approach is suitable for explorative study as it provides an opportunity to understand the subject-object relations without interfering on the construction of reality [10]. The multi-case study is selected due to the allowing of examination of similarities and differences patterns among several cases [34].

Data collection is conducted using semi-structured interviews with five biotechnology start-up owners during March-November 2018 in Bandung. The interviews are conducted directly and by-phone, recorded and complemented by some additional field notes. The validity of the research is ensured by triangulation from three different kinds of sources namely interview, observation, and documents [34]. Most of the interviews are conducted in a team hence there is more than one perspective involved to confirm validity.

Interviews are started by exploring firm's business model guided by Business Model Canvas [25] comprising of value proposition, customer relationships, channels, customer segments, key partners, key activities, key resources, cost structure, and revenue stream; and business model elements [6] which are value proposition, value creation and delivery, and value capture. After that, interviews are resumed to explore business model innovation to achieve sustainability based on business model innovation activity system design elements [2] which comprise of new content, structure, and governance along with their collaboration partners. Demographic information and firm's background are obtained through interviews and documents.

B. Case Analysis

The cases are then analyzed using a thematic approach [9]. Castleberry and Nolen (2018) mention that a thematic approach is purposed to capture every important information of data related to the research question and present them in some patterns that promote meanings behind the sets of data. In this way, we then find the pattern and develop a theoretical contribution about how start-up adapts sustainability in the business model.

C. General Description of Case Study

Botanina

Botanina is a natural homecare and body care company established in 2013. This brand offers three categories of product, which are health, lifestyle, and homecare products created from blends of pure essential oils as active ingredients. They currently strengthen their grasp on health, environment, and social value pillars in the business conduct. Botanina is active in social campaigns through their product packaging and knowledge sharing activity with society.

Ocean Fresh

Ocean Fresh is a cosmeceuticals brand that started to market their product in 2015 seriously. The company was created as a commercialization channel for aquaculture-based products resulted from biotechnology research of the owner in Institut Pertanian Bogor (Bogor Agricultural University). They use marine organisms as the primary material of their cosmetics as substitutions to harmful chemical skincare products. In the past year, they had help government in training marine farmers around Indonesia the technique of algae farming.

Evoware

Evoware was found in April 2016 and offers seaweed-based dinnerware. Their products are edible jelly cup and bowl and packaging material. They choose the best quality algae from Makassar and empower the farmers by paying them two times the usual amount the farmers get. Evoware is also active in environmental campaigns by collaborating with other like-minded social enterprises. They have won several business competitions and involved in Beyond Plastic team as the only one enterprise from Asia.

Mycotech

Mycotech is a biomaterial company founded in 2015. The concept of *tempe* (Indonesian traditional food) formation by binding soybeans with mushrooms is used by Mycotech to form sustainable materials from fibrous agricultural waste. Their product is made with the intention to reduce toxic chemical adhesive utilization, timber use, and deforestation. Mycotech research and development process takes place in Indonesia, Singapore, and Switzerland with the majority of the consumers come from foreign countries.

Bio-N

Bio-N is a health and beauty products company founded in 2016. The business was initiated by the research activities of bioengineering team of the founders as academician and researcher in Institut Teknologi Bandung (Bandung Institute of Technology). Bio-N products are halal single essential oils and propolis based on high-quality natural resources and supported by strong R&D which are intended for maintaining health and beauty. They emphasize knowledge sharing activity to the society to spread healthy lifestyle awareness.

IV. FINDINGS AND DISCUSSION

Drawing from the three elements of business model innovation of Amit and Zott (2012), we found two different types of biotechnology start-up work toward the sustainability. The two types use the three elements of business model innovation of Amit and Zott (2012) with varying degrees and ways. Below we describe the practice of the model. However, before we discuss the detail of how Amit and Zott (2012) business model innovation work in our sample studies, we begin the discussion of our finding related with the types and motivation of the start-up's sustainability. The types determine the character element of Amit and Zott (2012) business model innovation.

A. The Type and Motivation Toward Sustainability

In general, we found two types of drivers of business model innovation for sustainability, namely business motive and non-business motive. A business motive is driven by the business mindset to obtain economic profit, while non-business motive is driven by human's conscience to give benefit to others without any intention to benefit themselves. The business motive is occurred through 1) harnessing the available opportunity to fulfill market demand and needs, and 2) the awareness to enhance the product value along with efficiency and effectiveness in the value chain performance. Non-business motive came genuinely from the individual interest of the business owners to achieve sustainable development such as healthy society, social welfare, or the betterment of the environment (i.e., solving deforestation and single-use plastics issues). Nevertheless, the sustainability initiatives produced regarding the latter motive are not integrated with the business activities. For example, one of the start-up samples works with a foundation dedicated for children education due to the interest of the owner to the children education even though the core business produces home and body care products.

We will elaborate on each of the motives below:

First, we call it *Sustainable market demand*; this sustainable initiative is created due to the market opportunity or consumer expectation of the quality of products. Some sustainable practices were also generated from the owner's understanding of future market opportunity from sustainable issues, even though its existing market is still unaware of the values, but for the owners, it becomes their challenge to educate the market. Below are the quotes of our respondents related to this type of sustainability:

"currently the majority of consumers come from abroad...there is a need in their countries, the use of glue and raw material are already reduced (there). We use agricultural waste hence it is renewable and the process is also rapid compared to others, to trees. And then, there is regulation like I said before, the use of adhesive is started to be reduced because of formaldehyde emission, so chemical glue is emitting a certain scent, this scent is actually that makes it dangerous." (owner of Mycotech)

"actually, there is already fairly many numbers of essential oil products in Indonesia, most of them produce the formulated ones, so it can be used directly...we want to be different from them, thus finally we (determine that we) want to sell the single essential oil but we (need to) educate the consumers to blend the oil themselves regarding their needs." (owner of Bio-N)

Second, *Value chain performance*; this initiative is taken to add more value of sustainability of the products and to enhance efficiency and effectiveness in the business process as well as to enhance the opportunity of the product's raw material suppliers. Some quotes we obtained related to this motivation was mentioned by the informants as follows:

"so now we already added more requirements (other than materials, price, and quantity), we look for vendor according to their business process, for example, if they are an essential oil vendor, are they empower the farmers, so for vendor selection, we do not only see the output but the process" (owner of Botanina)

"we come to the coastal areas...converse with them (farmers), train them, and then...all the marine yields that meet our expectation will surely be bought by us, and from the record, they have never been disappointed with us...we definitely buy them because we already committed. Maybe because of that, the trust is built over time" (owner of Ocean Fresh)

"propolis is our superior product...as a matter of fact, the innovation is simple, only from the beehive...now the farmers use some woods, a ram wire is inserted in the middle of it, so later on the bees will fill the holes with its propolis and then we take the ram wire and replace it with new ram wire thus no trash is made, all media could be perpetually reused." (owner of Bio-N)

Third, *Sustainable individual interest*; as mentioned previously, we put this sustainable motive of start-up separate from the two business motives. This motive generally occurs as a reflection of the owner's interest of sustainable initiatives even though it does not link to their business activities. However, the owners always name their sustainable initiatives as part of their start-up's sustainability concern. Below are some comments related to this motive:

"she (the first owner) already has an idealism to empower primarily coastal farmer society and to make our marine resources to be the commodity with considerable added value. Because all this time in Indonesia, with its very vast ocean and very rich of marine crops...there are more than 600 species of seaweed but there has never been any fair trade in it...we want to make our marine materials to be more valuable, not only to let it sell to foreign countries with low price and back again (as cosmetics) with a high price." (owner of Ocean Fresh)

"so, the initial idea was emerged due to our concern toward the environment...when I came back to Jakarta...I felt that the pollution was very severe, a lot of trash in the streets, in the river, and from that, I knew that the garbage was mostly plastics...even our drinking water in Jakarta 76% are already contaminated by plastics, and more than 25% of fish are already contaminated by microplastics.. and then I thought that it all comes back to us as humans, but all this time, environment issue like this plastic issue is considered as a heavy issue thus people tend to not want to discern it more...then I thought how to educate or raise awareness of the society of this issue...so the idea was to make something unique that has never been created that can attract attention hence the people that are careless of the environment would also want to buy the product..." (owner of Evoware)

B. The Sustainable Innovation in Business Model Development

We found that the component Amit and Zott (2012)'s business model innovation (content, structure, and governance) do not always occur in every sustainable motive.

In this study, the contents are determined based on individual interest and market demand of sustainability which are categorized as business and non-business, respectively. All selected cases are embedding sustainability focus in the main business activities. The whole start-ups were commenced with both business motive of sustainability by looking up to market demand or adjusting their researched products to the perceived market needs; and non-business motive. The home and body care and beauty and healthcare businesses contents aim to conceive social sustainability impact, specifically the betterment of health in the society. The biomaterial businesses contents are more concerned with environmental sustainability impact through their renewable products. Whether the focus is leaning more into social or environmental issues, the companies always put both facets of sustainability into consideration in their business conduct.

Related to Sustainable market demand motive of business model innovation, we found that Amit and Zott (2012) business model innovation only work in terms of content and structure. When the start-up owners found a new value needs to be covered by their product, they include it as a new value or content to their product. The promoted sustainable content mostly affects to direct structure change but not always affect the governance aspect. For example, Botanina owner mentioned that she wants her business is branded as an honest corporation, she then assigned a change in marketing strategy by mentioning the entire materials they used in the product in the packaging or website as mentioned by an owner below:

"I want my company is recognized as an honest company, so we open up about all our material to the consumer. If we do not explain in the packaging due to the limitation of space, we will provide a link in our website that they could access to see the ingredients of our product without any issues being covered up" (owner of Botanina)

Above quoted samples explain no governance issues is needed to be modified for the interest. They work with similar practices and make it as corporate values. Nevertheless, when the sustainable idea directly affects the value chain performance, it always demands the change in the structure as well as the governance. To ensure the quality of the content meeting the sustainability standards set by the owners, the innovations are found to be performed in areas of procurement and firm's infrastructure, business operations, marketing and sales, and other value chain supporting activities. Procurement and firm's infrastructure activities include adding sustainability requirement for external partners, establishing a commitment to local suppliers, and training suppliers. For example, Ocean Fresh owner mentioned that they work with local coastal farmers to ensure that the quality of the raw materials is guaranteed. Therefore, the firm developed a training program for the farmers and commit to always buy the farmers' products. The value chain innovation in studied start-ups could occur in many stages of business operations, sustainable innovations are pursued through management in production technique, scheduling, partnering mechanism, and social impact measurement as mentioned below:

"So for the impact itself, we usually make social impact measurement, so there are some matrixes to be calculated every year, such as production capacity...(the number of) collected (agricultural) waste, how many of them we managed, how many farmers we involved with..." (Owner of Mycotech)

Innovations for sustainability in marketing and sales are embodied in product improvement and online and offline sales. One case example from Botanina, they changed their structure by altering their packaging materials to reduce environmental issues. Other activities encountered in support to the business are joining business pitching or competitions and supporting other business. Botanina also developed partnerships with other parties that the owner believes have connections with her firm's sustainable mission.

The majority of innovation with the change in the governance usually occurs when new sustainability values affect the value chain of business. For instance, as mentioned by Botanina owner in the previous subchapter, that their focus on increasing sustainable values in their business process affects the partners they choose. Other examples occur in situations such as when aiming to guarantee a suitable product offers, a company may hire experts as co-owners; when the current suppliers are not fulfilling the requirement of high-quality raw materials, they will be replaced by other suppliers; and when they won a competition, they would receive external funding support from investors. Other businesses with the same mission are also found to be collaborating with the firms on occasions especially in marketing and sales, which formed as product customization and product collaboration. For example, Mycotech work with a watches company for product collaboration to help them thrive economically as well as a strategy of market expansion.

A different pattern is found in the non-business motive. In this sense, the business owners' interest in sustainable development is always found to be directly related to the arrangement in the governance without any change of structure. The start-ups will find partners who have shared sustainability interest with them and work to achieve their concern together. The collaboration may be created between the start-up with the government and Non-Governmental Organizations (NGO) or other companies. Concerning the activities, it could be in many forms such as knowledge sharing, social campaign and donating, and create recycling programs, as the comment below:

"before this, we were focusing on motherhood community, then it developed into organics community,...and now we are continuing to hospitals, but not for selling our products, we conduct demos, act as sponsor,...and then to nursing homes...to mother and child service division (in a health business organization)..." (Owners of Botanina)

Aside from the sustainable interest perspective, these activities would indirectly promote the content of the business and increase their brand reputation. We found seven external partners working with the start-ups: supplier, customer, non-customer business, community, non-governmental organization, government, and investor.

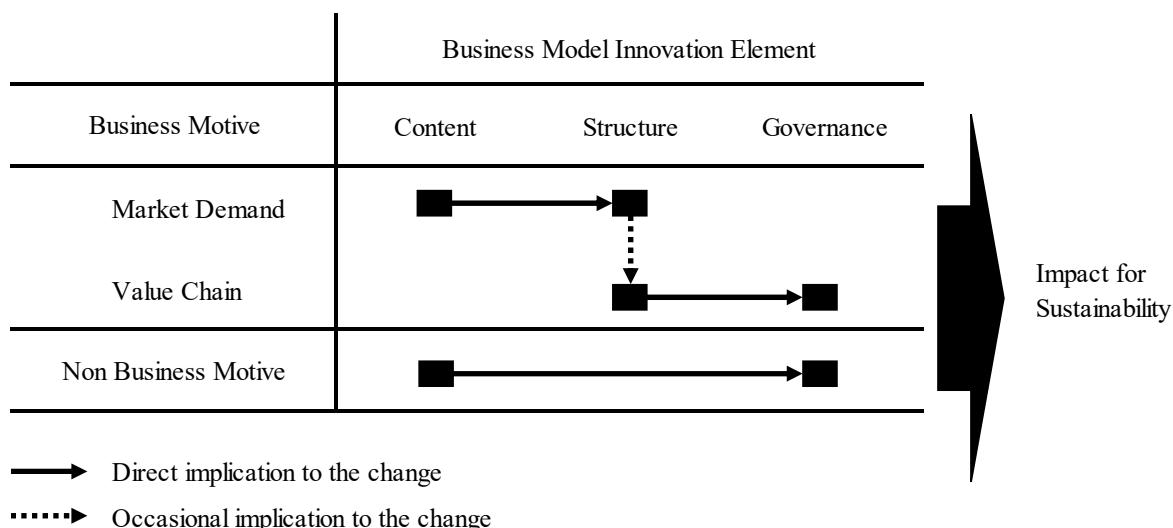


Figure 1. The Business Model Innovation elements and process for Sustainability in Biotechnology Start-ups.

V. CONCLUSION

This study found that business model innovations for sustainability in biotechnological start-ups are derived from three drivers: two drivers of business motive which are market demand and value chain performance; and an innate driver of business owner's morale. Sustainable business motive of market demand and sustainable non-business motive are always depicted in the business content of products or services, whereas the motive of value chain performance improvements acts as part of innovation in structure initiated by contents innovation. Innovation in governance takes place when there is a non-business motive or structure innovation in the business model which contents are based on market demand. One characteristic that we found in this study is that aside from the business intention, all biotechnology start-ups initiated their business regarding the owner's value of sustainability. This characteristic is uncommon to be found in large companies which in general focusing only on the economic gain. This study contributes to shedding light on sustainable business model innovation practices in biotechnology start-ups, especially in Indonesia.

REFERENCES

- [1] Aldrich, H., & Auster, E. R. (1986). Even dwarfs started small: Liabilities of age and size and their strategic implications. *Research in organizational behavior*, 8(1986), 165-186.
- [2] Amit, R., & Zott, C. (2012). Creating value through business model innovation. *MIT Sloan Management Review*, 53(3), 41-49.
- [3] Azar, S., & Mackey, T. K. (2015). Crowdfunding: A New Untapped Opportunity for Biotechnology Start-ups?. *Journal of Commercial Biotechnology*, 21(4).
- [4] Blank, S. (2010). *What's A Startup? First Principles*. Steve Blank.
- [5] Blomqvist, K., Hurmelinna, P., & Seppänen, R. (2005). Playing the collaboration game right—balancing trust and contracting. *Technovation*, 25(5), 497-504.
- [6] Bocken, N. M. P., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of cleaner production*, 65, 42-56.
- [7] Boons, F., & Lüdeke-Freund, F. (2013). Business models for sustainable innovation: state-of-the-art and steps towards a research agenda. *Journal of Cleaner Production*, 45, 9-19.
- [8] Caiado, R. G. G., de Freitas Dias, R., Mattos, L. V., Quelhas, O. L. G., & Leal Filho, W. (2017). Towards sustainable development through the perspective of eco-efficiency-A systematic literature review. *Journal of Cleaner Production*, 165, 890-904.
- [9] Castleberry, A., & Nolen, A. (2018). Thematic analysis of qualitative research data: Is it as easy as it sounds?. *Currents in Pharmacy Teaching and Learning*.
- [10] Charmaz, K., & Belgrave, L. (2012). Qualitative interviewing and grounded theory analysis. *The SAGE handbook of interview research: The complexity of the craft*, 2, 347-365.
- [11] Daily, B. F., & Huang, S. C. (2001). Achieving sustainability through attention to human resource factors in environmental management. *International Journal of operations & production management*, 21(12), 1539-1552.
- [12] Drummond, I., & Stone, I. (2007). Exploring the potential of high performance work systems in SMEs. *Employee Relations*, 29(2), 192-207.
- [13] Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, 14(4), 532-550.
- [14] Elkington, J. (1997). Cannibals with forks. *The triple bottom line of 21st century*, 73.
- [15] Fisk, P. (2010). *People planet profit: How to embrace sustainability for innovation and business growth*. Kogan Page Publishers.
- [16] Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The Circular Economy—A new sustainability paradigm?. *Journal of cleaner production*, 143, 757-768.
- [17] Greenwood, J. C. (2014). Unleashing the Promise of Biotechnology to Help Heal, Fuel, and Feed the World. In *Biotechnology Entrepreneurship* (pp. 3-13).
- [18] Hall, J. K., Daneke, G. A., & Lenox, M. J. (2010). Sustainable development and entrepreneurship: Past contributions and future directions. *Journal of Business Venturing*, 25(5), 439-448.
- [19] Hall, A., & Vredenburg, H. (2003). The challenge of sustainable development. *MIT Sloan Management Review*, 45(1), 61-68.
- [20] Hansen, M. T., & Nohria, N. (2004). How to build collaborative advantage. *MIT Sloan Management Review*, 46(1), 22.

- [21] Huang, X., & Brown, A. (1999). An analysis and classification of problems in small business. *International Small Business Journal*, 18(1), 73-73.
- [22] Lindgardt, Z., Reeves, M., Stalk, G., & Deimler, M. S. (2009). *Business model innovation. When the Game Gets Tough, Change the Game*, The Boston Consulting Group, Boston, MA.
- [23] López, M. V., Garcia, A., & Rodriguez, L. (2007). Sustainable development and corporate performance: A study based on the Dow Jones sustainability index. *Journal of Business Ethics*, 75(3), 285-300.
- [24] Okamuro, H., & Nishimura, J. (2015). Local management of national cluster policies: Comparative case studies of Japanese, German, and French biotechnology clusters. *Administrative Sciences*, 5(4), 213-239.
- [25] Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*. John Wiley & Sons.
- [26] Porter, M. E., & Kramer, M. R. (2011). *The big idea: Creating shared value*.
- [27] Rahbek Gjerdrum Pedersen, E., Lüdeke-Freund, F., Henriques, I., & Seitanidi, M. (2016). Collaborative Cross-Sector Business Models for Sustainability. *Special Issue of Business & Society*.
- [28] Sachs, J. D. (2012). From millennium development goals to sustainable development goals. *The Lancet*, 379(9832), 2206-2211.
- [29] Seyfang, G., & Smith, A. (2007). Grassroots innovations for sustainable development: Towards a new research and policy agenda. *Environmental politics*, 16(4), 584-603.
- [30] Shimasaki, C. (2014). Five Essential Elements for Growing Biotechnology Clusters. In *Biotechnology Entrepreneurship* (pp. 57-72).
- [31] Simms, S. V., & Robinson, J. (2009). Activist or entrepreneur? An identity-based model of social entrepreneurship. *International perspectives on social entrepreneurship*, 9-26.
- [32] Spieth, P., Schneckenberg, D., & Ricart, J. E. (2014). Business model innovation—state of the art and future challenges for the field. *R&d Management*, 44(3), 237-247.
- [33] Sukara, E., & Slamet-Loedin, L. H. (2000). Agricultural biotechnology in Indonesia. In *Proceedings of the Regional Conference on Agri-Biotech* (pp. 1-167).
- [34] Yin, R. K. (2011). *Applications of case study research*. Sage.
- [35] Yoon, W., Lee, D. Y., & Song, J. (2015). Alliance network size, partner diversity, and knowledge creation in small biotech firms. *Journal of Management & Organization*, 21(5), 614-626.

AUTHOR PROFILE

Lely Trianti Anggarini is a Science Management Graduate Student in School of Business and Management, Institut Teknologi Bandung. Her research themes are varied from sustainability, technology acceptance, to cultural intelligence.

Melia Famiola, PhD is a lecturer at The School of Business and Management, Institut Teknologi Bandung. She is also the head entrepreneurial development division at institute of innovation and entrepreneurial development in the same university. At the institution, she works with many startups. She has research interest in sustainable business, small business development and social entrepreneurship.