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## Sustainable development in the wake of the 4th industrial revolution in Indonesia

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**Abstract.** The Existing times of fundamental technological change. The rapid advances in technology changing the way we live, work and relate to one another. The three previous industrial revolutions all created major societal change and opportunity, but today's transformation is unique in terms of the great speed with the new ideas and technologies. Consider the unlimited possibilities of having billions of people connected by mobile devices, giving rise to unprecedented processing power, storage capabilities and knowledge access. The technologies driving the fourth industrial revolution. The potential of Indonesia's natural wealth is remarkable, both biological and non biological natural resources. The wealth when viewed geographically, from Sabang to Merauke. With a large island and thousands of small islands that surround the nature of Indonesia. Therefore, Indonesia is an archipelagic country that has enormous natural wealth.

In celebrating Indonesia's 73 years of independence, at August 17, 2018, it is important to invites all people of Indonesia to conduct self-evaluation, why various problems such as: poverty; gap between the have and don't; deforestry; land distruction; and the storm of industrial fourth era revolution (Industry 4.0) will creating unemployment; potential for widening economic inequality, etc. Next, the question is how to make the sustainable development in the wake of the 4th industrial revolution in Indonesia

### 1. Introduction.

The invention and development of computer technology and electromagnetic waves products which were originally used to improve weapon system capability, search, detection, target, acquisition, destruction with high accuracy, has brought the digital technology revolution from the virtual world into the world of daily human life. Competition between countries in the world is seen increasingly fierce. The digital technological revolution has made countries increasingly chasing competition in all areas, including transportation [1]. All countries increasingly fierce compete and to compete there must be competitiveness. A country that has competitive and fast serve will be the winner. This was disclosed by President Joko Widodo when inaugurating the groundbreaking of Adi Soemarmo Airport development project in Boyolali, Central Java, on Saturday (8/4).

As E-commerce continues to grow, its impact will occur on the workforce and wages as a result of a complex set of various variables. The loss of a job due to the impact of e-commerce when e-commerce replaces traditional business operations. Employment opportunities may be affected such as the retail sector, post offices and travel agencies[1].



The most striking feature of geographical economic activity is concentration and inequality. Developing countries like Indonesia, industrial distribution and lame people clustered around the nation's capital such as Jakarta. Grouping marks a spatial system based on capital and labour accumulation in urban agglomeration. Indonesia's industrial development and business activities over the past three decades tend to bias Java and Sumatra, demonstrating the continued lagging geographical distribution of large and medium industries by island in Indonesia.

Rapid, massive, and thorough changes to the paradigm, social and cultural interaction, of every human being and community, so as to raise awareness, care, and concrete steps towards virtuous character, for the acceleration of national development programs with the philosophy of Pancasila and the 1945 Constitution [2].

E-commerce revolution and the evolution of law. Inseparable the legal rules of rights and obligations in interaction, industry, business and commerce as an essential necessity of mankind, shall and should be wrapped by a legal force (a state) capable of protecting the parties within a territory of national law jurisdiction as well as international. The challenge that will arise is the impact of comprehensive business activities, ranging from tax laws, contract systems to the application of copyright laws or intellectual property. Ancient thinkers generally accepted a law different from the positive law, called natural law or God's will. The law is not written but each person is regarded as a law, because it states what belongs to the human nature itself, that is its nature. The law is unchanged, applicable to all ages. Natural law is stronger than positive law, because it involves the meaning of human life itself. Aristotle, Greek philosophy emphasized the distinction between "nature" (physis, φύσις) on the one hand and "law", "custom", or "convention" (nomos, νόμος) on the other. What the law commanded would be expected to vary from place to place, but what was "by nature" should be the same everywhere. A "law of nature" would therefore have the flavour more of a paradox than something that obviously existed.

Promoting sustainable development opens up debates about the relationship with the natural world, about what constitutes social progress and about the character of development, both in the North and the South, in the present and into the future. John Elkington, *Cannibals With Forks: The Triple Bottom Line of 21st Century Business*. Business is sustainable when it lives up to the "triple bottom line" focussing on economic prosperity, environmental quality and the element which business has tended to overlook/neglect-social justice. The three bottom lines are interrelated, interdependent, and partly in conflict. Delivering against the triple bottom line requires of business a revolution of thinking and acting in no less than seven dimensions ("thinking in 7D"): markets, values, transparency, life-cycle technology, partnerships, time-perspective and corporate governance. As for the global sustainable development problem is a worldwide environmental problem, the global environmental problem is divided into: a. World climate change; b. Ozone depletion; c. deforestation and desertification; d. Biological diversity; e. Sea and water resources; f. Population growth; g. Resources war; h. expanding deserts; i. Habitat loss and fragmentation; j. Misuse of narcotics and addictive materials. Sustainable development is a principled development process (land, city, business, community,

environment, people... etc.) "meets present needs without compromising the needs of future generations"[3]. The United Nations have since revised their development goals to include equitable development and environmental sustainability, especially the key goal of curbing the dangers of human induced climate change in their 2016 - 2030 Sustainable Development Goals (SDGs). Sustainable is based on a simple principle. Everything that we need for our survival and well being depends, either directly or indirectly, on our natural environment. Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations. Sustainability is important to making sure that we have and will continue to have, the water, materials, and resources to protect human health and our environment. (USA's Environmental Protection Agency). Today's companies use the phrases sustainability, good corporate governance, corporate social responsibility (CSR), going green, paperless or the "triple bottom line/3P (Planet, Profit, People)" to express society's desire to improve the longterm economic, social and environmental performance of firms.

Governance can be understood as steering towards collective goals. Current countries have taken development through three levels, namely: the level of unification; level of industrialization; and the level of welfare state. These levels are passed consecutively. However, developing countries reject these assumptions. The rejection is because developing countries are well aware that 3 (three) levels of development are regulated must be concurrent. In particular, Indonesia believes that economic growth and revenue binding can be implemented at the same time. Thus the law in Indonesia should be able to accommodate these levels of development. Including thinking about social welfare, so it can be passed through corporate social responsibility (CSR), but very unfortunate conditions and situations instead the opposite. Indonesia is one of the developing countries. As with other developing countries, Indonesia faces the same economic problems. Poverty is everywhere, the number of unemployed increases, the level of community intelligence is still low, and the income distribution is uneven. In a big city like Jakarta, many people who live less fortunate are forced to live as waste pickers. Since the income is very low, the child cannot be sent to school so that the child's intelligence level does not grow. It also creates a sharp economic gap between high-income and low-income people. Economic problems in developing countries such as Indonesia, among others: 1. *Poverty*. Poverty is a manifestation of uneven development conditions. 2. *Backwardness*. The problem of backwardness is closely related to the quality of human resources. In addition, the problem of inactivity is closely related to low levels of progress and health care, lack of maintenance of public facilities, and low public discipline.

In the context of Indonesian politics ahead of the 2014 Presidential Election, the couple Joko Widodo-Jusuf Kalla designed nine priority agendas if elected president and vice president [4, 5, 6]. Nine programs are called NawaCita. NawaCita or Nawacita is a common term that is absorbed from Sanskrit, nawa (nine) and cita (hope, agenda, desire). In the vision-mission is presented nine main agenda to continue the spirit of struggle and ideals Sukarno known as Trisakti, namely sovereign politically, independently in the economy, and personality in culture. The nine-point priorities are: *First*. Returning the state to its task of protecting all citizens and

providing a safe environment. *Second.* Developing clean, effective, trusted and democratic governance; *Third.* Developing Indonesia's rural areas; *Fourth.* Reforming law enforcement agencies; *Fifth.* Improve quality of life; *Sixth.* Increasing productivity and competitiveness; *Seventh.* Promoting economic independence by developing domestic strategic sectors; *Eighth.* Overhauling the character of the nation; *Ninth.* Strengthening the spirit of "unity in diversity" and social reform.

As has been mandated by the Founding Fathers of the Unitary State of the Republic of Indonesia as stipulated in the constitution of the 1945 Constitution of the State of the Republic of Indonesia. Indonesia is a welfare state. The formulation of the concept of State Welfare State is embodied in the Preamble of the 1945 Constitution of the State of the Republic of Indonesia in the fourth paragraph which reads: "Later than that to establish an Indonesian State Government that protects the whole Indonesian nation and the entire Indonesian blood sphere and to promote. The achievement of prosperity and prosperity for all Indonesian people is one of the ideals desired by the founders of the Indonesian state. The development process that only provides opportunities for a small number of community groups to enjoy the results of development and marginalize other community groups is the burning of the ideals just now. Populist economic researchers view that the process of economic development in Indonesia has been increasingly away from the ideals of social justice, prosperity and prosperity for all Indonesian people. This is because the development policies are not pro-people and the tendency in the market economy so that who is strong will be able to access more productive economic resources while the people are more regarded as the object of development so familiarized to be passive and resigned to accept the circumstances. Consequently, poverty and social imbalances arise as a result of the development process.

Indonesia has a long way to go before the country can fully embrace the so-called "Fourth Industrial Revolution," panel members at the 2017 Indonesia Economic Forum said in Jakarta on Wednesday (22/11). The word "revolution" denotes abrupt and radical change. The 1<sup>st</sup> industrial revolution spanned from about 1760 to around 1840. Triggered by the construction of railroads and the invention of the steam engine, it ushered in mechanical production. The 2<sup>nd</sup> industrial revolution, which started in the late 19<sup>th</sup> century and into early 20<sup>th</sup> century, made mass production possible, fostered by the advent of electricity and the assembly line. The 3<sup>rd</sup> industrial revolution began in the 1960s. it is usually called the computer or digital revolution because it was catalyzed by the development of semiconductors, mainframe computing (1960s), personal computing (1970s and '80s) and the internet (1990s). Today we are at the beginning of the 4<sup>th</sup> industrial. The revolution scope is much wider, it is characterized by a much more ubiquitous and mobile internet, by smaller and more powerful sensors that have become cheaper, and by artificial intelligence (AI) (self driving cars, drones to virtual assistants, translation software), machine learning, by automation, by enabling "smart factories," (voice recognition, robotic), e-commerce and the making of "unprecedented things," The megatrends (physical (autonomous vehicles, 3D printing, advanced robotics, new material); digital (IoT/Internet of all things); and biological (Genome Project, etc) [7, 8, 9].

## **2. Methodology**

### **2.1. Problem Statement.**

There are some problem statement for sustainable development in the wake of the 4th industrial revolution in Indonesia :

- The 1<sup>st</sup> to 3<sup>rd</sup> Industrial Revolution still going on, today the 4<sup>th</sup> industrial revolution is coming.
- The archipelago create the distance and high cost, at the end the problem is the uneven development in Indonesia.
- The worry of the dehumanising effects of work, today, perhaps the greater fear is where the elimination of work itself is the source of dehumanisation as a result of income insecurity, declining social agency and increase in crime.
- While digital startups are becoming more prolific across the world, Indonesia still lacks an entrepreneurial workforce that can truly take advantage of new technologies and ways of doing business.
- In Indonesia, education of the fourth revolution is still evolving and is rarely seen at schools.
- In the past two decades, the gap between the richest and the rest in Indonesia has grown faster than in any other country in South-East Asia. It is now the sixth country of greatest wealth inequality in the world. Today, the four richest men in Indonesia have more wealth than the combined total of the poorest 100 million people.
- An increasing numbersof birth, growing up in poverty families and soleparent or reconstituted families.

### **2.2. Research Questions.**

- How to make the fourth industrial revolution benefit to Indonesia people ?
- What is the best solution to Indonesia as a developing country in facing the digital era ?
- How is the sustainable development that suitable to Indonesia in developing the country ?

### **2.3. Purpose of The Study.**

- The purpose of this study is to provides an overview of the conditions that are being faced by the state of Indonesia due to the development of industrial revolution 4.0 and to awaken, anticipate the implementation of corporate assistance to face the fourth Industrial Revolution, and by the right developing system can reduce the poverty of the productive age and start to build the next potensial generation.
- Giving a picture of Indonesia's condition that are crises in 3P (Planet, Profit, People).
- Provide an appropriate view for Indonesia to adopt sustainable Engineering and technology innovation and application.
- Provide solutions to people to have a better life in Indonesia.

#### 2.4. Research Methods.

According to Soerjono Soekanto: "Research is a scientific activity based on an analysis and construction that is done in a systematic, methodological and also consistent and aims to be able to reveal the truth is as one manifestation of human desire to be able to know about what is being faced". This research is a type of field research (field research) with a qualitative approach. The study of this paper will use the utility theory of "greatest happiness for the greatest number", pioneered by Jeremy Bentham, supported by R. Edward Freeman in his theory, "A Stakeholder theory of the Modern Corporation".

### 3. Result and Discussion

Indonesia is the largest archipelagic country in the world consisting of 17,499 islands from Sabang to Merauke. The total area of Indonesia is 7.81 million km<sup>2</sup> consisting of 2.01 million km<sup>2</sup> of land, 3.25 million km<sup>2</sup> of ocean, and 2.55 million km<sup>2</sup> Exclusive Economic Zone (ZEE). The country of Indonesia is known as an agricultural country since the past because of its natural wealth and biodiversity. Geographically, all recognize Indonesia is still worth mentioning agrarian country proved still able to produce food. Besides having fertile soil and located in the equator area, the land of Indonesia is also suitable planted with various types of food crops. Indonesia is a country that has a variety of cultures, in other words Indonesia is a multicultural country. There are more than 300 ethnic groups or ethnic groups in Indonesia. or exactly 1,340 tribes and 546 languages according to the 2010 BPS census.

In this revolution, emerging technologies and broad based innovation are difussing much faster and more widely than in previous ones, which continue to unfold in some parts of the world. This 2nd industrial revolution has yet to be fully experienced by 20% of Indonesia people, as nearly 50 million people still lack access to electricity. This is also true for the 3rd industrial revolution, with more than half of the Indonesian's population, 132 billion people, lacking internet access.

These are all fundamental changes affecting the economic, social and political systems that are difficult to undo. The reality of disruption and the inevitability of the impact to drive policy choices and to enact the changes that will make the 4<sup>th</sup> industrial revolution an opportunity for all.

To protect nature of the environmental space, acknowledge that there are limits to the amount of pressure that the earth's ecosystem can handle (the threshold level) and the ecological footprint (impact of urban development).

The process of economic development in Indonesia has been increasingly away from the ideals of social justice and prosperity for all Indonesian people.

The depletion of Indonesian nation culture.

### 4. Conclusion

- FOCUS, Indonesia should further develop its agriculture with industry as its supporters. Indonesia's agricultural sector is unable to compete due to the problems of infrastructure,

logistics, management methods that are too traditional, resulting in high product costs and the handling of traditional agricultural products resulting in poor quality results, should be made technological literacy following the development of industrial revolution in the agricultural sector by training, counseling and a very intensive mentoring for Indonesian farmers to get used to technology that is more sophisticated and fast. This should be supported by the development in each region evenly with the advantages of cultural diversity, natural resources and human resources respectively.

- It is important to contextualize the potential impacts of the 4th industrial revolution on growth with the reference to advantages of Indonesia's natural resources and other factors that contribute to social process.
- Indonesia is included in the category of state that is ready to run the 4<sup>th</sup> Industrial Revolution by focus to Indonesia natural resources and human resources.
- Indonesia is an agro-industry, seafood product-industry country (agricultural, seafood and industry), covering agricultural, sea processing industry, industries producing equipment and agricultural, seafood machinery, agricultural, seafood input industries (fertilizers, pesticides, herbicides and others) and agricultural, sea services industry.
- Indonesia embraces the principles of Kinship, Togetherness and Mutual Cooperation.
- Nawacita program is the right supporting to Indonesia problem and in line with the SDGs, should be fully supported by the law enforcement.

## 5. References

- [1]. RhenaldKasali (2017). Disruption, Jakarta: PT GramediaPustakaUtama.
- [2]. HamryGusmanZakaria (2017). 5 Pilar Revolusi Mental untukAparatur Negara, Jakarta: PT Elex Media Komputindo.
- [3]. [https://en.wikipedia.org/wiki/Brundtland\\_Commission](https://en.wikipedia.org/wiki/Brundtland_Commission)
- [4]. Tjahjo Kumolo dan Tim (2017). NawaCitauntukKesejahteraan Rakyat Indonesia, Jakarta: PT. Kompas Media Nusantara.
- [5]. <http://nasional.kompas.com/read/2014/05/21/0754454/.Nawa.Cita.9.Agenda.Prioritas.Joko-wi-JK>
- [6]. <https://walizahid.com/2014/07/president-jokowis-9-priorities-for-indonesia/>
- [7]. <http://www.kemenperin.go.id/artikel/17565/Empat-Strategi-Indonesia-Masuk- Revolusi- Industri-Keempat>
- [8]. <https://www.ristekdikti.go.id/menristekdikti-nasir-indonesia-siap-menyambut-globalisasi- pendidikan-dan-revolusi-industri-ke-4/>
- [9]. <https://finance.detik.com/berita-ekonomi-bisnis/3557938/ct-kita-menghadapi- revolusi- industri-keempat>