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The Green Technology Agenda of the People's Republic of China (PRC) on Environmental Security and Health Security Issues for the People of the Democratic Republic of Congo (DRC)

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ABSTRACT
Journal This tries to analyze the green technology agenda against the sustainability of society and the environment in the Democratic Republic of the Congo (DRC). In facing the transformation of electricity, oil, and gas for acceleration technology and transportation in the era of the Industrial Revolution, 4.0, countries in the world need this approach to manufacturing to source natural power in a way that is feasible, sustainable, and friendly for the environment. Approach This is also known as the green technology agenda. This agenda has occurred in several countries with source power in large natural worlds, such as the Congo, which has cobalt as the material standard for the main battery. Unfortunately, the practice of mining cobalt by foreign countries, such as the People's Republic of China (PRC), has caused loss to Congolese society, starting from a degradation of the environment and bringing issues of human security. Research This study uses the library and data analysis through Glass's Green Theory. Conclusions obtained in the study Qualitative descriptive This supports the hypothesis that there is a green technology agenda that the PRC has left negative in the ecology and society of the Congo, especially in the security environment and health.

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INTRODUCTION

Before Industrial Revolution 4.0, the world has through three eras of revolution industry. Revolution industry First related with use of water and steam as a process mechanism making textiles and metals. Next, the revolution industry second with draft industry transportation and communication through use electricity, oil, gas, and steel. Lastly, the handling energy nuclear renewable and automotive in revolution industry third. Although has give significant changes to progress civilization human beings, the three eras of revolution industry the can changed become threat for sustainability life human. Threat the including among others change extreme climate, rain acid, thinning layer ozone, increasing list of threatened species extinction, and degradation diversity life. Therefore, the Industrial

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Revolution 4.0 is currently This lift draft empowerment source Power natural in a way feasible, sustainable and friendly environment. Concept the present through green technology as solution alternative and innovative in reduce impact negative industrialization to environment alive, like minimize carbon dioxide and emissions House glass through power solar, and process waste become Cheap, safe and friendly products environment (Bradu et al, 2022).

Revolution 4.0 was introduced by Klaus Martin Schwab, the founder at a time chairman executive World Economic Forum (WEF), which highlights that will There is change in capitalism industry. After that, in 2011, the Industrial Revolution 4.0 was first announced in Germany at the ' Hannover Fair ' event as a proposal for to form policy economy new Germany based initiative tall to technology. The Industrial Revolution 4.0 has create paradigm new in industrialization is marked with productivity high, efficient procedures, and sustainability environment (Bortolini et al, 2017). So that in the process, the Industrial Revolution 4.0 seeks to utilise source Power natural with more wise through progress technology that has cycle life machine more length (Jiang et al, 2021). Therefore that, source Power energy and machines generator electricity used according to needs and requests, without excessive (Bradu et al, 2022).

Change style proper living Sustainable and environmentally friendly Industrial Revolution 4.0 environment has Motivate public For become consumer friendly environment. Therefore that 's important For develop product friendly environment, especially those related to with detergent, paper, laptops and cell phones, as well as vehicle electricity. In addition, various industry start compete For create products friendly environment with mark minimal economy, such as the People's Republic of China (PRC) which focuses on research and development technology innovative with take risk certain (Kansara et al, 2021). Until, in June 2022, Parliament Europe state restrictions use gas or diesel in vehicles For the year 2035 will be coming. If the steps This approved by the European Union, then will happen automotive market revolution the biggest third in the world after China and the United States, with the transition to technology battery. Condition said in the end create opportunity for big countries For empower and dominate the areas that have material standard main battery as source Power nature (Staden, 2022).

Industrial investors friendly environment own more interest high in companies manufacturing that produces compared to with party supplier source Power energy. In the case of battery, company manufacturing car electricity or mobile phone will request industry green technology For produce battery friendly an innovative environment, so that can reduce cost production company. As a result, the company manufacturing that will take profit more Lots with bestow impacts production battery to the supplier. Therefore, it is important For guard good balance between companies manufacturing, industry green technology, and source suppliers Power energy (Wang et al, 2021). This prove that green technology industry and investors in a way No direct influence growth developing countries economy through countries with innovation technology friendly environment (Shen et al, 2021).

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Democratic Republic of the Congo (DRC) is examples of core battery supplier countries the largest in the world through source Power its nature in the form of cobalt. Through its mineral and oil wealth, Congo became key success geopolitics for Africa, because has bring in investment from big countries in the form of development infrastructure like school, home sickness, roads, and mining. However, Congo is also one of the countries in Africa that is experience crisis health, stagnation economy, and war domestic for 50 years consequence instability vulnerable politics to corruption. This is make production cobalt experience decline (Denta Utama et al, 2022). Until, Laurent Desire Kabila made policy about encouragement production cobalt by Artisanal and Small-scale Mining (ASM), with monitoring below Service d'Assistance et d'Encadrement du Small Scale Mining (SAESSCAM) (Sovacool, 2019). The policy Then continued and renewed by his son, Joseph Kabila. This seen through publishing Mining Code in 2002 which regulates regarding the permitted ASM mining areas. As time goes by year, Mining Code start arrange system in ASM mining. When ASM started diverted For working under Large Scale and Industrial Mining (LSM), both from division of mining areas until sale cobalt (Higgs & Crowley, nd).

The problem started when appear fears by some countries in Africa will exploitation from big countries through its green technology agenda in the Democratic Republic of Congo (DRC). This can seen through signing Memorandum of Understanding (MoU) between Congo and the People's Republic of China (PRC) on 17 September 2007 regarding right exploration mine. Based on barter principle, sharing right mine being 32% owned by Congo and 68% owned by PRC company. Through cooperation This, it is hoped that Congo will experience improvement quality infrastructure and life, especially in professionalism Congolese society in mining cobalt (Uren, 2021). Next, there is the signing of the ' China - Congo Cooperation Agreement ' in 2008, which contains about investment by PRC companies of $6 billion in infrastructure and $3.25 billion in Sino–Congolaise des Mines (SICOMINES) in Katanga (Amnesty International, 2013). Agreements and cooperation the in a way No direct forcing the ASM to close and only focused on NGOs.

Companies mine cobalt owned by the People's Republic of China (PRC) has operates in several regions in the Democratic Republic of the Congo (DRC), such as Lubumbashi in Katanga Province, Kolwezi in Lualaba Province, Likasi in Haut-Katanga Province, and Kamina in Haut-Lomami Province. However, cooperation between both countries Not yet bring significant changes to Congo's infrastructure. On the other hand, some impact negative precisely appear, such as exploitation worker children, decreasing field work, decreasing health public consequence exposure waste and damage environment in the surrounding area mining (Denta Utama et al, 2022). In addition, a studies from The Lancet states that the women pregnant in Southern Congo has exposed concentration counted metal Enough tall for woman pregnant, so cause abnormality fetus and defects children (Niarchos, 2021).

According to World Health Organization (WHO), exposure high cobalt can cause impact negative for health man Good term short and also term long (WHO, 2006). Dust containing cobalt can result in disease lungs leading to asthma and decreased function

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lungs. In addition, contact skin in a way straight and straight continuously with cobalt can causes dermatitis (CDC, nd). Therefore, it is important For establish and implement standardization in profession mining cobalt. However, in the study case mining cobalt in the Democratic Republic of the Congo (DRC), p. the Not yet achieved. Reported from notes Amnesty International Congo, researchers sent has interview nearly 90 communities including adults and children in five mining areas cobalt, with results part big from they No own equipment protector the most basic self, such as sarong hands and clothes closed work. Even they must transporting and washing the cobalt use cloth in the rivers closest. As a result, some of they, especially children, often complain painful muscles and bones around back (Amnesty International, 2016).

An investigation published by Rights & Accountability in Development (RAID) and African Resource Watch (Afrewatch) stated that the women who live in mining areas cobalt experience cycle menstruation that is not regular, urogenital infections, vaginal mycosis (fungus), even threatened miscarriage or give birth to baby in condition No perfect. Up to, Raid and Afrewatch conducting tests on the water content in nearby rivers with mining cobalt, such as the Dipeta River, Katapula River, Kalenge and Dilala-UCK, and Lake Kando. While study Still continued, results beginning from River water samples in March 2024 showed that the pH of the water is low. The researchers conclude the cause is Because impact pollution industry that is sour. Remembering level acidity, rivers the No can Again accommodate fish and water poisonous for health creature alive. So, even though public No drink river water in a way directly, they still do activities, such as bathing and washing clothes in the rivers that have been polluted those who are capable cause infection (RAID, 2024).

In the research this, writer try For analyze implementation of the green technology agenda by the People's Republic of China (PRC) in the Democratic Republic of Congo (DRC) through glasses Green Theory, with hypothesis existence comparison between goals and implications from Green Theory through green technology. Green technology is here For guard sustainability civilization humans and ecosystems environment, which is the thing This in harmony with draft Green Theory which carries empowerment source Power natural in a way feasible, sustainable and friendly environment when look for solution alternative for source Power natural limited to the earth. However, the reality is implementation green technology in the Democratic Republic of Congo (DRC) threatens security humans, especially environment and health, in society local. Threats the originate from waste mining cobalt which causes abnormality fetus, defects in children, and various diseases in the Congolese community. mining cobalt as material main in production battery car electricity disclose injustice structural in transition global energy. Although battery promoted as innovation from industry green, its impact towards producing countries source Power energy like Congo is very No fair. So, the research writer This important For done as development knowledge knowledge in International Relations related to the green technology agenda.

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METHOD

Study with title " Analysis of China's Green Technology Agenda on Issue Security Environment and Health Security for the People of the Democratic Republic of the Congo (DRC)" using method qualitative descriptive. Research This No only just gather ingredients in the form of existing theories, concepts and data the relation with main discussion, but also trying For explain the reality of the green technology agenda in society in the Democratic Republic of the Congo (DRC) as a related phenomena with security environment and health.

Types of research used by researchers is type study qualitative with use method qualitative in nature bibliography. So, technique collection the data obtained from books, articles scientific, as well as various valid sources from the internet such as news, reports and other data that is considered Still relevant, especially those published 10 years ago final.

Concepts and Theories

Draft Green Technology (Green Technology)

Green Technology or Green Technology is technology that has designed by scientists and experts technology as solution alternative to reduce impact negative industrialization to environment life. History of Green Technology started at the beginning the 20th century, when emergence movement an increasingly environment realize degradation environment consequence industrialization. Until, there is a number of some important momentum that drives development Green Technology from time to time. Some important moments the among others, such as in the 1970s, energy wind and solar panels start develop ; in the 1980s, Green Technology start enter sector business with promote practice more business sustainable and make product friendly environment ; in the 1990s, there emerged policies by the government about subtraction emission carbon and promote Green Technology ; in the 2000s, starting appear investment to Green Technology by companies, which is supported with incentive government For adopt Green Technology ; in the 2010s, Green Technology Keep going growing and growing adopted by companies and society, as well as create technology like car electricity ; and in the 2020s, Green Technology the more popular in the sector business and society with a number of the technology like technology processing waste, smart grid, and design architect green (Arifin et al, 2023) main purpose Green Technology is as solution alternative and innovative that supports protection and recovery environment life from impact negative industrialization. This is related with restrictions use source Power nature, especially the unnatural ones can updated, so that No happen exploitation by humans. In addition, another goal of Green Technology is For support practice business that considers social, economic and environmental with business model like management waste, production friendly environment, up to empowerment community local (Iskandar, 2024).

So far This is Green Technology has applied in various field like energy renewable, transportation friendly environment, processing waste, and design efficient building energy. In the field of energy renewable, Green Technology covering use source energy renewable like power wind, power solar, energy wind, biomass, and so on. In the field of transportation

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friendly environment, Green Technology implemented through hybrid, vehicle electricity, or use material burn a friendly alternative environment. In the field of processor waste, Green Technology covers use technology recycle repeat waste. Finally, in the design efficient building energy, Green Technology involving use material more buildings friendly environment like material building recycle repeat (Sudawarni, 2012).

Draft Human Security, Health Security, Environmental Security

When the Cold War ended, security national start under review repeat and more focused on security human. There are two aspects main in security human, namely safety from threat chronic (starvation, disease, and oppression) and protection from sudden interruption present in life everyday. Security No only seen from absence conflict and threats, but safe also means existence all something related with need human. Aspect this is also related with aspect freedom according to Human Development Report (1994) from United Nation Development Program (UNDP), ie freedom from fear and freedom from desire. Aspect safety and freedom the related with seven threat main for security man namely economic security, health security, food security, environmental security, personal security, community security, and political security (Edwards, 2010). In doing approach security man to seventh aspect mentioned, it is necessary existence analysis deep using five principles security human. First, people-centered. When security man consider various threatening conditions continuity life human, start from dignity until community man. Second, comprehensive viewing existence various method in overcome threat man in accordance conditions of each country. Third, context-specific. The principle This focus on the roots reason threat human beings that occur. So, the response to security man can develop prevention - oriented solutions with engage and empower community local (protection & empowerment) (Human Security Unit, 2016).

In the research these are the five principles security man will focused on health security and environmental security. Health security is form necessary security done in a way proactive and also reactive For issue threat like disease contagious, cancer, impact negative from pollution environment, limited clean water, and lack of access facility service health. This is driven by several factor like growth population, acceleration urbanization, degradation environment, and increasing dependence on materials chemistry (WHO, nd). On the other hand, degradation environment and limited clean water are also issue threat in environmental security. In addition, there is also degradation diversity life life and pollution environment life. Environmental security refers to protection environment life For place stay humans (Bajpai, 2000).

In fact, connecting health security with environmental security is not easy thing Because there is a number of considerations, such as scale degradation environment and levels diseases that can threaten security man That alone. Degradation environment Alone often the cause relate with human, which is related with aspect freedom. Although so, no There is absolute freedom Because will always There is trade-off. So, some people sometimes must limit choice them for the common ' good ' (Bajpai, 2000).

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Green Theory

When this, the world is faced with the issue damage environment, such as change climate, depletion ozone, scarcity in diversity life, pollution pollution and waste. Crisis environment the has become injustice consequence for civilization humans and ecosystems environment in the future. Since The Industrial Revolution occurred in 1784, technology experience changes and developments that provide impact big on life social economy human. Impact the cause degradation environment, which at the time that 's the problem environment Still considered become issue local. Until, in the 1960s, the " Modern Ecological Crisis " period emerged, when issue crisis environment life start impact wide with a larger scale big, which then bring up concern from public international (Eckersley, 2007). In addition, there is also the " Tragedy of The Commons " which is one of the momentum issues crisis environment life the more recognized by society. " Tragedy of The Commons " is understood as an exploitation agenda source Power nature in water and land For fulfil need interest personal (Dyer, 2018).

In the end, the theory connection international traditional that always focused on human- centered in anthropocentrism, starting see existence environment life as his study. Understand anthropocentrism allow man do exploitation to source Power nature to fulfill need term short humans (Dyer, 2018). This driven by growth life social economy humans and development rapid technology, and its impact on sustainability diversity life (Eckersley, 2007).

Therefore that, it is needed perspective ecocentrism For help see sustainability connection humans and the environment in the future. Perspective This become understand main in Green Theory or Green Theory, one of the theory critical issues that arise For answer problem issue environment. According to RE Goddin (1992), Green Theory own related focus with the Green Theory of Values, namely about restrictions freedom man in do exploitation source Power nature to maintain sustainability environment life (Dyer, 2018). Green Theory also has three assumption basic, namely more racing on the global side rather than side international, as example involvement public local in control source Power nature owned ; there is understanding implicit about practice human beings in the world who are not right them, but rather right nature ; and modern practices based on theory anthropocentric traditional believed has cause issues and crises environment life (Steans, 2005).

RESULTS AND DISCUSSION

The Urgency of the Green Technology Agenda in the form of Batteries and Cobalt

In the 21st century, developments industry and improvement population has push impact ecologically sufficient bad for the world. Impact the seen through degradation environment consequence pollution waste, increase greenhouse gas emissions glass, decreasing availability source Power sustainable nature, and change extreme climate. In its Climate Change Report, the UN Environment Programme includes data that average global temperature is increasing to 0.85°C (1880-2012); surface sea the earth rose 19 cm (1901-

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2010) along with with shrinking Arctic Ocean in a way consecutive since 1979; increasing emission carbon dioxide (CO2) by 50% globally since 1990, especially in 2000 and 2010; and in a number of decade Lastly, greenhouse gas emissions glass has reaching 1.5% per year (Ahluwalia, 2020). Up to when Covid-19 attacked, the community international realize has abusive and greedy to source Power nature and the energy provided earth For need daily humans. During the lockdown, emissions carbon Global dioxide (CO2) levels are decreasing by 7.8% in 2020. This is become warning for man For think about development sustainable which concerns sector environment, economy, energy, and socio-politics (Bradu et al, 2022).

Above issue has push development industry For development that sustainable, so that Industrial Revolution 4.0 now This focuses on green technology through technology economical energy and energy Renewable. Key success green technology lies in its ability in reduce impact negative from industry to environment alive, like preservation diversity life, protection and efficiency use source Power nature, and reduction greenhouse gas emissions glass (AmmarNurHandyka, 2023). For realize success mentioned, it is necessary role and cooperation by the community international. Therefore, all countries agree For adopt Green New Deal with objective reduce 80% usage energy material burn fossils by 2030 and transition full to use energy source Power renewable by 2050. The agreement this also includes ' One Health ' policy that takes into account health humans, animals, economy, and the environment (McNeely, 2021). Implementation from agreement Green New Deal For increase innovation friendly environment including among others savings hydrogen as replacement carbon, management carbon become bioenergy, and create vehicle electricity (Priya et al, 2021).

Often, innovation electricity friendly environment implemented by capable countries create partnership with other countries or private For provide necessary infrastructure with use ingredients base recycle repeat. This is has developed by many countries in Europe, so that in 2025, Europe get 20% of the material base low emission in what goes through processes and forms recycle (Chiappinelli et al, 2021). In addition, in June 2022, Parliament Europe state restrictions use gas or diesel in vehicles For the year 2035 will be coming. If the steps This approved by the European Union, then will happen automotive market revolution the biggest third in the world after China and the United States, with the transition to technology battery (Staden, 2022). Condition said in the end create opportunity for big countries For create partnership with other countries or party private sector capable push provision the necessary infrastructure, such as battery.

Currently, batteries, especially lithium-ion, are estimated to has save by 30% to 70% of material burn fossil in the industrial world. According to S7P Global, production global lithium-ion batteries are experiencing improvement from 455 GWh in 2020 to 1,447 GWh in 2025. In terms of this, China and Europe will become contributor biggest in development lithium-ion battery. On the electrodes positive in lithium-ion battery, contains lithium cobalt oxide (LiCoO2) and derivatives generally. Cobalt is very important in increase cycle life lithium-ion batteries because capacity its stabilization maintains service life and strength

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battery. Consumption cobalt in batteries globally experiencing improvement from 16% in 2000 to 55 % in 2017 (BMO Capital Markets, 2017). In addition to lithium-ion batteries, the system storage energy cobalt can also used in infrastructure energy renewable, reduce carbon and provide electricity in the field transportation through carbonization, as well as capable mitigate change climate (Earl et al, 2022).

Most of the source Power cobalt or around 7.1 million tonnes of cobalt is located in Central Africa, with an average of 51% located in the Democratic Republic of the Congo (DRC). In 2019, production global cobalt in Congo reached 69.4% or around 144,000 tons, with 68.2% or about 132,000 tonnes of cobalt processed in China. With supply complex cobalt However not enough diverse so far this, it is feared will cause problems in mining cobalt both in Congo and China, which resulted in disruption supply global cobalt, Although, until moment this, there is more from 150 deposits cobalt that has not been exploited globally. However, the sediment the estimated No can finish problem supply cobalt that occurs in term intermediate until long. Responding to matter this, consumer from some countries start take steps. At the time Currently, Asia followed by Europe and North America are the largest markets. cobalt. Europe has more formerly secure stock, route exports, and prices cobalt in the market through agreement term long and large subsidies from investors. This is can understood remember Europe is one of the most committed continent will transition technology green. Therefore, the supply cobalt must quick developed For reach transition more environment and energy green (Earl et al, 2022).

Importance and Impact in the Green Technology Agenda in the form of Cobalt by the People's Republic of China (PRC) in the Democratic Republic of Congo (DRC)

Democratic Republic of the Congo (DRC), as the 6th most fragile and 17th most corrupt country in the world, has around 51% reserves Global Cobalt Mining has play role big on interest domestically and internationally Congo (Earl et al, 2022). Mining history started when colonial Belgium monopolize source mineral resources in Katanga. Until, after Congo's independence in 1960, the government start take transfer mining in 1967, then do expansion and building factory smelting for mining cobalt and minerals below company state mines, namely Gécamines (Générale des Carrières et des Mines) (Prasad, 1989). Gécamines based in Lubumbashi, DRC has play role important in Congolese politics with manage deposits and contracts mining, as well as signed 27 contracts partnership with the average company foreign (Makal & Abulu, 2024).

Mining cobalt experience glory in 1970 to 1980. However, during 1990s, industry mining cobalt in Congo is experiencing decline drastic. This is caused by state corruption, war, conflict military, and the seizure of source mineral resources in the region around the Congo. Thus, under Laurent Desire Kabila's government, production cobalt by Artisanal and Small-scale Mining (ASM) starts driven. As a result, the production process cobalt become No efficient so that mark sell it not enough from 10% and has accumulating a foreign debt of $2.5 billion. Finally, Kabila established Service d'Assistance et d'Encadrement du Small Scale Mining (SAESSCAM) as institution government that regulates and imposes tax on the sector mining, in particular mining traditional (ASM). This is make ASM popular among

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society (Sovacool, 2019). Laurent Desire Kabila's policy then continued by his son, Joseph Kabila, who has determination strong in investment foreign. This is seen through publishing Mining Code in 2002 which regulates regarding the permitted ASM mining areas. As time goes by year, Mining Code start arrange system in ASM mining. When ASM started diverted For working under Large Scale and Industrial Mining (LSM), both from division of mining areas until sale cobalt (Higgs & Crowley, nd).

Democratic Republic of the Congo (DRC) has two types of source Power cobalt that can exploited, namely sediment oxide, mining surface land, which is experiencing weathering near surface soil and sediment sulfide, mining lower land, which is not experience weathering below sediment oxide, with depth between 70 and 150m (Crundwell et al, 2011). The exploitation process mine the run by two practices mining, namely Artisanal and Small-scale Mining (ASM) and Large Scale and Industrial Mining (LSM). ASM is mining traditional that do retrieval and extraction mineral substances use tools, methods and craft processes hand. Before war, 90% mining process cobalt in Congo uses ASM practice. Although Now has decrease to 15-20%, ASM succeeded contributes 20% of production cobalt national and 12.9% of production global cobalt (Al Barazi et al, 2017). Meanwhile, NGOs are practice mining use modern machines that level mechanization and automation high, usually use tool heavy like mixture scraper surface, bulldozer, and digger. Example Some NGOs in Congo include CDM and CHEF in Lubumbashi, Tenke Fungurume Mine in Fugurume, Sino–Congolaise des Mines (SICOMINES) in Katanga, China COMMUS in Musonoïe, and so on (Crundwell et al, 2011).

Most of the mining multinational cobalt (NGO) in Congo has occupied by China, starting from the extraction process until purification cobalt. According to the New York Times, by 2020, China has own or financed 15 of the 19 mines industry cobalt, with two-thirds The world's cobalt is processed in China. In addition, entrepreneurs from China also established station buy and sell cobalt or depots at 30 ASM cobalt locations in Lualaba and Katanga. The buying and selling process This For determine assessed price from quality seed cobalt. However, some ASMs feel disadvantaged with system This Because mark buy and sell cobalt they often valued more low or determined in a way arbitrarily by the PRC (Baumann-Pauly, 2023). This supported by the observation of Lindberg and Andersson (2019) that ASM miners are very poor. They even No capable For buy equipment base and protector in mining, such as ladder lower soil, shovel, hammer, helmet, and so on.

Companies Chinese foreigners in Congo have There is since 1970-1990 through investment small in the form of provide book school ; give help finance of $3 million ; helping progress rice -focused agriculture in Bumba, Equateur Province ; and building building parliament and stadium national football. Relationship the had time slowed down in the early 1990s due to instability Congolese politics (Clark et al, 2008). Until, in 2008, Congo signed the ' China -Congo Cooperation Agreement ', when Chinese companies invest $6 billion in infrastructure and $3.25 billion in Sino–Congolaise des Mines (SICOMINES) in Katanga (Amnesty International, 2013). In addition, there was also the signing of the Memorandum of Understanding (MoU) between Congo and China on 17 September 2007

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regarding right exploration mine. Based on barter principle, sharing right mine being 32% owned by Congo and 68% owned by company China (Uren, 2021).

Agreement both countries achieved For interest national of each country. When Congo got investment foreign For build infrastructure domestically after existence war. This is proven through the World Bank (2008) that sector Congo mining generates $186 million up to $388 million in mark production gross every year. That is, mining national contributed to 97.5% of exports national, 20% of national GDP, 24.7% of income government, and 23.9% of the field formal work. In addition, Jurnal Indonesia (2019) also reported that sector Congo mining in general overall contributed $1.57 billion income to government in 2018, which is the almost doubled from year previously (Sovacool, 2019). In the development infrastructure transportation and social, such as road, school and house ill, Congo is financed by loans from Export Bank Import (Exim) China. Later, the loan the must replaced through profit from business mining (Denta Utama et al, 2022). On the other hand, the interests national China focused on securing critical minerals For progress manufacturing China through transition energy green or source Power energy renewable, such as provision vehicle electricity, lithium batteries, and solar panels. China own ambition For become one of the automotive markets the largest in the world, following the European Union and America (Staden, 2022). This proven with China becoming the only supplier country batteries in the world with more market share from 30% (CNBC Indonesia, 2025).

When this, cobalt has become sword double -edged. From the material the most needed basics For battery, changed become material deadly chemical after become waste Because can pollute water, crops, and fertility land. According to Amnesty International and groups supervisor environment, location mining owned by China has associated with spill waste toxic, water pollution, and deforestation forest. There is about 14 incidents big about pollution the environment nearby industry mining in Congo (Makal & Abulu, 2024) and about 22 studies scientifically proven existence pollution to river, lake, land wet, and water flow due to activity mining (RAID, 2024). Such as research conducted with collect fish from lake Tshangalale, which is nearby with city mining, allegedly has contain carcinogens and there are element radioactive (Davey, 2023). In addition, in March 2022, the Ministry of Environment conducted investigation against acidic water that has affecting the Yenge, Kolwezi fields, which border with SICOMINES. As a result, growth sugar cane and bananas become slow and not quality, and the occurrence decay to plant cassava. There is also a Carter Center Report in 2019-2021 which states that happen degradation environment consequence activity COMMUS mine, child company Zinjin Mining from China, in Kolwezi (Makal & Abulu, 2024).

Rights & Accountability in Development (RAID) and African Resource Watch (Afrewatch) also conducted tests on the water content in nearby rivers. with mining cobalt, such as the Dipeta River, Katapula River, Kalenge and Dilala-UCK, and Lake Kando. While study Still continued, results beginning from River water samples in March 2024 showed that the pH of the water is low. The researchers conclude the cause is pollution waste industry that is acid (RAID, 2024). Degradation environment other in the form of pollution

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the air around toxic mine consequence extraction cobalt. This is cause Lots miners, especially those working without tool protector. Making mining in residential areas Congolese society also triggered pollution on water and sanitation that can cause distribution diseases, such as HIV/AIDS and infections Infectious Sexual (STDs) (Kamara and Bumba, 2025).

According to World Health Organization (WHO), exposure high cobalt can cause impact negative for health man Good term short and also term long (WHO, 2006). Dust containing cobalt can result in disease lungs leading to asthma and decreased function lungs. In addition, contact skin in a way straight and straight continuously with cobalt can causes dermatitis (CDC, nd). In the RAID and Afrewatch report entitled ' Beneath the Green: A critical look at the cost of industrial cobalt mining in the DRC ' it states that there are 56% of the people in Congo who were interviewed report that the water is contaminated waste cobalt has influence health reproductive and gynecological women. As a result, menstruation become No regular, miscarriage, and urogenital infections (RAID, 2024). The Lancet also states that the women pregnant in Southern Congo has exposed concentration counted metal Enough tall so that cause abnormality fetus and defects children (Niarchos, 2021). In reality, the Congolese people who live and work in mining cobalt contain level enough cobalt high inside urine and blood. Not infrequently, children who are affected can experience cancer or loss of neurons (Kamara and Bumba, 2025).

Apart from the problems environment and health, the Congolese people also face problem social. When some village evicted in a way force For expansion road industry cobalt. Like China COMMUS in Gécamines, Kolwezi and Musonoïe, companies mine China in Congo which does defoliation forests and evictions House public in a way force to build track transportation mining cobalt (Makal, 2024). Communities experiencing transfer force This has report existence intimidation, beatings and violence sexual, especially to children and women (Kamara and Bumba, 2025). In interviews conducted by RAID and Afrewatch, 59% of people in Congo said that they reduce intake Eat become once a day and take out children they from school Because No capable pay, and 79% others say that they No capable For pay medicines and treatments health (RAID, 2024).

Analysis of the Green Technology Agenda via Human Security and Green Theory

Main purpose green technology is as solution alternative and innovative that supports protection and recovery environment life from impact negative industrialization. This is related with restrictions use source Power nature, especially the unnatural ones can updated, so that No happen exploitation by humans (Iskandar, 2024). This is in line with Green Theory of Values by RE Goddin (1992), ie about restrictions freedom man in do exploitation source Power nature to maintain sustainability environment life (Dyer, 2018). Cobalt is one of the source Power energy that is not updated. As material base lithium ion battery that supports transition energy renewable, needs cobalt increased and created big countries, such as China, the European Union, and the United States compete For get it (Earl et al, 2022). In the process, these countries has do exploitation cobalt with damage sustainability environment living around the mining area. Such as China COMMUS in

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Gécamines, Kolwezi and Musonoïe, companies mine China in Congo which does defoliation forests and evictions House public in a way force to build track transportation mining cobalt (Makal & Abulu, 2024).

In addition, another goal of green technology is is For support practice business that considers social, economic and environmental with business model like management waste, production friendly environment, up to empowerment community local (Iskandar, 2024). However, in its implementation, China precisely throw away waste indiscriminately and monopolize the cobalt market in Congo. This proven through investigation by the Ministry of Environment in March 2022, which stated there is acidic water that has affecting the Yenge, Kolwezi fields, which border with SICOMINES, the mine China -Congo. As a result, growth sugar cane and bananas become slow and not quality, and the occurrence decay to plant cassava. In addition, according to Report Carter Center in 2019-2021, there are degradation environment consequence activity COMMUS mine, child company Zinjin Mining from China, in Kolwezi (Makal & Abulu, 2024).

Green technology Alone is product from Green Theory. When the issue crisis environment need perspective ecocentrism For help see sustainability connection humans and the environment in the future. Sustainability connection This has designed by scientists and experts technology with apply green technology as solution alternative to reduce impact negative industrialization to environment life (Arifin et al, 2023). So, empowerment community local and exploitation nature is also related with three assumption base in Green Theory about development more sustainable ecological. First, racing on the global side rather than side international, as example involvement public local in control source Power nature owned. Assumption This prioritize community local For take importance his rights in manage and take decision related source Power natural they themselves (Steans et al, 2005). In the study case this, Congo actually give right For manage cobalt, start from the refining process cobalt, mining area division until sale cobalt to Large Scale and Industrial Mining (LSM) or company multinational compared to Artisanal and Small-scale Mining (ASM) or mining traditional. This is set out in the policy Mining Code issued by Joseph Kabila in 2002 (Higgs & Crowley, 2017). So, ASM becomes Lots develop as mining illegal Because No supported by the state. Although succeed contributes 20% of production cobalt national and 12.9% of production global cobalt (Al Barazi et al, 2017).

Second, there is understanding implicit about practice human beings in the world who are not right them, but rather right nature. Meaning, Green Theory confess that man own significant impact to environment life, which is often impact the harm creature life others and living ecosystems side by side with human beings. So, the importance of man For consider presence they in taking decision about management source Power nature and effort For reduce damage environment (Steans et al, 2005). Unfortunately, mining cobalt China in Congo instead has bother balance water and land ecosystems. This is supported through research that collects fish from lake Tshangalale, which is nearby with city mining, has allegedly contain carcinogens and there are element radioactive (Davey, 2023). In addition, Rights & Accountability in Development (RAID) and African Resource Watch (

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Afrewatch) also conducted tests on the water content in rivers near with mining cobalt, such as the Dipeta River, Katapula River, Kalenge and Dilala-UCK, and Lake Kando. While study Still continued, results beginning from River water samples in March 2024 showed that the pH of the water is low. The researchers conclude the cause is pollution waste industry that is acid (RAID, 2024). Growth sugar cane and bananas also become slow and not quality, and the occurrence decay to plant cassava in the ground around SICOMINES mine in Kolwezi (Makal & Abulu, 2024).

Finally, modern practice is based on theory anthropocentric traditional believed has cause issues and crises environment live. So, must there is change in method think and act man For overcome crisis environment. Like consider return values and priorities humans, and try For develop more practice sustainable and friendly environment (Steans et al, 2005). In fact, up to moment This is a modern anthropocentric practice. Still there is in development more practice sustainable and friendly environment. Green technology agenda by major countries For capable meet transition targets energy clean or green in the future has leave footsteps negative to ecologically disturbing sustainability life humans in other parts of the world. This is seen through effect negative domino against health and environment communities in the Democratic Republic of Congo (DRC) generated by the green technology agenda of the People's Republic of China (PRC). When the transition energy clean or green in the future only will felt by some human and leave man others, the source Power its nature exploited. Until can it is said that in fact man always do modern practice based on anthropocentric or even with leave side anthropocentric owned by man other.

Effect negative domino involving health and environment in the Democratic Republic of Congo (DRC) society can it is said as threat No direct to security human beings. This is can analyzed through five principles in security man about root problem threat humanity that occurs until responses involving all component in overcome threat mentioned. First, people-centered. When security man consider various threatening conditions continuity life human, start from dignity until community humans (Human Security Unit, 2016). In the study case This, the Congolese government is more focused on the economy and foreign investors compared to vulnerability Congolese society. This is proven through Signature Memorandum of Understanding (MoU) between Congo and China on 17 September 2007 regarding distribution right mine being 32% owned by Congo and 68% owned by company China (Uren, 2021) and the ' China - Congo Cooperation Agreement ' in 2008 for $6 billion infrastructure and $3.25 billion establishment Sino–Congolaise des Mines (SICOMINES) in Katanga (Amnesty International, 2013).

Second, comprehensive viewing existence various method in overcome threat man in accordance conditions of each country (Human Security Unit, 2016). As a producing country cobalt the world's largest, Congo has do a number of effort legislative For do mining cobalt is responsible Respond in vulnerable areas conflict. The effort including among others cooperation with Organization for Economic Co-operation and Development (OECD) in due diligence requirements For management supply cobalt is responsible responsible and respectful of human rights; Responsible Minerals Initiative (RMI) which helps company For

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use tools and resources Power in accordance standard international : European Battery Alliance which uses instrument policy trading For ensure sustainable and ethical access to cobalt ; China Chamber of Commerce of Metals (CCCMC) for do investment and trade to strengthen not quite enough answer with follow principles in the UN; and the Responsible Assessment Framework For ensure the production process cobalt responsible answer to the creature living around it (Earl et al, 2022). Unfortunately, cooperation the No felt its benefits by the Congolese people themselves. In the RAID and Afrewatch report entitled ' Beneath the Green: A critical look at the cost of industrial cobalt mining in the DRC ' states that there are 56% of the people in Congo who were interviewed report that the water is contaminated waste cobalt has influence health reproductive and gynecological women. As a result, menstruation become No regular, miscarriage, and urogenital infections (RAID, 2024). The Lancet also states that the women pregnant in Southern Congo has exposed concentration counted metal Enough tall so that cause abnormality fetus and defects children (Niarchos, 2021). So far this, there is about 14 incidents big about pollution the environment nearby industry mining in Congo (Makal & Abulu, 2024) and about 22 studies scientifically proven existence pollution to river, lake, land wet, and water flow due to activity mining (RAID, 2024). The companies in studies the state has follow existing standards and says that pollution moment This owned by activity old mine or mining traditional. However, companies the No willing give proof that practice they in accordance standard (RAID, 2024).

Third, context-specific. Principles This focus on the roots reason threat human beings that occur. So, the response to security man can develop prevention - oriented solutions with engage and empower community local (protection & empowerment) (Human Security Unit, 2016). Research This focus on threats to health and environment humans in Congo. Connecting health security with environmental security is not easy thing Because there is a number of considerations, such as scale degradation environment and levels diseases that can threaten security man That alone. Degradation environment Alone often the cause relate with human, which is related with aspect freedom (Bajpai, 2000). In the Congo itself, the scale the measurable through percentage public or pollution from degradation environment in different areas. Among others, fish in the lake Tshangalale, which is nearby with city mining, allegedly has contain carcinogens and there are element radioactive (Davey, 2023); acid water in the Yenge field, Kolwezi, which borders with SICOMINES, which causes growth sugar cane and bananas become slow and not quality, and the occurrence decay to plant cassava (Makal, 2024); low water pH in the Dipeta River, Katapula River, Kalenge and Dilala-UCK; 56% of interviewed communities in Congo report that the water is contaminated waste cobalt has cause menstruation become No irregular menstruation, miscarriage, and urogenital infections ; 79% of Congolese people said that they No capable For pay medicines and treatments health (RAID, 2024); women pregnant in Southern Congo has exposed concentration counted metal Enough tall so that cause abnormality fetus and defects children (Niarchos, 2021); and defoliation forests and evictions houses by China COMMUS in Gécamines, Kolwezi, and Musonoïe (Makal, 2024).

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Although has cooperate with COMIAKOL cooperative and NGO PACT for strive for standard safety work and control access (Earl et al, 2022), Congo remains Still fail in involving community more local important, namely Artisanal and Small-scale Mining (ASM) or mining traditional. Moreover Congolese government often closed eye about incidents that befell society, especially ASM, to still retain foreign investors.

CONCLUSION

Most of the source Power cobalt or around 7.1 million tonnes of cobalt is located in Central Africa, with an average of 51% located in the Democratic Republic of the Congo (DRC). In 2019, production global cobalt in Congo reached 69.4% or around 144,000 tons, with 68.2% or about 132,000 tonnes of cobalt processed in China. Cobalt is very important in increase cycle life lithium-ion batteries because capacity its stabilization maintains service life and strength battery. Consumption cobalt in batteries globally experiencing improvement from 16% in 2000 to 55 % in 2017. This is because of batteries, especially lithium-ion are expected has save by 30% to 70% of material burn fossil in the industrial world. So, the need cobalt increased and made big countries, such as the PRC, the European Union, and the United States compete For get it. However, on the agenda, these countries, especially China, have do exploitation cobalt in a way excessive so that create threat to health and environment society in Congo. According to Amnesty International and groups supervisor environment, location mining owned by China has associated with spill waste toxic, water pollution, and deforestation forest. This is cause the descent quality animals and plants in water and land that have contaminated waste add, spread HIV /AIDS, STIs, and cancer in children and the elderly, as well as risk miscarriage and disorders reproduction by the race Woman. So, China's green technology agenda for going to transition energy clean or green No in accordance with objective green technology That yourself. Because of this the only will felt by some human and leave man others, the source Power its nature exploited.

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