STRATEGIC OPTIONS BASED ON INNOVATION FOR SUSTAINABLE DEVELOPMENT DURING THE RESOURCE CRISIS

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Abstract
A new global economic crisis is predicted for 2022. The Ukraine conflict has slowed the world's recovery, caused a humanitarian crisis in Europe, and raised food prices. Businesses and investors are pessimistic due to geopolitical and economic uncertainty. Ukraine's conflict and Russian sanctions have disrupted commodity markets and exacerbated supply-side shocks. International trade should slow in 2022 after a big jump in 2021. Climate change reduces raw materials and raises energy prices. To meet demand, production methods must change. The aim of our research is to identify innovation-based strategic options for sustainable development in the time of resource crisis. In this study, a mixed-methods approach was employed to explore innovation-based strategic options for sustainable development in the context of a resource crisis. A literature review was conducted to gather relevant information from academic databases, focusing on the food industry and its challenges in the face of resource scarcity. Additionally, empirical data analysis was performed using statistical data and indicators from reputable sources covering the period from 2018 to 2022. By integrating the findings from the literature review and empirical data analysis, this study aimed to identify key factors and characteristics that enhance business sustainability and provide meaningful recommendations for businesses and policymakers in their pursuit of sustainable development during resource crises. Business growth requires innovation. Business growth requires innovation. Competition and government constraints (during resource crises) encourage innovation. Innovation management facilitates sustained innovation via efforts (search, evaluation, implementation). Sustainability's significance and difficulty need professionals. Statistics show a few recognized characteristics that boost business sustainability. This study examines these factors.

Keywords: *sustainable option, resources crisis, food industry.*
DOI: 10.24818/CAFEE/2022/11/10

Introduction

We started by finding out how modern poverty affects not only the economy but also civil liberties, the natural world, and people's own lives. The numbers show that poverty and a falling standard of living are the same thing (Rădulescu, Bran et al., 2022). If the government really wants to fight poverty, it should change its policies to put more emphasis on social cohesion. (Burlacu, Pargaru et al., 2022; Burlacu, Georgescu et al., 2022) To reach this goal, it will be necessary to set up a system of interrelationships that, when analyzed, will lead to an increase in a society's production capacity and make sure that vital resources will continue to grow (Rădulescu, Angheluta et al., 2022).

After figuring out how bad the problem was, the researchers concluded that efforts to end poverty should use many different methods and tools (Alpopi et al., 2022). Because of this,

a plan to end poverty must consider not only the goal of ending inequality and the mental and physical pain caused by poverty, but also the government's ability, the protection of natural resources, and the protection of the environment from the threat of climate change (Mogos et al., 2021). So, the most important things to do are to make sure there is sustainable economic growth, good use of resources, investment in infrastructure and agriculture, trade with other countries, and access to energy and technology (Burlacu, Popescu et al., 2021).

1. Literature review

Recent studies say COVID-19 is one of the world's deadliest infectious diseases. Millions of people and companies are isolated to stop the virus's spread. As an exceptional event, the shutdown caused significant recessions in numerous countries. Meanwhile, COVID-19 shutdowns have shifted energy consumption patterns and lowered CO2 emissions. IMF and IEA data for 2020 still predict 2021 emissions growth. COVID-19's full impact on the crisis's duration, energy consumption patterns, and CO2 emissions is unclear. This analysis provides a broad and persuasive assessment of the observed and predicted consequences of the COVID-19 pandemic on the world economy, world energy demand, and world emissions of energy-related CO2 in the next few years. Pandemic, economic slowdown, and climate crisis all require fast governmental answers (Aktar et al., 2021).

Costa and Santana estimated smoothed mean standardized mortality rates in a 2021 cross-sectional ecological study using a hierarchical Bayesian model (sSMR). Relative risks (RRs) at 95% credible intervals were also measured for cause-specific mortality and education. Globally, healthcare-related deaths have decreased, according to their study. Inequalities within countries persist, with lower death rates in Central European regions and higher death rates in Eastern European regions. After the financial crisis, these deaths increased in almost all EU regions. A statistical association was found between healthcare-susceptible deaths and early exit from education and training. Identifying and understanding regional differences may lead to a better understanding of healthcare-related deaths and more effective policies.

Corriero, Aborode, Reggio, and Shatila discussed Lebanon's economic difficulties and COVID-19 outbreak in 2022. Food instability, water shortages, the Beirut port catastrophe, and gasoline and electricity shortages in 2021 threaten Lebanese health. Lebanon's position is not improving with food prices rising significantly in 2020 and 441 percent in October, not enough milk for infants, and 20-hour power outages. Researchers concluded that their country needs international support to avert synergistic calamities. Their conclusion suggests the government should prioritize long-term job-focused economic improvements. International aid should prevent starvation and power outages (Corriero et al., 2022).

People have had different ideas about what wealth is and what poverty is over time. To tell the difference between these definitions, you need to look at the time, the author's point of view, and the country or region where it was first used. All definitions of wealth and poverty have one thing in common: they are all based on resources. So, how rich or poor someone is depends on how many resources they have or how few. But these words mean different things to different people, and everyone has different hopes and needs. Because there have been a lot of attempts to explain these ideas in specialized literature and because the words are similar, the most common or well-known definitions of the two ideas will be given next. Most people agree that someone or a group is poor if they don't have as many resources as other people (Chirilă, 2013).

The World Health Organization says that a person is poor when they don't have enough money to live at a certain minimum level. The World Bank figures out the poverty line by looking at calorie consumption, which can be defined as "the minimum level of income at which consumption expenditures allow meeting nutritional needs and ensuring a calorie

consumption accepted as necessary by FAO" (Bran, et al., 2012). Zamfir and Zamfir (1995) says something similar: "Poverty is a permanent lack of resources needed to live a decent, acceptable life at the level of a given community". The UN says that poverty is "the inability to choose and have options, which is a violation of human dignity. It means not having enough money to feed and clothe a family, not having a clinic or school to go to, not having land to grow food on or a job to make a living. It means feeling unsafe, helpless, and left out of society. It means that someone is prone to violence and lives in dangerous places where they can't get clean water or use a toilet."

People can talk about two different kinds of poverty. The first is the subsistence level, which is also called absolute poverty. This is when a person doesn't make enough money to meet their basic needs and stay alive. The second kind of poverty compares a person's income to that of someone else.

From the point of view of other experts, being rich or poor isn't about having money or being able to meet needs. Instead, both are based on how a person acts when they don't know what will happen. Everyone knows that the only thing that is certain in life is death, which looms over everyone. A well-known saying says that death and taxes are the only things you can count on in life. When they will happen is a little bit up in the air, but everyone is sure that they will. Since life on Earth is full of risks and dangers, how people see them, how they react to them, how they act, and what they decide to do about them all affect how life goes on. So, wealth is "the result of the struggle to overcome dangers, the power to act proactively, and to destroy creatively while poverty is "the inability to fight the uncertainties of life, a power without the power to create" and grow in the name of and for man (Wels, 2002).

2. Methodology

The methodology used in this study involved a comprehensive and systematic approach to explore innovation-based strategic options for sustainable development in the context of a resource crisis. A mixed methods design was chosen to collect both qualitative and quantitative data, allowing for a more comprehensive investigation of the research issues.

To begin with, a declarative literature review was conducted to gather information from academic databases, focusing on the food industry and the challenges of resource scarcity. This involved a comprehensive search and analysis of peer-reviewed journal articles, books, reports and other relevant publications. The literature review served as a foundation for understanding existing knowledge and resources related to sustainable theory development, innovation, and resource crises. It also helped to identify gaps in the specialized literature, which guided subsequent stages of research.

In addition to the literature review, empirical data analysis was performed using statistical data and indicators from reputable sources. The selected data covered the period 2018-2022, allowing a recent and up-to-date analysis of the dynamics and trends related to resource crises and their impact on the food industry. Various data sources were consulted, including official reports, industry and public databases of international organizations. This quantitative analysis provided valuable insights into the scale and scope of the challenges faced by businesses in the context of resource scarcity.

Integrating findings from the literature review and empirical data analysis was a crucial step in this study. It involved a careful examination of identified factors and characteristics that enhance business sustainability during resource crises. By combining the theoretical perspectives from the literature review with the empirical evidence derived from the data analysis, a comprehensive understanding of the research problems was achieved.

2. Findings

Based on what was happening and what was expected in the middle of 2022, the world economy may be on the verge of a new crisis. The conflict in Ukraine has slowed down the global recovery and caused a terrible humanitarian crisis in Europe. It has also driven up the prices of food and other goods, slowed down global growth, and made inflation worse. Businesses and investors are not optimistic because the near-term economic outlook is not good. This is made worse by geopolitical and economic uncertainties.

Because of the conflict in Ukraine and the sanctions against the Russian Federation, commodity markets have been shaky, which has made supply-side shocks worse. After a strong recovery in 2021, the growth of international trade is expected to slow down a lot in 2022.

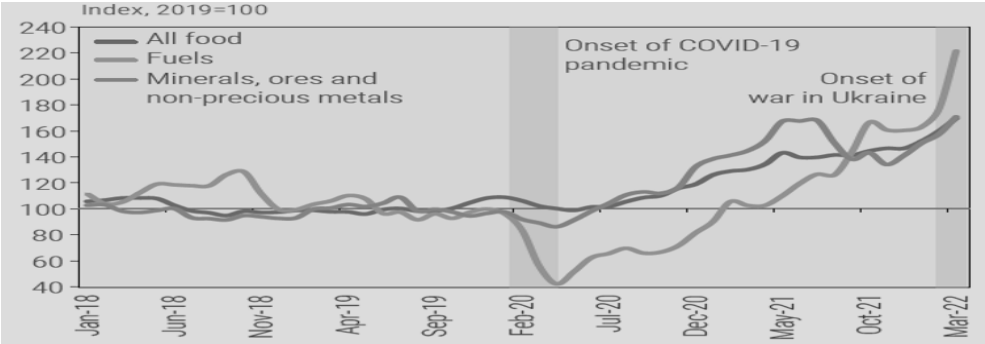

Figure 1. Major commodity prices. January 2018 to March 2022

Source: UNCTAD, 2022.

Exports of crude oil, natural gas, grains, fertilizers, and metals have been slowed down or stopped because of a conflict. This has caused the prices of these goods to go up (Figure 1). Russia and Ukraine are two of the world's largest exporters of agricultural goods. They send a lot of wheat (25% of global production), maize (16%), and sunflower oil (56% of global production) around the world.

The world's growth will go from 5.7% in 2021 to 2.9% in 2022, which is a big drop from the 4.1% predicted in January of that year. This is the rate economists think it will grow at in 2023–24, as the war in Ukraine disrupts short-term activity, investment, and trade, pent-up demand fades, and fiscal and monetary policy accommodation is pulled back. This year, the average income per person in developing economies will be about 5% less than it was before the pandemic.

In its latest Global Economic Outlook report, the World Bank warns that the COVID-19 pandemic and Russia's invasion of Ukraine could lead to a long period of slow growth and high inflation. Because of this, the chance of stagflation goes up, which could hurt both economies with high and low incomes.

War in Ukraine has caused a costly humanitarian crisis that needs to be solved peacefully. But the damage to the economy from the conflict will cause global growth to slow down significantly in 2022 and cause inflation to rise. The most vulnerable people in low-income countries have been hit hard by the fast rise in the cost of fuel and food.

After 2023, it is expected that the world's growth will slow to about 3.3% in the middle term. Due to rising price pressures and rising commodity prices caused by war, inflation is expected to be 5.7% in developed economies and 8.7% in emerging and developing economies in 2022.

To understand what the sentence means, you need to know that aid organizations working together to ease suffering, keep the economy from getting more divided, keep the international money supply liquid, handle the financial burden of debt, fight global warming, and end the pandemic are all important.

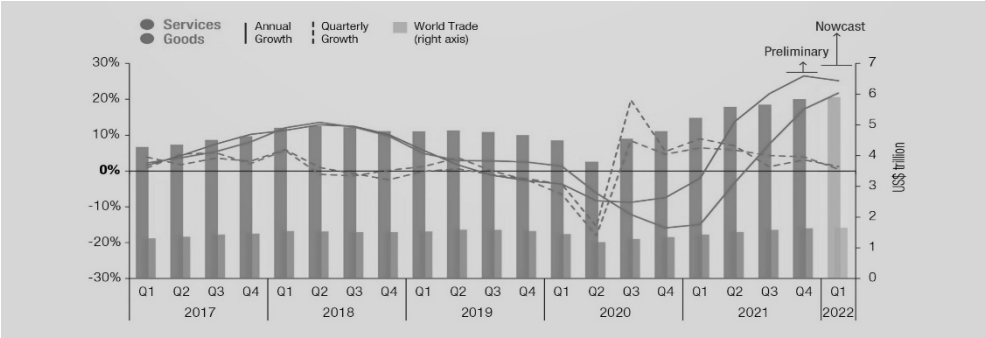

Figure 2. Global trade trends
Source: UNCTAD, 2022.

The trade of goods has grown more in the developing world than in the developed world. As can be seen in figure 2, compared to the same time in 2020, exports from developing countries went up by about 30%, while exports from developed countries went up by 15%. As the price of commodities went up, areas that exported those commodities grew faster. The average price of a gallon of gasoline around the world on July 4, 2022, is 1.41 euros. Despite this, there are large price variations between countries for these products. More developed economies have higher prices, while less developed ones that export oil at a net profit have much lower ones. The United States is an outlier among other countries due to its advanced economy and low gasoline prices. Gasoline prices can range widely from one nation to the next due to factors like taxation and government subsidies. Countries can all see the same oil price on global markets, but some may choose to tax their citizens more than others to offset the cost of their oil imports. Therefore, gas prices can differ significantly depending on where you go.

Table 1. Latest World Economic Outlook Growth Projections

		PROJECTIONS	
(real GOP, annual percent change)	**2021**	**2022**	**2023**
World Output	**6.1**	**3.6**	**3.6**
Advanced Economies	**5.2**	**3.3**	**2.4**
United States	**5.7**	**3.7**	**2.3**
Euro Area	**5.3**	**2.8**	**2.3**
Germany	***2.8***	***2.1***	***2.7***
France	***7.0***	***2.9***	***1.4***
Italy	***6.6***	***2.3***	***1.7***
Spain	***5.1***	***4.8***	***3.3***
Japan	**1.6**	**2.4**	**2.3**
United Kingdom	**7,4**	**3.7**	**1.2**

		PROJECTIONS	
(real GOP, annual percent change)	**2021**	**2022**	**2023**
Canada	**4.6**	**3.9**	**2.8**
Other Advanced Economies	**5.0**	**3.1**	**3.0**
Emerging Market and Developing Economies	**6.8**	**3.8**	**4.4**
Emerging and Developing Asia	**7.3**	**5.4**	**5.6**
China	**8.1**	**4.4**	**5.1**
India	**8.9**	**8.2**	**6.9**
ASEAN-5	**3.4**	**5.3**	**5.9**
Emerging and Developing Europe	**6.7**	**-2.9**	**1.3**
Russia	**4.7**	**-8.5**	**-2.3**
Latin America and the Caribbean	**6.8**	**2.5**	**2.5**
Brazil	**4.6**	**0.8**	**1.4**
Mexico	**4.8**	**2.0**	**2.5**
Middle East and Central Asia	**5.7**	**4.6**	**3.7**
Saudi Arabia	**3.2**	**7.6**	**3.6**
Sub-Saharan Africa	**4.5**	**3.8**	**4.0**
Nigeria	**3.6**	**3.4**	**3.1**
South Africa	**4.9**	**1.9**	**1.4**
Memorandum			
Emerging Market and Middle-Income Economies	***7.0***	***3.8***	***4.3***
Low-Income Developing Countries	**4.0**	**4.6**	**5.4**

Source: IMF, Word Economic Outlook, 2022

As can be seen in table 1, global trade reached a record 28.5 trillion dollars in 2021 but is likely to be reduced in 2022. In the last three months of 2021, all major trading economies saw an increase in imports and exports above pre-pandemic levels, with developing countries seeing a bigger increase in goods trade than developed countries. It's safe to say that 2019 was a great year for international trade in every major economy.

2.1 The Impact of the Ukraine War on Global Climate Action

War in Ukraine coincides with a global increase in CO2 emissions. These emissions decreased in the first half of 2020 as measures were taken to halt the COVID-19 pandemic but have recently begun to rise again.

Global emissions of greenhouse gases (GHGs) in 2019 were estimated to be about 59 gigatons of carbon dioxide equivalent units (GtCO2-eq). With a 50% chance of keeping global warming below 1.5 degrees Celsius, the remaining carbon budget is estimated to be 500 GtCO2-eq. This prediction was based on a scenario in which global warming persists at a rate of 1.5 degrees Celsius. This makes the rapid increase in emissions a more pressing concern.

People may switch to using fewer polluting biofuels or clear more land for farming if food prices rise. An increase in military spending is another factor, as it is commonly associated with sizable GHG footprints.

Several factors make it difficult to reliably forecast greenhouse gas emissions in the future. Increasing the cost of energy over the long term may hasten the transition to renewables and

other high-efficiency alternatives. However, profit-maximizing oil and gas companies may respond to these price increases by increasing their investment in fossil fuels. This could lead to an increase in asset failures. However, problems in the supply chain or an increase in the price of batteries could dampen interest in EVs.

2.2 Challenges for electric vehicles amid potential mineral shortage

The war in Ukraine has also shook-up metals markets around the world, which could have an effect on the price of renewable energy. A typical battery for an electric car, for example, has about 80 pounds of nickel in it. Nickel prices are about 50% higher than they were a year ago because 20% of the world's best nickel is processed in the Russian Federation. High nickel prices may also hurt the environment because the chance of making more money will likely lead to more nickel production in polluting and harmful mining areas, such as the rainforests of Indonesia and the Philippines.

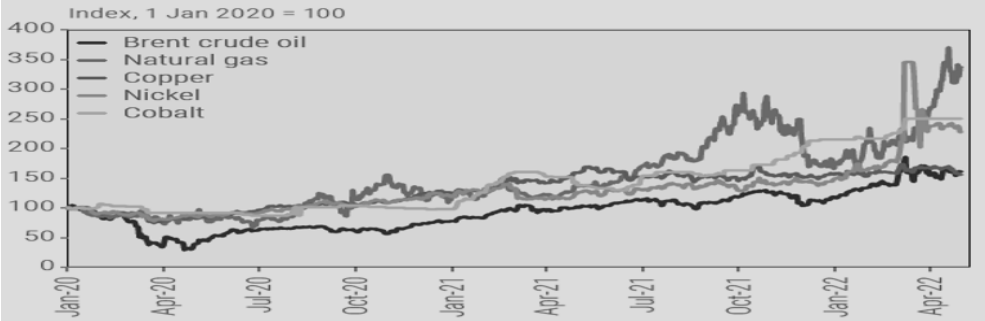

Figure 3. Selected commodity prices

Source: Trading Economics, 2022.

Since this time last year, the price of batteries for electric cars has gone up by 64%, which could add $2,000 to the final price of an electric car and make people less likely to buy one. This has the unintended effect of making the supply chain for electric vehicles vulnerable to changes in the price of key metals and problems caused by epidemics.

2.3 Challenges for climate action from rising food prices

Sustainable biofuels such as ethanol, biodiesel, and renewable diesel are examples of alternatives to the use of fossil fuels for land transportation. These alternatives play an important and necessary role.

The production of ethanol consumes thirteen percent of the world's crop of corn, twenty percent of the world's crop of sugarcane, and eleven percent of the world's crop of vegetable oil. On the other hand, biodiesel is produced from 11% of the total crop of vegetable oil around the world.

Due to the conflict, the price of food has gone up, particularly for essentials such as wheat, corn, and vegetable oil. The fact that the Russian Federation and Ukraine are major producers and exporters of these commodities is the primary reason for this situation. Recently, there has been increased scrutiny directed toward the production of biofuels using food crops. This is a direct result of growing concerns regarding the safety of both our food supply and energy supply. One example of recent efforts to alleviate price pressures in the energy market is the recent modification of biofuel blending mandates in countries such as Croatia, Finland, and Sweden. This is just one example of recent efforts.

3. Sustainable development strategies

Climate change, population growth, disease spread, global food security, and the availability of fossil fuels and raw materials are just a few of the world's most pressing problems, and the only ways to find long-term solutions are through research, the development of new technologies, and the dissemination of innovative ideas. This has led to the creation and implementation of sustainable development strategies by a number of countries, which could serve as examples for other governments. In the following, we'll discuss three strategies that contributed favorably not only to economic and social progress, but also to environmental preservation. The sustainable development strategies that Germany, Finland, and China have adopted are the ones described here.

3.1 Methods for achieving sustainable development in Germany

Secondary data sources reveal the energy system's status. Journalist Wettengel (2022) predicted that Germany will enter recession in 2023 due to growing energy costs and inflation. In his autumn projection for Germany's economic development, Minister of Economy Robert Habeck said, "We are facing a severe energy crisis that is turning into an economic and social crisis." He called for massive investments in climate neutrality and structural reforms, such as speeding up planning procedures, as key ways out of the crisis.

Primarily, the German strategy is distinguished by the following characteristics: experience in developing and implementing environmental standards; world leader in the development of environmental technologies; high potential in science and business, potential that is activated to identify solutions to global challenges. Expenditures on research and development as a percentage of GDP in 2020 were 3.14%; in Romania, that figure was only 0.47%.

The proposed strategies are aimed at:

- Framework program "Research for sustainable development".
- The master plan for environmental technologies.
- Energy research program.

Germany's top goals include:

- Making cities more energy efficient and cutting down on carbon dioxide emissions.
- Changing the energy supply in a smart way.
- Using renewable resources instead of oil.
- Increasing the number of electric cars.
- Protection of communication networks that works.
- More people using the Internet while using less energy.

3.2 Finland's Approaches to Sustainable Development

Priority objectives in Finland are focused on achieving sustainable development, while ensuring the health and happiness of people and the environment. We also want an economy that is both healthy and sustainable. For this, ecologically responsible lifestyles are promoted. The Finland we envision in 2050 – society's commitment to environmentally responsible growth. Insights into the health and happiness of populations that are on an equal footing. A society in which citizens actively participate is what Finland wants. Sustainable jobs, a community that leaves no carbon footprint behind, consumption in proportion to the natural world's ability to support it. sustainable local communities and an economy that rationally uses resources by considering environmental factors in decision-making are also popular goals for this country.

3.3 China's Long-Term Plan for Sustainable Development

The government has been using policy instruments to inspire original problem-solving since the beginning of economic reforms in 1978. As a "sponge of innovation," China is rapidly advancing in the use of new technologies and the improvement of existing ones. China has become a world leader in many fields, including consumer electronics and heavy machinery. The country invests over $200 billion annually in research (second only to the United States), nearly 30,000 scientists and engineers earn Ph.D.'s, and the country submits the most patent applications in the world (over 820,000 in 2013). The pollution issues are still very serious. World Health Organization (WHO) standards consider the air quality in most major cities to be unsafe. Despite allocating 6.5% of GDP to healthcare, China saw a 5.5-year decline in average life expectancy. Repercussions in areas like labor, infrastructure, and crop production are possible as a result of these effects. We suggest eliminating the use of coal in power generation and updating transportation systems, as well as switching from coal to natural gas or propane for home and commercial heating.

4. Results and discussion

At the business model level, sustainable innovation requires that: - the value proposition provides economic, social, and environmental value that can be measured; - the value proposition expresses the "dialogue" between society and the enterprise; - for existing products, a balance is formed between production and consumption practices, while for new products, this balance is actively sought by producers, consumers, and other stakeholders, and suppliers take responsibility. The financial model shows how the costs and economic benefits should be split between the different players, and it also takes into account the environmental and social effects.

Base-of-the-pyramid systems, supply-environment management, cradle-to-cradle, industrial symbiosis, and product-service systems are all examples of sustainable business models that have come from business model innovation (Boons & Lüdeke-Freund, 2013).

The societal challenges of sustainable development involve unprecedented changes in all fields of activity, most of them with profound implications from an economic point of view. The relevant trends for the strategic orientation towards sustainability in business administration can be considered the following:

- Emphasis on income inequality, which expresses inequality of opportunities, genders, ethnicities, ages.
- Economic growth achieved without job creation.
- The crisis of global leadership, at this level the community being ineffective in addressing the critical situations of recent years, including climate change, the financial crisis, local conflicts. Intensification of pollution in developing countries because of industrialization following trajectories similar to developed countries. Increasing incidence of extreme weather events caused by climate change.
- Intensification of nationalism to protect values and communities in the face of unequal opportunities for economic growth driven by globalization.
- Worsening water crisis due to population growth, resource depletion and poverty.

The incorporation of sustainable practices into business operations is widely acknowledged as a top priority on a global scale; however, satisfying this requirement is a crucial choice. There are many different approaches to sustainability that can be taken, and these approaches vary according to the possibilities that are available and the level of pressure that is being applied. The three most common categories are the strategies of risk avoidance, efficiency, and differentiation.

The emergence of a market for sustainability consulting, which makes the use of these managerial tools easier, is evident. These tools include management systems, corporate social responsibility, communication strategies, and methods for evaluating sustainable performance. The implementation of these strategies can make use of a variety of management tools, including these.
Innovation is one of the most important contributors to the development of sustainable businesses, which are conditioned by a plethora of factors that are interdependent on one another.

Conclusions

National sustainable development plans (Germany, Finland, China) highlight the importance of this strategy and the need for innovation to achieve economic, social, and environmental success. In these states, specialized programs have been implemented to facilitate sustainable innovation to ensure international competitiveness, equal opportunities, improve quality of life and working conditions, increase ecological performance in the industrial sector, rational use of natural resources, etc.
Business sustainability theory is wide. A sustainable firm recognizes different values. A sustainable company has quantifiable economic, social, and environmental benefits.
Sustainability is a global goal, yet it's tough to achieve. Depending on resources and needs, sustainability techniques include risk minimization, efficiency, and uniqueness. Execution of these strategies may depend on a range of managerial tools (management systems, CSR, communication strategy, sustainable performance evaluation techniques), supporting a sustainability consultancy industry.
Innovation is key to business development. According to Porter's approach, external forces like regulation and competition encourage the virtuous cycle of sustainable innovation. Market competition and government limits foster innovation. Innovation management affects sustainable innovation by facilitating specific actions (search, appraisal, implementation). Innovation ecosystems, open, collaborative networks, are increasing the innovation base.
Sustainability's importance and difficulties increase need for experts. Despite several studies, the statistics suggest some poorly known elements that speed up corporate sustainability.

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