

The Impact of Artificial Intelligence on Trade and Sustainable Development in India

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Abstract

This study focuses on A technology that can be used to give machines intelligence is called artificial intelligence (AI). Even though it has been around for a while, trading and investing with artificial intelligence is still in its infancy. But, as more organizations collaborate to use this technology successfully and efficiently in their operations, it is developing more innovations at a faster rate. This blog post's goal is to examine, using some real-world examples, how AI might assist traders and investors in making better judgments while using automated trading platforms. AI technology plays a major part in encouraging the expansion of global trade.. However, there is a significant negative relationship between foreign imports and exports and the number of patent applications for AI-related inventions. Additionally, the quantity of applications for patents pertaining to AI-related technology directly influences imports from nations with varying income distributions in a heterogeneous manner. Several aspects of AI technology are required to be considered account simultaneously in this context of researching the technology's effects on global trade. First, we provide an overview of the fundamental ideas behind trade global value chains, Sustainable Development, and the significance of these ideas for developing nations. We concentrate on the expansion of global value chains and the evolving character of commerce, which is marked by the increase of international trade. Global value chains have made it possible for manufacturers in developing nations to participate in global economic dynamics, which can aid in those nations' economic progress. AI-powered trading platforms have made trading more accessible in India, allowing individual investors to use analytics to make well-informed judgments on individual stocks, sectors, and indexes. AI will have a greater and greater impact on trading as technology develops, influencing a more data-driven and inclusive future that will benefit all investors. India progresses toward the SDGs. It is due to the robustness and tenacity of the Indian economy in addition to the country's enormous population.

Key Words: Artificial intelligence, International trade, Interrelatedness, value chains, Sustainable Development, Heterogeneous, Democratized

I. Introduction

A technology known as artificial intelligence (AI) enables computers to think and learn like people. Artificial intelligence (AI) has long been utilized in trading and investment, but it may also be applied in the media and even the medical field. Trade policy needs to change in tandem with artificial intelligence's ongoing transformation of industries and the global economy in order to guarantee fair growth for all countries. The conventional wisdom holds that trade policy should not obstruct technology when it comes to AI. According to this theory, artificial intelligence (AI) would lead to unchecked production if trade obstacles can be removed as the technology moves from developed to developing nations. This perspective, which is also held by the Organization for Economic Co-operation and Development, calls for more liberalization of the trade in items related to information and communication technology as well as a reduction in trade barriers for digital services.

India progresses toward the SDGs. It is due to the stability and resilience of the Indian economy in relation to the country's enormous population. Further, India has emerged as a global leader in the agenda for international climate action. It is now appropriate to assess the nation's current progress toward a number of the Sustainable Development Goals (SDGs) following four years since the ambitious agenda was adopted. An attempt has been made to portray the progress profile of India based on the SDG India Index: Baseline Report 2018 released by the NITI Aayog. Objectively. A nation's economic development and trade policy are closely related. Open, well-planned international trade can help a nation's economy develop and its poverty rate drop. This necessitates the existence of a national strategy in the nation that guarantees that development benefits all parties, including those impacted negatively by shifting trade patterns. Open trade is cross-border commerce unhindered by import quotas, tariffs, or other restrictions. Trade agreements between various nations and areas are one way to do this. Liberalization of trade can help achieve the 2030 Agenda's objectives and eliminate poverty in a number of ways. But in order to do this, multiple steps are frequently required at the same time.

It will take a variety of tools and policy initiatives to fulfill the SDGs. International commerce is highlighted as a crucial tool for achieving the other SDGs in the 2015 Agenda, particularly in SDG 17. The 2030 Schema for Sustainable Development characterizes international commerce as a catalyst for inclusive economic growth and poverty alleviation, while also supporting the advancement of enduring growth. While the expansion of global trade in recent years has brought advantages to economies and societies worldwide, it has at times failed to adequately address adverse social, environmental, and economic consequences. One strategy that appears to be employed more frequently is internalizing social, economic, and environmental issues in international trade in an effort to transform trade into a "sustainable engine." Numerous methods, tools, and policy instruments can be used to accomplish this. This report focuses on a particular tool called Voluntary Sustainability Standards, which include private standards, certification programs, and labelling schemes (Marx et al., 2012). Over the past three decades, VSS have grown to be a significant tool for transnational governance (Abbott and Snidal, 2009). They work to Enhance the long-term viability of worldwide value networks by incorporating social and environmental standards into the manufacturing process, from producer to consumer. Additionally, developing nations where a large number of producers are located and industrialized nations are frequently linked by VSS.

However, we also see that trade has evolved and that items are now created by assembling components from around the globe. Global value chains have made it possible for manufacturers in developing nations to participate in global economic dynamics, which can aid in those nations' economic progress. Furthermore, social and environmental standards can spread across production processes thanks to global value chains. The EU has taken the lead in integrating trade and enduring growth (TSD) into trade agreements, demonstrating its dedication to making sure that trade fosters social justice, environmental preservation, and labour rights in addition to economic growth.

1.2 Statement of the problem

An important shift in trade discussions is the growing alignment of economic aims with more general Sustainable Development objectives. This will help to shape a future in which trade will play a major role in promoting social progress, environmental protection, and economic prosperity. To assist us meet our goals for each of the SDGs, the development community must work together to take advantage of the linkages that commerce creates. Trade fosters positive and harmonious relationships between people and governments. Understanding and promoting trade's role in long term growth initiatives helps us better deliver wealth and peace to communities worldwide. The World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) sets out the basic criteria for safeguarding and enforcing intellectual property rights (IPR) in the context of international trade. Unfortunately, the TRIPS agreement does not specify how to handle AI-generated works. Instead, individual members have approached the issue differently in their national laws, with some requiring human creativity to grant protection at all to AI-generated works, while others completely exclude it. This patchwork will probably grow more and more inadequate as the proportion of intellectual property both copyright and patents generated by artificial intelligence and traded internationally rises.

1.3 AI important for traders and investors

AI is a very useful tool for investors and traders. Among other things, it aids in improving investment choices, lowering risks, raising returns, and boosting efficiency and transparency. AI helps to increase the accuracy of investment decisions while also cutting down on decision-making time. This can be achieved by applying machine learning algorithms, which use historical data analysis and past experience as model inputs to forecast future events.

1.4 Advantages of Using AI in Trading

There are several advantages of using AI in trading.

i. Improved Investment Decisions: You can outperform a person in investing decision-making when you use an algorithm. You will be able to increase your profits and lower the dangers in your investing portfolio by doing this.

ii. Reduced Risks: By eliminating human biases from the process of making investment decisions, artificial intelligence (AI) can help you lower the amount of risk involved in managing your portfolio. This can reduce errors made by traders and their appetite for risk, which can cause them to make poor decisions when attempting to predict market movements based on historical trends or other

factors like news headlines or economic reports released by various companies around the world (e-commerce giants like Amazon)

iii. **Increased Profits:** Since most people think differently than others do due to their own experiences growing up, it makes sense that anyone interested in investing should know how they might benefit from using tools like these ones to help them achieve their goals faster than before. That being said, we shouldn't be afraid to try something new every once in a while!

1.5 Concepts

i. Sustainable global trade

One of the difficulties facing international trade in the past thirty years is the perception of widening disparities in the distribution of trade advantages. There must be some sort of reciprocal benefit even though it is nearly impossible for all nations to receive precisely the same benefits.

ii. Sustainable trade

The exchange of commodities and services that generates advantages for the economy, society, and environment in line with Sustainable Development principles is known as sustainable trade. Creating economic value, lowering poverty and inequality, and protecting and reusing environmental resources are some of these guiding concepts.

iii. Sustainable Development in Trade

Sustainable Development must strike a balance among serving the demands of the current and ensuring that future generations can meet their own requirements. Three pillars social, environmental, and economic support it. To achieve Sustainable Development, policies in all three areas need to work together and support one another.

iv. Artificial intelligence (AI)

AI refers to a class of software that possesses human-like thought and decision-making abilities. AI can be used for trading, making investment decisions, and other tasks because its primary purpose is problem-solving and decision-making. Applications of AI can be broadly classified into two groups: supervised learning (often referred to as "classification") and unsupervised learning (sometimes referred to as "reinforcement"). When using supervised learning, you supply the training data, which helps the computer identify the kind of object or event you're searching for example, a TV commercial featuring a person eating. After being taught which types of advertisements are most effective for each type of product being advertised on television at various times of the day, week, month, etc.

1.6 Literature Review

Brännback et al., (2007). Assess the Businesses can grow by using AI technology to evaluate data from social media and e-commerce platforms, among other sources (Xiao et al., 2022). Financial innovation is advanced by AI technology. AI technology facilitates trade and streamlines the process of making cross-border payments (Huang & Wang, 2019). Investors can attain more efficient and profitable investment behaviour for foreign businesses by optimizing their investment models with the use of AI technology.

Paul Krugman (1980) presented a new trade theory that is centred on how enterprises differ from one another and how competition affects commerce internationally. A commodity may be produced in several nations as the scope of multinational corporations grows in an effort to achieve reduced production costs and improved product quality. From this, economies of scale result. Multinational corporations can improve production and resource allocation planning with the use of AI technology. However, some nations have lost their edge in labour costs under the global division of labour as a result of the use of AI technology in automated production, making them unable to engage in international trade. Furthermore, product differentiation has been impacted by AI technologies. Businesses can manufacture more consumer-friendly items by using AI technology to precisely find their target market. This will boost the company's competitive advantage in the global market and eventually lead to an increase in exports.

UNCTAD (2019) identified numerous variables demonstrate how trade has decreased inequality between countries and increased inequality inside them. Furthermore, it may be argued that integration into GVCs does not always lead to an overall improvement in the economy when taking into account the financial losses from potential environmental harm and social distortions brought

on by GVCs. In the era of global value chains, the subject of trade and Sustainable Development is discussed.

World Development Report(2020) suggests that key elements influencing GVC participation include factor endowment, market size, location, and institutional quality. There is ongoing discussion over the benefits of more engagement for developing countries, as well as the appropriateness and degree of addition into regional and global value chains.

Zhou, (2015).Said that the way AI technology is applied has also affected employees' mental health. AI technologies have the potential to make older workers feel more insecure in an aging world. Compared to young individuals, they are less receptive to new technologies. This has an impact on older persons' employability (Alcover et al., 2021). However, some research has shown that applying AI technology can lower manufacturing workers' psychological depression scores by 1.643 points, demonstrating that AI can improve workers' mental health.

1.7 Objectives

1. To Revealed the Trade and Sustainable Development
2. To Probe into Impacts of Improving Trade for Sustainable Development
3. To examine The Impact of Alon Economic Growth and International Trade
4. To suggest the measure of AI Influences Trade Sectors and Challenges of VSS Adoption which may lead to Change in Economic development.

1.8 Regulation of International Trade

The goods-services divide, which has demonstrated difficulty regarding digital commodities, for For instance, is a well-known problem that is exposed by the rise of artificial intelligence (AI). Even though case law from the World Trade Organization (WTO) has provided some advice on how to define a product as a good or a service, the issue is still being disputed 25 years after the WTO's work program on electronic commerce was developed to settle the matter more definitely. As AI is incorporated into more products, it will be more important to establish uniform regulations for determining if the General Agreement on Tariffs and Trade (GATT) or the General Agreement on Trade in Services (GATS) responsibilities apply (think self-driving automobiles and AI robotics). The patchwork that currently exists, which took the shape of Free trade agreements scatter the market, which will probably drive up trade costs. Other problems surface when it is evident that AI is a service. Certain professions, such as accounting, legal services, or medical services, have GATS market access commitments that are frequently linked to legal persons or certification requirements. Does legal personhood exclude artificial intelligence systems? Would this same hold true if AI systems were to acquire a type of electronic or digital personhood

. AI built into things, such as medical equipment, smartphones, and self-driving automobiles. These goods give rise to a problem with market access for trade in services, which is exempt from tariffs within the framework of the GATS. However, as their worth is reflected in the end product's price, which is subject to a tariff, services that are integrated with goods are susceptible to tariffication. Software that is given via mode 1 and is purchased online, for instance, is exempt from tariffs. But when an identical program is set up on a PC that is imported, will be subject to tariffs because the software's worth is included in the computer's customs value. Because of this, some have called for the introduction of a fifth method of service delivery, known as to extract the services component that exports of goods contain.

Meanwhile, a 2017 study predicted that international trade may increase by 500 billion euros as a result of the multilateral authorization of mode 5 trades.. The WTO has not made an attempt to incorporate mode 5 facilitation, despite various attempts to do so in bilateral agreements. Forging agreements to address these policy gaps seems to make sense within the framework of the WTO. The distinction between goods and services, Intellectual property rights (IPR) challenges, mode 5 services delivery, and professional certification issues related to GATS all fit in nicely with one or more WTO committees and working groups. So too are the more traditional issues of ICT prices, services liberalization, and data regulation. Passing legislation in the WTO stops global fragmentation and challenges the notion of might makes right that prevailed before the organization was established.

But there are some restrictions that must be taken into account while evaluating the WTO's applicability. Among them, the most well-known is the "pacing problem," which describes the well-known circumstance where technological improvement happens too quickly for regulation to keep up

with. The WTO is not the only organization dealing with this issue; national legislative frameworks also encounter it. However, the danger of relying only on the WTO to introduce laws is made clear by the fact that the organization is now finalizing texts on spam and electronic signatures as part of its Joint Statement Initiative on e-commerce. It is important to remember that blockchain technology, non-fungible tokens, cryptocurrencies, and artificial intelligence all operate in mostly unregulated environments.

1.9 Role of International Trade

International trade refers to the exchange of goods and services between multiple countries. The modern global economy is significantly dependent on international trade, as producers from many countries seek to access a wider market rather than being confined to domestic sales. International commerce transpires owing to causes including consumer preferences, specialized sectors, comparative advantage in manufacturing costs, and disparities in the availability of natural resources. International trade among nations is not a novel concept. Historical records indicate multiple occurrences of foreign trade in earlier periods.

1. Encourage cooperation.

Successful trade necessitates, by definition that its participants reach across sectors, boundaries, and regions and engage in the kind of cooperative, multistakeholder partnerships that are promoted by SDG 17.

2. Circulate knowledge.

Trade is not just about moving products. It also acts as a channel for the dissemination, sharing, and exchange of information, concepts, inventions, and technological advancements that have the potential to drastically improve living conditions in impoverished areas. Partnerships formed as a result of trade can then mobilize it, and knowledge acquisition has the capacity to accelerate progress toward a number of SDGs.

3. Provide access to new opportunities.

Trade gives people the tools they need to increase their incomes, improve their quality of life, increase their purchasing power, and achieve food security and zero hunger, which are goals of SDG 2, which aims to end hunger in all of its forms by 2030. Trade also gives people access to markets, better technologies, financing, and investment.

4. Generate shared benefits.

Because buyers and sellers have a mutual motive to exchange products and services, trade benefits are reciprocal. Access to markets that would not otherwise be possible is gained by both parties. For example, people in impoverished nations can make additional money to buy consumer items. The capacity to sell into expanding markets and a wider range of products for consumers are two advantages that developed country residents may enjoy. When lines of communication are open, everyone wins. Therefore, tradewhether local, regional, or globalshould be taken into account when developing solutions for Sustainable Development because it is essential to improving living everywhere in the world.

1.10 Trade and Sustainable Development

International trade has the potential to have negative social and environmental repercussions in addition to its capacity to promote wealth through direct effects (scale effects) and indirect effects (increased competition which leads to pressure to cut production costs) (Irwin, 2020; WTO, 2018). The numerous benefits of trade to the economy and society have been documented by numerous economists. These include economic diversification and restructuring (vertical integration), industrialization, efficient resource allocation, favorable income effects, export-driven economic growth, technological advances, and the reduction of poverty. Other authors have also seen the non-economic benefits of commerce on democracy and peace.

The capitalist peace theory, which dates back to the writings of Montesquieu and John Stuart Mill, holds that trade increases a nation's commercial interdependence and offers compelling incentives for nations to refrain from going to war. Also, there has been a lot of scholarly research done on the connection between trade, economic growth, and democracy. The international policy agenda is defined by the Sustainable Development Goals (SDGs), which constitute a comprehensive

framework. They address a wide range of environmental, developmental, and socioeconomic subjects.

The 2030 Agenda for Sustainable Development characterizes international commerce as a catalyst for equitable economic growth and poverty alleviation, while also playing a role in advancing the development of sustainability.. The effective distribution of capital and goods is a key component of international trade, as it boosts welfare and productivity and promotes enduring growth (Dupuy and Agarwala, 2014). Moreover, an abundance of laws and instruments function as policy interfaces between the Sustainable Development Goals and trade regulation, so influencing trade. These tools include sanitary and phytosanitary measures (SPS), technical barriers to trade (TBT), and various types of non-tariff measures (NTMs). Voluntary Sustainability Standards (VSS) are innovative market-based instruments that have been developed during the previous few decades to solve important sustainability issues major issues with sustainability.

Furthermore, commerce is essential for addressing issues like hunger, food security, nutrition, and sustainable agriculture (SDG 2: Zero Hunger), as well as for promoting good health and wellbeing (SDG 3: Good Health and Well-Being). While social issues are not currently covered by the WTO at the international level, they are frequently covered by bilateral agreements. As many have labour provisions that support gender equality or the observance of workers' rights (UNCTAD, 2019). Environmental and health protection are the primary objectives of many WTO agreements and trade restrictions. Ten percent of the initiatives outlined in the TBT Agreement and the WTO SPS Agreement identify environmental conservation as one of their objectives.. These include limitations on waste management, air pollution, and hazardous material use. On average, 41% of NTMs globally directly and favorably achieve SDGs, according to ESCAP and UNCTAD (2019).

14.11 Applying AI to MarketPlaces to Drive Sustainability

It is estimated that by 2030, the world economy might grow by up to \$5.2 trillion USD, or 4.4%, as a result of the application of AI to environmental problems. Moreover, McKinsey projects that by 2030, 70% of companies will employ AI-driven solutions to boost output and simplify operations. These figures indicate that now is the ideal moment for marketplaces and other online enterprises to harness AI's capabilities. AI-driven marketplaces aim to harness technology to provide a more personalized, near-real-time user experience, speed up and optimize processes, and obtain in-depth insights from massive amounts of data. Additionally, companies can streamline their processes to better meet customer wants by utilizing the behavioural data that is available in the market.

1.12 AI Help in Making Better Investment Decisions

Artificial intelligence is employed in trade and financial markets to enhance investment decision-making. The algorithms' ability to analyze data from several sources and generate predictions enhances trading strategies. These predictions are derived from a variety of sources, such as historical stock market data, news articles about companies or industries that could influence their performance, and even factors as simple as the weather on a specific day of the year. Instead of relying solely on intuition, you may utilize this information to make informed decisions regarding whether your stocks will rise or fall based on past patterns.

1.13 The Role of Trade in 'Economic-Development':

When talking about how trade promotes economic growth, we need to look at a number of different topics, such as the static and dynamic benefits of trade as well as export pessimism or the long-term decline in the terms of trade of least developed countries. We can talk about the trade policy of developing nations in this context.

1. The Static Effect of Trade on Economic Development:

Through commerce, an LDC can surpass its PPC and improve its wellbeing. It can consume more than it can create because of specialization and trade. An LDC can raise its standard of living by specializing in and exporting the domestic commodities that are comparatively less expensive domestically and importing the commodities that are relatively more expensive. Even if a nation's production remains unchanged, commerce can nevertheless yield profits if there is a disparity between domestic relative prices in autarky and those available internationally.

2. Employment Generation:

Specialization has led to a relative expansion of the sectors that use labour, which is an abundant component in LDCs, more intensely. Comparative advantage-based specialization aids in the

expansion of labor-intensive manufacturing rather than more sophisticated, capital-intensive industry for the majority of LDCs. This entails growing labor-intensive light manufacturing, primary products, and traditional agriculture. Thus, as the Heckscher-Ohlin (H-O) theorem suggests, international commerce increases employment and drives up wages. But the majority of LDCs are nations with a labour surplus. Thus, a rise in the labour demand is unlikely to result in a significant wage rate increase.

3. Export Instability:

Furthermore, if the production of traditional commodities is increasing at the expense of contemporary manufacturing, this development may not be beneficial. Even in the short term, increased specialization in these items can lead to increased income instability because of the low income and price elasticities of demand for such goods as well as the unpredictable supply of primary and agricultural products because of weather and other natural factors..

iii. Adverse Terms of Trade:

Furthermore, an LDC's tiny size (i.e., it has little control over the prices of its imports and exports) means that increasing export supply could result in unfavourable terms of trade movements, which would lower the trade's static profits. Gains from trade may then be distributed in a way that benefits industrialized nations.

4. Greater Dependency

Lastly, there is a risk of undue economic dependency when basic labor-intensive items are produced at a higher rate and industrialized nations are relied upon for capital goods and technology- and skill-intensive manufacturing. It also draws a comparison between the industrialized and developing countries' economies.

5 Vents for Surplus:

The foundation of both the modern (H-O) and classical (Ricardian) theories of international trade is the idea that full employment is the norm for output in every trading nation. But in LDCs, full employment is not the norm. Therefore, it is impossible to forecast how trade will affect distribution, output, consumption, and social welfare in these nations using trade theories. Trade agreements provide a nation with access to new and improved goods. Without a doubt, capital goods are a crucial category of industrial input that LDCs in less developed countries buy the majority of. A nation can increase its total factor productivity through trade by importing new and improved capital goods that "embody" superior technology.

1.14 Impacts of Improving Trade for Sustainable Development

Enhancing the economic viability of lead companies from wealthy nations and basic goods producers in developing nations by means of power sharing and profit sharing: Developing country producers are commonly found at the start of global value chains (GVCs), offering basic goods and raw materials for more sophisticated, "knowledge"-intensive, and lucrative intermediary manufacturing processes in developed countries. Producers from poor nations occasionally make only enough money to cover their costs of production, while lead corporations from rich nations are frequently able to reap the most of the benefits of these economic relationships.

VSS aims to tackle the issue of economic sustainability in two ways. First, by demanding price premiums for standard compliant items from downstream value chain actors through market interventions, VSS could promote more fair profit-sharing arrangements inside GVCs. Second, VSS may increase the income of certified producers by arranging trainings that instruct them on how to improve the caliber of their goods and the effectiveness of their manufacturing facilities. The two types of interventions offered by VSS are intended to enhance certified producers' livelihoods and general well-being, or economic sustainability.

Goals of environmental sustainability (environmental sustainability) and international trade reconciliation: A functioning market is essential to economic growth. On the other hand, healthy ecosystems are essential to healthy markets. Therefore, in order to guarantee the continued stability of GVCs, trade needs to be integrated into public rules and procedures that address the environmental effects of production. Economists have historically referred to the effects of pollution as negative externalities. This is because, if they could easily and inexpensively dispose of their waste in the environment, corporate actors would not think about the effects of pollution when making decisions about production and trade.

Therefore, decisions on production that seem sensible in the short run may even jeopardize those companies' capacity to generate in the medium and long run. Currently underway initiatives to enhance commerce in order to meet the socioeconomic SDGs by 2030 balancing global trade with fundamental labour and human rights (social sustainability): Additionally, workers, particularly those in developing nations, stand to gain a great deal from international trade. Since trade enhances an economy's production capacity by allowing enterprises and individuals to use their comparative advantages, hence increasing average pay levels.

1.15 AI's Effects on Global Trade and Economic Growth

The development of artificial intelligence (AI) will have many effects on international trade. One aspect to consider is the impact of AI on macroeconomics and its subsequent influence on commerce. For instance, if the efficiency of production is enhanced by artificial intelligence (AI), this will stimulate economic expansion and create novel global trade prospects. Various hypotheses have been put up to explain the current global phenomenon of sluggish productivity development. The process of integrating and efficiently utilizing new technology, particularly advanced ones such as artificial intelligence (AI), in an economy requires a significant amount of time. One factor contributing to the low increase in productivity, which is particularly important to understand in relation to the potential link with AI.

Artificial intelligence (AI) will significantly influence international trade and shape the kind and quality of economic development. Artificial Intelligence (AI), for example, is expected to expedite the shift towards service-oriented economies.. This is a natural progression of concerns regarding the impact of artificial intelligence on employment, as AI is likely to enhance automation and accelerate the displacement of jobs for unskilled, manual laborers in the industrial industry. AI will enhance worker competences by highlighting certain skills that contribute to the quality and productivity of output and merchandise. As a consequence, both global commerce and the share of services in overall production are expected to rise.

1.16 Increasing Sustainable Trade: AI-Assisted ESG Monitoring

AI and tech-driven solutions to promote good change in trade finance digitization, ESG monitoring, we want to make trade safer, uncover deceptive "green" promises, and enhance our ability to evaluate the sustainability of businesses. Better decision-making, more corporate integrity, and safer trade procedures are the benefits of our initiative. Come together with us to create a future where companies are accountable and transparent. The ultimate objective is to provide an AI-driven solution that significantly alters three key domains:

1. Monitoring ESG:

Environmental, social, and governance aspects, or ESG variables, are frequently used to gauge sustainability. With this project, we hope to assess businesses of all sizes according to these standards, providing a more comprehensive picture of their sustainable operations. The present emphasis on big publicly traded corporations ignores smaller organizations, which restricts a comprehensive comprehension of sustainability effects.

2. Identifying Greenwashing:

Green washing refers to the practice of businesses making green claims without actually being sustainable. Our objective is to develop a system that will identify and draw attention to these false statements in order to foster true transparency.

3. The project targets

Create a tech-driven strategy to improve fraud prevention, digitize trade finance, and raise the bar on ESG monitoring. Our goal is to develop methods and tools that will support a business ecosystem that is more transparent and efficient.

1.17 Creating Trade Regulations to Encourage AI

Trade regulations, such as those found in FTAs and the WTO might encourage the advancement of AI in addition to their effects on global trade patterns. The following lists the main areas where trade regulations will affect the worldwide development and application of AI. Data is crucial for artificial intelligence. The unimpeded flow of data globally, exemplified by trade agreements such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the United States-Mexico-Canada Agreement (USMCA), will significantly bolster AI research. As previously

mentioned, AI systems require access to vast volumes of data in order to be trained. Worldwide data must be accessed in order to develop AI systems that can react to a variety of problems and demographic groups. Thus, data localization policies that limit data mobility across borders will limit the potential to create customized AI capabilities.

Furthermore, cloud computing, big data, and the internet of things are the three main digital technologies that AI is building upon as it develops and is used.¹⁵ Cross-border data transfers are also essential to these digital technologies. Thus, data localization policies that impede worldwide data transfers would affect AI both directly by reducing the amount of training data available and indirectly by undermining the fundamental principles of AI. Governments, as repositories of massive data sets, will also need to improve public access to this data in order to support AI research. In this regard, the USMCA advances, as evidenced by the Parties' awareness of the significance of government information access for social and economic development as well as their efforts to make government data available in an open, machine-readable format whenever feasible.

1. Privacy and AI

Trade agreements reconcile governmental authority to impose data flow limits for legitimate public policy objectives with obligations to facilitate cross-border data flows. Countries are primarily restricting the transnational flow of personal data to uphold local privacy norms. The General Data Protection Regulation (GDPR) of the EU prohibits the transfer of personal data to countries deemed "inadequate" by the European Commission. The GDPR's limitations on the utilization and processing of personal data may adversely impact the progress of artificial intelligence. The GDPR forbids the utilization of personal data for purposes other than those for which it was originally collected; hence, personal data acquired during a transaction cannot thereafter be employed to train artificial intelligence (AI) for service enhancement.

2. Standards and AI

The integration of AI into industry will need the development of multiple new standards. Autonomous vehicles require a range of technical specifications and must comply with safety rules and new vehicle manufacturing standards. Foreign companies who need to modify their operations to be able to export will face increased costs due to the emergence of divergent domestic regulations between countries. To address this issue, the USMCA ensures that national standards would be aligned with international norms. This will enhance the compatibility and reduce barriers to the worldwide advancement of AI.

3. Protection of source code

A further impediment to AI advancement is the requirement of access to source code as a prerequisite for securing funding or entering the marketplace. The Office of the United States Trade Representative (USTR) acknowledged the importance of this access within the larger context of coerced technology transfer in China. The quantity is 18. The dependence on algorithms necessitates access to source code, creating a trade barrier that obstructs the global proliferation of AI.

4. Intellectual property protection and AI

The influence of AI on intellectual property (IP) and global trade is a matter of concern. Like I said, AI requires a large amount of data to be entered. It is frequently necessary to copy and alter training data before using it. This can entail the illegal duplication of thousands of works that are protected, depending on how the data is gathered. It's possible that using the 'transformative' or 'non-expressive' fair use exclusion to copyright protection in the United States will give such uses of data legal protection. It remains to be seen if some of the more intricate uses of data for AI training will be covered by fair use rules.

5. AI and trade in goods

..While standards, IP, and data access are major areas of concentration for AI research, worldwide access to commodities will also have an impact on this field. CPUs are a crucial piece of hardware used in Deep Neural Networks, namely, as mentioned above. Therefore, worldwide CPU trade is necessary for the advancement of AI. This emphasizes how important tariff reductions are in facilitating access to the technologies required for the advancement of artificial intelligence

6. Challenges and risks of AI

Artificial intelligence (AI) has grown to be an essential part of many societal and economic sectors. Applications include factory automation, supply chain optimization, personalized learning possibilities, and medical diagnostics.. While the quick development of these technologies presents many chances for progress and innovation, it also begs concerns about the long-term effects on the environment and society. Above all, ethical considerations must be made in order to combat any discrimination or the perpetuation of societal injustices brought about by AI. If AI systems are implemented without sufficient safety measures, there may be dire repercussions.

7. Goals and impact of the UN resolution

In light of this, the UN has been working hard to raise awareness of the value of reliable and safe AI systems as well as the benefits they provide society. The UN General Assembly passed a resolution addressing this matter in March. The goal is to reduce the possibility of AI being abused while purposefully utilizing AI's advantages. AI ought to be applied to safeguard human rights and promote Sustainable Development.

1.18 AI's significance for the 2030 Sustainable Development Agenda

The 2030 Agenda for Sustainable Development identifies artificial intelligence (AI) as an essential technology for achieving its goals. Adopted in 2015, these encompass 17 principal aims, spanning from environmental conservation to poverty eradication. In this context, artificial intelligence (AI) is crucial as it accelerates decision-making, offers innovative solutions to longstanding problems, and enhances system efficiency. AI can aid in bridging the digital divide and assisting underprivileged nations to fully leverage the digital revolution.

1. The future of AI and Sustainable Development

The UN resolution emphasizes that in order to keep up with the rapid evolution of technology, continual discussion and adaptation about AI governance are necessary. A flexible and adaptable strategy that takes into account the disparities in the needs and capabilities of industrialized and developing countries is required. The resolution also emphasizes how important it is for all stakeholders the business sector, civic society, and academic institutions to collaborate in order to achieve an inclusive and sustainable AI future.

2. Non-binding character

The UN General Assembly resolution is merely a political suggestion with no legal enforcement measures, unlike the AI Act, which was also approved in March 2024 by the EU Parliament and establishes mandatory legislation for EU Member States. It must, however, take into consideration the diverse stages of development in the use of AI in the various countries, given its wider audience. As a result, the resolution mostly consists of vague aspirations with very few concrete directives for implementation.

1.19 Challenges of VSS Adoption in Developing Countries.

Several studies have shown that integrating developing nations into VSS dynamics presents substantial challenges Ponte, (2020), Renckens and Auld (2019). The fourth flagship book of UNFSS (2020) offers a thorough examination of VSS usage worldwide and demonstrates the difference between developed and developing nations with regard to both the quantity and type of VSS used. VSS dynamics essentially excludes a number of emerging and middle-income nations Marx and Cuypers (2010) Marx & Wouters (2017). According to Tayleur et al., (2018), certified entities are found in regions that are crucial for biodiversity conservation but not in the poorest countries or those that most need poverty alleviation.

In addition, Schleifer, Fiorini, and Fransen (2020) argue that the ability of Voluntary Sustainability Standards (VSS) to promote sustainable commodity production in developing countries is restricted due to an uneven distribution across different regions and sectors, the lack of representation of producers in key decision-making bodies, and the prevalence of problematic cost-sharing agreements. The arguments presented are derived from a comprehensive research of 47 value-added service sectors (VSS) across 12 export-oriented commodities, inside the ten most populous developing nations.

1.19 The Emergence, Development and Use of VSS

The number of active VSS schemes worldwide or in particular countries, the number of certified businesses or producers, the amount of qualified hectares of production land, and the percentage of qualified products per commodity are just a few of the indicators that can be used to determine the significance of VSS. Despite a recent decline in the number of such schemes, the share of certified commodities in each market indicate that producers or business entities along global value chains across numerous industries have not stopped utilizing VSS schemes. The yearly releases of the State of Sustainable Markets are a collaborative endeavor with the ITC, the Research Institute of Organic Agriculture (FiBL), and the International Institute for Sustainable Development (IISD).2008.

This document aggregates data from the 14 largest VSS organizations globally about eight agricultural commodities: bananas, cocoa, coffee, cotton, soybeans, sugarcane, tea, and forestry. The principal conclusions of the 2019 study indicate that, regarding the ratio of certified production area and the percentage of certified commodities within their respective markets, certification has risen over the past decade. Refer to Table 1.

Table 19.1. Evolution of certification in selected agricultural commodities and forestry

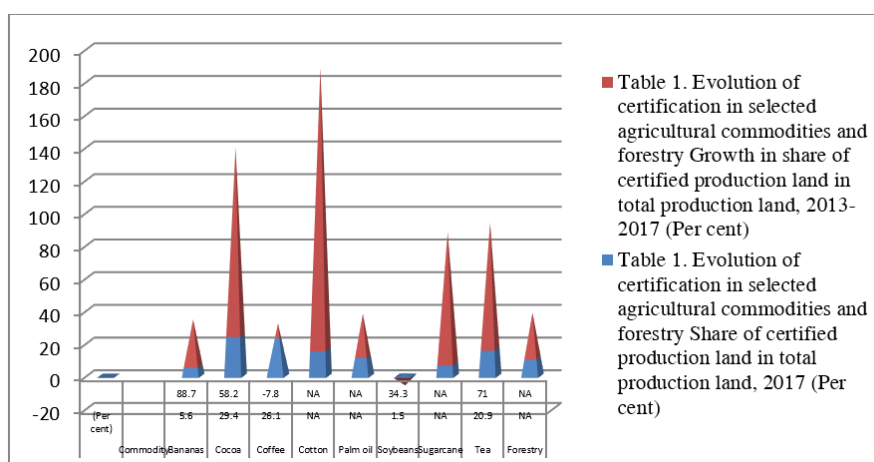
Commodity	Share of certified production volume in total production, 2017 (Per cent)	Growth in share of certified production volume in total production, 2013-2017 (Per cent)	Share of certified production land in total production land, 2017 (Per cent)	Growth in share of certified production land in total production land, 2013-2017 (Per cent)
Bananas	5.6	+88.7	6.0	+28.6
Cocoa	29.4	+58.2	24.8	+114.7
Coffee	26.1	-7.8	23.4	+8.7
Cotton	NA	NA	16.2	+172.4
Palm oil	NA	NA	11.9	+26.1
Soybeans	1.5	+34.3	1.5	-5.9
Sugarcane	NA	NA	7.6	+80.2
Tea	20.9	+71.0	16.4	+77.3
Forestry	NA	NA	10.8	+27.9

Source: Willer et al. (2019).

aFor wood, the reference period is 2010–2017

NA = data not available

Figure 19.1 Evolution of certification in selected agricultural commodities and forestry



Examining the changes in the overall number of VSS schemes worldwide between 1940 and 2020 is one method of analyzing their expansion (Figure 1). The European Union's Ecolabel Index and the ITC Standards Map, two VSS databases that map out all currently in use VSS schemes and gather information on their protocols and requirements, were used. The number only covers VSS schemes that were still in operation as of the indicated date of establishment. Two noteworthy trends can be identified despite the differences in numbers between the Ecolabel Index⁴ and the Map of ITC Standards. First, although not new Marx and Wouters (2015), the broad application of VSS is more recent: The actual emergence of VSS occurred in the 1990s, and their population grew gradually until the early 2010s. Second, the number of active VSS has been increasing more slowly lately, and it hasn't increased at all since 2017. The reason for this is unknown.

Furthermore, barely 1.94 percent of all agricultural land area worldwide is certified as producing land by the 12 leading agricultural VSS under consideration, according to the report Willer et al., (2019: 7), albeit this percentage is growing. The certified cropland is growing by over 11% year, as found by Tayleur et al., (2017), who plotted the coverage of 12 important agricultural VSS⁶. This finding verifies the expansion. However, The authors demonstrate that just 1.1% of global agriculture is certified by the twelve principal Voluntary Sustainability Standards (VSS), consistent with the findings of the 2019 State of Sustainable Markets report. Even while there is still a small amount of land used for certified production worldwide, it is increasing, and certified goods are gaining market share. But this pattern isn't the same in every nation. The percentage of land under certified production by nation was examined by Tayleur et al. (2017).

They gave an example of how some countries have stricter certification standards than others. Among the countries with high scores (> 10% of approved production land) are Austria, Belize, Colombia, Costa Rica, Cote d'Ivoire, Dominican Republic (the), Guatemala, Italy, Malaysia, Papua New Guinea, Peru, Sierra Leone, Sweden, and Zambia. Brazil, El Salvador, Estonia, Ghana, Honduras, Indonesia, Kenya, Latvia, Lithuania, Mexico, Nicaragua, and Spain are among the other countries with respectably high ratings (over 5%).

Examining the global level of engagement with VSS is another way to examine their significance. Based on information from the ITC Standards Map, the degree of VSS adoption in a given nation is ascertained by dividing the number of active VSS in that nation by the total number of active VSS globally.

1.20 Conclusion

- The domain of artificial intelligence is rapidly evolving and possesses the capacity to fundamentally transform investing and trading. Using your programming expertise, you as an AI developer can create new goods or services that will have a significant impact on this business. As long as traders keep spending money on technologies that will enable them to execute better and make more money, the future of trading seems promising.
- All things considered, these findings demonstrate that VSS are most effective in encouraging behavioural shifts toward more environmentally friendly habits (intermediate outcomes). These modifications, however, do not result in significant and durable sustainability benefits. This section will elaborate on this gap. This study enhances the understanding of the increasingly debated issue among scholars and policymakers in politics, economics, and civil society regarding the adequacy of VSS's problem-solving capabilities to facilitate or sustain essential sustainability transformations.
- The goals were to balance global trade with environmental sustainability, increase profit sharing between developed-nation lead companies and developed-nation primary goods producers, and balance global trade with fundamental labor and human rights.
- Given the present understanding of the enduring growth , impacts of VSS on certified production sites, we conclude that VSS's potential to solve problems and accomplish the aforementioned three objectives is constrained. Studies conducted at the ground level to examine the impacts of VSS have shown mixed, positive, and negative results.
- Overall yet, unfavourable assessments are more common. Adoption of VSS by itself does not appear to be adequate in many circumstances to encourage significant changes toward improved trade for Sustainable Development.
- It is important to note that there is still a great deal of fragmentation in the evidence base that allows us to assess how VSS affects sustainable production and commerce. The three

industries of forestry, (tropical) agricultural agriculture, and fisheries/aquaculture are heavily represented in the academic literature that has empirically evaluated the sustainability implications of VSS.

- The impact of VSS on certified production sites' sustainability results in other significant industries, Increasing multi-takeholder discussions with private governance actors could be one way for policymakers to counteract the logic of a "race to the bottom" and encourage VSS to adopt a uniform regulatory framework with quantifiable sustainable targets and transparent guidelines that apply to all schemes
- With the development of technology, the trading business has experienced a dramatic transition, and artificial intelligence is now a key factor in this revolution. The emergence of AI-driven trading platforms in India has brought about a democratization of trading, empowering individual investors to leverage analytics and make well-informed choices concerning stocks, sectors, and indexes..AI will have a greater and greater impact on trading as technology develops, influencing a more data-driven and inclusive future that will benefit all investors.

1. 21 Policy Recommendations

- A number of parties could intervene to remove the obstacles mentioned above. International organizations and aid agencies have the ability and have assisted in removing certain obstacles, particularly in developing nations.
- The utilization of Voluntary Sustainability Standards has been aggressively promoted by international funding agencies and multilateral organizations. to achieve the interconnected goals of integrating developing economies into global trade. These organizations have implemented transparent criteria based on sustainable principles to promote the adoption of VSS.
- Donors and multilateral organizations can keep working with VSS to get beyond some of the obstacles mentioned above. As a tool for Sustainable Development, donors and multilateral organizations have concentrated their attention on specific difficulties that VSS face.

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