NHSMUN50

National High School Model United Nations

UNIDO

BACKGROUND GUIDE

NHSMUN
National High School Model United Nations

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Dear Delegates,

Hello and welcome to NHSMUN 2024! My name is Duncan Buckerfield, and I am the Director of the United Nations Industrial Development Organization (UNIDO) for Session II. The whole NHSMUN team and I are really excited to present two amazing topics!

This is my third year with NHSMUN, and fourth year being involved in Model UN. At NHSMUN 2022, I came as a delegate for Afghanistan in the United Nations Human Settlements Programme (UN-Habitat). I returned to NHSMUN last year as an Assistant Director for the International Bank for Reconstruction and Development (IBRD). I really enjoyed my NHSMUN experience as a delegate, and I hope to extend that pleasure to you all this year at NHSMUN. Model UN has pushed me to be a better speaker and stronger thinker, and I believe it can help you do the same.

A little bit more about me, I am a second-year student at Cornell University in Ithaca, New York, studying industrial and labor relations within the ILR School. I also am pursuing a minor in human development in the College of Human Ecology and Information Science in the Cornell-Bowers College of Computing and Information Science. I study the worker-management relationship, the workplace, and the intersection between technology and the future of work. Beyond academics, I am a tour guide at Cornell and give about 1000 prospective students tours of my lovely university. I am also a Peer Mentor/TA for an introductory course: ILRID 1510: Introduction to Industrial and Labor Relations. I am also a part of an event planning organization on campus as well. I would also call myself a bit of a foodie and love trying new things with my friends around Ithaca. Fun Fact: Ithaca has more restaurants per capita than Manhattan.

I am really excited to see what you all think about our two topics: Improving Labor Standards in the Global Economy and Sustainable Manufacturing and Waste Management. If you have any questions during this process, please feel free to reach out. We are looking forward to welcoming you to New York for the 50th edition of NHSMUN!

See you soon,

Duncan Buckerfield
United Nations Industrial Development Organization
Session II
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Table of Contents

A Note on the NHSMUN Difference

Esteemed Faculty and Delegates,

Welcome to NHSMUN 2024! We are Dennis Zhang and Christian Hernandez, and we are this year's Secretary-General and Director-General. Thank you for choosing to attend NHSMUN, the world's largest and most diverse Model United Nations conference for secondary school students. This year is particularly special as NHSMUN celebrates its **50th Anniversary**, and we are thrilled to welcome you to our hometown, New York City, this March for this landmark year!

As a space for collaboration, consensus, and compromise, NHSMUN strives to transform today's brightest thinkers, speakers, and collaborators into tomorrow's leaders. Our organization provides a uniquely tailored experience for all through innovative and accessible programming. We believe that an emphasis on education through simulation is paramount to the Model UN experience, and this idea permeates throughout numerous aspects of the conference:

Realism and accuracy: Although a perfect simulation of the UN is never possible, we believe that one of the core educational responsibilities of MUN conferences is to educate students about how the UN System works. Each NHSMUN committee is a simulation of a real deliberative body so that delegates can research what their country has said in the committee. Our topics are chosen from the issues currently on the agenda of that committee (except historical committees, which take topics from the appropriate time period). We also strive to invite real UN, NGO, and field experts into each committee through our committee speakers program. Moreover, we arrange meetings between students and the actual UN Permanent Mission of the country they are representing. Our delegates have the incredible opportunity to conduct first-hand research, asking thought-provoking questions to current UN representatives and experts in their respective fields of study. These exclusive resources are only available due to IMUNA's formal association with the United Nations Department of Global Communications and consultative status with the Economic and Social Council. No other conference goes so far to deeply immerse students into the UN System.

Educational emphasis, even for awards: At the heart of NHSMUN lies education and compromise. Part of what makes NHSMUN so special is its diverse delegate base. As such, when NHSMUN distributes awards, we strongly de-emphasize their importance in comparison to the educational value of Model UN as an activity. NHSMUN seeks to reward students who excel in the arts of compromise and diplomacy. More importantly, we seek to develop an environment in which delegates can employ their critical thought processes and share ideas with their counterparts from around the world. Given our delegates' plurality of perspectives and experiences, we center our programming around the values of diplomacy and teamwork. In particular, our daises look for and promote constructive leadership that strives towards consensus, as real ambassadors do in the United Nations.

Debate founded on strong knowledge and accessibility: With knowledgeable staff members and delegates from over 70 countries, NHSMUN can facilitate an enriching experience reliant on substantively rigorous debate. To ensure this high quality of debate, our staff members produce detailed, accessible, and comprehensive topic guides (like the one below) to prepare delegates for the nuances inherent in each global issue. This process takes over six months, during which the Directors who lead our committees develop their topics with the valuable input of expert contributors. Because these topics are always changing and evolving, NHSMUN also produces update papers intended to bridge the gap of time between when the background guides are published and when committee starts in March. As such, this guide is designed to be a launching point from which delegates should delve further into their topics. The detailed knowledge that our Directors provide in this background guide through diligent research aims to increase critical thinking within delegates at NHSMUN.

Extremely engaged staff: At NHSMUN, our staffers care deeply about delegates' experiences and what they take away from

their time at NHSMUN. Before the conference, our Directors and Assistant Directors are trained rigorously through hours of workshops and exercises both virtual and in-person to provide the best conference experience possible. At the conference, delegates will have the opportunity to meet their dais members prior to the first committee session, where they may engage one-on-one to discuss their committees and topics. Our Directors and Assistant Directors are trained and empowered to be experts on their topics and they are always available to rapidly answer any questions delegates may have prior to the conference. Our Directors and Assistant Directors read every position paper submitted to NHSMUN and provide thoughtful comments on those submitted by the feedback deadline. Our staff aims not only to tailor the committee experience to delegates' reflections and research but also to facilitate an environment where all delegates' thoughts can be heard.

Empowering participation: The UN relies on the voices of all of its member states to create resolutions most likely to make a meaningful impact on the world. That is our philosophy at NHSMUN too. We believe that to properly delve into an issue and produce fruitful debate, it is crucial to focus the entire energy and attention of the room on the topic at hand. Our Rules of Procedure and our staff focus on making every voice in the committee heard, regardless of each delegate's country assignment or skill level. Additionally, unlike many other conferences, we also emphasize delegate participation after the conference. MUN delegates are well researched and aware of the UN's priorities, and they can serve as the vanguard for action on the Sustainable Development Goals (SDGs). Therefore, we are proud to connect students with other action-oriented organizations to encourage further work on the topics.

Focused committee time: We feel strongly that face-to-face interpersonal connections during debate are critical to producing superior committee experiences and allow for the free flow of ideas. Ensuring policies based on equality and inclusion is one way in which NHSMUN guarantees that every delegate has an equal opportunity to succeed in committee. In order to allow communication and collaboration to be maximized during committee, we have a very dedicated administrative team who work throughout the conference to type up, format, and print draft resolutions and working papers.

As always, we welcome any questions or concerns about the substantive program at NHSMUN 2024 and would be happy to discuss NHSMUN pedagogy with faculty or delegates.

Delegates, it is our sincerest hope that your time at NHSMUN will be thought-provoking and stimulating. NHSMUN is an incredible time to learn, grow, and embrace new opportunities. We look forward to seeing you work both as students and global citizens at the conference.

Best,

Dennis Zhang
Secretary-General

Christian Hernandez
Director-General

A Note on Research and Preparation

Delegate research and preparation is a critical element of attending NHSMUN and enjoying the debate experience. We have provided this Background Guide to introduce the topics that will be discussed in your committee. We encourage and expect each of you to critically explore the selected topics and be able to identify and analyze their intricacies upon arrival to NHSMUN in March.

The task of preparing for the conference can be challenging, but to assist delegates, we have updated our **Beginner Delegate Guide** and **Advanced Delegate Guide**. In particular, these guides contain more detailed instructions on how to prepare a position paper and excellent sources that delegates can use for research. Use these resources to your advantage. They can help transform a sometimes overwhelming task into what it should be: an engaging, interesting, and rewarding experience.

To accurately represent a country, delegates must be able to articulate its policies. Accordingly, NHSMUN requires each delegation (the one or two delegates representing a country in a committee) to write a position paper for each topic on the committee's agenda. In delegations with two students, we strongly encourage each student to research each topic to ensure that they are prepared to debate no matter which topic is selected first. More information about how to write and format position papers can be found in the NHSMUN Research Guide. To summarize, position papers should be structured into three sections:

I: Topic Background – This section should describe the history of the topic as it would be described by the delegate's country. Delegates do not need to give an exhaustive account of the topic, but rather focus on the details that are most important to the delegation's policy and proposed solutions.

II: Country Policy – This section should discuss the delegation's policy regarding the topic. Each paper should state the policy in plain terms and include the relevant statements, statistics, and research that support the effectiveness of the policy. Comparisons with other global issues are also appropriate here.

III. Proposed Solutions – This section should detail the delegation's proposed solutions to address the topic. Descriptions of each solution should be thorough. Each idea should clearly connect to the specific problem it aims to solve and identify potential obstacles to implementation and how they can be avoided. The solution should be a natural extension of the country's policy.

Each topic's position paper should be **no more than 10 pages** long double-spaced with standard margins and font size. **We recommend 3–5 pages per topic as a suitable length**. The paper must be written from the perspective of your assigned country and should articulate the policies you will espouse at the conference.

Each delegation is responsible for sending a copy of its papers to their committee Directors via myDais on or before **February 23, 2024**. If a delegate wishes to receive detailed feedback from the committee's dais, a position must be submitted on or before **February 2, 2024**. The papers received by this earlier deadline will be reviewed by the dais of each committee and returned prior to your arrival at the conference.

Complete instructions for how to submit position papers will be sent to faculty advisers via email. If delegations are unable to submit their position papers on time, please contact us at info@imuna.org.

Delegations that do not submit position papers will be ineligible for awards.

Committee History

The United Nations Industrial Development Organization (UNIDO) is a specialized agency within the United Nations Economic and Social Council (ECOSOC). The mandate of this committee is to "to promote, dynamize and accelerate industrial development."[1] The committee also works to improve living conditions in some of the world's poorest countries. UNIDO can promote growth by focusing on a country's area of economic expertise and assisting it in correctly allocating its resources. Today, the role of UNIDO has transitioned more toward poverty reduction by promoting the integration of developing countries into global trade. This is done through supporting and increasing environmental sustainability in the workforce and improving access to energy in less developed countries.

UNIDO was created on November 17, 1966, when the General Assembly passed Resolution 2152.[2] The body began with a mission to promote and accelerate industrialization in developing countries. In 1975, resolution 3362 was passed and established UNIDO as a specialized agency.[3] In 1979, the new UNIDO constitution was written, and in 1985, the constitution entered effect.[4] Primarily, the new constitution marked UNIDO's transformation into an independent body with its own budget, governing board, and decision-making powers. Furthermore, this shift allowed UNIDO to more effectively address its core priorities of promoting sustainable industrialization, mitigating climate breakdown, and ending world hunger. These priorities work in correspondence with Sustainable Development Goal (SDG) 9 which "seeks to build resilient infrastructure, promote sustainable industrialization and foster innovation."[5] Considering its focus on industry, UNIDO focused on targeting its services toward private sector growth rather than public sector development, since many of the issues regarding industry are most dominant in the private sector.

UNIDO is a very large committee, with 172 Member States.[6] The country representatives meet once every two years at the General Conference in Vienna. Within UNIDO, a subsidiary organ known as the Industrial Development Board consists of 53 Member States who review implementation of the "work programme and the budget which is prepared by the Programme and Budget Committee." The financial resources of UNIDO are derived from "regular and operational budgets" as well as special sponsorships. During the fiscal years 2022-2023, the budget was EUR 145.9 million. UNIDO is funded by the United Nations Development Programme (UNDP). Representatives from both organizations collaborate on industrial development projects.[7]

UNIDO advocates the use of inclusive and sustainable industrial development (ISID) to eradicate poverty. ISID's role in current industrialization efforts is heavily highlighted within the 2030 Agenda for Sustainable Development due to its accelerating impact on universal development frameworks. The operationalization of ISID in efforts of creating actionable solutions reflects renewed mandates given to the United Nations as a whole, in which shared prosperity and strengthening knowledge and institutions are the foundations of sustainable industrialization.[8] As industrialization continues to accelerate in developing nations around the world, UNIDO continues to be on the forefront of fostering this innovation in a sustainable manner.

1 "Who We Are," UNIDO, accessed September 30, 2023, https://www.unido.org/about-us/who-we-are.
2 "United Nations Economic Commission for Europe (UNECE)," *OECD Publishing*, 2017, https://doi.org/10.1787/9789264244047-en.
3 UNIDO, "Who We Are."
4 UNIDO, "Who We Are."
5 "Infrastructure and Industrialization," United Nations, accessed September 30, 2023, https://www.un.org/sustainabledevelopment/infrastructure-industrialization/?gclid=CjwKCAjw69.
6 UNIDO, "Who We Are."
7 "Programme and Budget Committee, 39th Session," UNIDO, 2023, https://www.unido.org/node/9457571.
8 "Mission: Towards Inclusive and Sustainable Industrial Development," UNIDO, accessed September 30, 2023, https://www.unido.org/who-we-are/mission-towards-inclusive-and-sustainable-industrial-development.

UNIDO

NHSMUN 2024

TOPIC A:

IMPROVING LABOR STANDARDS IN THE GLOBAL ECONOMY

Photo Credit: Kenneth C. Zirkel

Introduction

People intentionally participate in work to provide for their families, fulfill their personal needs, and give back to their communities.[1] Additionally, consumers purchase goods made by workers every day. However, many consumers know little about the dangerous or exploitative conditions these workers face. Unfortunately, issues such as labor rights and regulations are far from the top priority of any country. The World Trade Organization (WTO) also struggles with regulating labor standards within WTO agreements.[2] Addressing issues of labor is no easy task. To achieve this, the International Labor Organization (ILO) was founded in 1919 and laid the groundwork for equity in the field of labor.[3]

There is a long history of labor standards and their development since the turn of the industrial revolution.[4] However, the future of labor is currently at a crossroads. The number of workers unions, which are important in bargaining for better workers' rights, are declining in the Global North, but increasing in the Global South.[5] The labor markets in which labor is bought and sold continue to be changed by globalization, environmental changes, and technological developments. COVID-19 also worsened many issues within labor standards around the world. The power of trade unions to mobilize and represent workers has also decreased over time.[6] More recently, labor rights issues stemming from globalization have taken center stage in the labor debate.[7] In combating these widespread issues, it is critical that countries work together.

Globalization has connected the world through many different means of communication and transportation. However, globalization has also resulted in growing inequality.[8] Rural areas suffer the most, often being excluded from the benefits of globalization in urban areas. Despite this, they have some of the most potential for strong economic growth in the face of climate change.[9] Inclusive and sustainable development must occur within these areas, especially regarding how labor is treated. With this, we can ensure a strong future for labor markets, while also addressing the underlying Sustainable Development Goals.[10]

Today's meaning of "work" can include many different roles and responsibilities and cannot be reduced to a single definition or idea. Therefore, it is essential that the United Nations Industrial Development Organization (UNIDO) protects all forms of work and promotes development for workers globally. While it is critical to align goals with country policy, having unique solutions to novel problems is encouraged. Collaborative and innovative solutions are required to address the issues surrounding labor rights and to build a better future for workplaces globally.

History and Description of the Issue

History of Labor Standards

To understand current labor standards, it is important to note how they have evolved over time. In 1944, towards the end of World War II, the ILO met in Philadelphia, United States, and

1 "Definition of Work," Merriam-Webster, 2019, https://www.merriam-webster.com/dictionary/work.
2 "Understanding the WTO - Labour Standards: Highly Controversial," World Trade Organisation, 2023, https://www.wto.org/english/thewto_e/whatis_e/tif_e/bey5_e.htm.
3 "History of the ILO," International Labour Organization, 2019, https://www.ilo.org/global/about-the-ilo/history/lang--en/index.htm.
4 Freddie Wilkinson, "Industrialization, Labor, and Life," *National Geographic*, June 2, 2022, https://education.nationalgeographic.org/resource/industrialization-labor-and-life/.
5 Niall McCarthy, "The State of Global Trade Union Membership [Infographic]," *Forbes*, May 6, 2019, https://www.forbes.com/sites/niallmccarthy/2019/05/06/the-state-of-global-trade-union-membership-infographic/?sh=3b02a8f32b6e.
6 "Trade Unions in Transition: What Will Be Their Role in the Future of Work?" International Labour Organisation, 2021, https://www.ilo.org/infostories/en-GB/Stories/Labour-Relations/trade-unions.
7 Melina Kolb, "What Is Globalization?" *Peterson Institute for International Economics*, October 24, 2022, https://www.piie.com/microsites/globalization/what-is-globalization.
8 Kolb, "What Is Globalization?"
9 UN General Assembly, Resolution 70/1, Transforming our world: the 2030 Agenda for Sustainable Development, A/RES/70/1 (October 21, 2015) https://undocs.org/A/RES/70/1.
10 "Goal 8," United Nations, 2023, https://sdgs.un.org/goals/goal8.

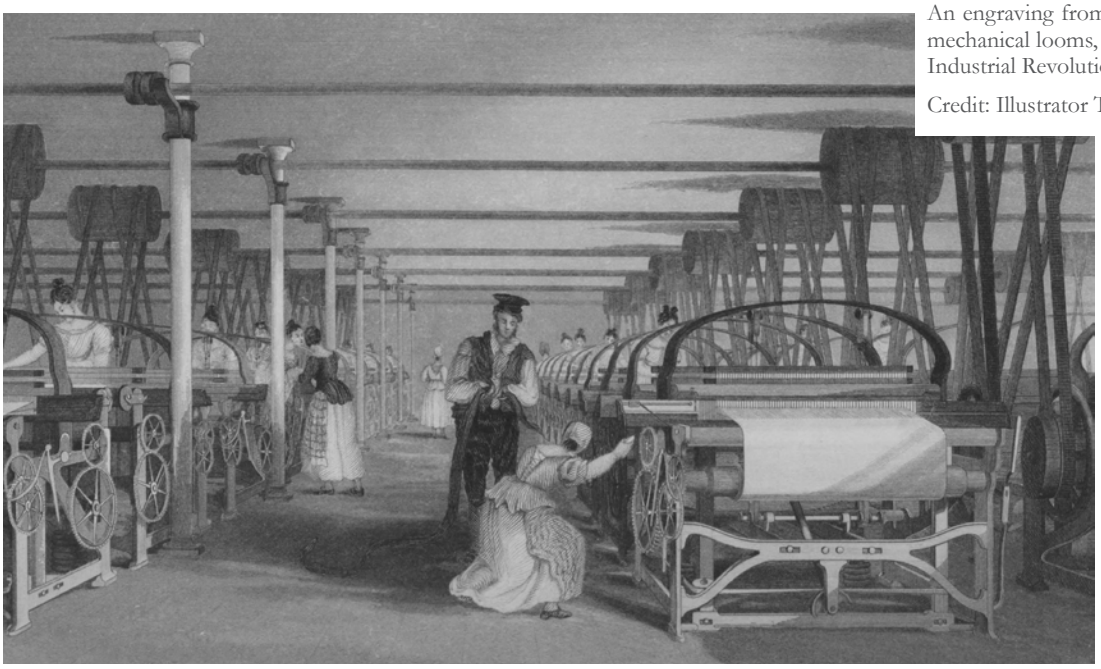
concluded that "labor is not a commodity."[11] This means that people should be valued in the workplace and treated with respect, rather than being treated merely as an input for a final good or service. The ILO instructed its members to use the Declaration of Philadelphia to guide their own labor policies around the world.[12] This was a key moment for workers, as for the first time ever, a group of countries agreed on a set of labor standards that upheld the respect and protection of workers. The ILO later became a part of the United Nations (UN), where countries continued to commit to the protection of labor.

Unfortunately, the guidelines of the Philadelphia Declaration were not upheld for long. This is because during the late 20th Century, many global issues were caused by the Cold War. Such problems included sudden changes in the oil supply, rising inflation, and economic inequalities.[13] Labor policies failed to consider these events, which left many workers disenfranchised. As a result, the United Nations adopted two agreements in 1966: The International Covenant on Economic, Social, and Cultural Rights, and the International Covenant on Civil and Political Rights. Despite these Covenants, many countries had different priorities when addressing labor and rights. For example, capitalist countries prioritized civil and political rights, while communist countries supported economic, social and cultural rights. These divided priorities skewed development across the world, changing labor conditions based on each countries' governing principles.[14]

Worsening labor conditions prompted workers to migrate internationally in search of better job opportunities. Whilst this brought many families new hope, it had severe repercussions when countries' labor policies differed. For example, if a person works internationally, an employer may alter their contract to exploit a foreign country's laws where labor rights are weaker. Many foreign workers thus endured nearly 60-hour work weeks, minimal pay, and no room for growth as a result.[15]

These circumstances resulted in the ILO Declaration on

11 Paul O'Higgins, "'Labour Is Not a Commodity' - an Irish Contribution to International Labour Law," *Industrial Law Journal* 26, no. 3 (September 1, 1997): 225–234, https://doi.org/10.1093/ilj/26.3.225.
12 "Declaration Of Philadelphia," International Labor Organization, accessed August 16, 2023, https://www.ilo.org/static/english/inwork/cb-policy-guide/declarationofPhiladelphia1944.pdf.
13 Gerry Rodgers, Eddy Lee, Lee Swepston and Jasmien Van Daele, *The International Labour Organization and the quest for social justice, 1919–2009,* (Geneva: ILO, 2009). https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_104643.pdf.
14 Rodgers, Lee, Swepston and Van Daele, *The International Labour Organization and the quest for social justice, 1919–2009.*
15 Rodgers, Lee, Swepston and Van Daele, *The International Labour Organization and the quest for social justice, 1919–2009.*



An engraving from 1835 depicting a weaving mill with mechanical looms, which played a significant role in the Industrial Revolution

Credit: Illustrator T. Allom, Engraver J. Tingle

Fundamental Principles and Rights at Work, adopted in 1998.[16] Decades after the Declaration of Philadelphia, the ILO convened to set a new standard for commitment by governments, employers', and workers' organizations to uphold basic human values in the workplace.[17] There are many important principles included. The first is the freedom of workers to freely associate with each other and collectively bargain for different or better workplace conditions. Next, is "the elimination of all forms of forced or compulsory labor." Additionally, there is the elimination of child laborers from every industry. Lastly, the declaration also outlined eliminating discrimination based on one's work and within each workplace.[18] Previously, all ILO conventions were ratified on a voluntary basis. In fact, only 18 countries out of 187 had ratified the 11 Conventions on child labor, labor rights, and discrimination.[19] However, the Declaration on Fundamental Principles and Rights at Work set a new standard. The Declaration was applicable to all members of the ILO, regardless of whether they had signed previous conventions or not.[20] It reaffirmed that all ILO members must uphold the four main principles outlined earlier.[21] This represented an important step forward for many workers and industries around the world.

In the 21st century, the Declaration on Fundamental Principles and Rights at Work is the basis for a healthy foundation for working conditions worldwide. However, they had little effect domestically. Despite various agreements and international policies, the progress of labor protections differed between countries. What countries pledged to do was usually very different from what they actually did. No single geographic region, alliance, or trade deal has members with the same consideration for labor protections.[22] This was because the regulation of labor is often governed by a group of domestic legal practices and laws. As a whole, these are often referred to as labor laws. Governments, workers, and employers each play a role in the relationship that labor law dictates. Overall, this can result in a lack of consistency in workplace conditions for many individuals and workplaces.

The largest issue facing labor law currently is that most labor regulations are developed with "standard work" in mind. Standard work is the traditional full-time, permanent arrangement of work. An example of standard work would be a teacher or college professor, who is paid with a salary. However, this is not what most work situations look like today.[23] This is because non-standard roles such as part-time jobs and on-call jobs have become very common.[24]

Non-standard work can look very different from one country to another. For example, non-standard work may look different in China versus Brazil, due to cultural and social differences. Non-standard work could include being a part-time chef at a fast-food restaurant. Additionally, women are overrepresented in part-time work. In the United States, about 60 percent of part-time workers are women.[25] We can also look at temporary labor, also known as "labor-for-hire," where companies sign contracts with other companies for the purpose of a temporary job. This is a very common practice globally. All of these types of work make it complicated to define one international standard by which all countries should abide.

On average, temporary workers make up about 11 percent of the

16 "ILO Declaration on Fundamental Principles and Rights at Work," International Labour Organization, 2022, https://www.ilo.org/declaration/lang--en/index.html.
17 International Labour Organization, "ILO Declaration on Fundamental Principles and Rights at Work."
18 International Labour Organization, "ILO Declaration on Fundamental Principles and Rights at Work."
19 "Ratifications of Fundamental Conventions," International Labour Organization, 2017, https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:10011:0::NO::P10011_DISPLAY_BY:2.
20 International Labour Organization, "ILO Declaration on Fundamental Principles and Rights at Work."
21 Julieta Lobato, "25 Years after the Adoption of the ILO 1998 Declaration on Fundamental Principles and Rights at Work: What Is New in the Human Rights Turn in Labour Law?" *EJIL: Talk!* July 4, 2023, https://www.ejiltalk.org/25-years-after-the-adoption-of-the-ilo-1998-declaration-on-fundamental-principles-and-rights-at-work-what-is-new-in-the-human-rights-turn-in-labour-law/.
22 Rodgers, Lee, Swepston and Van Daele, *The International Labour Organization and the quest for social justice, 1919–2009.*
23 International Labour Organisation, "NON-STANDARD EMPLOYMENT around the WORLD Understanding Challenges, Shaping Prospects," 2016, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_534326.pdf.
24 International Labour Organisation, "NON-STANDARD EMPLOYMENT around the WORLD Understanding Challenges, Shaping Prospects."
25 Lauren Hoffman and Isabela Salas-Betsch, "Including All Women Workers in Wage Gap Calculations," *Center for American Progress*, May 24, 2022, https://www.americanprogress.org/article/including-all-women-workers-in-wage-gap-calculations.

total employees.[26] However, there are big differences between countries. In countries such as Jordan, Latvia, Norway, and Sierra Leone, less than five percent of workers are temporary workers. In other countries such as Mongolia, Peru, and Spain, more than 25 percent of workers work temporary jobs.[27] It is important to note the differences between standard and non-standard forms of work, as there are many non-standard jobs that are under-regulated or have less regulatory oversight. This is because the majority of regulations focus on standard work. This creates a large disparity in how policies and labor laws are applied. When negotiated in the ILO or other platforms, labor and work are always tied to the traditional "nine-to-five" job, and leave out other forms of work. This leaves many workers underrepresented, making them vulnerable to being undervalued and exploited.

Finally, labor conditions have been plagued by a longtime issue: child labor. Child labor is a serious concern that goes beyond violating basic human rights. It impacts children's growth, endangering their physical and mental health in the long term. There is a strong connection between child labor and poverty within households, as child labor prevents many children from attending school and limits their chances of growing socially.[28] This reduction in human potential has broader effects, leading to slower economic growth and social development. Recent studies by the ILO indicate that eradicating child labor in developing and transitioning economies could produce economic benefits that outweigh the costs of investing in education and social services.[29] As a result, child labor is of great concern for the global community. Child labor is work that may deprive children of their potential and dignity and is harmful to their development.[30] Per the international labor standards developed by the ILO, no child should work if they are under the age of 15, under 13 in cases of light work, or under 18 for potentially hazardous work.[31] There is wide international consensus and regulation surrounding child labor. It is illegal in most countries, and all the signatories of the Industrial Labor Organization's Minimum Age Convention have pledged to end it.[32] Poverty and the related factors that lead to child labor have changed the fate of millions of children worldwide.[33] However, this problem has still persisted despite the efforts of the international community.

Throughout the years, labor laws have greatly impacted working conditions, unionization, and migrations. With organizations like ILO and the WTO regulating international labor standards, it falls on governments to individually ensure that the rights of their own citizens are taken into consideration. Delegates of this committee will be tasked to support the rights of workers and improve labor standards around the world through sustainable industrial development.

Globalization and the New Economy

Globalization refers to the growing connection between countries. This can take the form of cultural linkages, economic dependence, and new communication between countries.[34] Globalization is not a new phenomenon; whether it be Indigenous peoples across the western hemisphere or the conquests of the European empires, globalization has constantly shaped society. While globalization can benefit society as a whole, its benefits often exclude underprivileged communities and lower-income countries. To treat this, it is

26 International Labour Organisation, "NON-STANDARD EMPLOYMENT around the WORLD Understanding Challenges, Shaping Prospects."
27 International Labour Organisation, "NON-STANDARD EMPLOYMENT around the WORLD Understanding Challenges, Shaping Prospects."
28 "International Labour Standards on Child Labour," International Labour Organization, 2019, https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/child-labour/lang--en/index.htm.
29 "Eliminating Child Labour: The Costs and Benefits," International Labour Organization, February 6, 2004, https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_075570/lang--en/index.htm.
30 Kamila Facevicova and Petra Kynclova, "HOW INDUSTRIAL DEVELOPMENT MATTERS to the WELL-BEING of the POPULATION Some Statistical Evidence," United Nations Industrial Development Organization, 2020, https://www.unido.org/sites/default/files/files/2020-02/wellbeing_final_report.pdf.
31 "Convention C138 - Minimum Age Convention, 1973 (No. 138)," International Labour Organization, 2017, https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C138.
32 "International Labour Standards on Child Labour," International Labour Organization, 2019, https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/child-labour/lang--en/index.htm.
33 Muhammad Ahmed Faraz, "Economics of Child Labor: A Multidimensional Approach," *Journal of Social Science Research* 14 (October 2015), https://www.researchgate.net/publication/331079702_Economics_of_Child_Labor_A_Multidimensional_approach.
34 "What Is Globalization?" Peterson Institute for International Economics, last modified October 24, 2022, https://www.piie.com/microsites/globalization/what-is-globalization.

critical to create resilient and inclusive trade agreements that can grow economies worldwide and give fair access to all in the new era of globalization.

Under normal conditions, as the Gross Domestic Product (GDP) of a country grows, so does their average household income. GDP refers to the total market value of a country's goods and services produced in a given time period. Much of a country's GDP relies on a strong labor force, which is why it is important to understand that globalization and labor are linked.[35]

Trade has grown tremendously in the past century, with exports 40 times larger than they were in 1913.[36] Throughout the 1900s, a period characterized by rapid economic growth, global GDP per capita grew almost five times its initial value. GDP per capita is a country's GDP divided by its total population, and is meant to represent the average economic output of one person. However, the growth in GDP per capita was far from consistent, as most of its growth occurred during the latter half of the century. This era witnessed a rapid surge in trade, which was subsequently followed by economic freedom.[37] The world began to move away from globalization during the interwar period. As a result of this retreat, countries followed closed economies, protectionist laws, and extensive capital controls.[38] Unfortunately, this resulted in a decline in per capita income growth to less than one percent between 1913 and 1950.[39] Following this, the rest of the century saw improved per capita income growth that averaged more than two percent. The post-World War II boom in industrialized countries saw the most remarkable increase.[40]

Looking back, the 20th century witnessed substantial overall income growth, yet it is vital to acknowledge that this progress was unevenly distributed. Disparities emerged between affluent and impoverished nations and within countries among individuals of varying economic backgrounds.[41] Notably, the per capita GDP of the wealthiest quarter of the global population increased nearly six times over the century.[42] Meanwhile, the poorest quarter experienced less growth, leading to an increase in income inequality. This inequality in economic development is exemplified by events like the Rana Plaza disaster, where a stark lack of equitable industrial practices contributed to tragic consequences.

Rana Plaza is a recent example of how globalization and the push to increase manufacturing has had harmful impacts on workers.[43] The Rana Plaza was an eight-story skyscraper in Dhaka, Bangladesh, which collapsed on April 24, 2013. There were 1,134 fatalities and over 2,500 injuries, a majority of the fatalities being garment workers.[44] Rana Plaza was a hub for clothes manufacturing, other stores, and a bank. During the morning rush hour, it collapsed. Warnings to evacuate the structure due to cracking that had appeared the day before were disregarded, ending in a tragedy.[45] This was regarded to be the worst industrial catastrophe in Bangladesh's history. A long investigation concluded that a variety of factors led to the collapse. Notably, of the building's eight floors, the top four had not been approved for use.[46] Cracks in the building were also present the day before, yet the building was deemed safe by its owner, Sohel Rana.[47] Many workers continued to return to this unsafe building, even knowing it was not a good

35 "Growth and Economic Well-Being: Fourth Quarter 2022, OECD," Organization for Economic Co-operation and Development, 2022, https://www.oecd.org/newsroom/growth-and-economic-well-being-fourth-quarter-2022-oecd.htm.
36 Esteban Ortiz-Ospina, Diana Beltekian, and Max Roser, "Trade and Globalization," Our World in Data, last modified October 2018, https://ourworldindata.org/trade-and-globalization.
37 Ortiz-Ospina, Beltekian, and Roser, "Trade and Globalization."
38 "Globalization: Threat or Opportunity? An IMF Issues Brief," International Monetary Fund, 2011, https://www.imf.org/external/np/exr/ib/2000/041200to.htm.
39 International Monetary Fund, "Globalization: Threat or Opportunity? An IMF Issues Brief."
40 International Monetary Fund, "Globalization: Threat or Opportunity? An IMF Issues Brief."
41 International Monetary Fund, "Globalization: Threat or Opportunity? An IMF Issues Brief."
42 International Monetary Fund, "Globalization: Threat or Opportunity? An IMF Issues Brief."
43 Pamina Koenig and Sandra Poncet, "The effect of the Rana Plaza collapse on multinational firms' imports," Paris School of Economics, accessed August 20, 2023, https://www.parisschoolofeconomics.eu/en/economics-for-everybody/archives/5-papers-in-5-minutes/january-2021/the-collapse-of-rana-plaza-what-impact-has-it-had-on-multinational-company-sub-contracting/.
44 Tansy Hoskins, "Reliving the Rana Plaza factory collapse: a history of cities in 50 buildings, day 22," *The Guardian*, April 23, 2015, https://www.theguardian.com/cities/2015/apr/23/rana-plaza-factory-collapse-history-cities-50-buildings.
45 Michael Edwards, "Up to 1,000 feared dead after Bangladesh factory collapse," *ABC News*, April 25, 2013, https://www.abc.net.au/news/2013-04-26/up-to-1,000-feared-dead-after-bangladesh-factory-collapse/4652206.
46 Julfikar Ali Manik and Jim Yardley, "Building Collapse in Bangladesh Leaves Scores Dead," *The New York Times*, April 25, 2013, https://www.nytimes.com/2013/04/25/world/asia/bangladesh-building-collapse.html.
47 Red Marriott, "The house of cards: the Savar building collapse," Libcom, last modified April 26, 2013, https://libcom.org/article/house-

idea. Ether Tex, the largest tenant in the building, threatened to withhold one month's pay from workers who did not work due to feeling unsafe.[48]

This disaster led to widespread outrage and calls for stronger Corporate Social Responsibility (CSR) policies from the international community.[49] The most readily apparent strategy to foster social responsibility is to avoid sourcing from countries with low ethical standards. Products that are made in high-tech countries (with high labor expenses and social requirements) would be considered ethical. However, this leaves a gap in developing countries, as they may lack resources to increase their standard of living.[50] Sanjiv Pandita is the executive director of the Asia Monitor Resource Center. She has called this situation "the ugliest race to the bottom," referring to the lack of protections and how standards had lapsed to lead to this crisis[51]

The phrase "race to the bottom" refers to a phenomenon where nations compete to entice foreign investment. However, this is done by decreasing labor standards and workers' rights in order to increase output, particularly in the context of globalization.[52] According to this theory, nations may erode their labor regulations to get operational lower costs, encouraging foreign multinational firms looking to cut costs of manufacturing.[53] This concept was proposed by academic and researcher Anita Chan to comprehend how pressures from the global economy affect labor conditions globally. She stated that as businesses look for the most affordable production sites, they can take advantage of nations with less strict labor laws, setting off a chain reaction of declining working conditions and pay.[54] The "race to the bottom" argument draws attention to the difficulties faced by workers in a worldwide economy, where multinational firms might take advantage of disparities in labor standards to increase profits.[55] This idea also emphasizes how crucial it is for nations to work together to create and uphold fair labor laws in order to avoid situations in which employees' rights and welfare are jeopardized in the sake of maintaining economic competitiveness.[56] This goes back to the original idea established by the ILO, when they established that labor is not a commodity.

In response to this crisis, the world industrial relations saw a new wave of regulatory agreements to further worker safety and garment sustainability. The first of these was the Bangladesh Accords, which is a legally binding agreement regarding fire safety in factories. This agreement was carried out between labor unions, garment production companies, and the ILO.[57] Through this agreement, the ILO and the Bangladeshi Government worked to improve the country's labor law to align more closely with fellow countries.[58] More recently, the country has continued to develop stringent safety and sustainability regulations for its garment industry. In 2023, the country will have the greatest number of Leadership in Energy and Environmental Design (LEED) certified factories in the world, with 63 receiving a platinum ranking, and 110 receiving a gold ranking.[59]

Finally, there is one more component to globalization and labor that must be considered. Globalization has enabled a new flexible work arrangement called "remote work." This is where an individual conducts business away from a physical office or plant. This arrangement can ensure effective work-

cards-savar-building-collapse.
48 Arun Devnath and Mehul Srivastava, "'Suddenly the floor wasn't there,' Factory Survivor Says," *Bloomberg*, April 25, 2013, https://www.bloomberg.com/news/articles/2013-04-25/-suddenly-the-floor-wasn-t-there-factory-survivor-says.
49 Wieland, Andreas, and Robert Handfield, "The Socially Responsible Supply Chain: An Imperative for Global Corporations," *Supply Chain Management Review 17*, no. 5 (September 2013): 22–29, https://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=90423931&site=ehost-live&scope=site.
50 Wieland and Handfield, "The Socially Responsible Supply Chain: An Imperative for Global Corporations."
51 Kathy Chu, "Apparel Retailers Confront Tough Options," *The Wall Street Journal*, May 8, 2013, https://www.wsj.com/articles/SB10001424127887323687604578468912873242332.
52 Anita Chan, "A 'Race to the Bottom,'" *China Perspectives* 2003, no. 2 (April 2003), https://doi.org/10.4000/chinaperspectives.259.
53 Chan, "A 'Race to the Bottom."
54 Chan, "A 'Race to the Bottom."
55 Chan, "A 'Race to the Bottom."
56 Chan, "A 'Race to the Bottom."
57 "ILO welcomes accord on Building and Fire Safety in Bangladesh," *International Labour Organization,* last modified May 14, 2013, https://www.ilo.org/global/about-the-ilo/newsroom/statements-and-speeches/WCMS_213295/lang--en/index.htm.
58 "ILO welcomes accord on Building and Fire Safety in Bangladesh."
59 Refayet Ullah Mirdha, "Bangladesh now home to world's best green factory," *The Daily Star*, February 25, 2023, https://www.thedailystar.net/business/news/bangladesh-now-home-worlds-best-green-factory-3257106.

Asparagus harvesting in Maneadero Valley in Baja California, Mexico.

Credit: Tomascastelazo

life balance, access to career prospects, or lower commuting costs for employees who can finish work offsite. This can even help workers to have more flexibility in their schedules. Furthermore, the employer will gain from improvements in productivity, higher personnel retention rates, and cost savings on physical resources. Both advancement and difficulties of a connected world are reflected in the evolution of globalization over the course of the 20th and 21st century. It has led to opportunities for economic growth, but it has also highlighted the vulnerabilities of workers and marginalized groups. Societies can work to harness the advantages of globalization while ensuring that its costs are fairly distributed by encouraging equitable trade practices, improving labor standards, and prioritizing sustainable development.

Rural and Agricultural Labor

Rural jobs have many unique challenges. Eight out of ten workers who are poor live in rural areas. In these remote areas, much of the employment opportunity is limited to vulnerable employment, especially in agriculture.[60] Most child laborers are found in the agricultural sector, with over 98 million children being a part of some form of agricultural labor.[61] Climate change, natural resource degradation, violence, weak institutions, poor agricultural circumstances, and trade-related issues are all core causes of rural poverty. Rural poverty is an underlying cause of many societal issues, including hunger and malnutrition, poor working conditions, and child exploitation.

Rural areas contain all aspects of the economy, including the formal and informal sectors, local business, and large corporations. Many rural areas have competing interests at play. However, the opinions of rural workers are often not considered nor implemented in policy. The consultation of workers is critical for the implementation of the Sustainable Development Goals, more specifically, SDG 8: Decent Work and Economic Growth. A continued lack of opportunities to engage in decent work will lead to the "erosion of the basic social contract underlying democratic societies: that all must share in progress."[62] Even though poverty has decreased worldwide, severe and moderate poverty mostly still exist in rural areas. About 75 percent of the world's poor live in these rural places.[63] This is because there aren't many job options, and the goods rural workers can produce are not as

60 "Marking Progress against Child Labour Global Estimates and Trends 2000-2012 Governance and Tripartism Department," International Labour Organisation, 2013, https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---ipec/documents/publication/wcms_221513.pdf.
61 "Global Employment Trends 2012: Preventing a Deeper Jobs Crisis," International Labour Organisation, January 24, 2012, https://www.ilo.org/global/research/global-reports/global-employment-trends/WCMS_171571/lang--en/index.htm.
62 "DECENT WORK and ECONOMIC GROWTH: WHY IT MATTERS," United Nations, August 2016, https://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/8_Why-It-Matters-2020.pdf.
63 "Creating Shared Prosperity," United Nations Industrial Development Organization, 2015, https://www.unido.org/our-focus/creating-

demanded as industrial goods. When a country's economy grows, rural poverty usually goes down. But in places where the government does not assist farmers and improve things like roads and schools, rural poverty continues to be a big problem.[64] In order to address this, there must be equitable development that benefits all.

One of the most effective tools to reduce rural poverty is the development of the agro-industry.[65] This industry is twice as effective at development in terms of raising household incomes.[66] The agro-industry is simply the combination of all the processes that come from the production of agricultural items to getting them to where they are consumed.[67] Additionally, it helps to create shared prosperity, as it is projected to feed 9.7 billion people by the year 2050.[68] Development, especially in smaller countries, can be entirely dependent on agriculture. From Mongolia to Papua New Guinea and large portions of Sub-Saharan Africa, the share of agriculture in the GDP is over 30 percent.[69] There are also cross border effects of changes in the demographics of rural areas.[70] For example, in Mexico, the combination of a falling fertility rate, more educational opportunity, competition from domestic farms, and more job opportunities have led to less farm labor in the United States.[71] This has led to a rise in demand for farm labor, and the average farm wages have increased in the United States.

With this, the solution seems to be rather simple. However, major geopolitical issues can cause instability. Russia's invasion of Ukraine has caused a variety of effects on the global food supply, which directly affects the laborers involved with food production. The effects of this have been widespread, with many countries besides Ukraine being impacted. In Afghanistan during May 2022, food inflation had risen to 23.2 percent. This is mostly due to the rising fuel prices caused by the war. Afghanistan is a highly rural country, with 71 percent of the population living in rural communities.[72] This means that due to a conflict hundreds of miles away, there is loss of lives in Afghanistan due to hunger. In 2022, six million people in Afghanistan were classified as an Integrated Food Security Phase Classification (IPC) Phase Four Emergency.[73] This is the phase prior to what is classified by the IPC as Catastrophe/Famine.[74] Emergency Aid efforts are implemented regularly by UN organizations like the Food and Agriculture Organization (FAO) and the World Food Programme (WFP).[75] However, a key part of what UNIDO does follows the initial groundwork of these organizations. UNIDO works with both the WFP and FAO to develop programs and initiatives that will stop the recurrence of these catastrophic incidents in the first place.[76]

Taking steps to remedy this, UNIDO has a Department of Agribusiness. This department has a goal of using agriculture to promote the Sustainable Development Goals. They are able to accelerate the development of rural and agricultural economies by introducing advanced machinery and improving food security and investment in agribusiness worldwide.[77] Much of the work is rooted in humanitarianism,

shared-prosperity.
64 United Nations Industrial Development Organization, "Creating Shared Prosperity."
65 "Agriculture and Food," The World Bank, 2023, https://www.worldbank.org/en/topic/agriculture/overview.
66 Robert Townsend, "Ending Poverty and Hunger by 2030: An Agenda for the Global Food System," *World Bank*, April 16, 2015, https://documents.worldbank.org/en/publication/documents-reports/documentdetail/700061468334490682/ending-poverty-and-hunger-by-2030-an-agenda-for-the-global-food-system.
67 James Chen, "Agribusiness," Investopedia, 2019, https://www.investopedia.com/terms/a/agribusiness.asp.
68 "Agriculture and Food," The World Bank, 2023, https://www.worldbank.org/en/topic/agriculture/overview.
69 "Macroeconomy," Food and Agriculture Organization, 2014, https://www.fao.org/3/i2490e/i2490e01c.pdf.
70 David Oppedahl, "Labor Issues Facing Agriculture and the Rural Midwest," *Federal Reserve Bank of Chicago*, 2016, https://www.chicagofed.org/publications/chicago-fed-letter/2016/354.
71 Oppedahl, "Labor Issues Facing Agriculture and the Rural Midwest."
72 Government of Afghanistan, *Afghanistan Living Conditions Survey 2016-17* (2017), https://reliefweb.int/report/afghanistan/afghanistan-living-conditions-survey-2016-17.
73 "Hunger Hotspots: FAO-WFP Early Warnings on Acute Food Insecurity, October 2022 to January 2023 Outlook - World," World Food Programme and Food and Agriculture Organization of the United Nations, September 21, 2022, https://reliefweb.int/report/world/hunger-hotspots-fao-wfp-early-warnings-acute-food-insecurity-october-2022-january-2023-outlook.
74 "IPC Acute Food Insecurity Classification," Integrated Food Security Phase Classification, accessed September 30, 2023, https://www.ipcinfo.org/ipcinfo-website/ipc-overview-and-classification-system/ipc-acute-food-insecurity-classification/en/.
75 "Emergency Relief," World Food Programme, September 23, 2019, https://www.wfp.org/emergency-relief.
76 "FAO Working Together to Reduce Hunger, Helping Businesses from Farm to Fork," United Nations Industrial Development Organization, October 17, 2022, https://www.unido.org/news/unido-fao-working-together-reduce-hunger-helping-businesses-farm-fork.
77 "DEPARTMENT of AGRIBUSINESS PROMOTING INCLUSIVE and SUSTAINABLE AGRIBUSINESS DEVELOPMENT," United Nations Industrial Development Organization, 2019, https://www.unido.org/sites/default/files/files/2022-07/AGR_BROCHURE_

focusing on individuals, especially for disadvantaged groups, women, and youth. Focusing on improving many aspects of an individual's life by targeting activities in food safety and growth is important.[78] The department also focuses on wider, policy focused changes. They provide support to governments looking to make their development more sustainable and inclusive. They also contribute to global conversations of "farm-to-form" practices, sustainability, and the development of agricultural supply chains.[79]

Looking at an example, in Ethiopia, all of these solutions came together over 8 years. From 2014 to 2022, UNIDO transformed their largest export, coffee beans, into a more sustainable, more inclusive, higher quality product.[80] The production of coffee beans is a rather long and labor-intensive process. The only way to harvest the coffee "cherries" is by hand. Then they have to remove the outer and inner skin to get a green coffee bean that is ready to be roasted. For this project, UNIDO invested in small-scale washing and hulling mills across the country to develop more robust supply chains that allowed for more consistency for the people who work on these farms.[81] They also created robust training on how to ensure that sustainability is at the forefront of coffee production in the country moving forward.[82] As you can see, there are human level exchanges of information that will help to develop the coffee industry in Ethiopia. However, there are also macro level changes like showing industry leaders how to do things well, ensuring the coffee is of high quality, and guiding about selling and making different types of coffee products will make the whole coffee process better.[83] Others both in Ethiopia and other countries can then use this as an example to learn from and improve upon the industry in their own country.

The transformation of an industry can increase domestic economic development. For example, the project in Ethiopia was estimated to touch 20 million people dependent on the crop for their livelihood.[84] Rural economies have an often underutilized potential to create decent work.[85] For example, the green energy transition is dependent on clean energy and environmental protection jobs, particularly in rural areas.[86] Technology is also a key contributor in furthering economic development in agricultural areas. For example, digital tools can help farms grow more food and create more jobs.[87] However, the implementation of technology has the ability to exclude groups. This is why it is critical that digital solutions are inclusive and can help all rural workers. The Russian invasion of Ukraine, climate change, and the pandemic have led to a strained food supply that puts pressure on rural economies, yet they have underutilized potential for development.[88]

Workplace safety and prosperity must be an ongoing commitment.[89] In the coming years, the future of work in the rural economy will need to change. It will need to be improved organizationally to create decent and sustainable work beyond urban areas.[90] The youth and women must also be considered, as 520 million jobs will need to be created with these groups

WEB.pdf.
78 United Nations Industrial Development Organization, "DEPARTMENT of AGRIBUSINESS PROMOTING INCLUSIVE and SUSTAINABLE AGRIBUSINESS DEVELOPMENT."
79 United Nations Industrial Development Organization, "DEPARTMENT of AGRIBUSINESS PROMOTING INCLUSIVE and SUSTAINABLE AGRIBUSINESS DEVELOPMENT."
80 United Nations Industrial Development Organization, "DEPARTMENT of AGRIBUSINESS PROMOTING INCLUSIVE and SUSTAINABLE AGRIBUSINESS DEVELOPMENT."
81 United Nations Industrial Development Organization, "DEPARTMENT of AGRIBUSINESS PROMOTING INCLUSIVE and SUSTAINABLE AGRIBUSINESS DEVELOPMENT."
82 United Nations Industrial Development Organization, "DEPARTMENT of AGRIBUSINESS PROMOTING INCLUSIVE and SUSTAINABLE AGRIBUSINESS DEVELOPMENT."
83 United Nations Industrial Development Organization, "DEPARTMENT of AGRIBUSINESS PROMOTING INCLUSIVE and SUSTAINABLE AGRIBUSINESS DEVELOPMENT."
84 S.Weghofer, M.Mertl, X.Yao, S.Strambu, "Improving the Sustainability and Inclusiveness of the Ethiopian Coffee Value Chain through Private and Public Partnership," August 30, 2022, https://open.unido.org/projects/ET/projects/130144.
85 *Social Justice for Rural Populations Means Prosperity for the Planet - Potential,* (International Labour Organization, June 2023), https://www.ilo.org/infostories/en-GB/Stories/Employment/rural-economies#potential.
86 *Social Justice for Rural Populations Means Prosperity for the Planet - Potential.*
87 *Social Justice for Rural Populations Means Prosperity for the Planet - Potential.*
88 *Social Justice for Rural Populations Means Prosperity for the Planet - Potential.*
89 "ILO Declaration on Fundamental Principles and Rights at Work and Its Follow-Up," International Labour Organization, 1998, https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---declaration/documents/normativeinstrument/wcms_716594.pdf.
90 "THE FUTURE of WORK in the RURAL ECONOMY," International Labour Organization, 2019, https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_731693.pdf.

in mind.[91] This begins with investment in education and a commitment to furthering vocational education for rural areas.[92] This is so that their skills can be aligned with the current needs of businesses. This will provide them with access to social services and level the playing field. This means that all youth can aspire to learn and have decent work, no matter their race, gender, or income. Equally important to education is the implementation of safety programs to protect all workers.[93] Lastly, unlocking the green economy in rural areas is the final step. Rural areas will be the most exposed to climate change, but they also are valuable when transitioning to a carbon-neutral economy.[94]

Inclusive and Sustainable Industrialization and the Future of Work

From 1990 to 2010, the global economy grew roughly 2.7 percent every year. During that time, the number of people who had less than USD 1.25 to live on each day decreased from 43 percent to 21 percent, which is around 1.2 billion people.[95] However, this does not mean that everyone is benefiting from the growth of the global economy. For example, during the same time frame, the income inequality gap grew wider in Europe and Asia.[96] Addressing this gap is critical to achieving the Sustainable Development Goals.

Sustainable Development Goal Target 9.2, which tasks UNIDO with promoting "inclusive and sustainable industrialization," has been one of the guiding principles for UNIDO since the development of the Sustainable Development Goals.[97] Inclusive and sustainable industrial development (ISID) allows for quick and sustained gains in living conditions for all people, and provides technical solutions to ecologically sound industrialization. It works towards environmental goals, such as better resource and energy efficiency, and technological

91 International Labour Organization, "THE FUTURE of WORK in the RURAL ECONOMY."
92 "DECENT WORK and ECONOMIC GROWTH: WHY IT MATTERS," United Nations, August 2016, https://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/8_Why-It-Matters-2020.pdf.
93 United Nations, "DECENT WORK and ECONOMIC GROWTH: WHY IT MATTERS."
94 International Labour Organization,"Social Justice for Rural Populations Means Prosperity for the Planet - Trends."
95 "TST Issue Brief: Sustained and Inclusive Economic Growth, Infrastructure Development, and Industrialization," United Nations Human Settlements Programme, 2019, https://sustainabledevelopment.un.org/content/documents/2078Draft%20Issue%20Brief_Sustained%20and%20Inclusive%20Economic%20Growth_Final_16Oct.pdf.
96 Giovanni Andrea Cornia and Bruno Martorano, "DEVELOPMENT POLICIES and INCOME INEQUALITY in SELECTED DEVELOPING REGIONS, 1980–2010," United Nations Conference on Trade and Development, December 2012, https://unctad.org/system/files/official-document/osgdp20124_en.pdf.
97 "9.2 Promote Inclusive and Sustainable Industrialization, and by 2030 Raise Significantly Industry's Share of Employment and GDP in Line with National Circumstances, and Double Its Share in LDCs – Indicators and a Monitoring Framework," UN Sustainable Development Solutions Network, accessed October 29, 2023, https://indicators.report/targets/9-2/.

Automation is a new frontier for both businesses and workers alike

Credit: Clemenspool

advancement.[98] "Inclusive" means that everyone who could be affected by an issue is represented in the process. This is important, as every stakeholder should be provided with equal opportunity to benefit from the outcome. Stakeholders can include businesses, company managements, but also workers, local governments, and the local community.

Creating inclusive and sustainable development suggests that all areas of society are able to benefit from industrialization and global development. Industrialization is a process in which human settlement, consumption, and production radically transform and improve. Industrial development means that factories and mechanized production grow.[99] Industrialization raises the living standards of the entire population. However, with industrialization, the possibility for greater inequalities rises. This is because wages for some may rise faster than others during industrialization, which creates structural inequalities. This case stresses UNIDO's and other UN organizations' mission to work towards SDG 1 to end poverty, SDG 8 to promote decent work and economic growth, and SDG 10 to reduce inequality.[100] There is no single formula for successful development. However, looking at the rise of nations like the United States, China, Japan, or many European countries, one commonality can be seen: Industrial Development.[101]

As global production has largely shifted to developing countries, the landscape of manufacturing on a global scale has changed dramatically in recent years.[102] The global economic downturn resulted in a significant slowdown in emerging and developing industrial economies as well as a sharp decline in production in industrialized nations.[103] However, in recent years, global manufacturing has started to grow again steadily. Manufacturing, especially in the Asia-Pacific region, continues to be a key factor in global economic expansion.[104]

Looking at palm oil production in Malaysia, we can understand the complications and best practices that exist in promoting inclusive and sustainable growth. With the creation of long-term jobs and a fair revenue distribution, the palm oil sector in Malaysia has significantly aided in the country's steady socioeconomic growth over the past three decades, increasing national value added and export revenues.[105] The Malaysian government promoted the rapid growth of oil palm in the 1960s because it saw the crop's potential as a rubber-complementary crop.[106] Now, Malaysia is the leader in palm oil production with 39 percent of the world's palm oil originating from Malaysia.[107] Since there is little fertile land available for new oil palm plantations in Malaysia due to its small size, the country has been replacing underperforming palm trees with high-yielding hybrid plants to boost productivity and competitiveness. Replanting is a part of the exercise on lands owned by independent smallholders, who are responsible for 14 percent of Malaysia's oil palm land.[108] This example shows how identifying weaknesses and turning those into areas for growth and employment can successfully increase sustainability.[109]

However, progress made is reliant on the successes being shared with all members of a society. Industrialization patterns have a significant influence on the manner in which the poor benefit from growth.[110] Inclusive and Sustainable Industrialization relies on new government policy, sustainable,

98 United Nations Industrial Development Organization, "Inclusive and Sustainable Industrial Development," https://www.unido.org/inclusive-and-sustainable-industrial-development.
99 Wilkinson, "Industrialization, Labor, and Life."
100 "Industrialization as the Driver of Sustained Prosperity | UNIDO," UNIDO, accessed August 21, 2023, https://www.unido.org/industrialization-driver-sustained-prosperity.
101 Yong Li, "Towards Inclusive and Sustainable Industrial Development," *Development* 58, no. 4 (December 2015): 446–51, https://doi.org/10.1057/s41301-016-0055-8.
102 Li, "Towards Inclusive and Sustainable Industrial Development."
103 Li, "Towards Inclusive and Sustainable Industrial Development."
104 Li, "Towards Inclusive and Sustainable Industrial Development."
105 "Sustaining Employment Growth: The Role of Manufacturing and Structural Change," United Nations Industrial Development Organization, 2013, https://www.unido.org/sites/default/files/2013-12/UNIDO_IDR_2013_main_report_0.pdf.
106 United Nations Industrial Development Organization, "Sustaining Employment Growth: The Role of Manufacturing and Structural Change."
107 United Nations Industrial Development Organization, "Sustaining Employment Growth: The Role of Manufacturing and Structural Change."
108 United Nations Industrial Development Organization, "Sustaining Employment Growth: The Role of Manufacturing and Structural Change."
109 "Malaysian Palm Oil Industry Helps Achieve SDGs," *IChemE*, July 4, 2022, https://www.icheme.org/knowledge-networks/communities/special-interest-groups/palm-oil-processing-sig/news/malaysian-palm-oil-industry-helps-achieve-sdgs/.
110 Li, "Towards Inclusive and Sustainable Industrial Development."

and an increase in prosperity for all. The future of work is reliant on continued inclusive and sustainable industrialization. New forces, like telework, among many others, are changing the world of work. With this, the global community must ensure that strong, decisive action is taken.

Technology will change the majority of jobs in the near future. For example, automation is projected to replace 85 million jobs worldwide by 2025.[111] However, it is also expected to create 97 million new roles that will balance machines and human interaction.[112] With the clear picture that automation will lead to job loss, it is critical to slow this with proper adjustments. However, there is a mismatch of what skills people have and what is desired by businesses looking to automate.[113] This worries economists because they think the current education and training systems may not be ready for what's coming in the future.[114] This is why the exchange of information is a crucial aspect of globalization. For instance, direct foreign investment can contribute to a greater wealth of information in a country regarding technological development. In general, knowledge about the methods of production, management, markets, and economic policies is a very valuable resource for developing nations.[115]

Current Status

Recent Progress and the Gig Economy

In recent years, significant progress has been made to strengthen labor rights and protections globally. Governments, international organizations, and local groups have worked together to create environments where workers are given adequate working conditions.[116] While these improvements have been happening, new kinds of work offered in what is known as the "gig economy" have appeared. This refers to work that involves short-term jobs, freelancing, and using technology for work. An example of this could include being a ride-share driver, freelance graphic designer, or virtual assistant.[117] The gig economy has led many to wonder how it will affect worker rights, medical insurance or paid time off, and the future of labor.[118] It is becoming clear that the ways we protect workers may change based on different working environments.

As we look at how labor rights have improved and explore the gig economy, it is important to understand non-standard work and what it means for modern jobs. Workers in traditional employment arrangements are often subject to labor laws as defined previously. They are also entitled to benefits such as paid vacations, medical coverage, and insurance. However, many workers today participate in the informal economy, and may not have access to the benefits such as retirement funds and insurance coverage. With 11 percent of the global workforce in temporary or gig jobs, this forces governments to consider things such as the types of safeguards that non-standard laborers should be granted.

The informal economy is most simply defined as what happens beyond the scope of the government and is usually not taxed.[119] This includes non-standard jobs, as defined previously. The informal economy is not new, and many people interact with the informal economy daily. The informal economy is characterized by its own entry requirements in terms of money and professional qualifications, its relatively small size, and exploitative methods of production that are

111 Jennifer Kingston, "AI and Robots Fuel New Job Displacement Fears," *Axios*, April 2, 2023, https://www.axios.com/2023/03/29/robots-jobs-chatgpt-generative-ai.
112 "The Future of Jobs Report 2020," World Economic Forum, October 20, 2020, https://www.weforum.org/reports/the-future-of-jobs-report-2020/in-full/executive-summary.
113 "What Is Skills Mismatch and Why Should We Care?" *International Labour Organization*, April 1, 2020, https://www.ilo.org/skills/Whatsnew/WCMS_740388/lang--en/index.htm.
114 Kingston, "AI and Robots Fuel New Job Displacement Fears."
115 "Globalization: Threat or Opportunity? An IMF Issues Brief," International Monetary Fund, 2011, https://www.imf.org/external/np/exr/ib/2000/041200to.htm.
116 Gary Burtless, "Workers' Rights: Labor Standards and Global Trade," *Brookings*, September 2001, https://www.brookings.edu/articles/workers-rights-labor-standards-and-global-trade/.
117 Andrew Moran, "30 High-Paying Gig Economy Jobs You Should Consider," *Career Addict*, July 14, 2023, https://www.careeraddict.com/gig-economy-jobs.
118 Jim Daly, "As the Gig Economy Expands, Our Social Safety Net Shrinks," *Medium,* February 9, 2018, https://medium.com/@jrdaly/as-the-gig-economy-expands-our-social-safety-net-shrinks-f5078083e687.
119 "In the Shadows," *The Economist,* June 17, 2004, https://www.economist.com/finance-and-economics/2004/06/17/in-the-shadows.

Delivery drivers are an example of the growing gig economy

Credit: shopblocks

labor-intensive.[120] What is new, is the technology behind this gig economy. What this looks like varies in many countries. In some, it includes on demand services like Uber or DoorDash, whereas in others it can result in unregulated factories which could result in violations of labor law or avoidance of taxes.[121]

The gig economy began as a way to use technology to lessen labor costs and reliance on human capital (workers).[122] Jobs such as making deliveries, personal transportation, and other small tasks being contracted out to people who are not employees of a given firm. Uber and DoorDash are good examples of this. Uber is a ride-share service with contracted drivers, and DoorDash contracts food deliverers. Using this technology and implementing new social structures allows these platforms to flourish. There are three main selling points for why gig workers get involved with these platforms. Workers have a flexible schedule, consistent income, and low barriers to entry, as many of these do not require an educational degree or certification.[123]

Globally, countries are making changes to the legal statuses and protections for gig economy workers who work off mobile apps. In the United States, the Federal Trade Commission (FTC) has begun to push back against this big economy. The FTC has laid out three areas of concern regarding gig work. These include the possible misrepresentations about the functions of gig work, lessened bargaining power, and concentrated markets.[124] However, around the world, these concerns may not be applicable. In France, gig workers in the food delivery sector were recently guaranteed a minimum wage.[125] This is another step at regulating the growing gig economy that is occurring across the country. India's largest state, Rajasthan, has passed a new law requiring a two percent additional tax on every mobile app-based gig transaction.[126] This tax will go towards worker welfare measures and will help move gig workers into the formal economy, qualifying them for social security benefits. With over 7.7 million platform-based gig workers expected to grow to 23 million by the year

120 Kristina Floodman Becker, "The Informal Economy," *Sida*, March 2004, http://www.rrojasdatabank.info/sida.pdf.
121 Becker, "The Informal Economy."
122 Luka Bulian, "The Gig Is Up: Who Does the Gig Economy Actually Benefit?," *Interdisciplinary Description of Complex Systems 19*, no. 1 (2021): 106–119, https://doi.org/10.7906/indecs.19.1.9.
123 Bulian, "The Gig Is Up: Who Does The Gig Economy Actually Benefit?"
124 Micheal Holt and John Polson, "FTC Sends Strong Antitrust Warning to Gig Economy Businesses," *Fisher Phillips,* September 20, 2022, https://www.fisherphillips.com/en/news-insights/ftc-sends-strong-antitrust-warning-to-gig-economy-businesses.html.
125 "French Food Delivery Gig Workers to Get Minimum Wage," *Techxplore*, April 23, 2023, https://techxplore.com/news/2023-04-french-food-delivery-gig-workers.html.
126 Pawanjot Kaur, "Indian State's New Tax on Digital Platforms Sets Gig Workers against Firms," *Al Jazeera*, July 23, 2023, https://www.aljazeera.com/economy/2023/7/27/indian-states-new-tax-on-digital-platforms-sets-gig-workers-against-firms.

2030, India has a wide and unregulated informal sector. This tax is the first step towards closing that gap.[127]

Measuring the size of the informal economy can be extremely difficult. When comparing the size of the informal economy to the regulated economy, the size of the entire labor force is often underestimated. Using GDP to measure the economic development of a country can also be problematic. This is because it excludes the informal economy, which is a major driver of a country's economic growth.[128] For example, in Tanzania, it is estimated that 34 percent of all households in the country are participating either partly or fully in the informal economy.[129] Furthermore, roughly 22 percent of Tanzania's jobs are located within its informal sector. In Tanzania's capital, Dar es Salaam, the informal economy consists of 55 percent of the country's total economic output. However, these operations have their own issues for laborers.[130]

The gig economy brings about other disadvantages for workers. Due to the technological nature of the job, many workers are isolated, overworked, and underpaid.[131] Additionally, they don't receive as many benefits as traditional workers, and are forced to work even multiple jobs to afford their costs of living.

The evolution of informal labor and the gig economy has shown that creating fair working conditions will change based on how the jobs themselves are changing. As we note improvements in workers' treatments and explore the details of the gig economy, we can see that protecting labor means understanding the unique nature of informal work and gig jobs. Many countries are making new laws and rules to handle the issues caused by gig work. They are ensuring these workers get paid a certain minimum amount, adding taxes to help workers, and helping gig workers become part of the regular job system.[132]

It is important to note that the classification of a worker, whether it be formal or informal, has a significant impact on their personal conditions. It also has an impact on how they pay their taxes. There are many laws that determine whether an individual is an employee of the formal economy. Some of these classifications include having specific working hours and fixed wages. When none of these criteria are satisfied, an individual is classified as an independent contractor or self-employed, making them part of the informal economy.[133] It is important to note that individuals in this group have limited rights. According to this perspective, only formal employees are entitled to full employee rights. For example, unless specific legislation is in place, a worker in the gig economy cannot sue an employer for unfair dismissal. Despite this, they are usually entitled to benefits like paid annual leave and pay higher than the national minimum wage.

Recently, the United States has made it more difficult for gig companies to classify workers as independent contractors. This means that it is harder for a gig employer to avoid the responsibility to pay for employee benefits and follow labor laws.[134] The United States Department of Labor stated that this regulation conflicted with the Fair Labor Standards Act of 1938 and would have "undermined" current law on gig employment in the country.[135] However, many companies that rely on gig labor urged the United States Government to support and recognize gig workers as full employees. The reason for this is that the government would then pay much of

127 Kaur, "Indian State's New Tax on Digital Platforms Sets Gig Workers against Firms."
128 Jacques Charmes, "The Informal Economy Worldwide: Trends and Characteristics," *Margin: The Journal of Applied Economic Research* 6, no. 2 (May 2012): 103–132, https://doi.org/10.1177/097380101200600202.
129 "Roadmap Study of the Informal Sector in Mainland Tanzania, "International Labour Organization, United Nations Industrial Development Organization, and United Nations Development Programme, April 2002, https://www.ilo.org/wcmsp5/groups/public/@ed_emp/@emp_policy/@invest/documents/publication/wcms_asist_8365.pdf.
130 International Labour Organization, United Nations Industrial Development Organization, and United Nations Development Programme, "Roadmap Study of the Informal Sector in Mainland Tanzania."
131 "Gig Economy," Corporate Finance Institute, February 3, 2022, https://corporatefinanceinstitute.com/resources/economics/gig-economy/.
132 Hannah Johnston and Chris Land-Kazlauskas, *Organizing On-Demand: Representation,Voice, and Collective Bargaining in the Gig Economy CONDITIONS of WORK and EMPLOYMENT SERIES No. 94 INWORK,* (Geneva: ILO, 2019), https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_624286.pdf.
133 "Difference between Formal Sector and Informal Sector," GeeksforGeeks, February 8, 2023, https://www.geeksforgeeks.org/difference-between-formal-sector-and-informal-sector/.
134 Andrew J. Hawkins, "Biden's Labor Department reverses Trump-era gig worker rule," *The Verge*, May 5, 2021, https://www.theverge.com/2021/5/5/22420896/biden-labor-department-reverse-gig-worker-rule-trump.
135 Hawkins, "Biden's Labor Department reverses Trump-era gig worker rule."

these workers' benefits as opposed to the company itself. For example, Uber in the United States and Canada claims their drivers are independent contractors, and that Uber should not have to pay for their benefits.[136] Uber believes that their workers should be recognized as full standard employees, so that the federal government can provide them with relief.[137]

As a result of this, many countries have begun to impose laws that protect the workers in the informal and gig economies. In 2018, France's Supreme Court ruled that gig workers for online platform workers are considered full employees.[138] In the United Kingdom, the Revenue and Customs Office has promised to provide tax and social security benefits to people who work in the gig economy.[139] In Canada, the Expert Panel on Modern Federal Labor Standards has been established. This committee is mandated to develop labor protections for non-standard workers.[140] All of these efforts show that governments are beginning to grapple with the increasing participation in the gig and informal economies and protect labor within them.

One of the biggest considerations that delegates must make is that there are clear definitions and rules regarding relationships between companies, governments, and the informal economy. When a company hires non-standard employees such as temporary employees, the company's performance may be harmed.[141] This is because these temporary workers may not know a lot of people in the company, meaning that they cannot easily share important information with everyone else.[142] They may also be unfamiliar with the specific company's procedures, methods, and products. A higher use of temporary workers leads to lower productivity and higher rates of employees not showing up to work.[143] This means that for businesses, the gig economy is not always the best option.

The gig economy may be considered a double-edged sword. It allows workers to have flexible arrangements, but also, it can deprive them of stable incomes and important employment benefits. As a response, regulatory bodies are creating new legislation to safeguard the rights and welfare of gig workers, recognizing the need for an adapted framework in response to evolving work patterns. International bodies such as the International Labor Organization and the United Nations Industrial Development Organization are also creating guidelines for their members to navigate and protect labor in the informal and gig economies. Delegates in this committee should consider how to further the benefits of the informal and gig economies while strengthening protections for their workers.

Deregulation and its Effect on the Economy and Labor

Evidence around the world has shown that the current labor regulations are not protecting everyone. There are more people than ever before working in non-standard roles, such as temporary jobs, who are not protected by regulations. Critics often argue that deregulation is needed, as the current regulations mainly benefit select groups.[144] Deregulation involves relaxing or removing certain rules and regulations that businesses need to follow.[145] It is aimed at granting more flexibility for companies to shape their strategies and operations. Supporters of deregulation argue that by reducing regulations, businesses can become more agile and

136 Andrew J. Hawkins, "Uber wants Congress to include protections for drivers in coronavirus stimulus package," *The Verge*, May 23, 2020, https://www.theverge.com/2020/3/23/21190806/uber-coronavirus-driver-protections-economic-stimulus.
137 Hawkins, "Uber wants Congress to include protections for drivers in the coronavirus stimulus package."
138 Nathalie Devernay, Benjamin Fiedler, and Chris Ivey, "Delivery riders are employees, not self-employed workers, according to a French Supreme Court ruling," *Bird&Bird*, November 29, 2018, https://www.twobirds.com/en/insights/2018/france/delivery-riders-are-employees-not-self-employed-workers-according-to-a-french-supreme-court-ruling.
139 Flor Zaccagnino, "Gig Economy Law in Different Countries Around the World," BunnyStudio, last modified August 19, 2021, https://bunnystudio.com/blog/gig-economy-law/.
140 "Expert Panel on Modern Federal Labour Standards," Government of Canada, accessed August 20, 2023, https://www.canada.ca/en/employment-social-development/campaigns/expert-panel-labour-standards.html.
141 Elizabeth George and Prithviraj Chattopadhyay, *Non-standard work and workers: Organizational implications* (Geneva: International Labour Office, 2015), https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_414581.pdf.
142 Patricia Sias, Michael Kramer, and Edith Jenkins, "A Comparison of the Communication Behaviors of Temporary Employees and New Hires," *Communication Research* 24, no. 6 (December 1997): 731–754, https://doi.org/10.1177/009365029702400606.
143 Michele Battisti and Giovanna Vallanti, "Flexible Wage Contracts, Temporary Jobs, and Firm Performance: Evidence From Italian Firms," *Industrial Relations: A Journal of Economy and Society* 52, no. 3 (June 2013): 737-764, https://doi.org/10.1111/irel.12031.
144 Rubery, *Re-regulating for inclusive labour market*.
145 "Deregulation," Corporate Finance Institute, accessed September 5, 2023, https://corporatefinanceinstitute.com/resources/economics/deregulation/.

Collective bargaining and unionization are both common responses to deregulation

Credit: AFGE

make greater contributions to economic growth. However, deregulation has significant impacts, as it can change both the functioning of businesses and the rights of workers. Some shortcomings of deregulation include less oversight on corporations, which can lead to cases of fraud or an attempt to monopolize a certain market.[146]

The deregulation of labor markets is a significant issue debated globally. The consequences of labor deregulation can impact workers, businesses, and society in various ways, leading to both positive and negative outcomes. For example, as the global economy changes and new trends form, new goods and services will be in demand. To meet this demand, many regions have eliminated regulations and labor protections. In some cases, a country may employ child labor to produce more of a highly demanded good. On the other hand, many countries have pursued greater deregulation in the interest of more flexibility and economic competitiveness. Deregulation promotes greater labor market flexibility, allowing firms to swiftly adjust to shifting economic situations.[147] For instance, changes that make hiring and firing employees easier may encourage employment growth because they give firms the ability to make quick adjustments to their personnel. According to the World Bank, labor market flexibility can improve economic performance by encouraging a more effective resource allocation and increasing productivity.[148] However, this does not always benefit the individual workers, as that same flexibility can lead to uncertain working conditions.

There are issues concerning workers' rights and job security when regulations are loosened. Cases of extreme deregulation may face workers with insecure working conditions, an unstable income, and insufficient benefits. Excessive deregulation may also result in the loss of basic labor rights, such as the freedom to engage in collective bargaining and the protection from abusive labor practices.[149] At-risk populations such as low-skilled employees and migrants may be disproportionately impacted by these forms of deregulation.[150] The uncertainty surrounding deregulation has effects beyond work, including deep health issues. Workers in precarious jobs may be more susceptible to stress and health problems.[151]

146 Corporate Finance Institute, "Deregulation."
147 *World Development Report 2017* (Washington: World Bank, 2017), https://www.worldbank.org/en/publication/wdr2017.
148 *World Development Report 2017*.
149 Anasua Bhattacharya and Tapas Ray, "Precarious Work, Job Stress, and Health-related Quality of Life," *Centers for Disease Control and Prevention*, August 9, 2022, https://blogs.cdc.gov/niosh-science-blog/2022/08/09/precarious-work.
150 "Precarious employment trends indicate increases in income inequality and health disparities," *Department of Epidemiology School of Public Health*, January 28, 2021, https://epi.washington.edu/news/precarious-employment-trends-indicate-increases-in-income-inequality-and-health-disparities/.
151 "Precarious employment trends indicate increases in income inequality and health disparities."

Opposition to regulation in labor stems from economic theory.[152] In essence, the idea is that the most efficient markets have little governance or regulation.[153] However, there is limited evidence to support this. Findings point to no correlation between employment regulations and productivity or growth.[154] This can be particularly difficult to declare globally, as few studies have covered every country.[155] Also, every country has slightly different legal practices, and it may be difficult to capture all groups of society in case studies which may put certain groups at risk of being left out.[156] Thus, research on the global effects of regulation and its effect on labor markets is limited. However, specific case studies can show how deregulation has impacted local economies and jobs. Overall, trends indicate that less strict regulations don't necessarily lead to higher market performance.

In the 1980s, the of the United States railroad industry had lasting impacts on labor in the country. Most notably, the Staggers Rail Act of 1980 brought a wave of deregulation that changed the labor landscape of the railroad industry. Prior to this act, the railroad industry operated in a heavily unionized environment with high labor costs and extensive work rules.[157] However, the Staggers Act reduced much of this and created a disproportional relationship between employers and laborers. Despite these changes, the rates of union participation remained substantial, at about one in two workers being in a union.[158] Similar impacts occurred with the deregulation of the flight and trucking industries.

In 2023, the impacts of the Staggers Act can still be felt. From short-staffed train crews to unregulated hours, the impact of the deregulation is well embedded in the United States transportation industry. As newer trains grow in length, they may delay first responders in the event of an emergency as they must wait for three-mile-long trains to pass.[159] Trains this long were enabled by the Staggers Act. In light of this, new legislation was created to make rail lines safer. For example, the Railway Safety Act in the United States was created after a freight train accident in February 2023, in East Palestine, Ohio.[160] This accident gained public attention mainly because the train was carrying dangerous chemicals that spilled and caught fire.[161] The Railway Safety Act then allowed the United States Department of Transportation to make new guidelines for rail safety. For example, they can limit the transport of hazardous materials, the length of a train, and the size of the train crew.[162] It is important to consider the effects that this will have on labor in the United States railroad industry. For example, one provision of the bill is that it will ensure a permanent two-person train crew requirement, meaning that rail companies cannot cut costs by hiring smaller crews. This form of regulation has increased the opportunities for prospective rail workers.[163]

On another note, since the deregulation of United States airlines in 1978, we have seen more than 150 new airlines formed in the country. Today, less than a dozen of these still exist.[164] Between 1998 and 2006, the remaining airlines cut 26 percent of their employees.[165] Flight attendants have seen pay cuts, work rule modifications, and layoffs. Since 2003,

152 Sangheon Lee and Deirdre McCann, *Regulating for Decent Work*, (2011), chap. 3, https://doi.org/10.1057/9780230307834_1.
153 "THE OECD JOBS STUDY Facts, Analysis, Strategies Wages: The Link between People and Jobs Five Country Experiences," 1994, https://www.oecd.org/els/emp/1941679.pdf.
154 Howell et al., "Are Protective Labor Market Institutions at the Root of Unemployment? A Critical Review of the Evidence," *Capitalism and Society* 2, no. 1 (May 2007), https://doi.org/10.2202/1932-0213.1022.
155 J. Rubery, "Towards a gendering of the labour market regulation debate," *Cambridge Journal of Economics* 35, no. 6 (November 2011): 1103-1126, https://www.jstor.org/stable/24232491.
156 Rubery, *Re-regulating for inclusive labour market.*
157 James Peoples, "Effect of Deregulation on Labor Markets," *Regulatory Studies Center Columbian College of Arts & Sciences*, October 28, 2020, https://regulatorystudies.columbian.gwu.edu/effect-deregulation-labor-markets.
158 David Kemp and Peter Van Doren, "Understanding the Railroads-Unions Fight," CATO Institute, accessed August 20, 2023, https://www.cato.org/regulation/spring-2023/understanding-railroads-unions-fight.
159 Andrea Salcedo, Luz Lazo, and Lee Powell, "Miles-long trains are blocking first responders when every minute counts," *The Washington Post*, May 25, 2023, https://www.washingtonpost.com/nation/interactive/2023/long-trains-block-intersections-paramedics/.
160 Salcedo, Lazo, and Powell, "Miles-long trains are blocking first responders when every minute counts."
161 Marc Scribner, "The Senate's Railway Safety Act won't improve rail safety," Reason Foundation, last modified May 17, 2023, https://reason.org/commentary/the-senates-railway-safety-act-wont-improve-rail-safety/.
162 Scribner, "The Senate's Railway Safety Act won't improve rail safety."
163 Scribner, "The Senate's Railway Safety Act won't improve rail safety."
164 James Lardner and Robert Kuttner, *Flying Blind Airline Deregulation Reconsidered* (New York City: Demos, 2009), https://www.demos.org/sites/default/files/publications/Flying%20Blind.pdf.
165 United States Government Accountability Office, *Potential Mergers and Acquisitions Driven by Financial and Competitive Pressures* (2008),

the number of employees at American Airlines, a prominent international airline, has decreased by 35 percent, from 26,000 to 17,000. Many flight attendants must work three or four more days per month to get anywhere near their previous income levels.[166]

The growing trend of deregulation puts employees at risk. However, it also puts economic prosperity at risk. Between 2009 and 2015, the net benefit of regulations was estimated at over USD 100 billion annually, according to the Economic Policy Institute, a non-profit economic research body.[167] Therefore, a wave of deregulation has the potential to reduce a lot of the economic benefits from existing regulations. The United States Congress' Office of Management and Budget (OMB) found that in major regulations from 2000 to 2010, the average annual benefit was about seven times the cost.[168] This means that the benefit of many regulations far exceeded the costs associated with keeping them. In the context of labor, in the United States, mass layoffs occur when at least 50 people file for unemployment benefits against the same employer in a five-week period.[169] While mass layoffs are not a direct result of regulations, a lack of regulations can lead to job loss.[170] Therefore, regulations play a role in sustaining future work and creating more job opportunities. Recently, there has been a push to enable children to join the labor force in the United States. From 2021 to 2023, there has been a 37 percent increase in violations of minor labor laws.[171] Additionally, 10 states have already or are now beginning to remove child labor laws.[172] For example, a proposed law in the state of Iowa would allow 14-year-olds to work in meatpacking facilities.[173] This particularly affects unaccompanied minor migrants who cross the United States-Mexico border. These deregulations will roll back labor protections for them at a particularly vulnerable time.[174]

Delegates must think carefully about the trade-offs between deregulation and defending workers' rights. To ensure that labor deregulation does not compromise employees' welfare and fundamental rights, efficient labor inspection systems and open social dialogue are required. Despite the idea that deregulating labor markets can boost economic performance, critics of this stress the potential loss of worker rights, job security, and income equality. To create an atmosphere in which economic progress is compatible with worker protection and dignity, the proper balance of deregulation and workers' rights must be struck.

Sustainable Development Goals

The United Nations developed the Millennium Development Goals (MDGs) in 2000, with the intention to reduce poverty, eradicate AIDS/HIV, empower women, and more. The MDGs were intended to be met by 2015, but on each goal, the world came up short.[175] In 2015, building on the lessons learned from the MDGs, the United Nations introduced the Sustainable Development Goals (SDGs). The SDGs are similar to the MDGs, but are more focused on inclusive, sustainable economic development. The SDGs and their targets are intended to address areas of critical importance for humanity, such as ending climate change.[176]

https://www.gao.gov/assets/gao-08-845.pdf.
166 Lardner and Kuttner, *Flying Blind Airline Deregulation Reconsidered.*
167 Celine McNicholas, Heidi Shierholz, and Marni von Wilpert, "Workers' health, safety, and pay are among the casualties of Trump's war on regulations," Economic Policy Institute, last modified January 29, 2018, https://www.epi.org/publication/deregulation-year-in-review/.
168 Celine McNicholas, Heidi Shierholz, and Marni von Wilpert, "Workers' health, safety, and pay are among the casualties of Trump's war on regulations."
169 McNicholas, Shierholz, von Wilpert, "Workers' health, safety, and pay are among the casualties of Trump's war on regulations."
170 Heidi Shierholz and Celine McNicholas, "Understanding the anti-regulation agenda," Economic Policy Institute, last modified April 11, 2017, https://www.epi.org/publication/understanding-the-anti-regulation-agenda-the-basics/.
171 Jennifer Sherer and Nina Mast, "Child labor laws are under attack in states across the country," Economic Policy Institute, last modified March 14, 2023, https://www.epi.org/publication/child-labor-laws-under-attack/.
172 Sherer and Mast, "Child labor laws are under attack in states across the country."
173 Katie Akin and Stephen Gruber-Miller, "'Our kids are not for sale:' Unions protest proposed changes to Iowa child labor law," *Des Moines Register*, February 27, 2023, https://www.desmoinesregister.com/story/news/politics/2023/02/27/amid-union-protests-iowa-lawmakers-consider-changes-to-child-labor-bill/69951320007/.
174 "The Dangerous Race to Put More Children to Work," *The New York Times*, March 24, 2023, https://www.nytimes.com/2023/03/24/opinion/editorials/arkansas-child-labor.html.
175 United Nations, "United Nations Millennium Development Goals," 2000, https://www.un.org/millenniumgoals/bkgd.shtml.
176 Economic Commission for Europe, Resolution 70/1, Sustainable Development Goals Voluntary Local Reviews: measuring progress towards the Sustainable Development Goals at the local level, ECE/HBP/2021/4 (July 19, 2021), https://unece.org/sites/default/files/2021-08/ECE_HBP_2021_4-2109985E.pdf.

One particular issue may be addressed by multiple SDGs. For example, the topic of defending labor standards in the global economy most closely aligns with three Sustainable Development Goals. Those being, Goal 4: Quality Education, Goal 8: Decent Work and Economic Growth, and Goal 10: Reduced Inequalities.[177] Development is best realized when people are treated fairly, have equal access to education, and can thrive in sustainable environments. Specifically, UNIDO works toward these goals through stimulating economic growth that prioritizes inclusive and sustainable industrial development and the creation of jobs.[178]

SDG 4: Quality Education is relevant when promoting and safeguarding labor rights.[179] Having a quality education helps equip workers with knowledge, skills, and critical thinking abilities. An educated workforce is better equipped to understand and advocate for their rights in the workplace. Well-educated employees are more likely to be aware of their rights, engage in informed collective bargaining, and stand up against unfair labor practices.[180] Also, the level of education has a direct correlation to the growth of a person's wage.[181] SDG Target 4.3 indicates that quality education includes vocational and technical education as well.[182] Vocational and technical education may help reduce skill gaps in the labor market by offering appropriate training and ensuring that employees are qualified for open positions.

Another SDG related to the topic of improving labor standards would be SDG 8: Decent Work and Economic Growth.[183] When addressing Goal 8, delegates have the opportunity to address policy gaps that would affect 3.22 billion workers worldwide.[184] Challenges such as child labor, forced labor, and fair wages need to be addressed. SDG Target 8.3 hopes to achieve full and productive employment, decent work for all, and wages equal to the value of people's work.[185] This offers us a chance to comprehend and discuss how multinational organizations like UNIDO support and keep track of labor standards. Delegates can also discuss how

177 United Nations, "The 17 Goals," accessed September 5, 2023, https://sdgs.un.org/goals.
178 "UNIDO & Sustainable Development Goals | UNIDO," United Nations Industrial Development Organization, accessed September 30, 2023,, https://www.unido.org/unido-sdgs.
179 United Nations, "Goal 4: Quality Education," sdgs.un.org, 2015, https://sdgs.un.org/goals/goal4.
180 Organization for Economic Cooperation and Development, "Home," November 19, 2019, https://www.oecd-ilibrary.org//sites/19de3145-en/index.html?itemId=/content/component/19de3145-en#sect-71.
181 Organization for Economic Cooperation and Development, "Home."
182 "Goal 4: Quality Education," United Nations, 2022, https://sdgs.un.org/goals/goal4.
183 "Goal 8: Decent Work and Economic Growth," United Nations, 2022, https://sdgs.un.org/goals/goal8.
184 "Global Employment Figures 2022," Statista, June 16, 2023, https://www.statista.com/statistics/1258612/global-employment-figures/.
185 United Nations, "Goal 8: Decent Work and Economic Growth," 2022, https://sdgs.un.org/goals/goal8.

Strikers picketing for the International Ladies Garment Worker Union (ILGWU)

Credit: The Kheel Center for Labor-Management Documentation and Archives

international cooperation can result in the better enforcement of labor standards.

To promote stronger labor standards, delegates should also explore SDG 10: Reduced Inequalities.[186] Labor standards play a key role in reducing inequalities. For example, eliminating gender inequality is closely related to protecting workers' rights. There are still numerous cases of wage differences between genders, occupational segregation, and discrimination.[187] Gender equality can be advanced by having robust labor laws that support work-life balance, ensure equal compensation for equal effort, and outlaw gender-based discrimination.[188] Delegates can encourage a comprehensive strategy to address gender inequities in the workplace by connecting with SDG 10. Improving labor rights is crucial for achieving decent work as well as for lowering social, economic, and gender inequities. In committee, UNIDO member countries may collaborate to create a more inclusive and equitable global economy where everyone has the chance to flourish by addressing these interconnected concerns.

Bloc Analysis

Points of Division

Countries' commitment to labor protections both at home and abroad are the main points of division when determining what bloc they will be in. There are two positions that are measurable and can show the status of labor in a country. The first point of consideration is a country's domestic labor protections and legislation surrounding them. The second point is the country's foreign labor policy. Using this, there are four possible combinations for blocs. The first bloc would include countries with strong domestic labor protections and a commitment to improving international labor standards. Another bloc would include countries with strong domestic labor protections and a disregard to improving international labor standards. On the other end, the third bloc would include countries with minimal domestic labor protections and a commitment to improving international labor standards. The last bloc includes countries with minimal domestic labor protections and a disregard to improving international labor standards.

Using the Labor Rights Index (LRI) as a guide, a country's commitment to labor domestically can be derived based on the amount of legislative protection that is given to laborers. The LRI is a valuable tool for measuring and comparing labor rights across different countries. It assesses factors such as workers' freedom of association, collective bargaining, child labor, forced labor, and discrimination. The LRI gives countries a score between 0 and 100 depending on how strong their domestic labor protections are. The higher a country scores, the stronger its labor protections are. The LRI surveys 95 percent of the global labor force, which is about 3.57 billion people.[189] One shortcoming of the LRI is that it only bases its scores on the written labor laws of a country, but not on whether they are enforced.[190]

Finding their international labor commitments can require an evaluation of trading policies and partners to understand how labor is respected beyond a country's borders. It is important to note that these blocs are not meant to villainize those without labor considerations. In many cases, smaller countries and less industrial countries may have less labor protections or no international stance on labor. However, it is important that labor protections at home and abroad are embraced everywhere.

It is important to consider that a country may have different policies between domestic jurisdictions, like states or provinces, and that a country may not always have consistent labor policies as labor is a political issue in some countries. In this instance, delegates should look to more recent examples within the last two years for their country's stance, as this will

186 United Nations, "Goal 10: Reduced Inequalities," 2015, https://sdgs.un.org/goals/goal10.
187 Jessica Schieder and Elise Gould, "'Women's Work' and the Gender Pay Gap: How Discrimination, Societal Norms, and Other Forces Affect Women's Occupational Choices—and Their Pay," Economic Policy Institute, July 20, 2016, https://www.epi.org/publication/womens-work-and-the-gender-pay-gap-how-discrimination-societal-norms-and-other-forces-affect-womens-occupational-choices-and-their-pay/.
188 Schieder and Gould, "'Women's Work' and the Gender Pay Gap: How Discrimination, Societal Norms, and Other Forces Affect Women's Occupational Choices—and Their Pay."
189 "Labor Rights Index 2022," Center for Labour Research, 2022, https://clr.org.pk/lri-2022/.
190 "Labor Rights Index 2022," Center for Labour Research.

be the most relevant in committee.

Countries with Strong Domestic Labor Protections and a Commitment to Improving International Labor Standards

Countries with strong domestic labor protections and a commitment to improving international labor standards form a crucial bloc in the global effort to promote fair and just working conditions. Countries that have strong labor protections for their own workers as well as efforts to promote labor protection for workers abroad fit in this bloc. Countries like France and many other European states would fall into this bloc.

These countries prioritize the well-being and rights of their own workers, while also actively engaging in initiatives to extend labor protections to workers in other countries. The use of metrics like the Labor Rights Index (LRI) helps assess the extent of these countries' domestic commitment to labor rights. Countries with high LRI scores are those that prioritize and uphold workers' rights, creating an environment where workers are treated fairly. Countries within this bloc have well-established labor laws and regulations that protect workers' rights. Minimum fair wages, regulated working hours, the right to unionize, and protection from unfair dismissal are common laws in these countries. Strong domestic labor protections are a great first step in safeguarding workers. However, equally important is the strong enforcement of these laws. Strong enforcement ensures that labor protections are not just on paper but are actually practiced and respected.

The other criterion for this bloc is the commitment to improving international labor standards. Countries in this bloc understand that labor rights are a global issue and actively work to improve labor conditions beyond their own borders. They may engage in diplomatic efforts and agreements with other countries to promote better labor practices globally. One of the ways that countries can participate in this is through development assistance. Development assistance is when a country may choose to provide funds to other countries to spur new industrial development. With this, countries may be encouraged to create stronger labor protections based on the terms of the funds received. Lastly, this bloc's members are active members of organizations like the International Labour Organization (ILO) or UNIDO, where they help create international labor standards and promote their acceptance and use.

Countries with Strong Domestic Labor Protections and Low Investment in Improving International Labor Standards

Countries with a high LRI and legislation that protects its own workers, yet do not have extensive commitments abroad, fit into this bloc. Belgium and the Russian Federation are examples of countries that would fall into this bloc. These countries prioritize their workers and want to make sure they are treated well. Using the LRI, we can note that these countries have high scores on the index. Therefore, these countries prioritize and uphold their own workers' rights, creating an environment where workers are treated fairly and with dignity. At minimum, fair wages, regulated working hours, the right to unionize, and protection from unfair dismissal are practices that are upheld in these countries. Strong domestic protections are a great first step in defending labor globally.

The other criterion for this bloc is the commitment to improving international labor standards. This bloc has demonstrated fewer commitments to improving labor conditions internationally. They usually have no major labor protections within trade deals and little involvement in major global supply chains. This means that while their domestic protections are strong, they often do not promote these abroad. Countries in this bloc may exploit the less strict labor conditions in other countries in order to facilitate their own imports. However, these countries should work towards increasing the labor conditions in other countries, using their own conditions as a guideline.

Countries with Minimal Domestic Labor Protections and a Commitment to Improving International Labor Standards

Countries with a low LRI and limited legal protection for their own workers, but a selfless policy platform abroad are relatively rare. These countries, often grappling with their own labor rights issues, recognize the importance of enhancing labor standards on a global scale. They may face a variety

of challenges in improving their domestic labor protections, which must be considered individually.

While their domestic labor protections may need improvement, their engagement in international labor initiatives shows a willingness to address these shortcomings beyond their borders. These countries score relatively low on the LRI and have limited protections for workers. For example, the United States has limited labor protections domestically with an LRI score of 63.5.[191] This indicates that the United States has limited access to decent work. However, the United States is also a member of the United States-Mexico-Canada Agreement (USMCA), the free trade agreement that replaced the North American Free Trade Agreement (NAFTA). The USMCA has new requirements for its members to adhere to.[192] These requirements include a variety of rules regarding labor. For example, USMCA members must adopt the ILO 1998 Declaration on Fundamental Principles and Rights at Work and maintain strong labor law enforcement.[193]

Although their own labor landscape may be characterized by inadequate wages, poor working conditions, and limited worker representation, their commitment to enhancing international labor standards demonstrates a growing awareness of the importance of equitable work environments. By participating in international forums and collaborations, these countries acknowledge that labor rights transcend national boundaries. Although these countries may not be leaders in terms of domestic labor protections, they contribute actively to international organizations such as the International Labor Organization (ILO) or UNIDO. As members of these forums, they play a role in shaping and advocating for international labor standards as they work to address their own labor rights deficiencies. Their involvement showcases a recognition that collaboration and shared commitment are necessary steps towards achieving global labor equity.

Countries with Minimal Domestic Labor Protections and Low Investment in Improving International Labor Standards

Countries with minimal labor protections at home and little focus on improving global labor standards constitute a unique group in the global labor landscape. These countries tend to have lower LRI scores and prioritize economic considerations over worker rights. This has resulted in weaker labor protections such as inadequate wages, unregulated work hours, and limited support for labor unions. Workers within these countries might face challenges due to the less comprehensive labor laws and limited enforcement. Countries with limited legal protections and a low LRI tend to have low commitments to labor protections outside their borders as well. This bloc usually does not adhere to the ILO Fundamental Principles and Rights at work.[194]

Two countries that fit in this bloc are Sudan and Papua New Guinea. Both have a low LRI and little foreign policy on labor. One common trait that countries share in this bloc is crisis. This bloc has many countries with very limited governments facing major catastrophes. Sudan has undergone a challenging and complicated process of transitioning towards civilian governance after the removal of former President Omar Hassan Al-Bashir in April 2019.[195] The country has encountered several obstacles since then, including a military coup.[196] With the ongoing crisis at hand, it can be difficult to commit the time and effort required to promote rigorous labor protections. However, Sudan has a few basic labor laws that could lay the foundation for reform. Regarding equal pay for women, the country's Labor Act of 1997 is a step towards ending gender pay discrimination.[197]

Due to their minimal domestic labor protections and lax adherence to international labor standards, the countries that make up this bloc frequently come under fire. It is important to keep in mind that different countries, including Sudan, may

191 "LABOUR RIGHTS INDEX 2022 - United States of America," Center for Labour Research, 2022, https://labourrightsindex.org/lri-2022-documents/united-states.pdf.
192 "USMCA: Labor Provisions" Congressional Research Service, 2020, https://crsreports.congress.gov/product/pdf/IF/IF11308.
193 "USMCA: Labor Provisions" Congressional Research Service, 2020, https://crsreports.congress.gov/product/pdf/IF/IF11308.
194 International Labour Organization, "ILO Declaration on Fundamental Principles and Rights at Work."
195 "Background to a Crisis: In Sudan, the Stakes Are High for the Whole of Africa | UN News," United Nations, April 28, 2023.
196 Sudan - Gender Justice & the Law" (United Nations Development Programme, 2019), https://www.undp.org/sites/g/files/zskgke326/files/migration/arabstates/Sudan.Summary.19.Eng.pdf.
197 United Nations, "Background to a Crisis: In Sudan, the Stakes Are High for the Whole of Africa."

encounter difficulties when trying to prioritize worker rights while handling the pressing conditions in their country. While the current state of their labor laws may have unfavorable effects on workers and social welfare, being aware of the complexities of their circumstances encourages discussions on finding the balance between promoting economic growth and upholding respectable working conditions.

Committee Mission

The purpose of the UNIDO is to "promote, dynamize and accelerate industrial development."[198] This means that labor issues are an important concern for UNIDO. Creating sustainable industrial development is critical to issues like income inequality and the economic empowerment of women.[199] Bettering labor standards not only safeguards the well-being and dignity of workers, but also contributes to achieving broader Sustainable Development Goals. With over 3.32 billion people in the global labor market, it is a critical issue to improve their livelihoods.[200]

UNIDO seeks to support countries in developing their economies and industries in a way that leaves no one behind. While talking about this topic, delegates must collaborate to create policies and agreements that guarantee the safety and respect of workers. This is important because as working conditions are continuously changing, workers' rights must always be upheld. Simply put, delegates must ensure that people are treated with dignity and respect while they are at work. Labor issues are important around the world because they are about making sure people who work are treated fairly, like getting paid enough and having safe workplaces. When workers are treated well, it helps them thrive and be healthy, and it makes the world a better place where everyone has a chance to do their best.

When considering what direction the committee should take, delegates should explore domestic and international labor standards, the role of private businesses, and how UNIDO can help. While considering this, delegates must use diplomacy to come to a resolution that all parties can agree to. In order to achieve the objective of decent work in a globalized economy, worldwide action is required.[201] Delegates should seek to propose holistic solutions that will benefit workers around the world, no matter the situation each country is in. This requires consideration of the individual challenges each country faces, and how they can best be addressed.

198 "Who We Are," United Nations Industrial Development Organization, accessed August 13, 2023, https://www.unido.org/about-us/who-we-are.
199 "UNIDO in Brief," United Nations Industrial Development Organization, accessed August 13, 2023, https://www.unido.org/about-us/unido-brief.
200 "Global Employment Figures 2022," Statista, June 16, 2023, https://www.statista.com/statistics/1258612/global-employment-figures/
201 "The Benefits of International Labour Standards," International Labour Organization, Spring 2015, https://www.ilo.org/global/standards/introduction-to-international-labour-standards/the-benefits-of-international-labour-standards/lang--en/index.htm.

UNIDO

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TOPIC B:
SUSTAINABLE MANUFACTURING AND WASTE MANAGEMENT

Photo Credit: Cezary p

Introduction

The past decades have shown the detrimental effects of industrial processes on the environment. This includes issues such as increased greenhouse gas emissions, the growing amount of waste in landfills and oceans, and the release of harmful pollutants. The planet is nearing a "point of no return," where the internationally agreed limit of an increase in 1.5 degrees Celsius will be surpassed.[1] Industry contributes significantly to this issue, as only 100 companies contribute 71 percent of worldwide greenhouse gas emissions.[2] Specifically, releasing carbon dioxide from fossil fuels alone contributes to approximately 79 percent of total anthropogenic greenhouse gas emissions.[3]

Industrial processes also generate various types of pollution that harm the environment and public health. Air pollution is created due to particulate chemicals from industrial sources. These pollutants can contribute to respiratory illnesses, cardiovascular diseases, and premature mortality.[4] Factories can also discharge chemicals like heavy metals and wastewater into aquatic ecosystems, posing risks to marine life and human consumption. Ocean plastic pollution affects ecosystems worldwide. In fact, plastic waste makes up 80 percent of all marine pollution, and by 2050, it is predicted that plastic will outweigh all fish in the sea.[5] These activities further intensify the ecological footprint of worldwide industrial production.

In light of these alarming statistics, it is clear that urgent and coordinated action is needed to steer industrial practices on a more sustainable and environmentally conscious path. To assist with this issue, the United Nations Industrial Development Organization (UNIDO) has previously emphasized a shift towards a global circular economy.[6] This economy would uproot the issues present with current manufacturing and consumption, where most things are developed to be used once, by one consumer, and then thrown away. This ultimately extends the lifespans of items, mitigating the prevalence of disposable items in landfills and oceans.

Delegates in UNIDO are tasked with redefining the role of industry in the future to ensure inclusive and sustainable development. By promoting the regenerative cycle of the circular economy, UNIDO will champion this shift towards a sustainable world. Action must be taken immediately to ensure reduced emissions and warming, while addressing the impacts of climate change on the industry.

History and Description of the Issue

Inclusive and Sustainable Industrial Development

Industrialization is known as the process when a country's manufacturing and output abilities improve.[7] This shift also transitions an economy mainly based on agriculture to one based on manufacturing and production of goods.[8] Improved machinery and manufacturing allow new industries to emerge in a given country.[9] Other important manufactured goods include chemicals, machinery, computer parts, petroleum, and medical equipment. The total output in the global manufacturing

1 "'Point of no return': UN report to provide stark climate warning," *Aljazeera*, March 20, 2023, https://www.aljazeera.com/news/2023/3/20/point-of-no-return-un-report-to-provide-stark-climate-warning.
2 "Climate Change & Industry," The Conscious Challenge, last modified April 26, 2019, https://www.theconsciouschallenge.org/ecologicalfootprintbibleoverview/climate-change-industry.
3 "Where greenhouse gasses come from," US Energy Information Administration, accessed September 12, 2023, https://www.eia.gov/energyexplained/energy-and-the-environment/where-greenhouse-gases-come-from.php.
4 Xu-Qin Jiang, Xiao-Dong Mei, and Di Feng, "Air pollution and chronic airway diseases: what should people know and do?" *Journal of Thoracic Disease* 8, no. 1 (January 2016): 31-40, https://doi.org/10.3978%2Fj.issn.2072-1439.2015.11.50.
5 "Ocean plastic pollution an overview: data and statistics," United Nations Educational, Scientific and Cultural Organization, accessed September 12, 2023, https://oceanliteracy.unesco.org/plastic-pollution-ocean/.
6 "Circular Economy," United Nations Industrial Development Organization, accessed September 12, 2023, https://www.unido.org/unido-circular-economy.
7 Li Yong, *Industrialization as The Driver of Sustained Prosperity* (Vienna: United Nations Industrial Development Organization, 2020), https://www.unido.org/sites/default/files/files/2020-04/UNIDO_Industrialization_Book_web4.pdf.
8 Yong, *Industrialization as The Driver of Sustained Prosperity.*
9 "How did the Industrial Revolution change society?" Britannica, accessed September 14, 2023, https://www.britannica.com/question/How-did-the-Industrial-Revolution-change-economies.

market is expected to reach USD 71.86 trillion by the end of 2023.[10] However, industrialization is a great opportunity for countries to increase their exports and boost their economies as the manufactured goods market grows. Industrialization also has the potential to create higher-paying jobs, helping remove many from poverty. Historically, industrialization has helped transform new and developing countries into thriving economies. Countries such as England, The United States, and China are clear examples of how industrialization can create a supportive infrastructure to nurture technological innovation.[11] The United Nations has calculated that in the past 25 years, "over one billion people have managed to escape extreme poverty, and maternal and child mortality rates have dropped significantly."[12] This is major progress towards economic development on a global scale. However, there are still millions of people globally who live in extreme poverty. Nearly 10 percent of the global population lives in extreme poverty.[13] Additionally, the number of people suffering from hunger has been on the rise. Therefore, advances in economies worldwide through industrialization may provide those living in poverty with new job opportunities.

The Lima Declaration, adopted by UNIDO in 2013, laid the foundation for inclusive and sustainable industrial development (ISID). This declaration highlights the importance of industry in achieving sustainable development. With this, UNIDO aims to improve industry globally and help generate lasting prosperity for all.[14] Since then, significant progress has been made toward understanding and measuring the impact of industrialization on environmental and sustainability goals. Additionally, significant progress has been made in understanding the relationship between industrialization, development, and growth.[15] ISID is the primary source of income generation for countries with developing or underdeveloped economies.[16] It allows for rapid yet sustained increases in the standard of living, provides technological innovation, and most importantly, contributes toward development.[17] Inclusive in the context of ISID is defined by UNIDO as including "all countries and all peoples, as well as the private sector, civil society organizations, multinational development institutions, and all parts of the UN system, and offer equal opportunities and an equitable distribution of the benefits of industrialization to all stakeholders." [18] This comprehensive definition helps frame the guidelines on how to be inclusive within development. This is important because growth and development must happen equitably to ensure collective global growth.

Sustainable is defined as using resources only to the extent that they are needed, in order to ensure these resources last for a long time. Sustainability also includes reducing environmental harm.[19] Many developing economies rely on oil, minerals, or the exploitation of other natural resources as their primary source of income. ISID encourages global growth and development while tackling the effects that industrialization has on the environment and humanity. [20] It is important to note that any attempt to reduce poverty through industrialization and manufacturing will be short-lived if environmentally sustainable practices are not implemented. One effect of industrialization is its large environmental impact. Currently, there is not a single country that has fully resolved challenges regarding waste management, water purification, and pollution.[21] However, environmentally-conscious policies and systems have been highly effective in significantly reducing environmental degradation.[22] Development not only encompasses an increase in economic wealth, but includes

10 "Manufacturing," Statista, accessed September 14, 2023, https://www.statista.com/outlook/io/manufacturing/worldwide.
11 Yong, *Industrialization as The Driver of Sustained Prosperity.*
12 Yong, *Industrialization as The Driver of Sustained Prosperity.*
13 Yong, *Industrialization as The Driver of Sustained Prosperity.*
14 "Inclusive and Sustainable Industrial Development," United Nations Industrial Development Organization, accessed August 24, 2023, https://www.unido.org/inclusive-and-sustainable-industrial-development.
15 Yong, *Industrialization as The Driver of Sustained Prosperity.*
16 United Nations Industrial Development Organization, "Inclusive and Sustainable Industrial Development."
17 United Nations Industrial Development Organization, "Inclusive and Sustainable Industrial Development."
18 United Nations Industrial Development Organization, "Inclusive and Sustainable Industrial Development."
19 United Nations Industrial Development Organization, "Inclusive and Sustainable Industrial Development."
20 United Nations Industrial Development Organization, "Inclusive and Sustainable Industrial Development."
21 *Inclusive and Sustainable Industrial Development* (United Nations Industrial Development Organization, 2014), https://www.unido.org/sites/default/files/2014-03/ISID_Brochure_web_singlesided_12_03_0.pdf
22 *Inclusive and Sustainable Industrial Development.*

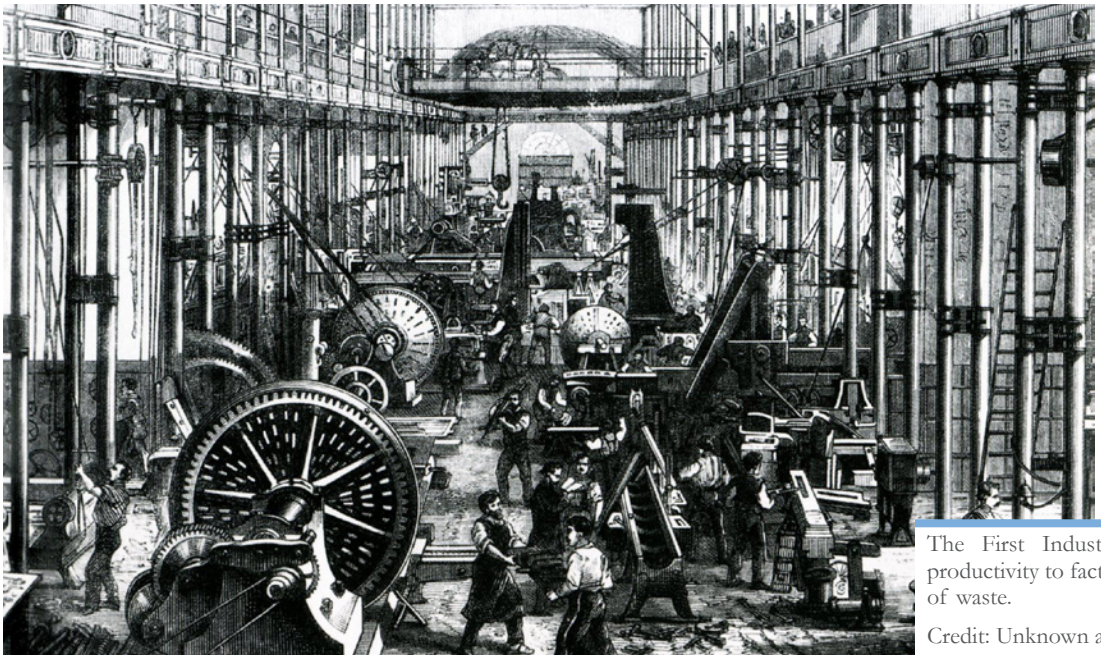
improving the well-being and inclusiveness of society.[23] Industrialization does not need to come at the expense of the environment or people's health and well-being.[24] This is why it is important to study past cases of industrialization to help uncover important lessons for the international community in promoting ISID.

The first ever Industrial Revolution occurred in Britain from 1760 to 1830. Early British industries operated on a much smaller scale and were less advanced than modern industries.[25] For example, most textile production occurred in small workshops or the households of the producers. This small-scale production was consistent throughout other industries in Britain, such as metal production.[26] However, new inventions such as steam engines made many tasks easier. Using steam engines in coal mining ensured that industries had a reliable supply of coal, a key energy source.[27] Eventually, the work that once occurred in households transitioned to factories as new technologies emerged that allowed the mass production of certain goods. These factories were large industrial buildings that relied on one central power source to drive their machines.[28] Cotton factories in cities such as Nottingham and Cromford employed nearly 600 people by the 1770s. The factory system allowed many other industries to advance, with some metalworking factories employing around 1,000 people.[29] Ultimately, through the advancement of technology and the construction of factories to support mass production, Britain underwent the First Industrial Revolution.

While Britain improved its manufacturing output, many of the steps taken were not environmentally sustainable. As burning coal was extremely common during the First Industrial Revolution, air pollution increased.[30] Air pollution continued rising in the 1800s, causing greater respiratory illnesses and higher death rates in high coal-burning areas. Additionally, it is hypothesized that climate change caused by human activities began as early as the 1830s.[31] It is vital to consider the potential environmental effects of industrialization and the importance of sustainable industrialization.

During Britain's first period of industrialization from 1760 to 1830, climate change was not recognized as a prevalent international threat. In fact, it was not until the 20th century that climate change became increasingly important on the United Nations agenda.[32] Therefore, countries must consider the UN Sustainable Development Goals when industrializing so that impacts as large as the First Industrial Revolution are not realized again. Since UNIDO's foundation in 1966, many global efforts have facilitated sustainable industrialization in many countries.[33] For example, from 2013 to 2014, UNIDO launched a USD 26.7 million fund to support sustainable industrialization worldwide. This funding was partly used to support sustainable initiatives in Latin America and the Caribbean. Specifically, The Dominican Republic launched a project with UNIDO to generate and use renewable energies such as biomass in industrial parks. This is important as industrial parks are large areas reserved for industrial uses and are typically where most production occurs in a country.[34] Given the high volume of pollution that comes from industrial parks, it is important that they are powered by renewable energy such as biomass.[35] UNIDO's mission with The Dominican Republic is an excellent example of how

23 Yong, *Industrialization as The Driver of Sustained Prosperity.*
24 Yong, *Industrialization as The Driver of Sustained Prosperity.*
25 Matthew White, "The Industrial Revolution," British Library, last modified October 14, 2009, https://www.bl.uk/georgian-britain/articles/the-industrial-revolution.
26 White, "The Industrial Revolution."
27 White, "The Industrial Revolution."
28 White, "The Industrial Revolution."
29 White, "The Industrial Revolution."
30 Patrick Kiger, "7 Negative Effects of the Industrial Revolution," History, last modified August 9, 2023, https://www.history.com/news/industrial-revolution-negative-effects.
31 Kiger, "7 Negative Effects of the Industrial Revolution."
32 Peter Jackson, "From Stockholm to Kyoto: A Brief History of Climate Change," United Nations Chronicle, last modified June 2007, https://www.un.org/en/chronicle/article/stockholm-kyoto-brief-history-climate-change.
33 "A brief history," United Nations Industrial Development Organization, accessed September 14, 2023, https://www.unido.org/who-we-are/brief-history.
34 "Industrial Park Overview," United Nations Industrial Development Organization, accessed September 14, 2023, https://sipp.unido.org/industrial-parks-overview.
35 United Nations Industrial Development Organization, *Inclusive and Sustainable Industrial Development in Latin America and Caribbean Region* (Vienna: United Nations Industrial Development Organization, 2019), https://www.unido.org/sites/default/files/files/2019-06/UNIDO_in_LAC_Region.pdf?_token=1885662879.



The First Industrial Revolution brought immense productivity to factories, and also immense new sources of waste.

Credit: Unknown author

inclusive, sustainable industrialization can occur. Industrial parks are vital to a country's development, and if provided with clean energy, they can continue to provide output while doing less environmental damage.

Industrialization is critical for a country's development. Through historical and recent examples, it is important to understand how countries have developed. As we reach a point where climate change is more pressing than ever, countries must continue to develop in environmentally friendly ways. However, regardless of the way a country develops, there are trade-offs. According to the World Bank, an international finance organization, it would require 34 million metric tons of copper, 40 million tons of lead, 50 million tons of zinc, 162 million tons of aluminum, and no less than USD 4.8 billion to produce about seven terawatts of clean electricity by 2050.[36] These materials will require an immense amount of mining, which is harmful to the environment. Although there is no perfect route, facilitating the transition toward sustainable industrial sectors globally is critical in reducing the amount of carbon dioxide output. Therefore, it is in every country's best interest to work with UNIDO in fulfilling the goal of ISID. Both economic and social growth are supported within ISID. ISID allows countries to continue to develop without jeopardizing the wellbeing of future generations.[37]

Sustainable Manufacturing

Sustainability in manufacturing represents a growing trend within global companies and politics. Environmentally sustainable manufacturing is vital for the long-term overall well-being of a country and its economy. Once countries have industrialized and established a strong manufacturing industry, there is a constant demand for resources and to protect their goods and services from potential threats. Countries have strategically defended their manufacturing and export industries to maintain an advantage in the global economy. Examples include Commodore Perry of the United States Navy, who pressured Japan to open for trade in 1853. Other examples include the creation of the Organization of the Petroleum Exporting Countries (OPEC) during the Cold War and the Taiwan Semiconductor Manufacturing Company (TSMC).[38] The manufacturing sector has remained geopolitically significant throughout history. Yet, sustainability

36 Mark J. Perry, "The Environmental Costs of Renewable Energy Are Staggering," Foundation for Economic Education, last modified September 15, 2019, https://fee.org/articles/the-environmental-costs-of-renewable-energy-are-staggering/.
37 United Nations Industrial Development Organization, *Inclusive and Sustainable Industrial Development in Latin America and Caribbean Region.*
38 Bonnie Miller, "Commodore Perry and the Opening of Japan," Bill of Rights Institute, accessed July 19, 2023, https://billofrightsinstitute.org/essays/commodore-perry-and-the-opening-of-japan; "OPEC: Brief History," Organization of the Petroleum Exporting Countries, accessed July 19, 2023, https://www.opec.org/opec_web/en/about_us/24.htm; Kathrin Hille, "TSMC: how a Taiwanese chipmaker became a linchpin of the global economy," *Financial Times*, March 24, 2021, https://www.ft.com/content/05206915-fd73-4a3a-92a5-6760ce965bd9.

only entered public and policymaking debates within the last 50 years. While industrialization was not factored into the Millennium Development Goals framework, inclusive and sustainable industrialization—including manufacturing—is now featured strongly in the 2030 Agenda for Sustainable Development.[39]

A country's economic choices drastically affect its development, especially regarding its trading partners. Developing countries which rely heavily on producing or extracting one resource are known as commodity-exporting countries. Many developing countries export agricultural, raw materials, and natural resources for low prices, often due to existing colonial and imperial relationships.[40] Countries that depend on exporting these goods are the most vulnerable to changes or failures in the supply chain. When prices of these commodities change or their ability to meet demand drops, they do not have other resources or goods to sell.[41] Additionally, the resources that commodity-exporting developing countries sell to industrialized countries are often necessary for producing finished goods. These are complicated and expensive products such as cars, medical equipment, and electronics.[42] Investing in civilian populations through skills and education is known as raising human capital. With stronger human capital, workers learn better skills that will ensure their success in the manufacturing sector and allow them to manufacture more valuable goods. This helps a country grow, as trading manufactured goods is more beneficial than trading commodity resources.[43] It also allows for stable and lasting development, since new jobs and industries are being created. The economic benefits of a diverse manufacturing sector can ensure that reliable growth is achieved within a country.

With the creation of the Environmental Protection Agency (EPA) in the United States and similar departments across other countries, sustainability has become an established policy goal for many. The EPA defines sustainability as the principle of protecting our environment for future generations.[44] In the past, industrialization in many countries occurred rapidly and with minimal regard for the environment. Manufacturers focused on profit maximization, leading to environmental degradation, sick workers, quality of life issues, and lower life expectancies. Since then, many laws and international regulations have been set to prevent such issues from arising again.

However, many companies today are becoming more socially and environmentally responsible. Most large companies have environmental, social, and governance (ESG) goals and standards which guide how a company makes an investment or decision. Today, the demand for sustainable investments currently exceeds supply. This demonstrates that companies want to be more sustainable in manufacturing and business processes.[45] However, no standardized methods exist to assess a company's progress towards its ESG frameworks.[46] There are over 600 ways to assess corporate ESG activity, which makes it challenging to determine which companies are making a difference.[47] This has led to much debate over if companies are "greenwashing" their manufacturing and business practices.

Greenwashing is a term created by an environmentalist named Jay Westerveld. He used this term in his 1986 essay, claiming that the hotel industry falsely promoted the reuse of towels as part of their contribution to the environment. In reality, it was just a way to cut costs.[48] As defined by Westerveld, greenwashing is when a company provides false or deceptive information about its environmental goals, actions, and

39 United Nations Industrial Development Organization, *Inclusive and Sustainable Industrial Development in Latin America and Caribbean Region.*
40 Joe Myers, "This map shows every country's major export," World Economic Forum, last modified March 31, 2016, https://www.weforum.org/agenda/2016/03/this-map-shows-every-country-s-major-export/.
41 "More than 100 countries depend on commodity exports," United Nations Conference on Trade and Development, last modified September 8, 2021, https://unctad.org/news/more-100-countries-depend-commodity-exports.
42 Brandon Sheridan, "Manufacturing exports and growth: when is a developing country ready to transition from primary exports to manufacturing exports?" *Journal of Macroeconomics* 42, (December 2014): 1-13, https://doi.org/10.1016/j.jmacro.2014.06.002.
43 Sheridan, "Manufacturing exports and growth."
44 "Learn About Sustainability," United States Environmental Protection Agency, accessed July 18, 2023, https://www.epa.gov/sustainability/learn-about-sustainability.
45 "Rethinking the Governance of ESG," United Nations Development Programme, accessed September 12, 2023, https://www.undp.org/future-development/signals-spotlight/rethinking-governance-esg.
46 United Nations Development Programme, "Rethinking the Governance of ESG."
47 United Nations Development Programme, "Rethinking the Governance of ESG."
48 Karen Becker-Olsen and Sean Potucek, "Greenwashing," *Encyclopedia of Corporate Social Responsibility,* (2013): 1318-1323, https://doi.

motivations.[49] Greenwashing is still present in today's industry. One industry in particular is the fast fashion industry. Many of the top fashion brands provide false claims about sustainability at a rate of nearly 96 percent.[50] In business practices, they use ambiguous buzzwords such as "eco-", "organic", "no chemicals", and "sustainable." The lack of clarity in these terms means they can get away with less environmentally friendly practices, with unknowing consumers. These terms expand the gap between what consumers expect they are buying and what they are really buying.[51]

Companies may take advantage of the environment due to a dilemma known as the tragedy of the commons.[52] In economics, the tragedy of the commons relates to the usage of resources in the short run that are commonly shared between people. These resources are known as public goods. Some examples of public goods include land, water, air, and wildlife. These are all necessary for survival in the long run. Since there is no cost for accessing publicly shared goods, a profit-maximizing company will continue using these resources in the shared environment. However, in the tragedy of the commons, the common resource can get used up quickly if it is not shared equally amongst all users. By acting in their own interests, companies will deplete this resource, leaving none for others. Although there is no perfect solution to this issue, monitoring and regulating these resources at domestic and international levels with coordination from governments and manufacturing industries can reduce this problem.[53]

Both development and manufacturing are closely linked, as the gains from manufacturing can assist in the development of countries. Countries that experienced early industrialization were built by favorable trade policies and dominant domestic manufacturing industries. Great Britain, the birthplace of the Industrial Revolution, emerged ahead of the other European powers due to its ability to produce steel and process cotton effectively.[54] Cheap labor, access to global markets, the dissolution of monasteries, and the availability of iron and coal all contributed to Britain's ability to industrialize.[55] New technology, such as the steam engine, required steel, which was processed from iron in British steel mills. Steel was an extremely important manufactured resource, commonly used as an input for many finished goods, and was necessary for railroad construction and other infrastructure. During this period, Great Britain could import inexpensive wool and cotton from colonial territories for processing in domestic textile mills. As the country rapidly industrialized, waterwheels that previously provided power for workers in textile mills were gradually replaced with steam engines to manufacture various goods.[56] With the growth of both the British industrial and manufacturing sectors, worker's wages steadily increased.

Following Great Britain, industrialization spread across Western Europe and into other continents like North America. In the following decades, many countries gained independence and entered the global marketplace. To establish themselves, many experimented with their national industries and looked to countries already undergoing industrialization. For example, many economies in South America chose Import-Substitution Industrialization (IS), while some countries in Asia preferred Export-Promotion Industrialization (EP). With IS industrialization, countries protected domestic industries through market regulations to replace imported manufactured goods with domestic products.[57] This can be done through regulations such as tariffs. These are taxes

org/10.1007/978-3-642-28036-8_104.
49 Becker-Olsen and Potucek, "Greenwashing."
50 Julia Adamkiewicz et al., "Greenwashing and sustainable fashion industry," *Current Opinion in Green and Sustainable Chemistry* 38, (December 2022): 100710, https://doi.org/10.1016/j.cogsc.2022.100710.
51 Adamkiewicz et al., "Greenwashing and sustainable fashion industry."
52 Garrett Hardin, "The Tragedy of the Commons," *Science* 162, no. 3859 (December 1968): 1243-1248, https://doi.org/10.1126/science.162.3859.1243.
53 Joanna Vince and Britta Hardesty, "Governance Solutions to the Tragedy of the Commons That Marine Plastics Have Become," *Frontiers in Marine Science* 5, (June 2018), https://doi.org/10.3389/fmars.2018.00214.
54 Mehdi Shafaeddin, *How did developed countries industrialize? The History of Trade and Industrial Policy: The Cases of Great Britain and the USA* (Reading: United Nations Conference on Trade and Development, December 1998), https://unctad.org/system/files/official-document/dp_139.en.pdf.
55 Sebastian Vollmer and Leander Heldring, "The Origins of the Industrial Revolution," VOX EU Center for Economic Policy Research, last modified November 18, 2017, https://cepr.org/voxeu/columns/origins-industrial-revolution.
56 Joe Bush, "How Britain shaped the manufacturing world," The Manufacturer, last modified May 27, 2022, https://www.themanufacturer.com/articles/how-britain-shaped-the-manufacturing-world/.
57 N. C. Pahariya, *Import Substitution and Export Promotion as Development Strategies* (Jaipur: CUTS International, 2008), https://www.cuts-citee.

businesses or people must pay on imported goods from other countries. Most countries relied on IS industrialization, which became especially popular in Latin America after the Great Depression. Argentina, Chile, Venezuela, and other nations focused on producing consumer goods or building materials domestically for low prices.[58] Besides Hong Kong, no country has successfully industrialized without industry protection found in IS industrialization.[59] EP industrialization requires countries to sell manufactured goods directly into the global market at competitively low prices.[60] This can make the domestic market more efficient, removing trade barriers such as tariffs. China and Taiwan are both examples of countries that have successfully done so.[61] However, there are many criticisms of these rapidly developing East Asian economies which do not have strong environmental laws present or meaningful enforcement.[62] IS and EP industrialization strategies have both been used in various countries, relying on the market and government to manage the manufacturing sector.

Many developing countries still rely on these economic strategies, even though environmental concerns have become more serious. Countries must continue deciding their developmental path as long as it is not at the expense of the environment. Since manufacturing can comprise a significant part of development, the conversation has shifted towards sustainable development in the manufacturing sector. Sustainable development became popular with the publication of the UN Brundtland Commission Report in 1987. Here, they define the term as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[63] Since the report's publication, various international agreements have been reached. In the 2013 Lima Declaration, all members of the United Nations Industrial Development Organization

org/pdf/BP08-DI-13.pdf.
58 Werner Baer, "Import Substitution and Industrialization in Latin America: Experiences and Interpretations," *Latin American Research Review* 7, no. 1 (October 2022): 95-122, https://doi.org/10.1017/S0023879100041224.
59 Shafaeddin, *How did developed countries industrialize?*
60 Pahariya, *Import Substitution and Export Promotion as Development Strategies.*
61 Tatsuyuki Ota, *The Role of Special Economic Zones in China's Economic Development As Compared with Asian Export Processing Zones: 1979 - 1995* (Tokyo: Toyo University, March 2003), https://www.researchgate.net/profile/Tatsuyuki-Ota/publication/238694334_The_Role_of_Special_Economic_Zones_in_China's_Economic_Development_As_Compared_with_Asian_Export_Processing_Zones_1979_-_1995/links/568e839908aef987e567bfdb/The-Role-of-Special-Economic-Zones-in-Chinas-Economic-Development-As-Compared-with-Asian-Export-Processing-Zones-1979-1995.pdf.
62 Benjamin Richardson, "Is East Asia Industrializing Too Quickly? Environmental Regulation In Its Special Economic Zones," *The Pacific Basin Law Journal* 22, (2004), https://heinonline.org/HOL/LandingPage?handle=hein.journals/uclapblj22&div=7&id=&page=.
63 Jacobus A. Du Pisani, "Sustainable Development - historical roots of the concept," *Environmental Sciences* 3, no. 2 (2006): 83-96, https://doi.org/10.1080/15693430600688831.

Protestors demonstrating against greenwashing
Credit: Stay Grounded

(UNIDO) agreed to mandate the inclusion of sustainable development in all policies past 2015.[64] One such policy is the introduction of the circular economy, which is a system that maximizes the efficient use of resources.[65] In relation to manufacturing, countries can pass laws and enforce regulations on the production of products to be compatible with sustainable development.

The Circular Economy

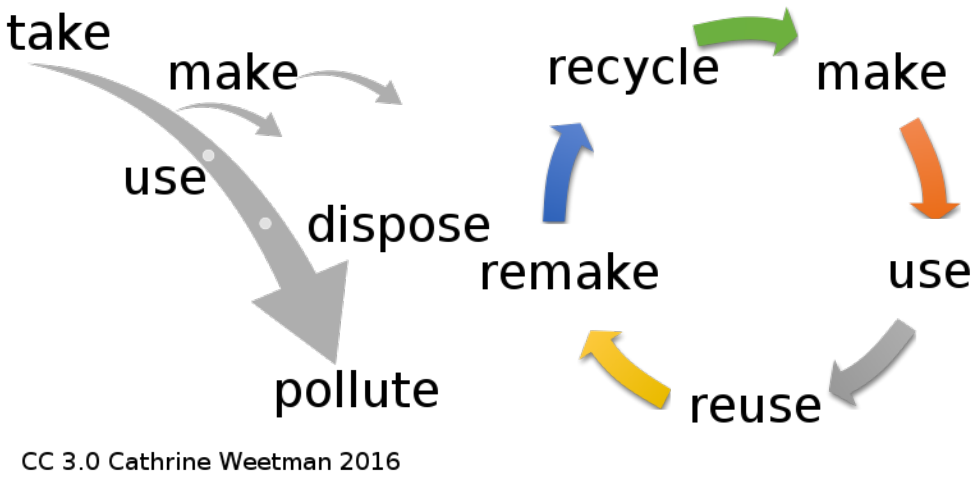
In manufacturing, the circular economy is a new concept that introduces sustainability into all aspects of industry. The circular economy can be defined as an economy where items are reused, repaired, and recycled to reduce waste.[66] In this economy, a product stays in a "cycle" as long as possible. When a product reaches the end of its use, its materials are recycled and used to build other products. This increases the value of each product while reducing the amount of waste produced.[67] Currently, the earth's economic model is linear, where products are extracted from the earth, used, and then disposed of. In a circular economy, nothing is considered waste. Rather, waste is considered a resource instead of a cost.[68] This economy has many benefits, such as protecting the environment, reducing dependence on raw materials, and creating new jobs.[69]

In a linear economy, producers rely on raw materials such as wood, metals, or gas. These products can be vulnerable to changes in supply, natural disasters, and economic crises. If these products become less available for any reason, they will increase in cost, creating significant expenses for many companies. However, in a circular economy, producers are less dependent on raw materials. Instead, these raw materials can be salvaged from products at the end of their life cycle. By doing this, companies can reduce their environmental impact, as resource extraction is invasive and disrupts natural ecosystems.[70] Evidently, the use of recycled materials requires innovative thinking and planning. This is one way a circular economy can create more jobs, as innovative business models and collaborative discussions are central to this model.[71]

Buy-back programs are one of the most common business practices that reflect the ideas of a circular economy. With these programs, companies will buy back products from individuals when they have reached the end of their life.[72] One example of this is the Swedish furniture company IKEA. This company will buy back used furniture in good condition to refurbish or renew it, so it can be sold again. This project gives a new life to old products.[73] However, the principles of the circular economy can also be implemented on an individual level. Sharing services such as libraries or car shares reduces the individual need for these items, reducing the need to create more of them.[74]

In the manufacturing industry, the circular economy can be defined by four Rs — reduce, reuse, recycle, and refurbish. These four principles must be integrated into every step of manufacturing to create a circular economy. The first step involves reducing the consumption of products. This also means reducing dependence on raw materials that are extracted elsewhere. Instead, projects should be completed using the least amount of resources necessary.[75] The next step requires companies and individuals to reuse existing, functioning products instead of purchasing new ones. Recycling is a significant step in this model, as it requires many complex processes such as inspections, sorting waste,

64 *Inclusive and Sustainable Industrial Development.*
65 Anil Hira et al., "Sustainable Manufacturing and Environmental Pollution Programme (SMEP): A Circular Economy Experiment in the Global South," *Journal of Developing Societies* 38, no. 3 (July 2022): 287-309, https://doi.org/10.1177/0169796X221106013.
66 "Circular economy: definition, importance, and benefits," *European Parliament News*, May 24, 2023, https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits.
67 "Circular economy: definition, importance, and benefits."
68 "Circular Economy," Government of Canada, accessed September 3, 2023, https://www.canada.ca/en/services/environment/conservation/sustainability/circular-economy.html.
69 "Circular economy: definition, importance, and benefits."
70 "Circular economy: definition, importance, and benefits."
71 "Circular Economy," United Nations Conference on Trade and Development, accessed September 3, 2023, https://unctad.org/topic/trade-and-environment/circular-economy.
72 Government of Canada, "Circular Economy."
73 "IKEA Sell-back program," IKEA, accessed September 3, 2023, https://www.ikea.com/ca/en/customer-service/services/buy-back/.
74 Government of Canada, "Circular Economy."
75 Hans-Jörg Kutschera et al., "Importance of the Circular Economy for Manufacturing," *Strategy &*, December 14, 2021, https://www.strategyand.pwc.com/de/en/industries/industrials/importance-of-the-circular-economy-for-manufacturing.html.



A simple graphic comparing traditional manufacturing with the rising circular economy.

Credit: PennineFoxhound, Clonewayx Catherine Weetman

salvaging materials, and innovative thinking to create new products. Finally, refurbishing is the process of renewing an object or material for it to be used or sold again at a much lower cost to both producers and consumers.[76]

Across different industries, different aspects of the four Rs require focus. For example, while the industrial and car industries need to focus on reusing products, pharmaceutical industries need to focus more on recovering products. However, all industries need to focus on reducing product consumption and recycling.[77] There are significant challenges that come along with implementing these changes. To convert to a circular economy, these industries must rethink their business models and create new product designs.[78] For this reason, the transition to a circular economy has been slow.

There are many barriers that must be overcome to transition to a circular economy. One of the largest barriers is overcoming the consumer need for convenience. For many individuals, the idea of not producing garbage seems impossible, as current practices support the creation of trash out of convenience.[79] Sometimes, government regulations unknowingly support the creation of more garbage. This can be seen in the food industry, where strict food safety regulations result in high volumes of food waste.[80] Another challenge is the lack of adequate waste storage and infrastructure. In fact, over one-third of the world's plastic waste is not captured by a waste management system, but rather is fed directly into rivers, lakes, and oceans.[81] However, current recycling practices are not advanced enough to support recycling the high volume of plastic produced daily. Waste management also plays an essential role in the transition to a circular economy. In this model, waste management must find innovative ways to convert waste into useful products and materials. Unfortunately, current practices of waste management do not support this transition.[82] Finally, the last challenge is current business practices that do not support a circular economy.[83] This is one of the biggest hurdles to the

76 Kutschera et al., "Importance of the Circular Economy for Manufacturing."
77 Kutschera et al., "Importance of the Circular Economy for Manufacturing."
78 Kutschera et al., "Importance of the Circular Economy for Manufacturing."
79 Mathy Stanuslaus, "Barriers to a Circular Economy: 5 Reasons the World Wastes So Much Stuff (and Why It's Not Just the Consumer's Fault)," World Resource Institute, last modified May 24, 2018, https://www.wri.org/insights/barriers-circular-economy-5-reasons-world-wastes-so-much-stuff-and-why-its-not-just.
80 *Governance challenges to the circular transition,* (Paris: Organisation for Economic Co-operation and Development, May 2021), https://www.oecd-ilibrary.org/sites/a14eff9d-en/index.html?itemId=/content/component/a14eff9d-en.
81 Stanuslaus, "Barriers to a Circular Economy."
82 Hanna Salmenperä et al., "Critical factors for enhancing the circular economy in waste management," *Journal of Cleaner Production* 280, no. 1 (January 2021): 124339, https://doi.org/10.1016/j.jclepro.2020.124339.
83 Stanuslaus, "Barriers to a Circular Economy."

circular economy transition.

The fast fashion industry is a well-known example of business practices that do not support a circular economy. In this industry, the production standards are to create cheap, disposable clothing that consumers can only wear a few times before it becomes unusable. This prompts the consumers to purchase more and more of these items, thus sustaining the business.[84] However, the issue is not isolated to this industry. Across industries, few organizations are thinking of innovative ways to create change in manufacturing.[85] This is partially due to a lack of public awareness of the importance of a circular economy. It is also due to a lack of funding. Additionally, many companies don't have the knowledge to train their employees and partners in best practices for a circular economy.[86]

Despite challenges, a few industries have come up with innovative ways to reflect circular economics into their businesses. One of these examples is using artificial intelligence (AI) to improve waste management and recycling. Although automated work has been present in the industry for a long time, the recent developments in AI technology present a valuable resource. AI can be used to sort waste and recycle products into different categories according to the material. This removes a significant cost from waste management companies, who must sort waste by hand. This AI can also collect data about waste, which can be used to better inform recycling and manufacturing processes.[87]

The principles of "green chemistry" have recently been developed to reduce waste in the pharmaceutical industry. Green chemistry is the process that designs both chemicals and chemical processes to reduce waste and avoid creating toxic products. While many of these principles are very specific to chemical processes, renewable products must be used over expensive, non-renewable ones. A few other key ideas are improving energy efficiency and reducing the amount of resources used for a chemical reaction. Thus, the amount of waste produced is reduced.[88] By adhering to these principles for pharmaceutical chemical pathways, this industry has started their transition to a circular economy.

Another new idea that has gained popularity in the automotive industry is the use of biofuel to power cars. Biofuel is an energy source created from food waste. It can be used as an alternative to gasoline to power vehicles.[89] This renewable energy source reduces dependence on non-renewable fossil fuels to power cars and other vehicles. Because food waste presents an economic loss to many companies, this is one way in which companies can save money while also working to transition to a green economy.[90] Many of these solutions presented are great examples of innovative solutions to reduce waste across industries. However, much must be done to complete this transition to a circular economy.

In some regions, governments have prioritized the transition to a circular economy. In the European Union (EU), a circular economy action plan was recently developed. This plan outlines regulations that will support the transition. These include stricter recycling rules, promoting sustainable products, and new rules on single-use packaging.[91] These principles will seek to reduce overall waste across all industries, completing an essential step in the transition to a circular economy. A transition like this seems simple in a stable economy like the one present in the EU. However, in other regions, the possibility of this transition is questioned.

In Africa, there are substantial challenges to enabling the transition to a circular economy. However, the region presents an ideal candidate for this transition. Many communities across the region are highly dependent on non-renewable resources, which are very expensive. Additionally, these communities are

84 Stanuslaus, "Barriers to a Circular Economy."
85 Salmenperä et al., "Critical factors for enhancing the circular economy in waste management."
86 OECD, *Governance challenges to the circular transition.*
87 R. Sarc et al., "Digitalisation and intelligent robotics in value chain of circular economy oriented waste management – A review," *Waste Management 95* (July 2019): 476-492, https://doi.org/10.1016/j.wasman.2019.06.035.
88 "12 Principles of Green Chemistry," American Chemical Society, accessed September 3, 2023, https://www.acs.org/greenchemistry/principles/12-principles-of-green-chemistry.html.
89 Sunny Dhiman and Gunjan Mukherjee, "Utilization of Food Waste for Biofuel production: a biorefining perspective," *Materials today: Proceedings* (December 2022), https://doi.org/10.1016/j.matpr.2022.12.009.
90 Dhiman and Mukherjee, "Utilization of Food Waste for Biofuel production."
91 "Circular economy: definition, importance, and benefits."

very vulnerable to the effects of climate change.[92] Problems such as pollution, high carbon use, economic loss due to poor waste management, and hunger can all be traced back to the linear economic models.[93] By implementing circular economic practices such as circular food systems, hunger can be prevented while reducing food waste. Circular manufacturing will reduce dependence on raw materials and resource extraction.

To support this transition, there are many organizations dedicated to funding this process. One such example is the African Circular Economy Foundation. This organization is a trust fund that can provide money to individuals seeking to improve economic practices in Africa. These donations can be used to fund start-up companies that practice circular economics. They also can help companies fund a transition to a circular economy.[94] However, while funding is a major component of this transition, it is not the only solution. There must be creative solutions to reduce waste, improve recycling, and promote circular production that can create sustainable practices in manufacturing and waste management, helping to keep the environment from further harm.

Climate Change and Pollution

Climate change refers to the long-term shifts in weather patterns. These shifts occur naturally on a geologic time scale, but the recent increase in temperature is attributed to human causes, which have caused this trend to be magnified.[95] Anthropogenic sources of energy release greenhouse gasses, which prevent heat from escaping the Earth's surface.[96] The primary greenhouse gasses causing climate change are carbon dioxide and methane. Carbon dioxide and methane are released when fossil fuels such as coal, oil, and gas are burned, which are all common sources of fuel for everyday processes.[97] As greenhouse gasses accumulate in the atmosphere, it increases the amount of heat trapped in Earth, increasing the gradual temperature. In fact, the average temperature of Earth's surface is now about 1.1 degrees Celsius warmer than it was in the late 1800s before the industrial revolution.[98] There are many notable effects of climate change and higher global temperatures. Consequences of climate change include intense droughts, water scarcity, severe fires, rising sea levels, melting polar ice, and heavy storms.[99]

Fossil fuels have dominated the world's economy for over 150 years and supply around 80 percent of energy worldwide.[100] Many economies rely heavily on fossil fuels, as they are ubiquitous sources of energy. Fossil fuels are used for many purposes and provide the energy required for transportation, industrial development, and buildings. Specifically, the industrial sector was responsible for emitting nine gigatons of carbon dioxide in 2022, which accounted for a quarter of the global carbon dioxide emissions.[101] Some progress has been made in reducing emissions as annual emissions slightly declined in 2020 and 2022. However, the industry is not on track to meet the Net Zero Carbon Emissions goal by 2050.[102] Renewable energy, international collaboration, and developing climate-friendly infrastructure can all facilitate this shift.[103] Since industrial production is a driving factor of climate change, it is important to revise the industry so that production can continue while emissions decline.

Manufacturing and industry mainly release greenhouse gasses

92 "Africa Circular Economy Foundation," African Development Fund, accessed September 3, 2023, https://www.afdb.org/fr/topics-and-sectors/topics/circular-economy/africa-circular-economy-facility-acef.
93 *The Africa Circular Economy Facility* (Abidjan: African Circular Economy Foundation, 2023), https://www.afdb.org/sites/default/files/2023/05/12/acef_brochure_-_e_version_.pdf.
94 Africa Circular Economy Foundation, *The Africa Circular Economy Facility*.
95 Rafael Santos and Reze Bakhshoodeh, "Climate change/global warming/climate emergency versus general climate research: comparative bibliometric trends of publications," *Heliyon* 7, no. 11 (November 2021): E08219, https://doi.org/10.1016/j.heliyon.2021.e08219.
96 "What is Climate Change?" United Nations, accessed September 12, 2023, https://www.un.org/en/climatechange/what-is-climate-change.
97 United Nations, "What is Climate Change?"
98 United Nations, "What is Climate Change?"
99 United Nations, "What is Climate Change?"
100 "Fossil Fuels," Environmental and Energy Study Institute, last modified July 22, 2021, https://www.eesi.org/topics/fossil-fuels/description.
101 "Industry," International Energy Agency, accessed September 12, 2023, https://www.iea.org/energy-system/industry.
102 International Energy Agency, "Industry."
103 International Energy Agency, "Industry."

from using fossil fuels as energy to produce items such as cement, iron, steel, plastics, and clothes.[104] Heavy machinery often runs on coal, oil, or gas, and is used frequently during industrialization and manufacturing. Processes related to industrial development, such as mining and construction, also release emissions.[105] In fact, the extraction of resources and production has accounted for 90 percent of habitat loss and 50 percent of greenhouse gas emissions.[106] Resources and the creation of factories, buildings, and homes are vital for a country's development. However, such development is not sustainable given its current harm to the climate and environment. Some ways the industrial sector can reduce its emissions include using clean and renewable energy, using energy more efficiently, effectively reusing and recycling materials, and utilizing carbon capture and storage methods.[107]

Another type of greenhouse gas unique to industrial processes is hydrofluorocarbons (HFCs). These are often used in refrigeration processes and air conditioning and are the fastest-growing greenhouse gas.[108] They are entirely human-made, and most are contained within equipment. Thus, emissions result from wear, faulty maintenance, or leakage at the end of a product's lifetime.[109] Over a 20-year period, the most abundant form of HFC can warm the planet 3790 times faster than carbon dioxide.[110] Even more concerning, HFC usage is growing at 10 percent per year.[111]

There are many climate-friendly alternatives for HFCs, such as hydrocarbons or ammonia.[112] Due to the available options, the Climate and Clean Air Coalition (CCAC) has campaigned to reduce international use of HFCs. This was done through the Kigali Amendment to the Montreal Protocol, enacted in 2019.[113] Originally, the Montreal Protocol was created to restore the ozone layer by phasing out chlorofluorocarbons (CFCs). These are gases that deplete the ozone layer. Since HFCs do not contain chlorine, they do not cause ozone depletion, so they were recommended as a replacement for CFCs. However, due to the negative effects of HFCs, the Kigali Amendment states that countries should aim to use fewer HFCs.[114] As of September 2023, 152 states have ratified this amendment.[115] Under the amendment, countries commit to cutting the production and consumption of HFCs by more than 80 percent over the next 30 years. This will avoid the equivalent of 70 billion metric tons of carbon dioxide by 2050.[116] As larger businesses and manufacturers are the primary users of HFCs, the burden falls on them to reduce their use to protect the globe from unnecessary warming.

To take action to reduce emissions, the origins of the emissions are classified into three scopes created by the Greenhouse Gas Protocol.[117] These help companies to specifically focus on what areas they most need to improve.[118] Scope 1 emissions are direct emissions. Any emissions from something that a company owns or controls are in this category.[119] This could include the combustion of fuels for heating or vehicles,

104 "Causes and Effects of Climate Change," United Nations, accessed September 12, 2023, https://www.un.org/en/climatechange/science/causes-effects-climate-change.
105 United Nations, "Causes and Effects of Climate Change."
106 *The Africa Circular Economy Facility,* (Abidjan: African Circular Economy Foundation, 2023), https://www.afdb.org/sites/default/files/2023/05/12/acef_brochure_-_e_version_.pdf.
107 "Controlling Industrial Greenhouse Gas Emissions," Center for Climate and Energy Solutions, accessed September 12, 2023, https://www.c2es.org/content/regulating-industrial-sector-carbon-emissions/.
108 Center for Climate and Energy Solutions, "Controlling Industrial Greenhouse Gas Emissions."
109 "Hydrofluorocarbons," Climate and Clean Air Coalition, accessed September 12, 2023, https://www.ccacoalition.org/short-lived-climate-pollutants/hydrofluorocarbons-hfcs.
110 Climate and Clean Air Coalition, "Hydrofluorocarbons."
111 Climate and Clean Air Coalition, "Hydrofluorocarbons."
112 "Climate-friendly alternatives to HFCs," European Commission, accessed September 12, 2023, https://climate.ec.europa.eu/eu-action/fluorinated-greenhouse-gases/climate-friendly-alternatives-hfcs_en.
113 United Nations, Amendment to the Montreal Protocol on Substances that can Deplete the Ozone Layer, C.N.872.2016.TREATIES-XXVII.2.f, (Oct. 15, 2016), https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-2-f&chapter=27.
114 C.N.872.2016.TREATIES-XXVII.2.f.
115 C.N.872.2016.TREATIES-XXVII.2.f.
116 Climate and Clean Air Coalition, "Hydrofluorocarbons."
117 "What are scope 1, 2 and 3 carbon emissions?" National Grid, accessed September 12, 2023, https://www.nationalgrid.com/stories/energy-explained/what-are-scope-1-2-3-carbon-emissions.
118 National Grid, "What are scope 1, 2 and 3 carbon emissions?"
119 "What is the difference between Scope 1, 2 and 3 emissions, and what are companies doing to cut all three?" World Economic Forum, last modified September 20, 2022, https://www.weforum.org/agenda/2022/09/scope-emissions-climate-greenhouse-business/.

fugitive emissions from refrigerators, or other GHGs released from industrial processes.[120] Scope 2 emissions are indirect emissions created by the production of energy that a company buys. For example, if a company used renewable energy rather than electricity from fossil fuels, their Scope 2 emissions would decrease.[121] Last, Scope 3 emissions are also indirect emissions, but include emissions that occur upstream and downstream of the value chain. These are controlled by suppliers and customers, so they can be affected by decisions made outside the company.[122]

Scope 3 emissions account for over 70 percent of a company's carbon footprint and are the hardest to control.[123] This is because the emissions are created within the business model and not directly from the company. However, it is still possible to mitigate these emissions. For example, the organization could selectively choose to contract with other vendors who produce lower emissions.[124] Despite the complexity of these emissions, over 240 companies have registered for the Science Based Targets initiative. This is an organization that promotes climate action in the private sector.[125] To reduce emissions, 94 percent of these firms are focusing on their customers and suppliers, demonstrating that they understand the importance of Scope 3 emissions.[126]

Although fossil fuels produce a large amount of greenhouse gases, industrial organizations also pollute the environment in other sectors. The second-worst industry for pollution is agriculture, accounting for 11 percent of GHG emissions.[127] This is primarily due to methane and nitrous oxide emissions from crop and livestock activities. To reduce these emissions, actions such as a global shift to eat less meat would reduce the demand for livestock and deforestation for the necessary land.[128] Carbon farming is another method that can help to offset emissions. This refers to practices that increase carbon sequestration in the soil, roots, and leaves of food products. This then increases the carbon in the soil that can be used to support plant growth while reducing carbon in the

120 Jane Courtnell, "Scope 1 2 3 Emissions Explained: Understanding the GHG Protocol's Emission Classification System," Green Business Bureau, last modified April 19, 2022, https://greenbusinessbureau.com/green-practices/energy/scope-1-2-3-emissions/.
121 World Economic Forum, "What is the difference between Scope 1, 2 and 3 emissions, and what are companies doing to cut all three?"
122 World Economic Forum, "What is the difference between Scope 1, 2 and 3 emissions, and what are companies doing to cut all three?"
123 Courtnell, "Scope 1 2 3 Emissions Explained."
124 World Economic Forum, "What is the difference between Scope 1, 2 and 3 emissions, and what are companies doing to cut all three?"
125 Peter Spiller, "Making supply-chain decarbonization happen," McKinsey and Company, last modified June 14, 2021, https://www.mckinsey.com/capabilities/operations/our-insights/making-supply-chain-decarbonization-happen.
126 Spiller, "Making supply-chain decarbonization happen."
127 "The world's most polluting industries," Climate Trade, last modified May 11, 2023, https://climatetrade.com/the-worlds-most-polluting-industries/.
128 Climate Trade, "The world's most polluting industries."

Pollution from factories is a major driver of climate change.

Credit: KarinKarin

atmosphere, which is harmful.[129]

The adverse effects of GHG emissions from various industrial sectors on the environment demonstrate the need for urgent intervention. Average temperatures of the Earth will continue to rise if this problem is not addressed, and industry commits to sustainable manufacturing processes. Thus, UNIDO must act quickly to shape the trajectory of industrial development, mitigating the dire consequences of climate change. Through UNIDO's partnership with Latin America, many initiatives have been launched to reduce the emissions from many Latin American countries. For example, UNIDO has launched a project with Brazil to ensure the elimination of hydrochlorofluorocarbons (HCFCs) by 2023.[130] HCFCs contain chlorine and can cause harm to the ozone layer.[131] That said, such emissions must be expeditiously removed from the sectors that produce them. UNIDO will play an important role in facilitating this, as it has done with other countries such as Brazil. Ultimately, climate change caused by greenhouse gas emissions and other environmental pollutants such as HCFCs must be addressed. Combating climate change is one of the key components that come with ISID, and such industrialization that is environmentally sound cannot occur without addressing the damage it has done and may continue to cause.

Waste Management

Efficient waste management is critical to the sustained development of every country. Without effective waste management systems, sustainable development would be nearly impossible to achieve. Proper waste management allows countries to continue developing and producing goods despite the waste that may stem from this process. Waste management is the collection and treatment of materials that have served their purposes or are considered no longer useful.[132] Anything that fits this context is defined as "waste." Waste comes in many solid, liquid, or gaseous forms. The European Union's Waste Framework Directive also distinguishes between hazardous, non-hazardous, and byproduct forms of waste.[133] By classifying the different forms of waste that exist, targets can be set for regulating waste production and reuse. It is also important to note that each type of waste will have different waste management practices. In order to work towards a circular economy, waste management is a central consideration.

Industries across the world create waste. Whether it be manufacturing, pharmacy, transportation and housing, or even education, there is a large amount of waste produced. 2.01 billion tons of waste worldwide is generated every year.[134] By 2050, the total amount of global waste is expected to grow to 3.40 billion tons.[135] This waste is not produced equally by everyone. High-income countries, which account for 16 percent of the world's population, produce 34 percent of the world's waste. It is also estimated that yearly global waste will double by 2050 at the current rate.[136]

This waste is very detrimental for the environment, especially as 33 percent of the world's waste is not managed in an environmentally friendly way. Additionally, 5 percent of the world's carbon emissions come from waste and waste mismanagement.[137] Thus, this issue is necessary to address to increase sustainability in industries worldwide. Some awareness campaigns have worked for many years to bring awareness of this issue to the general public.

In 1970, a university student at the University of Southern California, Gary Anderson, urged consumers to use the "Three R's." This refers to the common saying, "Reduce,

129 Climate Trade, "The world's most polluting industries."
130 United Nations Industrial Development Organization, *Inclusive and Sustainable Industrial Development in Latin America and Caribbean Region.*
131 "What are hydrochlorofluorocarbons (HCFCs)?" Global Monitoring Laboratory, accessed September 15, 2023, https://gml.noaa.gov/hats/about/hcfc.html.
132 Jerry Nathanson, "Solid-waste Management," Britannica, accessed September 20, 2023, https://www.britannica.com/technology/solid-waste-management.
133 "Waste Framework Directive," European Commission, accessed August 3, 2023, https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en.
134 "What a Waste 2.0," The World Bank, accessed September 5, 2023, https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html.
135 The World Bank, "What a Waste 2.0."
136 The World Bank, "What a Waste 2.0."
137 The World Bank, "What a Waste 2.0."

Reuse, and Recycle."[138] This waste reduction campaign aimed to make consumers aware of the physical waste present in their daily lives. This campaign became a slogan for sustainability worldwide and is now known by children across continents. However, this is only one small step towards sustainable waste management. Additionally, the Waste Framework Directive has set a 55 percent reuse and recycling goal for non-hazardous waste produced by consumers at home and businesses, known as municipal solid waste.[139]

One of the most common forms of waste is municipal solid waste, which is the everyday trash gathered in households. Municipal solid waste contains product packaging, yard trimmings, furniture, clothing, bottles and cans, and electronics.[140] While municipal waste may seem household-centered, industry plays a crucial role in municipal waste production. This is because industries provide consumers with the content found in municipal solid waste, such as plastic. In 2017, the global production of plastics for packaging amounted to 146 million metric tons.[141] It is common for households to discard any excess packaging, contributing to growing landfills and pollution. In fact, 79 percent of the global plastic produced is either in landfills or polluting the natural environment. Specifically, eight million metric tons of plastic end up in the oceans annually.[142] However, waste has the potential to generate energy, which is much more productive than letting it accumulate in landfills or the oceans. This process is known as "waste-to-energy" (WTE). WTE is the process of burning municipal solid waste to produce steam that can power an electric generator turbine.[143] In the United States, for every 100 pounds of municipal solid waste, about 85 pounds can be burned as fuel to generate electricity.[144] WTE systems play an important role in ensuring the reduction of waste overall and serve as a strong remedy to the buildup in landfills. This type of solution is essential towards creating a circular economy.

One notable example of solid waste management is Singapore's efforts to reuse consumer and business waste for electricity. The amount of waste in Singapore in 1970 was 1,260 tons. In 2021, this number had risen to 8,741.[145] Given the rising amount of waste, using systems such as WTE is important. Since then, Singapore has been able to generate electricity from one of four WTE plants.[146] Singapore is one of several countries to successfully incorporate waste management into society.

Another common form of waste is liquid waste. Liquid waste is any waste that takes the form of a liquid. It is often extremely hazardous, as it cannot be picked up or removed as easily as solid waste.[147] Liquid waste comes from many sources and can negatively impact the environment by harming bodies of water. Industrial wastewater includes toxins such as sulfuric acid, which makes rivers more acidic, harming aquatic wildlife.[148] Toxic metals and chemicals also enter the bodies of plants and mammals through liquid waste, which threatens food chains. Therefore, liquid waste must be carefully maintained such that the toxins found in it do not cause severe damage to our ecosystems and food chains. There are many ways in which liquid waste can be effectively managed. Some common methods include dewatering, solidification, and disposal.[149] Dewatering is the act of separating liquid waste from solid

138 "'Reduce, Reuse, Recycle' Button," Smithsonian National Museum of American History, accessed August 3, 2023, https://americanhistory.si.edu/collections/search/object/nmah_1284430.
139 European Commission, "Waste Framework Directive."
140 "Municipal Solid Waste," United States Environmental Protection Agency, accessed September 20, 2023, https://cfpub.epa.gov/roe/indicator_pdf.cfm?i=53.
141 "Plastic production worldwide in 2017 by industrial sector," Statista, accessed September 20, 2023, https://www.statista.com/statistics/1134796/plastic-production-by-industrial-sector-worldwide/
142 Laura Parker, "A Whopping 91 Percent of Plastic Isn't Recycled," National Geographic, last modified May 20, 2022, https://education.nationalgeographic.org/resource/whopping-91-percent-plastic-isnt-recycled/.
143 "Biomass explained," US Energy Information Administration, last modified December 28, 2022, https://www.eia.gov/energyexplained/biomass/waste-to-energy-in-depth.php.
144 US Energy Information Administration, "Biomass explained."
145 "Solid Waste Management Infrastructure," National Environment Agency of Singapore, accessed August 3, 2023, https://www.nea.gov.sg/our-services/waste-management/waste-management-infrastructure/solid-waste-management-infrastructure.
146 National Environment Agency of Singapore, "Solid Waste Management Infrastructure."
147 Ricardo Beiras, "Liquid Wastes: From Self-purification to Waste Water Treatment Author links open overlay panel," *Marine Pollution*, (2018): 53-67, https://doi.org/10.1016/B978-0-12-813736-9.00005-2.
148 Beiras, "Liquid Wastes."
149 "7 Common Liquid Waste Disposal Methods," VLS Environmental Solutions, accessed September 20, 2023, https://www.vlses.com/2022/10/03/7-common-liquid-waste-disposal-methods/.

waste. It is important to separate waste accordingly as each is easier to treat independently. Solidification is the process of solidifying liquid waste to make it easier to dispose of. One well-known example of this is found in South Carolina, United States. Here, 36 million gallons of high-level liquid nuclear waste are converted into solid waste so they can be disposed of more easily.[150] Lastly, disposing of the liquid waste through the help of a professional waste management company is a common method. Waste management companies will collect liquid waste from the industry and treat it according to local regulations.[151] The Global Liquid Waste Management market size was valued at USD 96.30 billion in 2022 and is expected to reach USD 126.93 billion by 2032.[152] This indicates that liquid waste management is a larger concern that is often addressed through waste management companies.

Another example of liquid waste management can be seen in Jordan's collection of greywater. Greywater is household wastewater produced through showers, washing dishes, and doing laundry. Since 75 percent of Jordan is a desert, they receive very little rain annually. Climate, population growth, and a rapidly developing society have heavily contributed to water scarcity in Jordan, with water demand falling far below the quantity of water supplied in the last three decades.[153] By collecting greywater, Jordan can increase their water supply.[154] This water has been reused for crop irrigation and toilet water.[155] As Jordan continues to industrialize, its greywater management ensures more efficient water usage.

The final common form of waste takes the form of gas. Some of the most common gaseous wastes include carbon dioxide, methane, and ethane.[156] While often difficult to manage, gaseous waste has recently led to the creation of innovative waste management programs. Given that excessive greenhouse gases are produced due to iron, steel, chemical, and cement production, it is important to apply certain gas waste management systems. Carbon capture, usage, and storage (CCUS) is the most cost-effective decarbonization effort.

150 VLS Environmental Solutions, "7 Common Liquid Waste Disposal Methods."
151 VLS Environmental Solutions, "7 Common Liquid Waste Disposal Methods."
152 "Global Liquid Waste Management Market Size To Grow USD 126.93 Billion By 2032 | CAGR of 2.8%," Yahoo Finance, September 13, 2023, https://finance.yahoo.com/news/global-liquid-waste-management-market-103000889.html.
153 Stephen Mcillwaine, "Graywater Reuse in Other Countries and its Applicability to Jordan," Center for the Study of the Built Environment, accessed September 20, 2023, https://www.csbe.org/greywater-reuse-in-other-countries.
154 "Geography," The Hashemite Kingdom of Jordan, accessed August 3, 2023, http://www.kinghussein.gov.jo/geo_env1.html.
155 Mcillwaine, "Graywater Reuse in Other Countries and its Applicability to Jordan."
156 Sumit Dhawane, Eslam Al-Sakkari, and Deepak Yadav, "Cost-effective viable solutions for existing technologies," *Hazardous Waste Management*, (2022): 381-395, https://doi.org/10.1016/B978-0-12-824344-2.00033-1.

Greywater is often collected in settling tanks to begin removing contaminants.

Credit: SuSanA Secretariat

This involves separating carbon dioxide before or after fuel is combusted using chemical reactions.[157] This system plays an important role in reducing the total amount of carbon dioxide released into the atmosphere from industrial processes. Although still in the early stages of development, CCUS has received financial support in the 2023 European Union's Net Zero Industry Act, the United States's 2021 Infrastructure Investment and Jobs Act, and the 2022 Inflation Reduction Act.[158] Investment and action have been made in the United States, European Union, United Kingdom, Indonesia, China, and Japan. Despite this, the International Energy Association has deemed the implementation of CCUS technology as not on track.[159] Therefore, continuous investments in carbon capture and related gas waste management solutions must be made.

As more countries develop and industry expands, it is extremely important to be aware of the waste that can come from this process. As waste is found in every industry, measures must be taken to effectively manage this waste and ensure healthy, sustainable development. Considering that the total global waste is expected to reach 3.40 billion tons by 2050, it is important to take every step possible to ensure that such an expectation does not become a reality.

Current Status

Existing Solutions

Sustainability has been at the forefront of global discussions regarding climate change and its ever-growing consequences. Creating a circular economy, managing waste, and ensuring sustainable development are key to protecting the Earth. Recently, UNIDO announced its medium-term programme framework (MTPF) from 2022-2025. This framework is focused on contributing as much as possible to global inclusive, sustainable development.[160] Specifically, UNIDO aims to work with its member states to "build back better." This means improving industrialization pathways for inclusive growth, reducing inequalities, and promoting digital and green transitions.[161] From 2022 to 2023, the MTPF has been funded through a budget of Euro 144.0 million.[162] It is important for UNIDO to take a more aggressive approach through the launch of medium-term projects focused solely on improving sustainable development throughout the world. Projects undertaken through the MTPF will drive inclusive sustainable industrial development. They will also boost economic competitiveness, shared prosperity from industry, and an environmentally sustainable industry.[163]

Three UNIDO projects won the 2023 Lower Global Warming Potential Refrigeration and Air-Conditioning Innovation Award. This award is presented by the American Society of Heating, Refrigerating and Air Conditioning Engineers along with the UN Environment Programme.[164] This award recognizes projects that have found innovative ways to reduce a country's potential to contribute to global warming by improving refrigeration and air-conditioning appliances. Two of the three projects were implemented in Brazil, and the other in Ecuador.[165] One of the projects in Brazil involved using propane as a replacement for HCFCs in commercial zones, particularly in the refrigeration systems found in supermarkets.[166] Similarly, the project in Ecuador involved using propane as an alternative to HCFCs. This

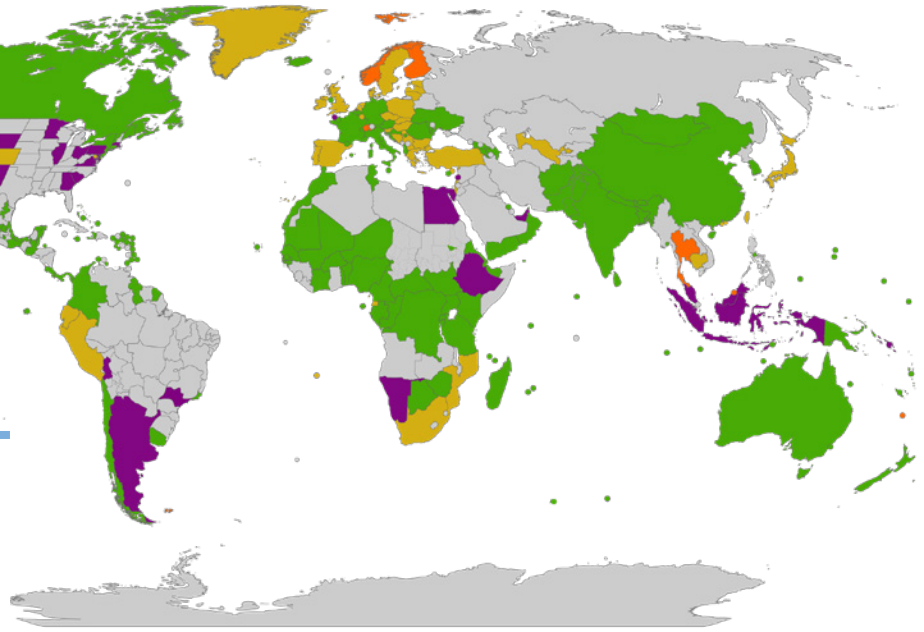
157 Esin Serin, "What is carbon capture, usage and storage (CCUS) and what role can it play in tackling climate change?" London School of Economics and Political Science, last modified March 13, 2023, https://www.lse.ac.uk/granthaminstitute/explainers/what-is-carbon-capture-and-storage-and-what-role-can-it-play-in-tackling-climate-change/.
158 "Carbon Capture, Utilization and Storage," The International Energy Association, last modified July 11, 2023, https://www.iea.org/energy-system/carbon-capture-utilisation-and-storage.
159 The International Energy Association, "Carbon Capture, Utilization and Storage."
160 *2022-2025 Medium-term Programme Framework* (Vienna: United Nations Industrial Development Organization, July 2021), https://www.unido.org/sites/default/files/unido-publications/2023-02/2022-2025-MEDIUM-TERM-PROGRAMME-FRAMEWORK-en.pdf.
161 *2022-2025 Medium-term Programme Framework.*
162 United Nations Industrial Development Organization, Medium-term programme framework 2022–2025, IDB.49/8-PBC.37/8, (March 18, 2021), https://downloads.unido.org/ot/20/94/20947253/PBC.37_8_E_Medium-term%20programme%20framework%20(MTPF)_2022-2025_2101690E.pdf.
163 IDB.49/8-PBC.37/8.
164 Ole Nielsen, "Three UNIDO projects win ASHRAE-UNEP innovation award," *United Nations Industrial Development Organization*, August 10, 2023, https://www.unido.org/news/three-unido-projects-win-ashrae-unep-innovation-award.
165 Nielsen, "Three UNIDO projects win ASHRAE-UNEP innovation award."
166 Nielsen, "Three UNIDO projects win ASHRAE-UNEP innovation award."

resulted in a 36 percent reduction in energy consumption and a 41 percent decrease in total carbon dioxide emissions.[167] This kind of innovation is required to reduce the harm done to the environment through industrial processes. Finding sustainable alternatives to emissions that pose serious threats is very important and should continue to be prioritized within UNIDO.

Besides UNIDO, many other actors are working to create a more sustainable world for future generations. For example, Scale 360 is an initiative working to create a global public-private partnership to move towards a circular economy.[168] It is co-supported by both the World Economic Forum and the Circular Economy Council of the United Arab Emirates. It focuses on bottom-up innovation as well as entrepreneurship. This innovation is important because it allows communities to create solutions that cater to their needs. Additionally, it pushes community members to note exactly which areas they can improve resource management. So far, the initiative has been implemented in 21 cities across countries such as Argentina, Chile, Singapore, and the United Arab Emirates. The initiative selects "Circular Shapers" from the Global Shapers Community, a network of young volunteers looking to make their hubs more sustainable. These Circular Shapers then assess their local environments, identify challenges, and create solutions that best address their needs. When implemented, the program gives resources and shares knowledge to industry leaders that could better contribute to a circular economy. In particular, Scale 360 uses the Circular Innovation Playbook to better transition into sustainable practices.[169] This connects financiers, public servants, activists, and other stakeholders so the community's participation can be better leveraged. The initiative also connects people beyond just within their communities. Circular Shapers also have access to the network of experts within the World Economic Forum and industry leaders such as the Ellen MacArthur Foundation, a foundation dedicated to creating a circular economy.[170] A specific hub in which Scale 360 can be seen at work is Cebu, Philippines. It first identified four material value chains with the worst impact on the Philippines' economy. They identified plastics, fashion, food, and e-waste to be the least sustainable industries in the area. Following this, they had an intervention within each value chain to create public and private listings to better each sector. They created Scale 360 Plastic Directory to create a central network for plastic drop-off points, recycling plants, and sanitary landfills.[171] They also implemented new infrastructure, including creating urban gardens to turn food waste into compost for farmers.[172]

Another example can be seen with the Global Environment Facility (GEF).[173] The GEF funds Plastics Integrated Programs throughout over 15 countries. It specializes in the food and beverage industry and tackles single-use plastic packaging to prevent pollution. It is a USD 107 million program, representing the largest global investment in modern history. It was created in preparation for the Global Plastics Treaty, a document dedicated to holistically addressing and reforming the life cycle of plastics. This initiative is an extremely hopeful step of building circular economies. Plastic waste comprises 85 percent of marine pollution and 40 percent of total plastic waste comes from the food and beverage industry.[174] In partnership with the World Wildlife Fund and the United Nations Environmental Program, they have created the six-year Circular Solutions to Plastic Pollution Integrated Program. This program will specialize in decreasing unnecessary plastic in packaging, revamping business practices, bolstering reusable packaging, and extending the life of packaging materials through product redesign. Additionally, it aims to increase collaboration with global partners and promote investment and behavior change.[175]

167 Nielsen, "Three UNIDO projects win ASHRAE-UNEP innovation award."
168 Bontu Yousuf et al., "How youth are driving the circular economy transition across the world," *World Economic Forum*, April 13, 2023, https://www.weforum.org/agenda/2023/04/global-shapers-driving-the-circular-economy-transition-shaperssummit23/.
169 Yousuf et al., "How youth are driving the circular economy transition across the world."
170 "What we do," Ellen MacArthur Foundation, accessed September 20, 2023, https://ellenmacarthurfoundation.org/about-us/what-we-do.
171 "What's the problem in plastic waste?" Scale 360, accessed September 20, 2023, https://scale360.ph/plastics-overview/.
172 Yousuf et al., "How youth are driving the circular economy transition across the world."
173 "Who we are," Global Environment Facility, accessed September 20, 2023, https://www.thegef.org/who-we-are.
174 Organisation for Economic Co-operation and Development, *Global Plastics Outlook: Economic Drivers, Environmental Impacts and Policy Options* (Paris: OCED Publishing, 2022), https://doi.org/10.1787/de747aef-en.
175 United Nations Environment Programme, "Circular solutions in focus in landmark global investment to tackle plastic pollution," news release, June 30, 2023, https://www.unep.org/gef/news-and-stories/press-release/circular-solutions-focus-landmark-global-investment-



A map of countries and territories with plastic bag bans.

Green: Total Ban
Yellow: Charge for bags
Orange: Voluntary charge agreement
Purple: Partial charge or ban

Credit: Elekhh

Specific countries have begun implementing certain policies to bolster their circular economies. The European Union aims for a 90 percent collection goal of plastic bottles by 2029.[176] To meet this goal, Denmark created the Dansk Retursystem, a Danish deposit and return system for cans and bottles. Essentially, when people buy drinks from beverage producers, they are charged an additional "deposit" on their drink. If the customer returned the empty bottle or can to a return and deposit system at any supermarket or kiosk, they were given back their deposit. Bigger supermarkets also have machines within them that scan the returned drink packaging, separate them, and then compress them to be made into new drink packaging. Since this system has been implemented, Denmark has also added new programs to make this process even simpler. They now have Grab and Go machines which can handle drops of up to 300 empty bottles at a time.[177] In 2021, Denmark had a 93 percent return in disposable drinking packaging.[178] That means 1.9 billion cans, bottles, and glasses were recycled.[179] Not only does this conserve resources, but producing cans from recycled materials uses 95 percent less energy.[180] Finally, refillable bottles are reused up to 30 times. In total, this initiative saves around 210,000 tons of carbon dioxide emissions annually.[181]

Many governments have also begun cracking down on plastic bags. In May 2022, New Jersey's ban on plastic bags was implemented. Supermarket clerks, restaurant staff, and retailers across the state retired plastic bags as they could no longer be given to consumers.[182] This was an important step as the New Jersey Clean Communities Council estimates that the ban will eliminate more than eight billion plastic bags annually.[183] This ban has encouraged consumers to use reusable bags. While the removal of plastic was a major lifestyle change for many New Jersey residents, the ban has proven to be extremely effective in safeguarding the environment. Last year, many New Jersey

tackle-plastic.

176 "The Danish deposit & return system for recycling drink cans and bottles," State of Green, last modified October 13, 2022, https://stateofgreen.com/en/solutions/the-danish-deposit-return-system-for-recycling-drink-cans-and-bottles/?utm_campaign=National%20forankring&utm_content=160448745&utm_medium=social&utm_source=linkedin&hss_channel=lcp-2375118&hsa_acc=504065278&hsa_cam=629483653&hsa_grp=213173993&hsa_ad=219684953&hsa_net=linkedin&hsa_ver=3.
177 State of Green, "The Danish deposit & return system for recycling drink cans and bottles."
178 State of Green, "The Danish deposit & return system for recycling drink cans and bottles."
179 "10 Examples of Circular Economy Solutions," State of Green, last modified July 21, 2017, https://stateofgreen.com/en/news/10-examples-of-circular-economy-solutions/.
180 State of Green, "The Danish deposit & return system for recycling drink cans and bottles."
181 State of Green, "The Danish deposit & return system for recycling drink cans and bottles."
182 Scott Fallon, "A year into NJ's plastic bag ban, what impact has it had?" *North Jersey*, May 11, 2023, https://www.northjersey.com/story/news/environment/2023/05/11/nj-plastic-bag-ban-impact-after-one-year/70192915007/.
183 Fallon, "A year into NJ's plastic bag ban, what impact has it had?"

beach cleanups took place from Cape May to Sandy Hook. These cleanups were facilitated by the environmental group Clean Ocean Action. From 2021-2022, there were 37 percent fewer plastic bags, 39 percent fewer plastic straws, and 37 percent less foam waste.[184] This shows how major decisions such as bans on plastic bags and related items may prove to be helpful.

Ultimately, many solutions have been enacted or are currently in development when meeting UNIDO's goals. While many countries, states, and individual groups have pursued their own actions, the importance of international collaboration must be stressed. The practice of creating sustainable industries must be applied globally through the input and actions of every country. Additionally, a true circular economy cannot be developed within the borders of one country, but rather, must encompass the global community.

Emerging Technologies

New technological advances in recent years have the potential to reduce the harmful effects of manufacturing. Many developed technologies have helped manufacturing processes have a lower impact on the surrounding environment.

Additive manufacturing is another term for 3-D printing. It involves creating a 3-D digital model and then using that model to create a product by adding thin layers of a material together.[185] The use of additive manufacturing is growing and could reduce some of the harmful effects of manufacturing on the environment. For example, additive manufacturing allows companies to reuse waste to create new materials and reduce the amount of materials used. This is because products made using additive manufacturing are usually lighter and stronger, performing better than products made by traditional manufacturing methods.[186] Additive manufacturing can also reduce energy consumption and greenhouse gas emissions. Since additive manufacturing products are lighter, they significantly reduce the fuel consumption necessary to transport them.[187] Additive manufacturing is also quicker since manufacturers can print a product on-demand in their facility. This has been especially beneficial during the global supply chain crisis, as companies can receive parts almost instantly.[188]

Additive manufacturing can also help create a circular economy by reusing and recycling materials. It already produces less waste and the waste it does produce can also easily be used to create new products.[189] For example, HP, a technology company, used additive manufacturing waste from its facilities to create car parts for Ford, a car company.[190] Waste can also be recycled to create new products with additive manufacturing. For example, Continuum is a metal recycling company based in the United States and Singapore.[191] Continuum transforms scrap metal into materials that can be used for industrial 3D printing, contributing to creating a circular economy.[192]

Several companies across the world have already implemented additive manufacturing as a way to improve sustainability. For example, Coral Maker is an Australian company using additive manufacturing to restore coral reefs. They create coral skeletons with recycled stone waste from construction companies that speed up the restoration process. This reduces waste and carbon emissions since the coral skeletons can be manufactured locally.[193] Additionally, an engineering company in Lebanon called Dar Al-Handasah made a smart bridge that

184 Fallon, "A year into NJ's plastic bag ban, what impact has it had?"
185 Jinge Liu and Peng Wen, "Metal vaporization and its influence during laser powder bed fusion process," *Materials & Design* 215, no. 110505 (March 2022), https://doi.org/10.1016/j.matdes.2022.110505.
186 Stephen Hooper, "Innovations for the Future of Sustainable Manufacturing," *Society of Manufacturing Engineers*, June 15, 2023, https://www.sme.org/technologies/articles/2023/june/innovations-for-the-future-of-sustainable-manufacturing/.
187 Hooper, "Innovations for the Future of Sustainable Manufacturing."
188 Daniel Keyser, "Additive Manufacturing for Sustainability," ARC Advisory Group, accessed September 1, 2023, https://www.arcweb.com/industry-best-practices/additive-manufacturing-sustainability.
189 Sangmin Lee, "Analyzing True Sustainability in 3D Printing," *3DPrint.com*, August 28, 2023, https://3dprint.com/302778/analyzing-true-sustainability-in-3d-printing/.
190 Lee, "Analyzing True Sustainability in 3D Printing."
191 Continuum, "Continuum™ Secure $36 Million in Funding Led by Ara Partners to Support Rapid Advancement of the Circular Metals Economy," news release, December 13, 2022, https://www.prnewswire.com/news-releases/continuum-secures-36-million-in-funding-led-by-ara-partners-to-support-rapid-advancement-of-the-circular-metals-economy-301702103.html.
192 Lee, "Analyzing True Sustainability in 3D Printing."
193 Hooper, "Innovations for the Future of Sustainable Manufacturing."

is five meters in length using additive manufacturing. This smart bridge also uses robotics and AI as part of an initiative to make the construction industry safer and more sustainable.[194] Another engineering company in the Netherlands similarly used additive manufacturing to construct a bridge over a canal in Amsterdam. This process decreased the time and energy needed to construct the bridge.[195] The aviation industry has also used additive manufacturing to improve energy efficiency. For example, a group of researchers in Germany reduced the size of a turbine for an aircraft engine by 30 percent with additive manufacturing. Reducing the size of the turbine using additive manufacturing can help reduce emissions from aircraft.[196] Lastly, Apple, a multinational information technology corporation, has been testing 3-D printing to make the steel chassis used in smartwatches. If this process succeeds, Apple will apply 3-D printing when manufacturing other products. This is a major step in the right direction for Apple's sustainability ambitions.[197] Processes such as additive manufacturing must continue to be applied to new industries to make manufacturing more sustainable and to reduce waste.

In addition to manufacturing, robotic process automation (RPA) is another technology that helps companies reduce waste. RPA is when companies use software to perform repetitive tasks automatically.[198] RPA saves companies time, eliminates waste, and improves sustainability.[199] One way that RPA reduces waste is with its consistent performance. When humans perform the same task many times, they often make mistakes as they become more tired over time. However, since robots are programmed to follow a set of rules, they perform tasks with more consistency than most humans. Thus, RPA reduces the amount of product that has to be thrown away due to a mistake.[200] Additionally, robots require less resources to make a product. For example, when sanding a product, RPA uses sensors to determine the optimal time to switch sandpaper when producing a given product. Humans often switch the sandpaper at times that are less efficient, which requires them to use more sandpaper.[201] Robots can also work in hazardous environments without personal protective equipment. Employing RPA in hazardous environments reduces consumption and also protects humans from potential health issues.[202] Finally, RPA increases energy efficiency as it eliminates the need for temperature control. For example, temperatures in buildings generally must be between 68-78 degrees Fahrenheit for human comfort. However, robots can operate under a much wider range of temperatures, usually between 60-90 degrees Fahrenheit.[203]

There are many examples of the application of RPA worldwide. Eastman Chemical, a global materials company that produces additives, specialty chemicals, and fibers, recently added RPA to its operations.[204] Eastman Chemical was interested in using RPA to automate specific processes to boost efficiency and save costs. At first, Eastman Chemical used RPA in its finance groups, where large amounts of data were gathered and analyzed daily in massive spreadsheets. This was extremely effective as RPA could swiftly and automatically extract data, saving the employees from doing this task.[205] Following the success of this implementation, Eastman Chemical expanded the use of RPA to its supply chain, data processing, accounting, and human resources departments. Now, the company has 120 robots, making them much more efficient. In fact, roughly

194 Hooper, "Innovations for the Future of Sustainable Manufacturing."
195 Hooper, "Innovations for the Future of Sustainable Manufacturing."
196 Hooper, "Innovations for the Future of Sustainable Manufacturing."
197 Will Feuer, "Apple Tests Use of 3D Printers in Smartwatch Components, Bloomberg Reports," *Morningstar*, August 30, 2023, https://www.morningstar.com/news/dow-jones/202308307726/apple-tests-use-of-3d-printers-in-smartwatch-components-bloomberg-reports.
198 Pete Peranzo, "Robotic Process Automation in Manufacturing: Benefits, Uses, Cases, and Examples," *Imaginovation Insider*, September 6, 2023, https://imaginovation.net/blog/rpa-in-manufacturing/.
199 "How Technology Supports Sustainability in Manufacturing & Distribution," *iLink Digital*, September 7, 2022, https://www.ilink-digital.com/insights/blog/technology-supports-sustainability-in-manufacturing/.
200 Satyandra Gupta, "How Robot Use In Manufacturing Can Impact Environmental Sustainability," *Forbes*, August 11, 2023, https://www.forbes.com/sites/forbestechcouncil/2023/08/11/how-robot-use-in-manufacturing-can-impact-environmental-sustainability/?sh=6e54532162ad.
201 Gupta, "How Robot Use Impacts Environmental Sustainability."
202 Gupta, "How Robot Use Impacts Environmental Sustainability."
203 Gupta, "How Robot Use Impacts Environmental Sustainability."
204 "RPA in Manufacturing - 6 Examples of Successful Real-World Applications," CFB Bots, accessed September 20, 2023, https://www.cfb-bots.com/single-post/rpa-in-manufacturing-6-examples-of-successful-real-world-applications.
205 CFB Bots, "RPA in Manufacturing - 6 Examples of Successful Real-World Applications."

20,000 hours of work have been saved at Eastman Chemical annually since it implemented RPA.[206]

Another example of RPA application can be noted in MAS Holdings, a South Asian apparel and textile manufacturer. MAS Holdings grew from having just seven processes automated in 2017 to having 52 processes automated in 2021.[207] MAS Holdings' implementation of RPA has saved 14,000 workdays for employees and has allowed for on-time deliveries of their products by ensuring purchase orders go out on time.[208] Eastman Chemical and MAS Holdings are just two examples of many that show the effectiveness of RPA. When mundane tasks are automated, employees can be much more productive elsewhere. Additionally, companies using RPA can focus their efforts on much larger projects rather than the work that can be automated. RPA plays an important role when considering global inclusive and sustainable industrialization as it saves resources, increases productivity, and improves the industries' output.

While RPA can benefit manufacturers, there are a few shortcomings of this process. In many cases, robotic automation leads to job loss and displacement. Many workers who rely on paychecks from working in the manufacturing sector could lose their income should their jobs be replaced by automation. Therefore, it is important that the workers whose jobs are at risk have the opportunity to find other jobs. Programs that provide training and guidance to those who may have to transition jobs must be developed. Additionally, robots still consume energy. With this, efforts must be made to ensure that the equipment used to build robots is energy efficient. Policies must also be introduced to ensure that robots do not consume energy when they are idle. Furthermore, policies are also needed regarding the refurbishment, recycling, and disposal of electronic components from robots once they have been exhausted. As a key point of automation is to reduce waste and ensure productivity, the components used to create robots should not contribute to the problem.

New technologies must be carefully monitored and implemented accordingly to ensure inclusive, sustainable industrial development worldwide. From additive manufacturing to RPA, the advantages that these technologies can bring to the manufacturing sector must not be overlooked. These technologies can greatly reduce waste and boost the productivity of a given industry. However, they must be implemented carefully to avoid any negative consequences. Overall, UNIDO must consider these technologies as they work towards sustainable development. Each country must consider how they can incentivize and support the growth of these technologies while balancing their shortcomings.

Sustainable Development Goals

The United Nations adopted 17 Sustainable Development Goals (SDGs) in 2015 as a part of the 2030 Agenda for Sustainable Development. They are collaborative goals created by the international community to commit themselves to creating solutions to improve the well-being of the Earth and its people. When looking at sustainable manufacturing and waste management, the SDGs are directly involved in numerous aspects of the future.[209]

This topic directly helps achieve SDG 12: responsible consumption and production. In a world of climate change, massive corporations, and centuries of unsustainable but profitable business practices, new and creative ways must be implemented to accomplish this goal. Circular economies in particular are one of the most sustainable models which are being implemented worldwide in response to this goal. They specifically focus on the ways in which products and resources can be reused or reincorporated back into their respective economies for as long as possible.[210]

Another big SDG in relation to this topic is SDG 7: affordable and clean energy. Sustainable manufacturing and waste manufacturing expends tons of energy every day across the globe. In 2018, the manufacturing sector made up almost 74 percent of total industrial energy consumption. UNIDO

206 CFB Bots, "RPA in Manufacturing - 6 Examples of Successful Real-World Applications."
207 CFB Bots, "RPA in Manufacturing - 6 Examples of Successful Real-World Applications."
208 CFB Bots, "RPA in Manufacturing - 6 Examples of Successful Real-World Applications."
209 "The 17 Goals," United Nations Department of Economic and Social Affairs, accessed September 20, 2023, https://sdgs.un.org/goals.
210 "Goal 12: Sustainable consumption and production," United Nations Environment Programme, accessed September 20, 2023, https://www.unep.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-12.

must ensure that these practices are falling within the realm of sustainable production.[211] In order to make energy accessible and clean, current industrial practices must be reevaluated.

Other SDGs are also intrinsically intertwined with this topic. For example, SDG 3: good health and well-being aims to improve and ensure the living quality for people of all genders, ages, and backgrounds. As a part of this goal, governments have pledged to decrease the death and illness toll from hazardous chemicals and air, contamination, and pollution. Many manufacturing practices are often harmful to the residents of plants or factories. Waste is disposed of responsibly and companies take minimal responsibility for the damages they create. However, in circular systems, resources needed for such productions actually become helpful whether that be as sustainable alternatives or just a reuse of already existing products.

Bloc Analysis

Points of Division

In September 2015, Professor Christian Kroll, a professor of sustainability at IU International University of Applied Sciences, created the prototype for the SDG Index.[212] The SDG Index is the first tool that measures countries' progress towards achieving the SDGs, and it is included annually in the UN's Sustainable Development Report.[213] Countries receive an SDG Index score on a scale of 0-100. A country's SDG Index score represents the percentage of an optimal performance in achieving the SDGs that the country has obtained. For example, a country with a score of 70 is 70 percent of the way towards achieving an ideal SDG performance. Therefore, the difference between 100 and a country's SDG Index score is the percentage that a country needs to overcome to reach an optimal SDG performance. In the previous example, the country with an SDG Index score of 70 would have to improve its performance by 30 percent to reach an optimal performance.[214] This index helps demonstrate how much

211 "Analysis finds decrease in U.S. manufacturing energy consumption," Office of Energy Efficiency and Renewable Energy, last modified May 20, 2022, https://www.energy.gov/eere/amo/articles/analysis-finds-decrease-us-manufacturing-energy-consumption.
212 "About," Sustainable Development Report, accessed August 30, 2023, https://www.sdgindex.org/about/.
213 Sustainable Development Report, "About."
214 "Methodology," Sustainable Development Report, accessed August 30, 2023, https://dashboards.sdgindex.org/chapters/methodology.

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Credit: H005

progress each UN member state has made towards achieving the 17 SDGs.

To determine a country's SDG Index score, data from household surveys, civil society organizations, peer-reviewed journals, and geographic information systems are used.[215] From this data, researchers select indicators for each SDG that measure a country's performance towards achieving that specific SDGs. Each indicator is scaled, so they can be measured on a scale from 0 to 100 and countries are assigned a score for each indicator based on their performance.[216] Next, researchers assign each country a score for each SDG by averaging the scores of the indicators for each SDG. Finally, researchers assign each country an overall score by averaging their score for each SDG. Researchers decided to give each SDG an equal weight when determining averages to reflect the equal importance the UN gives to each of the 17 SDGs.[217]

Since the SDG Index score measures a country's performance towards achieving sustainable development, this index can be used to determine differences in policies between countries when it comes to sustainable manufacturing and waste management. Countries with similar SDG Index scores will likely align with each other more closely on topics of sustainability because they are at a similar point in implementing the 2030 Sustainable Development Agenda. Delegates should research their country's SDG Index score and their country's policies on sustainable manufacturing and waste management to determine which bloc they will most likely align with in committee.

Countries with Significant Progress Towards the Sustainable Development Goals

Countries in this bloc have the strongest SDG performance, measured through the Sustainable Development Ranking report. They have an SDG Index Score between 70-100 and show a strong commitment to sustainable manufacturing and effective waste management. These countries often have established efficient recycling systems and have found ways to reduce waste produced by their industries.[218] They often have made more progress towards achieving the SDGs and have performed better on several indicators for sustainable growth and development.[219]

Finland is ranked first on the 2023 Sustainable Development Report with an SDG Index score of 86.76.[220] In 2016, Finland became the first country to create a plan for achieving a circular economy.[221] This plan includes targeted caps on natural resource extraction and supporting entrepreneurship in creative reuse and upcycling. Another important part of this plan is including lessons about the circular economy in school curriculums and adult education courses.[222] Finland's plan to reduce waste and promote sustainable manufacturing is producing results. The forestry industry, one of Finland's largest industries, has also committed to waste reduction. As of 2022, 28 percent of domestic energy consumption in Finland came from wood-based fuels, often repurposed from the forestry industry.[223] Repurposed wood is also used for battery production.[224] Renewable energy sources also surpassed fossil fuels in Finland in 2020.[225]

Japan has also made significant progress towards sustainable manufacturing and waste management by implementing a circular economy.[226] Japan is ranked 21 on the 2023

215 Sustainable Development Report, "Methodology."
216 Sustainable Development Report, "Methodology."
217 Sustainable Development Report, "Methodology."
218 "Rankings," Sustainable Development Report, accessed August 31, 2023, https://dashboards.sdgindex.org/rankings.
219 Sustainable Development Report, "Methodology."
220 Sustainable Development Report, "Rankings."
221 Lisa Abend, "Inside Finland's Plan to End All Waste by 2050," *TIME Magazine*, January 20, 2022, https://time.com/6132391/finland-end-waste/.
222 Abend, "Inside Finland's Plan to End All Waste by 2050."
223 Abend, "Inside Finland's Plan to End All Waste by 2050."
224 Steven Dorst, "Finland's Green Building Revolution," *International Monetary Fund*, November 2, 2021, https://www.imf.org/en/News/Articles/2021/10/27/110421-finlands-green-building-revolution.
225 Abend, "Inside Finland's Plan to End All Waste by 2050."
226 Naoki Tamaki and Naoki Wada, "How Japan is using the circular economy to recycle plastics," CirularEconomy.Earth, last modified March 15, 2023, https://circulareconomy.earth/publications/how-japan-is-using-the-circular-economy-to-recycle-plastics.

Sustainable Development Report and has an SDG Index Score of 79.41.[227] In Japan, traditional practices related to conservation and recycling combined with government policies have contributed to its progress towards achieving the SDGs.[228] In 2000, the Japanese government passed the Law for Establishing a Recycling-Oriented Society, which created a legal framework for a circular economy.[229] In 2001, it passed the Law for the Promotion of Effective Utilization of Resources. This required businesses to implement responsible waste management practices in their manufacturing processes.[230] Japan has also created two certifications that businesses can earn for collecting and recycling their products sold to consumers and their own industrial waste.[231] These practices have helped Japan significantly reduce the amount of waste they produce.[232]

Countries in this bloc have strong legal frameworks to promote a circular economy and have developed effective waste management systems. While they have made significant progress towards achieving the SDGs, they can still make progress. Though many countries in this bloc have taken steps towards establishing a circular economy, they might still struggle to encourage some businesses in their country to implement these practices. Countries in this bloc might also focus on how they can help other countries establish similar frameworks for sustainable manufacturing and waste management and encourage them to make further progress towards achieving the SDGs.

Countries with Moderate Progress Towards the Sustainable Development Goals

Countries in this bloc have made moderate progress toward achieving the SDGs and are ranked towards the middle of the Sustainable Development Report. These countries have an SDG Index Score between 54-70. Countries in this bloc have made some efforts to promote sustainable manufacturing and waste management, but more is needed to achieve the targets established in the 2030 Sustainable Development Agenda.[233] Some countries in this bloc might have established targets or frameworks for waste reduction but struggle to execute them. Others might face political or economic obstacles to implementing a circular economy and reducing waste. While countries in this bloc have taken steps in the right direction, they must significantly increase these efforts to achieve the SDGs.[234]

India, which has an SDG Index score of 63.45, is one example of a country that falls into this bloc.[235] India's manufacturing sector has grown significantly in recent years due to the Indian government's "Made in India" campaign. This campaign aims to reduce India's dependence on other countries for imports.[236] However, with this manufacturing growth has come increased pollution and environmental concerns.[237] India is currently the world's fourth-largest economy, but it is also the fifth-largest greenhouse gas emitter.[238] To address this issue, the Indian government has implemented the National Action Plan on Climate Change and the State Action Plan on Climate Change which aim to establish sustainable manufacturing practices.[239] India has seen some businesses implement sustainable manufacturing practices, such as a manufacturing start-up in Mumbai that repurposes leftover aluminum and other waste.[240] However, India still faces many obstacles to implementing widespread sustainable manufacturing practices, such as problems with infrastructure and technology adoption.[241]

227 Sustainable Development Report, "Rankings."
228 Tamaki and Wada, "How Japan is using the circular economy to recycle plastics."
229 Tamaki and Wada, "How Japan is using the circular economy to recycle plastics."
230 Tamaki and Wada, "How Japan is using the circular economy to recycle plastics."
231 Tamaki and Wada, "How Japan is using the circular economy to recycle plastics."
232 Tamaki and Wada, "How Japan is using the circular economy to recycle plastics."
233 Sustainable Development Report, "Rankings."
234 Sustainable Development Report, "Methodology."
235 Sustainable Development Report, "Rankings."
236 K.K. Pulicherla et al., "Current efforts on sustainable green growth in the manufacturing sector to complement 'make in India' for making 'self-reliant India,'" *Environmental Research* 206, (April 2022): 112263, https://doi.org/10.1016/j.envres.2021.112263.
237 Pulicherla et al., "Current efforts on sustainable green growth."
238 Pulicherla et al., "Current efforts on sustainable green growth."
239 Pulicherla et al., "Current efforts on sustainable green growth."
240 Annanya Agarwal, "India leaping towards sustainable manufacturing future," *The Times of India*, November 24, 2022, https://timesofindia.indiatimes.com/blogs/voices/india-leaping-towards-sustainable-manufacturing-future/.
241 Sonam Motwani, "Green and clean technology: The future of Indian manufacturing," *The Times of India*, June 17, 2023, https://timesofindia.indiatimes.com/blogs/voices/green-and-clean-technology-the-future-of-indian-manufacturing/.

Like India, South Africa has taken some measures to promote sustainable manufacturing, but still falls behind SDG targets. South Africa has an SDG Index score of 64.00.[242] Manufacturing is the fourth-largest industry in South Africa and stimulates economic growth for the country.[243] However, the heavy manufacturing sector in South Africa is also the fifth-largest source of direct carbon emissions in South Africa, responsible for 10 percent of the country's total emissions.[244] Additionally, South Africa produces over 50 million tonnes of waste each year, only a third of which is recycled.[245] Despite this, South Africa could transition to a green manufacturing industry. It has access to many renewable energy sources and raw materials and a growing young population.[246] Furthermore, local businesses and informal waste collectors have been practicing sustainable manufacturing and recycling.[247] However, these groups often have limited financial resources to help them carry out these practices.[248] South Africa also faces structural challenges such as a lack of a reliable power supply, insufficient transportation infrastructure, and skill shortages that prevent it from successfully transitioning to a green manufacturing industry.[249]

Countries in this bloc are experiencing growth in their manufacturing industries. However, they are also seeing this growth set back their progress on climate action. These countries must find ways to overcome structural issues such as infrastructure and technology challenges to establish more sustainable manufacturing and waste management practices. Countries in this bloc might focus on improving current initiatives for sustainable manufacturing, or they might look to implement successful local initiatives on a national level. They might also seek support from international organizations or other countries to help their growing economies become more sustainable.

Countries with Little Progress Towards the Sustainable Development Goals

Countries in this bloc have made little progress towards achieving the SDGs and are ranked low on the 2023 Sustainable Development Report. These countries have an SDG Index score between 0-54. These countries produce a significant amount of waste relative to their population size. They also do not have sustainable manufacturing systems in place. They might not have the infrastructure or resources necessary to transition to a circular economy or to implement green manufacturing practices. Citizens in these countries might also experience health issues due to waste management issues.

Afghanistan, which has an SDG Index score of 49.01, falls into this bloc.[250] Afghanistan struggles with efficient waste management due to years of conflict that created many environmental issues.[251] Failure to effectively manage waste causes health issues, especially for those living in larger cities.[252] While the country struggles to manage waste, it is also experiencing growth in several industries. This economic growth has led to construction and the import of chemicals from other countries.[253] While economic development in Afghanistan has many benefits, it also worsens existing waste management issues.[254] Afghanistan does have one piece of legislation that addresses waste management: The Waste Management Policy. However, this legislation alone is insufficient to address current and new waste

242 Sustainable Development Report, "Rankings."
243 PwC South Africa, "Insights into the I4.0 maturity of SA Manufacturing," news release, June 29, 2022, https://www.pwc.co.za/en/press-room/smart-manufacturing-2022.html.
244 Lucas Chaumontet, *Decarbonising South Africa's Heavy Manufacturing Sector* (Johannesburg: National Business Initiative, April 2023), https://web-assets.bcg.com/22/eb/fa5776c341b293357439378d9b42/nbi-decarbonising-sas-heavy-manufacturing-sector.pdf.
245 "South Africa," WasteAid, accessed August 31, 2023, https://wasteaid.org/programmes/south-africa/.
246 Chaumontet, *Decarbonising South Africa's Heavy Manufacturing Sector*.
247 WasteAid, "South Africa."
248 WasteAid, "South Africa."
249 Chaumontet, *Decarbonising South Africa's Heavy Manufacturing Sector*.
250 Sustainable Development Report, "Rankings."
251 "Building a strong foundation for responsible waste management in Afghanistan," United Nations Environment Programme, July 4, 2019, https://www.unep.org/news-and-stories/story/building-strong-foundation-responsible-waste-management-afghanistan.
252 United Nations Environment Programme, "Building a strong foundation for responsible waste management in Afghanistan."
253 United Nations Environment Programme, "Building a strong foundation for responsible waste management in Afghanistan."
254 United Nations Environment Programme, "Building a strong foundation for responsible waste management in Afghanistan."

management challenges facing Afghanistan amidst growing industrialization.[255]

Haiti is another country in this bloc that struggles with sustainable manufacturing and efficient waste management. Haiti has an SDG Index score of 52.58.[256] In some parts of the country, there are no government regulations or services responsible for waste management. For this reason, waste management is often left to informal waste collectors.[257] Haiti produces roughly 0.6 kg of waste per person daily, but only about 12 percent of this waste is collected.[258] Most waste is sent to illegal dumps, burned, or buried underground. This leads to pollution and increased greenhouse gas emissions.[259] It also causes health issues for many citizens.[260] Haiti struggles to implement sustainable waste management practices due to rapid urbanization, population growth, public management issues, and infrastructure challenges.[261]

Countries in this bloc will likely focus on overcoming infrastructure challenges that prevent them from establishing sustainable manufacturing. They might also look to adopt stronger legal frameworks to create more efficient waste management systems. Countries in this bloc might also seek support from the UN, other countries, international organizations, and nonprofit organizations to provide the resources necessary to create more sustainable manufacturing and waste management systems.

Committee Mission

The United Nations Industrial Development Organization (UNIDO) is an agency designed to "promote, dynamize and accelerate industrial development."[262] They are responsible for facilitating debate among member states concerning sustainable development and proper working conditions in industrial sectors. Specifically, they support technical cooperation, provide action-oriented research and policy-advisory services, and foster partnerships for knowledge and technology transfer.[263] Although all UN bodies work towards the SDGs, UNIDO's mandate is essential towards SDG 9. This is because their actions directly affect the economic and social development of the international community, which subsequently affects other SDGs.[264] Thus, UNIDO can bring lasting change that will lay the groundwork for future innovation and fuel the lives of those in current generations.

The Lima Declaration, adopted by UNIDO's Member States in 2013, established a vision of inclusive and sustainable industrial development (ISID).[265] UNIDO believes that without industrialization, development will not happen. Throughout the committee, delegates should promote the ideals of ISID when addressing this topic. Delegates must consider all the different steps of manufacturing and how these can be adapted to be more efficient. They must also consider what barriers their country faces to sustainable development. Finally, delegates must come together to create holistic solutions that address these barriers and ensure that all countries can take a step towards inclusive sustainable development. By taking a comprehensive approach to promoting sustainable manufacturing and waste management, delegates have the ability to alter the development of the Earth for future generations to ensure prosperity for all.

255 United Nations Environment Programme, "Building a strong foundation for responsible waste management in Afghanistan."
256 Sustainable Development Report, "Rankings."
257 "Haiti - Country Commercial Guide," International Trade Association, last modified August 3, 2022, https://www.trade.gov/country-commercial-guides/haiti-waste-management.
258 Mickens Mathieu, "Source sorting, management, and recovery of solid waste in Haiti: ideas to create sustainable jobs and preserve the environment," *United Nations Development Programme*, December 9, 2021, https://www.undp.org/fr/haiti/blog/source-sorting-management-and-recovery-solid-waste-haiti-ideas-create-sustainable-jobs-and-preserve-environment.
259 International Trade Association, "Haiti."
260 Mathieu, "Source sorting, management, and recovery of solid waste in Haiti: ideas to create sustainable jobs and preserve the environment."
261 International Trade Association, "Haiti."
262 "Who we are," United Nations Industrial Development Organization, accessed September 12, 2023, https://www.unido.org/about-us/who-we-are.
263 United Nations Industrial Development Organization, "Who we are."
264 United Nations Industrial Development Organization, "Who we are."
265 United Nations Industrial Development Organization, "Inclusive and Sustainable Industrial Development."

Research and Preparation Questions

Your dais has prepared the following research and preparation questions as a means of providing guidance for your research process. These questions should be carefully considered, as they embody some of the main critical thought and learning objectives surrounding your topic.

Topic A

1. Who do labor standards affect the most in your country?
2. What are the economic and social implications of labor standards, both at the national and international levels?
3. What is the relationship between trade agreements and labor standards? How can trade agreements be structured to encourage the improvement of labor standards?
4. What is the role of technology and automation in shaping labor standards and the future of work in the global economy? How can technology be harnessed to improve labor conditions?
5. What challenges arise in fostering sustainable development while maintaining equitable labor standards? How can industry help address this challenge?
6. What are some potential consequences of not addressing labor issues and workers rights, thinking both on the local and global scale?
7. What has your country done to promote equitable labor standards and sustainable industrialization? How can your country's actions help in addressing similar challenges in other nations?

Topic B

1. What are the challenges that developing countries face when achieving sustainable development? How can industry help these countries sustainably develop?
2. What is UNIDO's scope and role in fostering sustainable development? What can UNIDO do to help foster cooperation between countries? How much can UNIDO focus on social and environmental goals? How does the committee achieve their economic goals?
3. What has your country done to create sustainable development infrastructure, and what issues might have arisen in the process? How can your country's past actions be applied to developing countries or transitioning economies?
4. In what ways do developed countries aggravate situations in developing nations that prevent sustainable development? How can UNIDO foster systematic change in those developed countries?
5. How can the private sector industry help foster sustainable development in their respective countries? What are the issues facing aid distribution and subsidies?
6. What is UNIDO's role in the distribution and development of emerging technology to achieve sustainable development?
7. What role does interstate cooperation between states have in promoting sustainable development? What cooperative efforts has your state undergone in the past?

Important Documents

Topic A

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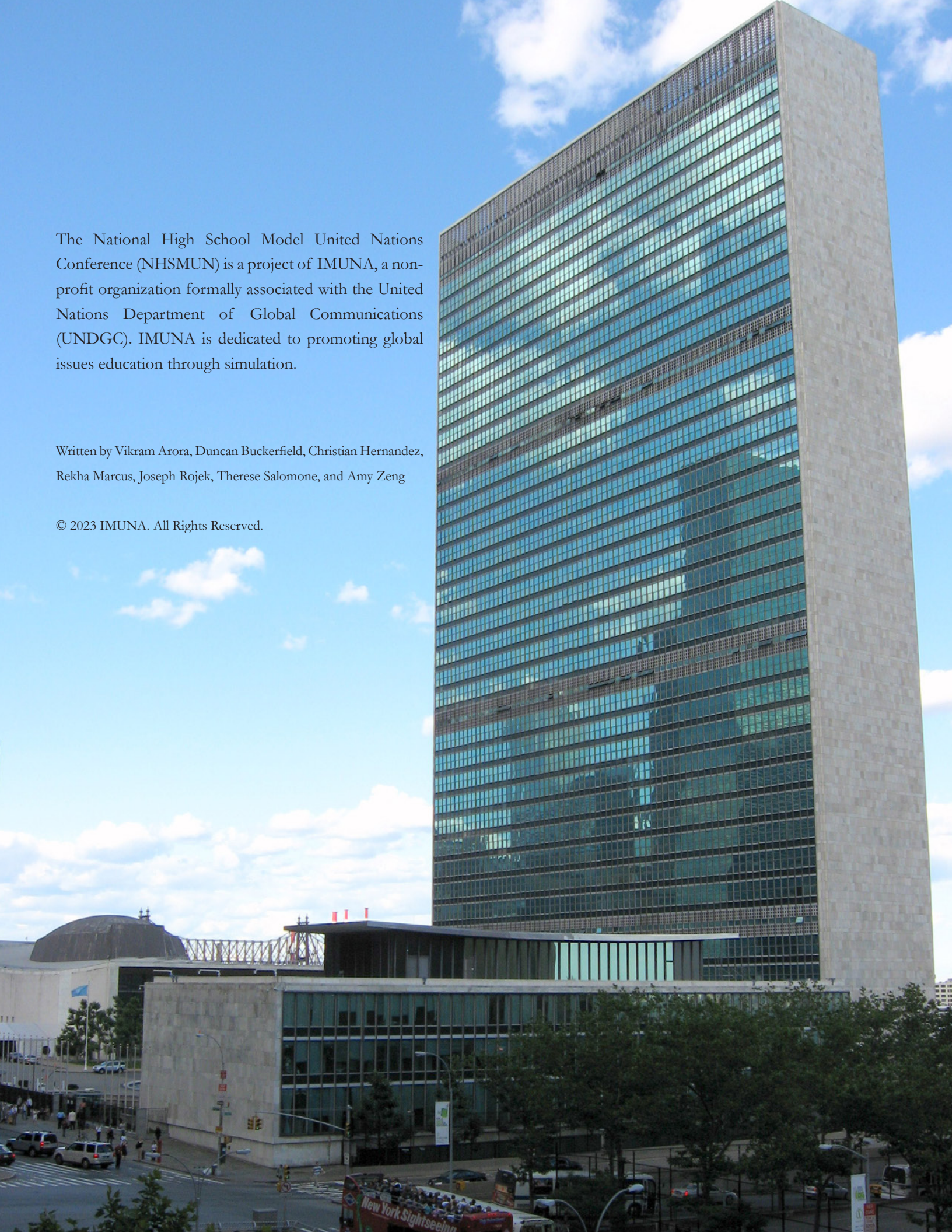

The National High School Model United Nations Conference (NHSMUN) is a project of IMUNA, a non-profit organization formally associated with the United Nations Department of Global Communications (UNDGC). IMUNA is dedicated to promoting global issues education through simulation.

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