Main Model United Nations Conference
Frankfurt am Main, Germany
18th Session
2nd to 5th of March 2023

SDGs – Leave No One Behind

BACKGROUND GUIDE

GENERAL ASSEMBLY

Alena Heise

Jacob Krüger

Main Model United Nations Conference 2023

www.mainmun.de

1. Words of Welcome

Honourable delegate of the United Nations General Assembly,

with the utmost pleasure, we, Alena, and Jacob, welcome you to the General Assembly of MainMUN 2023. For some, it may be your first MUN conference, which can sometimes be overwhelming and nerve-wracking but also very exciting. We will ensure that you all have a good overview of the Rules and Procedure and the debate process. To those who have been to a few conferences – welcome back!

A little bit about us: my name is Alena, and I study political science and economics at the Goethe University in Frankfurt. I started with MUN back in secondary school in 2014, so this will be my 15th MUN conference and around the 8th time chairing. In my free time I dive, do ballroom dancing or you can find me in the kitchen trying out new recipes from around the world.

My name is Jacob and I am studying Economics and the AfriZert certificate programme at the University of Bayreuth focussing on International Economy. In my freetime I like to go for a hike and I fight Brazilian Jiu Jitsu. I was introduced to Model United Nations conferences in my 1st semester and ever since I am hooked. I am looking forward to meeting you at the conference.

Here are a couple of things that could be helpful before you arrive at the conference:

- Read this background guide
- Do your research – consider specialising in one of the two topics
- Familiarise yourself with your country and its position towards the two topics at hand
- Have a look at our Rules of Procedure
- Prepare and hand in your Position Paper

As the conference motto is “SGDs – Leave No One Behind”, we found it essential to focus on two topics which are particularly significant to sustainable development on an international level. Topic A explores "Big Data and Sustainable Development”, which has a high potential to make international development more efficient and could be used to measure the process of the SDGs efficiently. Topic B focuses on “Establishing Sustainable Food Systems”, which can improve well-being and land use efficiency, make food more affordable globally and significantly reduce carbon levels. With both topics, we are looking forward to creative solutions, fruitful debate, and purposeful proposals.

We will be there to guide you throughout the conference and are happy to answer any questions that might arise concerning the two topics, the conference, your position paper, rules of procedure or anything else regarding MUN. We are happy that you chose MainMUN and the General Assembly and look forward to meeting you all in March.

Alena Heise – heisealena@gmail.com

Jacob Krüger – jacob.krueger.contact@gmail.com

Yours sincerely,

Alena & Jacob

2. About the Committee

Compromised of all Member States, the General Assembly (GA) is the primary policy-making body of the United Nations. As such, it provides a unique forum for multilateral discussion of the full spectrum of international issues covered by the Charter of the United Nations. Each of the 193 Member States of the United Nations has the same right to an equal vote.

Apart from policy-making, the GA also makes the following critical decisions for the UN:

- Appointing the Secretary-General on the recommendation of the Security Council
- Electing non-permanent members of the Security Council
- Approving the UN budget

Meeting in regular sessions from September to December, and after that, when required, the UNGA discussed specific issues through dedicated agenda items or sub-items, which led to the adoption of the resolutions.

All resolutions passed by the General Assembly are recommendations to the Member States, thus not legally binding. Nonetheless, the resolutions passed in the General Assembly can encourage action if a broad coalition supports and implements its recommendations, therefore also placing pressure on other Member States.

In order to improve its overall efficiency, six subsidiary bodies were created by the General Assembly. Each Member State may send one representative to each of the six committees. Member States may also assign advisors, technical advisors, experts or people of equal status, but only one person may attend the General Assembly or its subsidiary bodies. The following are the subsidiary committees:

- The First Committee: Disarmament and International Security
- The Second Committee: Economic and Financial
- The Third Committee: Social, Humanitarian and Cultural
- The Forth Committee: Special Political and Decolonisation
- The Fifth Committee: Administrative and Budgetary
- The Sixth Committee: Legal

The UNGA and the Sustainable Development Goals (SDGs)

The SDGs were set up by the GA in 2015 and are intended to be achieved by 2030. They are included in the GA-Resolution called the 2030 Agenda (A/RES/70/1) and were developed to succeed the Millennium Development Goals. In September 2000, the leaders of all Member States of the UN gathered to sign the Millennium Declaration, committing to achieving a set of eight measurable goals by 2015. Even though the goal of halving the extreme poverty rate was realised in 2015, many of the other goals had uneven achievements. Consequently, the discourse began surrounding the post-2015 agenda, setting the foundation for the SDGs. In 2017 the goals were made more actionable by a UN Resolution of the General Assembly, identifying specific targets for each goal, along with indicators being used to measure each target. The year by which each target should be achieved lies between 2020-2030. However, some goals have no deadline, and many targets were strongly impacted by the consequences of Covid-19.

3. Topic 1: Establishing Sustainable Food Systems

3.1. General Introduction

The intensive growth of the world population, the global exposure to the climate crisis and the global interlinking of food production and trade represents critical challenges for the global community and the United Nations (UN). Food systems include sociological, environmental and economic elements. The United Nations Food and Agricultural Organization (FAO) defines food systems (FS) as a general concept considering several sub-systems, such as waste management and farming systems. FS are a part of a network consisting of different economic and social systems, all closely interwoven. Sustainable food systems (SFS) are defined as FS that ensure safe food and nutrition considering three fundamental sustainability approaches:

- Economic sustainability
- Social sustainability
- Environmental sustainability

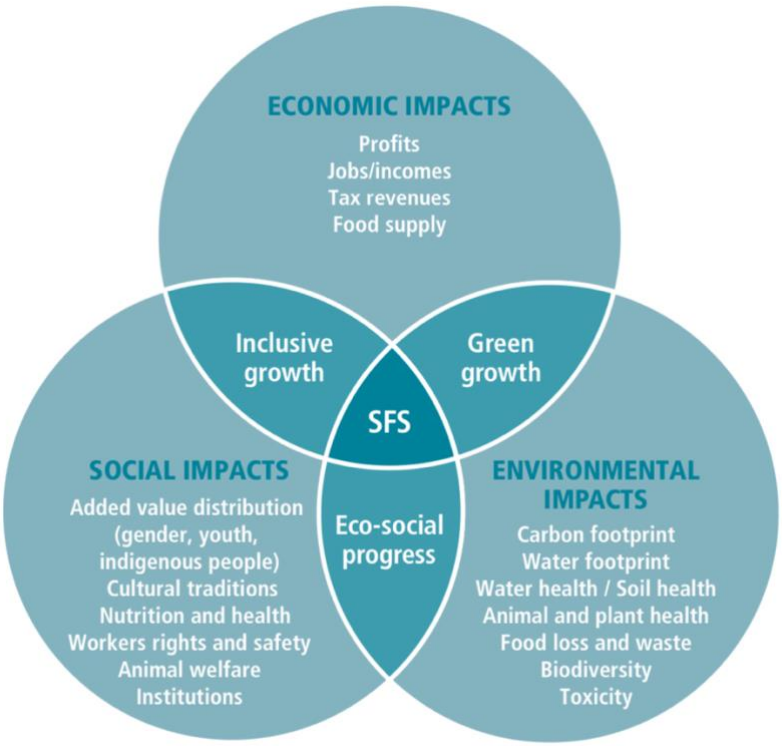

Figure 1. Nguyen, Hanh. "Sub-areas of SFS" FAO 2018, p4. Retrieved from: https://www.fao.org/3/ca2079en/CA2079EN.pdf

SFS ensure profitability, a healthy diet and a climate-neutral or climate-positive impact on our environment[1].

Considering the past growth of the world population, agriculture adapted to this trend by ensuring food security and an extensive food supply. While most areas do not suffer from food insecurity due to low supply it does not remain a vital issue. Nevertheless, certain areas like sub-Saharan Africa still need to develop higher and more reliable food supply, systems[2]. Today's FS and food production are highly dependent on cheap fossil-fuel based technologies in ways that do not consider the further

[1] https://www.fao.org/3/ca2079en/CA2079EN.pdf
[2] https://www.imf.org/en/Blogs/Articles/2022/09/14/how-africa-can-escape-chronic-food-insecurity-amid-climate-change

impact of the production and distribution of the food consumed[3]. Considering the numerous dimensions of SFS, the UN aims to achieve fair and long-lasting solutions on all levels.

The introduction of SFS is especially crucial considering the inclusion of various organizations and stakeholders across disciplines. For instance, economic sustainability includes several conflict areas regarding SFS. While the globalized world is driven by global labour division and price incentives that benefit production sites in countries with laxer regulations and minimal labour costs, it is crucial to ensure profitability through sustainability. Therefore, the design of economic frameworks needs to consider investment frameworks that benefit environmentally friendly approaches without harming global efficiency.

The UN general assembly (UNGA) mandate qualifies the UNGA to propose policy solutions to member states that ensure global equality and inclusion, benefitting all member states[4]. Implementation of SFS covers technical and agriculture-specific elements and solutions that lead to overlapping competencies within the UN system. The World Food Programme (WFP) aims to ensure access to food and healthy nutrition for all humans, FAO's mandate focuses on ending world hunger and the endurance of high living standards in rural areas, and the World Health Organization tries to improve the global health situation, focussing on healthy diets in the context of SFS[5]. Additionally, the International Fund for Agricultural Development (IFAD) is promoting the development of rural areas, combatting poverty and hunger in rural territories through global investments in the named areas[6]. Within this variety of UN organs working on the transformation of FS, the UNGA can be considered a coordinating and universal organ aiming to mainstream initiatives and formulate general and widely applicable policy concepts to be implemented in member states.

This Background Guide (BGG) aims to give delegates a starting point for their research by showing the scope of this extensive but utmost important topic, giving information on actions taken so far and relevant documents (see sections c and d) and examples for approaches to lay the foundations for the development of sustainable food systems in an encompassing manner.

[3] https://www.resilience.org/stories/2006-06-11/implications-fossil-fuel-dependence-food-system/

[4] https://www.un.org/en/ga/about/background.shtml

[5] https://www.un.org/youthenvoy/2013/09/fao-food-and-agriculture-organization-of-the-united-nations/ - https://www.wfp.org/overview

[6] https://www.ifad.org/documents/38711624/39633845/Ifad+goal+and+mandate%2C+organizational+structure.pdf/6e3799c2-2f16-49a2-8fbf-fbb48892afc6?t=1511784816000

3.2. Background, Data & Facts

Sustainability in FS varies in specificity and requires different appropriate approaches. This introduction focuses on areas and possible actions within the UNGA's general and comprehensive mandate. Other actions may be sensible and within the UNGA mandate. The background information presented here represents some aspects of sustainability in FS to enable all delegates to discuss on the same introductory basis.

3.2.1. Environmental Impacts – Focus on Carbon Footprint and Biodiversity

SFS include a definite approach to reducing FS's impact on the environment and biodiversity. According to the EDGAR-FOOD database, FS contributed to 34 percent of all global greenhouse gas emissions caused by humans. Luckily this share dropped from 44 percent in 1990 to 34 percent in 2015. However, this drop is due to significant increases in global greenhouse gas emissions rather than due to a reduction in emissions in FS in absolute numbers. The allocation of these emissions is dominated by 73% from developing countries (DC) and less developed countries (LDC), including stronger economies like the People`s Republic of China and Brazil. The share of FS emission within national greenhouse emissions in DC and LDC dropped from 68 percent over 25 years until 2015. Equivalently this drop is a result of the increase in the total carbon footprint in these member states[7]. Furthermore, it is found that food miles, the actual transportation of agricultural commodities, contribute significantly low shares to the total emission of FS. This illustrates the complexity of data regarding greenhouse emissions as well as the complicated global dynamics regarding the topic.

Reducing the carbon footprint of FS is crucial to ensure environmental sustainability, yet it is necessary to take other environmental factors into account, too. Biodiversity describes the variety of life on earth, e.g. the number of species[8]. A report by Chatham House says that global FS are the primary contributor to biodiversity loss through insufficient and environmentally harmful use of land and unhealthy diets. According to the United Nations Environment Programme, adapting FS to rising populations by simply driving high supply and low-cost agricultural matters is the main contributor to this frightening development[9].

[7] https://www.carbonbrief.org/food-systems-responsible-for-one-third-of-human-caused-emissions/
[8] https://www.britannica.com/science/biodiversity
[9] https://www.unep.org/news-and-stories/press-release/our-global-food-system-primary-driver-biodiversity-loss

3.2.2. Social Impacts – Focus on SDG 3 and 5

FAO considers the social impacts of traditional FS to have adverse effects on various concrete areas. Those include the equality of gender and the integration of indigenous people, ensuring workers' safety and legal security, and strong institutions that guarantee improvements in the named areas[10]. The social impacts of traditional FS mainly include SDGs 3 (Good health and well-being) and 5 (Gender equality). To ensure healthy lives for all, malnutrition, mainly concerning children, needs to be eradicated. Malnutrition includes wasting, stunting and overweight children. These elements can be solved by ensuring higher food security and a higher food supply. The Joint Child Malnutrition Estimates 2021 issued by the WHO, the World Bank Group and the United Nations Children's Fund (UNICEF) shows that especially regions with LDCs and DCs are mostly affected. Sub-Saharan Africa is confronted with an extraordinarily high rate of children affected by stunting[11].

SDG 5 aims to promote and reach gender equality. Known problems are a significant gender pay gap and the high dependency of women on local natural resources if living in rural areas. Additionally, climate change will continuously aggravate this problem. Women only hold 13% of the global agricultural land and are, therefore, less integrated into decision processes and investment opportunities. While these only represent a portion of the gender equality problems related to traditional FS, they show how interconnected FS are – especially considering their social impacts[12].

3.2.3. Economic Impacts – Focus on Tariffs and Supply Industrialization

Historically tariffs on imported food and agricultural goods were incredibly high. Member states used tariffs to control dependency and access to the necessary market, which is usually considered to be a critical element of a country's economy. The Uruguay Round Agreements Act laid the foundation for the World Trade Organisation (WTO). Under the WTO framework, developed countries may implement trade tariffs on agriculture below 5 percent. Nevertheless, tariffs on individual commodities may vary up to 770 percent. While tariffs and domestic subsidies can protect local producers, they usually harm global efficiency by keeping cheap foreign commodities out of national markets. This may lead to significant disadvantages for LDC, which can offer cheaper products.

[10] https://www.fao.org/3/ca2079en/CA2079EN.pdf
[11] https://data.unicef.org/wp-content/uploads/2021/07/JME-2021-United-Nations-regions-v2.pdf
[12] https://www.un.org/en/food-systems-summit/sdgs / https://www.unwomen.org/en/digital-library/multimedia/2018/7/infographic-why-gender-equality-matters-to-achieving-all-17-sdgs

The industrial revolution also led to significant developments in the agriculture sector. The percentage of U.S. workers in the agricultural sector declined from 41 to 2 percent from 1900 to 2000[13], indicating significant industrialization, mechanization and speculation in the agricultural sector[14]. World agricultural exports continuously increase in the past, and this trend is expected to continue over the next 35 years[15]. Considering the trade balances globally, Africa is a net importer of food in all areas despite fruits and vegetables. Furthermore, Europe and the Americas, are dominated by the U.S. and Canada, which are incredibly dominant among the most significant food exporters.[16] Aside from this western dominance in the global food markets, some member states, including Brazil for soybeans and Ukraine and Russia for wheat crops, need to be considered essential exporters of specific agricultural goods.[17] Local crises can change the global supply situation significantly, as observed with Russia's invasion of Ukraine.

3.3. General Assembly Framework

As cornerstones of the UN system, numerous documents are the general reference point when implementing sustainability measures. Considering the holistic characteristics of SFS, the key documents and elements within the UNGA framework are:

- The Agenda for Sustainable Development introducing and the SDG progress reports
- The Paris Agreement and the Global Sustainable Development Reports
- The UN Nutrition Decade
- The UN Convention on Biodiversity

The UN Agenda for Sustainable Development was adopted in 2015 and introduced 17 SDGs and 169 targets ranging from gender equality to access to clean and safe water. It is the attempt to implement the measures included in older cornerstone documents of the UN, such as the Universal Declaration of Human Rights and the Millennium Goals. While the Millennium Goals mainly categorize the world in developed countries and LDC & DC, the Sustainable Development Goals Report 2022 categorizes the development of the SDGs in multiple-word regions since it also

[13] Dimitri C, Effland A, Conklin N. The 20th Century Transformation of U.S. Agriculture and Farm Policy. *USDA ERS*. 2006

[14] https://www.foodsystemprimer.org/food-production/industrialization-of-agriculture/

[15] https://www.ifpri.org/news-release/current-state-agricultural-trade-and-world-trade-organization

[16] https://wits.worldbank.org/CountryProfile/en/Country/WLD/Year/2020/TradeFlow/Export/Partner/by-country/Product/16-24_FoodProd/Show/Partner%20Name;XPRT-TRD-VL;XPRT-PRDCT-SHR;/Sort/XPRT-TRD-VL/Chart/top10 / https://www.fao.org/3/cb9928en/cb9928en.pdf

[17] https://www.statista.com/statistics/961087/global-leading-exporters-of-soybeans-export-share/ / https://oec.world/en/profile/hs/wheat

considers regional similarities.[18] As part of the Agenda for Sustainable Development, SDGs 2, 3, 8 and 12 are crucial for establishing SFS. The discussed complexity of SFS includes all SDGs by design, and the divided impact structure of FS allows the Focus on other individual SDGs. SDG 2, 4, 8 and 12 represent the main:

- SDG 2 – Zero Hunger
    - Achieving Zero Hunger includes SFS within their primary objectives. Additionally, SDG 2 covers achieving increased productivity in agriculture, maintaining high diversity in seeds and promoting investments in agricultural research. FAO considers SDG 2 to include further ending world hunger, promoting food security and improving nutrition for all[19]
- SDG 3 – Good Health and Well-being
    - While SDG 3 aims include more general aspects like reducing the global mortality rate and reducing mortality because of transmittable diseases, lowering the contamination of air, water, and land directly refers to SFS[20].
- SDG 8 – Decent Work and Economic Growth
    - The detailed framework of SDG 8 includes improving resource efficiency and promoting small- and middle-sized enterprises. The report on IFAD's implementation of the SDGs shows significant improvements with the financing of 1.96 million rural enterprises[21].
- SDG 12 – Responsible Consumption and Production
    - In order to ensure sustainable consumption and production patterns, the UN considers the efficient use of natural resources, reducing global food waste and the implementation of a 10-year framework to guarantee sustainable production[22].

In conclusion, all SDGs include elements that play a crucial role in establishing SFS. Some are more applicable to SFS in general or the named sub-elements[23].

[18] https://unstats.un.org/sdgs/report/2022/The-Sustainable-Development-Goals-Report-2022.pdf
[19] https://www.un.org/development/desa/disabilities/envision2030-goal2.html / https://www.wfp.org/sdgs
[20] https://www.un.org/development/desa/disabilities/envision2030-goal3.html
[21] https://www.un.org/development/desa/disabilities/envision2030-goal8.html / https://www.ifad.org/ride-report/development-results.html
[22] https://www.un.org/development/desa/disabilities/envision2030-goal12.html
[23] https://www.un.org/en/food-systems-summit/sdgs

The UN plays a crucial role in policy recommendations. The UNGA may suggest policy recommendations and suggest platforms to implement these, yet its mandate does not allow it to force member states to implement specific measures. On the contrary, international treaties can be framed as a binding framework. The Paris Agreement adopted von COP 21 Paris in 2015 is an example of an internationally binding treaty aiming to enhance the fight against climate change and protect our environment. Within its frameworks and goals, countries shall implement individual contributions, known as Nationally Determined Contributions or NDCs, to communicate concrete actions to reduce their greenhouse-gas emissions. This work includes multilateral support through investing, technology sharing and global capacity building in an environmentally friendly way[24]. The Paris Agreement offers an orientation for global climate action. Organizations can evaluate all actions taken if they are implemented accordingly to an internationally binding treaty. FAO and the International Renewable Energy Agency evaluate the progress in achieving SFS to be limited due to the extensive use of fossil fuels and the high energy dependency of food production in DC[25].

The UN issues the Sustainable Development Goals Report (SDGR) to track progress in substantively achieving all SDGs. The SDGR 2022 indicates that climate change and the COVID-19 pandemic represent significant challenges to the achievement of SDG 2, potentially undermining global food security. SDG 2 is especially at risk due to the global COVID-19 pandemic and the lack of universal health coverage. Likewise, SDG 8 is facing the problems of the COVID-19 pandemic, rising inflation, supply-chain bottlenecks and disruptions, and the Ukraine crisis. The report shows that the economic recovery works worse in LDCs, correspondingly pushing the global inequality in achieving SFS. Food waste on a consumer and transport level reaches up to 17%, and the reliance on natural resources, including fossil fuels, is rising. Above all, the combination and interconnectivity of climate change, biodiversity loss and global pollution are considered the triple planetary crisis[26].

A/RES/70/259 calls upon governments and all stakeholders to implement the UN Decade of Action on Nutrition led by FAO and WHO. The UN Decade of Action on Nutrition adopted in 2016 reaffirms the commitments made at the Second International Conference on Nutrition according to the Agenda for Sustainable Development. The time frame between 2016 and 2025 aims to reach the implementation of SFS as its top priority. The mid-term review of the UN Decade of Action and Nutrition concludes that SFS enjoy higher global recognition. Yet, it identifies further crop diversification and the implementation of Food Safety Standards to need to be implemented more[27].

[24] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
[25] https://www.fao.org/policy-support/tools-and-publications/resources-details/en/c/1469998/
[26] https://unstats.un.org/sdgs/report/2022/The-Sustainable-Development-Goals-Report-2022.pdf
[27] https://www.un.org/nutrition/sites/www.un.org.nutrition/files/general/pdf/20200723-ny-mtr-nutrition-decade-presentation.pdf

The Nutrition Decade can be described as a step-by-step and year-by-year plan to implement the SDGs through measures adopted at the Second International Conference on Nutrition.

The UN Convention on Biological Diversity is

> "the international legal instrument for 'the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources' that has been ratified by 196 nations"[28].

It recognizes the role of FS and agricultural sustainability as key factors that guarantee the maintenance of biodiversity on a global level[29].

Figure 2: United Nations Standing Committee on Nutrition "The relationship between the Nutrition Decade, the SDGs and the ICN2 Framework for Action" United Nations Standing Committee on Nutrition 2017, p. 14. Retrieved from: https://www.unscn.org/uploads/web/news/NutritionPaper-EN-14apr.pdf

[28] https://www.un.org/en/observances/biological-diversity-day/convention

[29] https://www.cbd.int/topic/food

3.4. Further and Regional Framework

The establishment of SFS includes a multidimensional and interweaved whole-of-system approach. Due to this nature, a broad scope of the UN framework is relevant in this manner. In addition to the discussed framework, the following programs and documents play an essential role in transforming FS:

- The United Nations Food System Summit
- Universal Declaration of Human Rights
- Specific conventions on the protection of ecosystems, water greenhouse gas emissions and the use of synthetic components
- Specific governance implementation plans and considerations in national and regional contexts

Likewise, local organizations, multilateral institutions and globally active Non-Governmental-Organisations (NGOs) promote the establishment of SFS according to the agenda of the individual institution.

The UN Food Systems Summit was held in 2021 in New York City. It established a coordination hub between FAO, IFAD and WFP to enhance collaboration within the UN system. The hub aims to improve synergy effects, including young and indigenous people in the establishment process of SFS and the integration of high-level politicians and experts supporting the process. The Secretary-General's statement of Action readdresses the importance of SFS to achieve Zero Hunger[30].

The Universal Declaration of Human Rights (UDHR) is the cornerstone of the UN system, ensuring all humans' fundamental rights and well-being worldwide. Article 25 (1) of the UDHR guarantees the right to adequate food for all humans and their families. Article 11 of the International Covenant on Economic, Social and Cultural Rights reaffirms a minimum standard of living, including adequate food. Furthermore, article 11 stresses the need for contact improvement of living conditions, which is an essential part of the redesign of FS[31].

Regional and multilateral organizations are driving concrete policy approaches. The African Union held the High-Level Food Security and Nutrition Conference in October 2022, coordinating African member states efforts on COP 27 and other platforms. The African Union implements programs such

[30] https://www.un.org/en/food-systems-summit/news/making-food-systems-work-people-planet-and-prosperity

[31] https://www.ohchr.org/en/instruments-mechanisms/instruments/universal-declaration-eradication-hunger-and-malnutrition /. https://www.fao.org/3/w9990e/w9990e03.htm

as the Comprehensive African Agriculture Development Programme and collaborates with international organizations such as FAO, the International Federation of Red Cross, Red Crescent Societies and the African Development Bank[32].

The European Union includes SFS measures in the work of the European Environment Agency, its legislative framework through the Inception Impact Assessment and by holding public fora such as civil dialogues and the consultation of experts and advisory groups, like the Advisory Group on Food Chain and Animal and Plant Health[33].

NGOs are crucial stakeholders in modernizing our society and contribute to all aspects of the work of the UN. NGOs are usually focussing on specific areas and want to provide expertise and knowledge sharing. The think tank foodtank collects information about the work of numerous NGOs in SFS. Their work ranges from ensuring biodiversity, sustainable agricultural development, local and regional implementation and overseeing the state of our FS and environment[34].

The listed examples shall serve as an orientation on how the establishment of SFS can be transported to regional levels and implemented in legislative frameworks. Positive examples are visible worldwide; therefore, the listed ones represent a small extract of global initiatives.

3.5. Conclusion and remaining challenges

Ensuring safe and high-quality food while guaranteeing economic, social and environmental sustainability is a global challenge. Statistics clearly illustrate how encompassing and ostensibly contradictory certain elements of SFS are. The UNGA must balance topic-related elements that dive into technical implementation and details while considering its general mandate and role in the UN system. SFS can be reached, but the need for transformation is urgent. The existing UN framework allows this development, yet it needs a global approach to implement measures within these frameworks regarding establishing SFS across society, economy and policy areas. The following contradictions can be understood as examples of remaining challenges:

- Including all SDGs into the consideration and implementation of SFS while mainstreaming SFS through general policies

[32] https://au.int/en/pressreleases/20221015/galvanizing-support-build-resilient-and-sustianable-food-systems-food

[33] https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy/legislative-framework_en /. https://www.eea.europa.eu/publications/reimagining-the-food-system-the

[34] https://foodtank.com/news/2013/05/forty-organizations-that-are-shaking-up-the-food-system/

- Lowering tariffs to enhance global trade without price incentives overruling the development of local food supply in sub-Saharan Africa through western member states
- Ensuring food supply in SFS that does not include classic mass-production approaches to ensure environmental stability

3.6. Further Reading and Guiding Questions

Establishing SFS from the perspective and within the mandate of the UNGA is incredibly challenging due to the variety of general and particular elements of the approaches to transform FS. Delegates shall try to balance specific and general approaches within the UNGA mandate that can be comprehensively implemented on a national level. The guiding questions shall serve as an orientation for further research and orientation to prepare appropriately for the committee.

Delegates can ask themselves:

- What solutions are comprehensive yet specific enough to change FS systematically?
- How can the UN system, especially the UNGA and the discussed sub-organizations, work together by the organizational structure of the UN and the individual organization's mandates?
- How can implemented measures activate the synergy effect to meet the complexity of the transformation of SFS and interconnected areas?
- How can the UN nutrition decade be finalized and evaluated, ensuring learnings from the program and carrying the elements forward?
- How can the development of the agricultural industry and the assurance of ample food supply in sub-Saharan Africa be reached while considering global economic factors?
- How can partnerships with Non-governmental-organisations and the private sector be established to mainstream the transformation of FS to SFS across society?

3.7. Bibliography

Hang Nguyen. "Sustainable food systems – Concept and framework". FAO, 2018. Retrieved from: https://www.fao.org/

Kemoe, Laurent. Mitra, Pritha. Okou, Cedric. Unsal, D. Filiz. “How Africa Can Escape Chronic Food Insecurity Amid Climate Change”. International Monetary Fund, September 14, 2022. Retrieved from: https://www.imf.org/

Tomczak, Jay. “Implications of Fossil Fuel Dependence for the Food System”. Tompkins Country Relocalization Project, June 11, 2006. Retrieved from: https://www.resilience.org/

United Nations. “Functions and powers of the General Assembly”. Retrieved from https://www.un.org/

United Nations. “FAO: Food and Agriculture Organization of the United Nations” Retrieved from: https://www.un.org/

IFAD. “IFAD goal and mandate, Organizational structure”. IFAD, April, 2012. Retrieved from: https://www.ifad.org/

Tendon, Ayesha. “Food systems responsible for ‘one third’ of human-caused emissions”. Carbon Brief Ltd, March 8, 2021. Retrieved from: https://www.carbonbrief.org/

Pimm, S.L.. “biodiversity”.*Encyclopedia Britannica,* December 21, 2022. Retrieved from: https://www.britannica.com/

UNEP. “Our global food system is the primary driver of biodiversity loss”. February 3, 2021. Retrieved from: https://www.unep.org/

Dimitri C, Effland A, Conklin N. “The 20th Century Transformation of U.S. Agriculture and Farm Policy”. USDA ERS, 2006.

Observatory of Economic Complexity. “Wheat”. Retrieved from: https://www.oec.world/

United Nations. “Food Systems Summit x SDGs”. Retrieved from: https://www.un.org/

United Nations Children’s Fund. The World Health Organization. The World Bank. “Levels and trend in child malnutrition: key findings of the 2021 edition of the joint child malnutrition estimates”. United Nations Children’s Fund, New York, 2021. Retrieved from: https://data.unicef.org/

European Commission. “Legislative framework for sustainable food systems”. Directorate-General for Health and Food Safety. Retrieved from: https://food.etc.europa.eu/

Jesus, Ana. “Reimaging the food system: the transformative potential of social innovations”. *Briefing no. 16/2022.* European Environment Agency, October 6, 2022. Retrieved from: https://www.eea.Europa.eu/

United Nations. “Universal Declaration on the Eradiction of Hunger and Malnutrition”. United Nations Human Rights Office of the High Commissioner. Retrieved from: https://www.ohchr.org/

Eide, Asbjorn. “The human right to adequate food and freedom from hunger”. *The right to food in theory and practice.* FAO Information Division, Rome, 1998. Retrieved from: https://www.fao.org/

UN Women. “Infographic: Why gender equality matters to achieving all 17 SDGs”. July 5, 2018. Retrieved from: https://www.unwomen.org/

CENTER for A LIVIABLE FUTURE. “Industrialization of Agriculture”. Johns Hopkins Bloomberg School of Public Health. Retrieved from: https://www.foodsystemprimer.org/

Glauber, Joseph W.. “The current state of agricultural trade and the World Trade Organization”. International Food Policy Research Institute, July 29, 2020. Retrieved from: https://we.ifpri.org/

United Nations. “#Envision2030”. United Nations Department of Economic and Social Affairs Disability. Retrieved from: https://www.un.org/

World Food Programme. “WFP and the Sustainable Development Goals”. Retrieved from: https://www.wfp.org/

United Nations Climate Change. “The Paris Agreement”. Retrieved from: https://unfccc.int/

FAO. “Renewable energy for agri-food systems”. IRENA and FAO, 2021. Retrieved from: https://www.fao.org/

Lartey, Anna. “Mid-term Review of the UN Decade of Action on Nutrition (2016-2025). *Virtual Informal briefing on the Permanent Missions to the United Nations in New York.* July 23, 2020. Retrieved from: https://www.un.org/

United Nations. “Convention on Biological Diversity, key international instrument for sustainable development”. Retrieved from: https://www.un.org/

United Nations. “Secretary-General’s Chair Summary and Statement of Action on the UN Food Systems Summit”. September 23, 2021. Retrieved from: https://www.un.org/

AU. IFRC. FAO. ADBG. “Galvanizing Support to Build Resilient and Sustainable Food Systems for Food Security and Nutrition in Africa”. Information & Communication Directorate, Addis Ababa, October 15, 2022. Retrieved from: https://au.int/

Andrews, Eve.”40 Organizations That Are Shaking Up the Food System”. Foodtank. Retrieved from: https://foodtank.com/

World Integrated Trade Solution. “Food Products Exports by region in US$ Thousands 2020”. World Bank Group, 2020. Retrieved from: https://www.wits.worldbank.org/

Jensen, Lois. “The Sustainable Development Goals Report 2022”. United Nations, 2022. Retrieved from: https://www.unstats.un.org/

Shahbandeh, M. “Soybean export share worldwide in 2020, by leading country”. Statista Inc., August 15, 2022. Retrieved from: https://www.statista.com/

Food and Agricultural Organization of the United Nations. “Trade of agricultural commodities. 2000-2020”, FAOSTAT ANALYTICAL BRIEF 44. Food and Agricultural Organization of the United Nations, Rome, 202. Retreived from: https://fao.org/

3.8. Table of Figures

4. Topic 2: Big Data for Sustainable Development

4.1. Introduction

4.1.1. What is Big Data?

Big Data is a collection of too large or complex data to be handled by traditional forms of data-processing application software. Big Data is “big” not only due to its vast volume, but also due to the variety and complexity of its nature. Moreover, Big Data can originate from anywhere or anything that we can monitor digitally: weather satellites, Internet of Things devices, social media and street cameras, to name a few. As we progress towards a more and more digitally dependent society, our data generation has grown exponentially with this progress. A fantastic example of this development is the take-off of Apollo 11. Just over 50 years ago, the amount of digital data generated

worldwide could have fit today's average laptop. In 2020, the International Data Corporation (IDC)ed that the amount of digital data created over the next five years would be greater than twice the amount of data created since the beginning of digital storage[35]

Big Data is divided into structured, unstructured, and semi-structured. Structured data is the most straightforward kind of data when it comes to organising and searching and can include things like financial data, machine Jogs, and demographic details. Structured data is often not considered Big Data as it is relatively easy to manage in data bases. Unstructured data includes things like social media posts, audio-visual files, images, and comments and can therefore not be captured in typical excel-like databases but is stored in the form of data lakes, data warehouses and NoSQL databases. Lastly, semi-structured data is a hybrid form of the abovementioned data forms. A good example is e-mailing which includes unstructured data in the text message and more structured properties such as the sender, recipient, subject and data.

4.1.2. What is the Data Revolution?

The 'data revolution' refers to the transformative innovations needed to respond to data collection, management, usage, analysis and sharing demands. This is necessary to prevent discrimination and build capacity and data literacy to promote transparency and accountability[36]. The High-Level Panel initially expressed the need for a 'data revolution' and established the need to deliver concrete recommendations to States, the UN-System, and other relevant stakeholders. They were appointed by UN Secretary-General Ban Ki-moon to advise on the global development agenda after the 2015 millennium development goals[37].

> "Better data and statistics will help governments track progress and make sure their decisions are evidence-based; they can also strengthen accountability. This is not just about governments. International agencies, CSOs and the private sector should be involved. A true data revolution would draw on existing and new sources of data to fully integrate statistics into decision making, promote open access to, and use of, data and ensure increased support for statistical systems."[38]

Three significant factors that have accelerated the 'data revolution' are:

1. New datasets

   These include the Internet of Things, satellites, mobile phones, and social media etc.

[35] https://www.sap.com/uk/insights/what-is-big-data.html
[36] https://www.opml.co.uk/in-focus/why-theres-more-to-the-data-revolution-than-big-data
[37] https://www.undatarevolution.org/data-revolution/
[38] https://www.undatarevolution.org/data-revolution/#nav-mobile

2. Methods of analysis

Machine learning: when computers can think and act with less human intervention, which requires less computing power.

Deep learning: a subset of machine learning where computers learn to think using structured modelled on the human brain, which can be used to analyse images, videos, and unstructured data in ways that machine learning cannot easily do.

Artificial intelligence (AI): a science devoted to making machines think and act like humans[39].

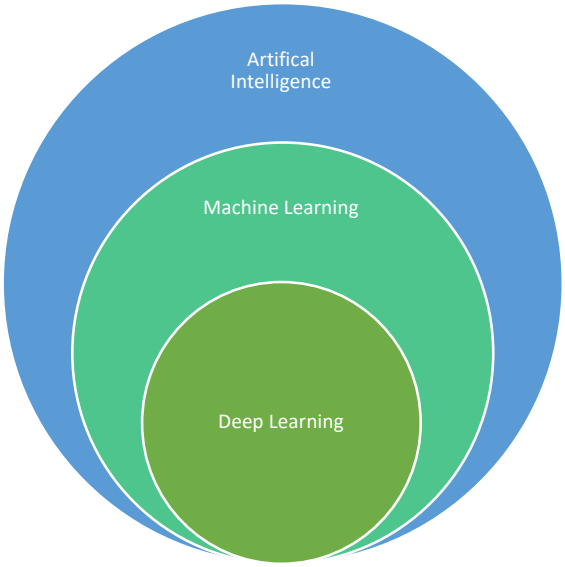

Figure 1: Middleton, Michael. "Deep Learning vs. Machine Learning - What's the Difference?" Flatiron School. Flatiron School, February 8, 2021. https://flatironschool.com/blog/deep-learning-vs-machine-learning/.

3. Computing

This consists of parallel or distributed computing, cheap memory as well as cloud computing. Parallel computing generally requires one computer with multiple processors, whereas distributed computing uses several autonomous and often geographically separate computer systems working on divided tasks. This advancement can also be specified as cloud computing. It was expected that by 2020, over a third of the available data either exists or will move to the cloud[40].

4.2. Important UN Resolutions and Frameworks Regarding (Big) Data

[39] https://flatironschool.com/blog/deep-learning-vs-machine-learning/
[40] https://technative.io/3-trends-enabling-the-big-data-revolution/

Secretary General's Data Strategy

The Secretary General's *Data Strategy for Action by Everyone, Everywhere: With Insight, Impact and Integrity* is the UN agenda for data-driven transformation and was approved in April 2020. The aim is to improve the approach towards data in order to deliver a better outcome for everyone: more decisive decision-making and policy advice, more significant data access and sharing, improved data governance and collaboration, robust data protection and privacy, enhanced efficiency across UN operations, greater transparency and accountability as well and better services for people and planet[41].

The priorities for data action include the following:

- Decade of Action to deliver the SDGs by 2030:

  Mobilising governments, civil society, and businesses
- Climate Action:

  Employing data and analytics for urgent climate action
- Gender Equality:

  Building better gender data and analytics capabilities
- Human Rights and Rule of Law:

  Forming global coalitions for human rights-based approaches to data, fighting hate speech online while upholding freedoms and strengthening human rights monitoring
- Peace and Security:

  Leveraging data and analytics for the prevention, mediation, and resolution of conflicts: for more substantial analysis and recommendations, to deploy peacekeepers faster to where they are needed most, and to protect civilians and UN personnel
- Governance and Ethics for the Future:

  Helping to foster dialogue and the implementation of data policies that advance the responsible human-rights-based use of data and drive innovation for people and the planet
- UN Reform:

  Accelerating UN reform by fostering centres that catalyse stronger data and analysis capabilities, help account for reform benefits, foster transparency, raise performance, and build resilient supply chains
- Data Protection and Privacy:

  Improving Data Protection and Data Principles and strengthening dialogue with public and private stakeholders.

[41] https://www.un.org/en/content/datastrategy/index.shtml

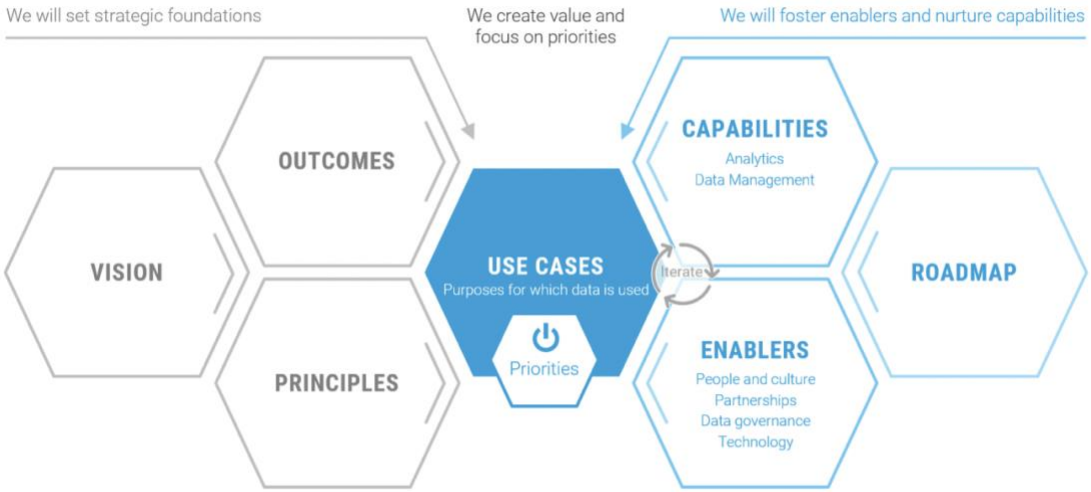

Figure 2: "UN Secretary-General's Data Strategy." United Nations. United Nations. Accessed January 9, 2023. https://www.un.org/en/content/datastrategy/index.shtml

Resolution adopted by the Human Rights Council on 26th September 2019: The right to privacy in the digital age (A/HRC/RES/42/15)

This Human Rights Council Resolution focuses on the right to privacy in the digital age, calling upon all States to respect and protect the right to privacy and to take measures to end violations and abuses of the right to privacy and to create conditions that prevent these situations, amongst many other measures. It focuses on the various risks that come with an increasingly digitalised world and the many facets of these risks and their potential solutions.

Economic and Social Council: Statistical Commission – Report of the Committee of Experts on Big Data and Data Science for Official Statistics

This recent report of the Committee of Experts on Big Data and Data Science for Official Statistics is from the fifty-third session 1-4 March 202. It urges the Committee of Experts on Big Data and Data Science for Official Statistics to strengthen the methodology for the use of big data and data science for official statistics. Furthermore, it addresses the issues by the Commission by preparing methodological handbooks, increasing the number of projects on the Global Platform, and by further improving the training programme.

Data Privacy, Ethics and Protection: Guidance Note on Big Data for Achievement of the 2030 Agenda[42]

This UN document offers a general guidance on data privacy, data protection and data ethics for the

[42] https://unsdg.un.org/sites/default/files/UNDG_BigData_final_web.pdf

United Nations Development Group (UNDG). It concerns itself with the use of big data, collected in real time by private sector entities as part of their business offering, and shared with the UNDG members for the purpose of strengthening operational implementation of their programme to support the success of the 2030 Agenda. The document follows the following principles: 1) lawful, legitimate, and fair use, 2) purpose specification, use limitation and purpose compatibility, 3) risk mitigation and risks, harms, and benefits assessment, 4) sensitive data and sensitive contexts, 5) data security, 6) data retention and data minimisation, 7) data quality, 8) open data, transparency, and accountability and 9) due diligence for third party collaborations.

Economic and Social Council, Economic Commission for Europe, Committee on Sustainable Energy: "Role of utilities, big data and geo-spatial data in energy transition" (ECE/ENERGY/GE.6/2018/6)[43]

This report of the Economic Commission for Europe focuses on the role of utilities, big data, and geo-spatial data in energy transition. It outlines that many countries have begun using big and geo-spatial data and related data management and analysis methods for implementation of sustainable energy projects. This data management and analysis is an interesting IT-solution, which could be easily transferred among different locations and could be expanded across States.

4.2.1. Other Important Frameworks regarding (Big) Data

European Big Data Value Forum

The European Big Data Value Forum brings together industry professionals, business developers, researchers, and policymakers from all over Europe and other regions to advance policy actions and industrial research activities in the areas of Data and Artificial Intelligence[44]. The last session that was held was in November 21-23, 2022, on the topic of "The Heart of the Ecosystem for Data and AI".

BRICS Forum on Big Data for Sustainable Development

China proposed to organise a BRICS Forum on Big Data for Sustainable Development in support of the 14th BRICS Summit in April 2022, which the Chinese Academy of Sciences (CAS), Academy of Science of South Africa, Brazilian Academy of Sciences, Russian Academy of Sciences, and Indian National Science Academy hosted. It was organised by the International Research Centre of Big Data for Sustainable Development Goals and the Aerospace Information Research Institute, CAS. It provided an opportunity to strengthen the dialogues on global sustainable development among BRICS countries, to promote the cooperation mechanism in achieving sustainable development goals, and to enhance international scientific and technological exchanges and cooperation to address the

[43] https://documents-dds-ny.un.org/doc/UNDOC/GEN/G18/264/22/pdf/G1826422.pdf?OpenElement
[44] https://european-big-data-value-forum.eu

sustainable development challenges faced by BRICS countries and the world as well as to contribute to the implementation of the UN 2030 Agenda for Sustainable Development[45].

4.2.2. What is the Future of Big Data? – How is it Evolving?

Joint Research Centre (JRC) Science for Policy Report: Towards a Green and Digital Future[46]

The study examines how the European Union can ensure that the green and digital transitions mutually reinforce each other, allowing for a twin transition. According to the study, digital technology can provide functions that catalyse the green transition by monitoring and tracking real-time information, simulation, and forecasting, can improve efficiency, the visualisation of production and consumption can alter sectors and reduce environmental impact by moving activities online. Additionally, digital technologies can support different sectors in their green transition. For example, better systems management can increase agricultural productivity in the agricultural sector through more accurate applications of feed, water, energy, fertilisers, and pesticides. The study sets out five critical requirements for the twin transition: social, technological, environmental, economic, and political.

Social:

- Ensure just transitions
- Increase societal commitment to the need to change
- Ensure privacy and ethical use of technology

Technological:

- Implement innovation infrastructure
- Build a coherent and reliable technology ecosystem
- Ensure data availability and security

Environmental:

- Avoid rebound effects
- Reduce the environmental footprint of green-digital technology

Economic:

- Create enabling markets
- Ensure diversity of market players
- Equip labour with relevant skills

[45] https://bricsbd4sd.en.cbas.ac.cn/about/index.html

[46] https://op.europa.eu/en/publication-detail/-/publication/58c3af16-f692-11ec-b976-01aa75ed71a1/language-en

Political:

- Implement adequate standards
- Ensure policy coherence
- Channel investments into green-digital solutions

4.3. Big Data and Sustainable Development

4.3.1. What is Big Data's Impact on Sustainability?

Assessing environmental risks

Big data can be used to assess environmental risks. They can enable environmental sustainability by improving our understanding of the demand for energy and food as the global population increases and climate change reduce these resources annually[47].

Optimising resource usage

Minor improvements in efficiency due to resource optimisation can result in significant savings, making it very necessary to seek solutions for optimising resources. An example is the tire company Pirelli, which uses SAP's big data management system HANA to optimise its inventory, reduce waste, increase profits, and reduce the number of defective tires going to landfills, improving the company's environmental impact whilst even increasing profits[48].

Improving Regulation

Big data can also be integrated into government policies to improve environmental regulation. Data can be used to monitor the emissions of extensive utility facilities or other industries and can be used to regulate these. Governments can implement technology that monitors real-time reporting of environmental quality data[49], which can be used on a large scale to regulate firms.

4.3.2. How Does Data Science Enable Sustainable Development?

Monitoring and tracking

Monitoring and tracking allow for the precise provision of knowledge. Data, algorithms, and analysis can provide information on the state of the environment that fosters sustainable development.

[47] https://sustainablebrands.com/read/cleantech/what-does-big-data-mean-for-sustainability
[48] https://sustainablebrands.com/read/cleantech/what-does-big-data-mean-for-sustainability
[49] https://sustainablebrands.com/read/cleantech/what-does-big-data-mean-for-sustainability

Furthermore, accessible, and interoperable data, combined with digital infrastructure and AI solutions, can facilitate evidence-based decisions, and expand capacities to understand and tackle environmental challenges.

Simulation and forecasting

Digital simulations can identify options to improve human action or environmental footprints and allow for improvement. For example, computer models for buildings can test alternative cooling approaches to reduce energy consumption or forecasting methods can be used to balance the demand and supply in energy grids.

Virtualisation

Virtualisation covers new approaches to digital alternatives such as videoconferences, virtual reality experiences or digital prototypes. It can change people's behaviour and adapt to new solutions. As such, they can be energy-efficient and circular to ensure a positive impact.

Systems management

The efficient combination of AI, The Internet of Things, systems, models, and resource management can be used to cope with the increasing complexity of our society in a quickly developing technological world. Therefore, effectively managing of these systems is essential to create and to develop efficient solutions.

Information and communication technologies

Our modern information and communication technologies provide opportunities for almost unlimited information collection and circulation, potentially benefiting our behaviour and gathering information. Digital platforms can also be used to communicate sustainable actions and make consumers more aware[50].

4.3.3. Big Data and the Sustainable Development Goals

The United Nations outlines the Sustainable Development Goals and possible ways big data could be used to help achieve the SDGs[51].

- "SDG 1: - No Poverty	- Spending patterns on mobile phone services can provide proxy indicators of income levels

[50] https://op.europa.eu/en/publication-detail/-/publication/58c3af16-f692-11ec-b976-01aa75ed71a1/language-en

[51] https://www.un.org/en/global-issues/big-data-for-sustainable-development

- SDG 2: - Zero Hunger	- Crowdsourcing or tracking of food prices listed online can help monitor food security in near real-time
- SDG 3: - Good Health and Well-Being	- Mapping the movement of mobile phone users can help predict the spread of infectious diseases
- SDG 4: - Quality Education	- Citizen reporting can reveal reasons for student drop-out rates
- SDG 5: - Gender Equality	- Analysis of financial transactions can reveal the spending patterns and different impacts of economic shocks on men and women
- SDG 6: - Clean Water and Sanitation	- Sensors connected to water pumps can track access to clean water
- SDG 7: - Affordable and Clean Energy	- Smart metering allows utility companies to increase or restrict the flow of electricity, gas or water to reduce waste and ensure adequate supply at peak periods
- SDG 8: - Decent Work and Economic Growth	- Patterns in global postal traffic can provide indicators such as economic growth, remittances, trade and GDP
- SDG 9: - Industry, Innovation and Infrastructure	- Data from GPS devices can be used for traffic control and to improve public transport
- SDG 10: - Reduced Inequality	- Speech-to-text analytics on local radio content can reveal discrimination concerns and support policy response
- SDG 11:	- Satellite remote sensing can track encroachment on public land

- Sustainable Cities and Communities	or spaces such as parks and forests
- SDG 12: - Responsible Consumption and Production	- Online search patterns or e-commerce transactions can reveal the pace of transition to energy efficient products
- SDG 13: - Climate Action	- Combining satellite imagery, crowd-sourced witness accounts and open data can help track deforestation
- SDG 14: - Life Below Water	- Maritime vessel tracking data can reveal illegal, unregulated, and unreported fishing activities
- SDG 15: - Life on Land	- Social media monitoring can support disaster management with real-time information on victim location, effects and strength of forest fires or haze
- SDG 16: - Peace, Justice and Strong Institution	- Sentiment analysis of social media can reveal public opinion on effective governance, public service delivery or human rights
- SDG 17: - Partnership for the Goals	- Partnerships to enable the combining of statistics, mobile and internet data can provide a better and real-time understanding of today's hyper-connected world"

4.4. Challenges of Big Data

Privacy

Privacy can be considered the most sensitive issue, with conceptual, legal, and technological implications. According to the International Telecommunications Union, privacy is defined as the "*right of individuals to control or influence what information related to them may be disclosed*" and should therefore be seen as a fundamental human right[52].

Access and Sharing

Much of our data is already readily available as online data from the "open web". However, there is still much data, which is held by corporations and is not accessible. Many companies or institutions do not share the data of their clients or users or their own data for reasons being legal, reputational, or to protect their competitiveness. However, some of this data, especially from international institutions could be very useful when shared considering development factors. Often, data is repeatedly collected as it is not shared amongst institutions, thus slowing down processes that could be much shorter if data were be gathered and shared[53].

Analysis

Working with new data sources can create several analytical challenges, especially when summarising the data, interpreting it, correcting it, and defining and detecting anomalies. One must also consider that data can be outright false or fabricated, or incorrectly interpreted, which can cause many difficulties when working on solutions to the collected data[54].

Inequality and Bias

Significant gaps are opening between those who have access to or create data and those who do not; as data grows this inequality is constantly growing with it. As such, many people are excluded from data and information by language, poverty, lack of education, technology infrastructure, remoteness or prejudice and discrimination. Therefore, it is necessary to build the capacities of all countries, especially Least Developed Countries, Land-locked Developing Countries and Small Island Developing States[55].

[52] https://www.unglobalpulse.org/wp-content/uploads/2012/05/BigDataforDevelopment-UNGlobalPulseMay2012.pdf
[53] https://www.unglobalpulse.org/wp-content/uploads/2012/05/BigDataforDevelopment-UNGlobalPulseMay2012.pdf
[54] https://www.unglobalpulse.org/wp-content/uploads/2012/05/BigDataforDevelopment-UNGlobalPulseMay2012.pdf
[55] https://www.un.org/en/global-issues/big-data-for-sustainable-development

UN Risks, Harm and Benefits Assessment Tool

The UN Global Pulse has created a two-phase "Risk, Harms and Benefits Assessment Tool", a data privacy, ethics and data protection compliance mechanism designed to help identify and minimise the risks of harm and maximise the positive impact of data innovation projects[56].

Assessment Level 1: Checklist: Designed to understand the data innovation project's context, nature, and scope".

Assessment Level 2: "Is designed to measure the likelihood of the magnitude and significance of the positive impacts of a data innovation project against the likelihood of the risks and the likelihood, magnitude, and severity of potential harms. It provides a framework for balancing the risks and potential harms to individuals and groups caused by data misuse, and non-use". [57]

4.5. Examples of Big Data in Sustainable Development

Global Fishing Watch

The Global Fishing Watch creates and publicly shares knowledge about human activity at sea to enable fair and sustainable use of the ocean. They use new technology to transform big data into actionable information as they believe that human activity at sea should be common knowledge to safeguard the global ocean for the good of all[58].

Example: "Hotspots of unseen fishing vessels illuminate areas of concern for illegal, unreported, and unregulated fishing". [59]The Global Fishing Watch uses automatic identification systems (AIS) data to track the movements of commercial fishing vessels worldwide.

[56] https://www.unglobalpulse.org/policy/risk-assessment/
[57] Ibid.
[58] https://globalfishingwatch.org
[59] Ibid.

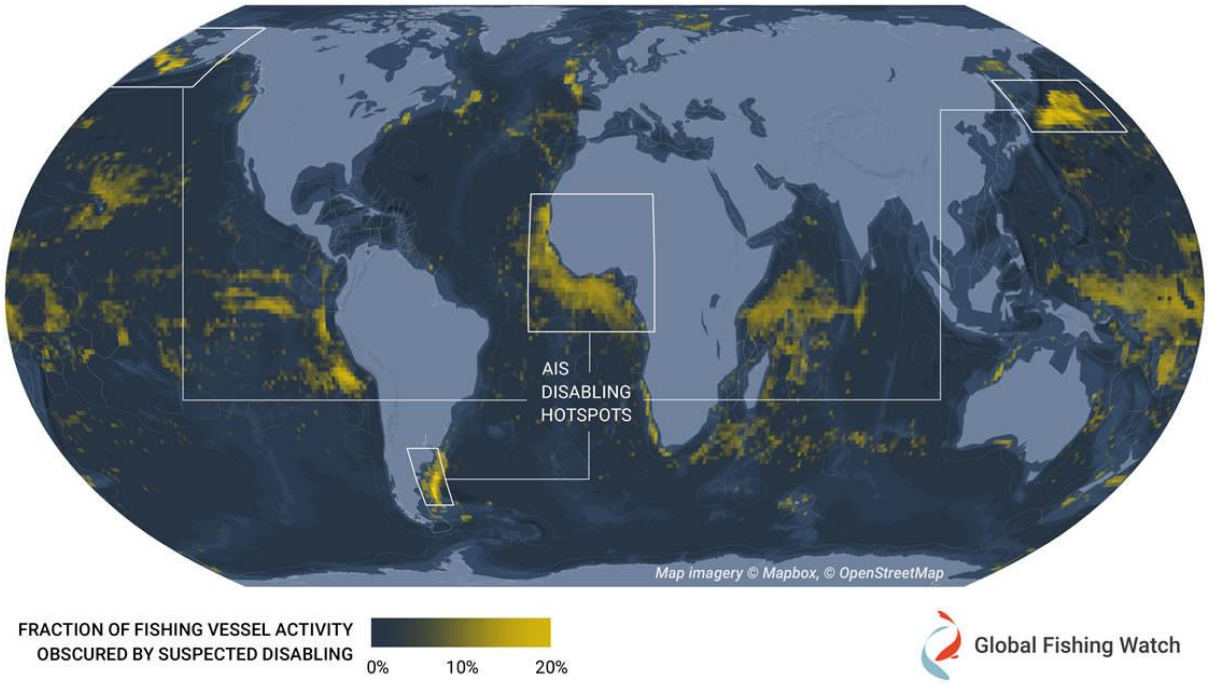

Figure 3: "Revolutionizing Ocean Monitoring and Analysis." Global Fishing Watch. Accessed January 9, 2023. https://globalfishingwatch.org.

Climate Smart Agriculture

Climate Smart Agriculture (CSA) is an approach to help people who manage agricultural systems to respond effectively to climate change and is managed by the Food and Agriculture Organisation of the United Nations[60]. CSA aims to achieve three main pillars: 1) increased productivity, 2) enhanced resilience and 3) reduced emissions. Tanzania and Vietnam are among the countries that will work towards CSA. Furthermore, the World Bank has developed over 10 Climate-Smart Agriculture Investment Plans (CSAIPs) for Bangladesh, Zimbabwe, Zambia, Lesotho, Mali, Burkina Faso, Ghana, Cote D'Ivoire, Morocco and The Republic of Congo to support investments for development[61].

India Night Lights

India Night Lights has shown light output at night for 20 years monitoring 600,000 villages across India. The Defence Meteorological Satellite Program (DMSP) has taken pictures of the Earth every night from 1993 to 2013, which can be used to look at changes in light output. This output can then complement research about the country's electrification[62].

Ocean Observatories Initiatives

[60] https://www.fao.org/climate-smart-agriculture/overview/en/
[61] https://www.worldbank.org/en/topic/climate-smart-agriculture
[62] http://india.nightlights.io/#/about

The Ocean Observatories Initiative is a science-driven ocean observing network which monitors ocean activity from more than 800 instruments and real-time analysis to anticipate the risk of seabed movement and possible tsunamis. It has provided 90 terabytes of data in the past eight years and has stored 119 billion rows of data[63].

Life under your feet

Life under your feet is a tool that collects satellite data on the global variation of humidity or temperature, allowing a more accurate study of clime change – thus optimising the decision making in agriculture or the construction of infrastructures[64].

Aqueduct

Aqueduct is an interactive water-risk mapping tool from the World Resources Institute that monitors and calculates water risk anywhere in the world. These calculations are based on water quantity, quality, and other changing regulatory issues in the area. Aqueduct's tools use open-source, peer-reviewed data to map water risks such as floods, droughts, and stress. Furthermore, the team works with companies, governments, and research partners through the Aqueduct Alliance to advance best practices in water resource management and enable sustainable growth in a water-constrained world[65].

4.6. Guiding Questions

- How can Big Data be effectively used on an international level?
- How can one monitor Big Data?
- How can one support the development of Big Data – also in rural areas
- How can one promote and foster innovation to fill gaps?
- How can one mobilise resources to overcome inequalities?
- How can one coordinate Big Data?
- How can one create public-private partnerships?

[63] https://oceanobservatories.org/about-ooi/
[64] http://lifeunderyourfeet.org/en/sensor/
[65] https://www.wri.org/aqueduct

4.7. Recommended Reading

Data Privacy, Ethics and Protection: Guidance Note on Big Data for Achievement of the 2030 Agenda: https://unsdg.un.org/sites/default/files/UNDG_BigData_final_web.pdf

Joint Research Centre (JRC) Science for Policy Report: Towards a Green and Digital Future: https://op.europa.eu/en/publication-detail/-/publication/58c3af16-f692-11ec-b976-01aa75ed71a1/language-en

4.8. Bibliography

About OOI. Ocean Observatory Initiative. Accessed January 9, 2023. https://oceanobservatories.org/about-ooi/.

Aqueduct. World Resources Institute. Accessed January 9, 2023. https://www.wri.org/aqueduct.

"Data Privacy, Ethics and Protection: Guidance Note on Big Data for Achievement of the 2030 Agenda." New York: United Nations Development Group, n.d.

"Big Data for Sustainable Development." United Nations Global Issues. United Nations. Accessed January 9, 2023. https://www.un.org/en/global-issues/big-data-for-sustainable-development.

"Big Data for Development: Challenges and Opportunities," May 2012. https://www.unglobalpulse.org/wp-content/uploads/2012/05/BigDataforDevelopment-UNGlobalPulseMay2012.pdf.

Climate-Smart Agriculture. FAO. Accessed January 9, 2023. https://www.fao.org/climate-smart-agriculture/overview/en/.

Climate-Smart Agriculture. The World Bank, April 5, 2021. https://www.worldbank.org/en/topic/climate-smart-agriculture.

"ECE/ENERGY/GE.6/2018/6." Kiev: Economic and Social Council, November 15, 2018.

"European Big Data Value Forum." European Big Data Value Forum. European Big Data Value Forum, 2022. https://european-big-data-value-forum.eu.

"Forum Introduction." BRICS Forum on Big Data for Sustainable Development. BRICS Forum on Big Data for Sustainable Development. Accessed January 9, 2023. https://bricsbd4sd.en.cbas.ac.cn/about/index.html.

"India Nightlights." About. India Nightlights. Accessed January 9, 2023. http://india.nightlights.io/#/about.

Jasper, Paul. "The All Data Revolution." Oxford Policy Management. Oxford Policy Management, May 2019. https://www.opml.co.uk/in-focus/why-theres-more-to-the-data-revolution-than-big-data.

Kumar, Sai. "3 Trends Enabling the Big Data Revolution." TechNative, March 19, 2018. https://technative.io/3-trends-enabling-the-big-data-revolution/.

Life Under Your Feet. Life Under Your Feet. Accessed January 9, 2023. http://lifeunderyourfeet.org/en/sensor/.

Middleton, Michael. "Deep Learning vs. Machine Learning - What's the Difference?" Flatiron School. Flatiron School, February 8, 2021. https://flatironschool.com/blog/deep-learning-vs-machine-learning/.

Muench, S, E Stoermer, and K Jensen, et al., *Towards a green & digital future: Key requirements for successful twin transitions in the European Union*, 2022. https://doi.org/10.2760/977331.

"Revolutionizing Ocean Monitoring and Analysis." Global Fishing Watch. Accessed January 9, 2023. https://globalfishingwatch.org.

"Risk, Harms and Benefits Assessment." Risks, Harms and Benefits Assessment Tool. UN Global Pulse. Accessed January 9, 2023. https://www.unglobalpulse.org/policy/risk-assessment/.

Tyagi, Saurabh. What Does Big Data Mean For Sustainability? Cleantech. Accessed January 9, 2023. https://sustainablebrands.com/read/cleantech/what-does-big-data-mean-for-sustainability.

"UN Secretary-General's Data Strategy." United Nations. United Nations. Accessed January 9, 2023. https://www.un.org/en/content/datastrategy/index.shtml.

"What Is Big Data?: Advanced Big Data Analytics : SAP Insights." SAP. Accessed January 9, 2023. https://www.sap.com/uk/insights/what-is-big-data.html.

"What Is the 'Data Revolution'?" UN Data Revolution. Data Revolution Group, May 9, 2016. https://www.undatarevolution.org/data-revolution/#nav-mobile.

"What Is the 'Data Revolution'?" UN Data Revolution. Data Revolution Group, May 9, 2016. https://www.undatarevolution.org/data-revolution/.

4.9. Table of Figures