FOUNDATIONS OF SUSTAINABLE DEVELOPMENT

COMMON ISSUES OF SUSTAINABLE DEVELOPMENT
SEMINAR CLASS

Study aid

Recommended by the Methodological Council of the Igor Sikorsky Kyiv Polytechnic Institute
as a study aid for master's degree applicants in educational programs
«Electronic micro- and nanosystems and technologies» and «Micro- and nanoelectronics»
of specialty 176 «Micro- and nanosystem engineering»

Compilers: I. M. Dzhygyrey, A. A. Verlan

Electronic online educational edition

The publication provides instructions for the seminar class "Common issues of sustainable development" of the educational component " Foundations of sustainable development". The study aid contains the detailed ranking assessment system of the educational component. The publication provides students with the study of theoretical material regarding main society's development concepts, prehistory, background, milestones and principles of sustainable development, preparation for the seminar class, and is useful for independent work.

Content

Preface

This study aid is part of the informational and methodological support of the seminar class "Common issues of sustainable development" of the educational component " Foundations of sustainable development". It is developed in accordance with master's degree first-year students in educational programs, both professional and scientific, «Electronic micro- and nanosystems and technologies» and «Micro- and nanoelectronics» of speciality 176 «Micro- and nanosystem engineering». The educational component "Foundations of sustainable development" belongs to the cycle of general training and is obligatory in the training of masters in the specified programs.

This seminar class is the basis of forming students' learning outcomes regarding main society's development concepts, prehistory, background, milestones and principles of sustainable development. The student's work on the educational material within the seminar class "Common issues of sustainable development" includes the following types of work: studying the material according to textbooks and web resources, preparing for the seminar class, completing tasks set for independent study, and individual consultations.

The presented materials aim at consolidating knowledge and acquiring the ability to apply the skills obtained during studying issues considered in the seminar session "Common issues of sustainable development" of the discipline "Foundations of sustainable development". The publication provides a list of questions, which students should consider, and with the discussion of which the seminar class is held. The main theoretical provisions are given.

The purpose of the seminar class "Common Issues of sustainable development" is to get acquainted with definitions of sustainable development, key milestones and the background of sustainability concept appearance and implementation, from the 1972 Stockholm Conference to nowadays. Main three components or dimensions of sustainable development are considered and discussed, as well as models of sustainability. The 2030 Agenda and Sustainable Development Goals (SDGs) issue is raised.

Seminar plan

1. Introduction of ranking assessment system

Short notes to ranking assessment system of the educational component "Fundamentals of sustainable development".

2. Headline statements discussion

3. Worldview quiz "Common misconceptions"

4. Discussion "SDGs achievement: progress, successes and failures"

Guidance for conducting the seminar class

The seminar class "Common issues of sustainable development" is the first class of the educational component "Fundamentals of sustainable development" in the semester. It should begin with a detailed explanation of the component's ranking assessment system by the teacher. Thus students have the opportunity to ask questions and clarify the details.

1. Ranking assessment system of the educational component

"Fundamentals of sustainable development"

Attending classes. Absence does not result in penalty points. The final rating score of the student is formed solely on the evaluation of learning outcomes. At the same time, the discussion of the results of the thematic tasks, as well as the presentation / public speech and participation in the discussions and additions to the seminars, are evaluated during the classroom sessions. To actively participate in a seminar, the student prepares for a particular seminar using literature and sources recommended by the lecturer. Participation in seminar classes also involves the preparation of reports and co-reports within all classes.

Missed evaluation control measures. Each student has the right to work out classes missed for a good reason (sick leave, mobility, etc.) through independent work[1].

---

[1] "Polozhennia pro potochnyi, kalendarnyi ta semestrovyi kontrol rezultativ navchannia v KPI im. Ihoria Sikorskoho," Igor Sikorsky Kyiv Polytechnic Institute. Accessed: Jan. 10, 2023. [Online]. Available: https://kpi.ua/files/n3277.pdf

Procedure for appealing the results of evaluation control measures. The student can raise any issue related to the control procedure and expect it to be considered according to predefined procedures. Students have the right to challenge the results of control measures, explaining which criterion they do not agree with according to the assessment.

Calendar control is carried out to improve the quality of student learning and monitor student compliance with syllabus requirements (Table 1).

Table 1 – Calendar control criterions

Criterion		First calendar control	Second calendar control
Term of calendar control		Week 8	Week 14
Conditions for obtaining a positive assessment	Current rating	≥ 10 points	≥ 30 points

Academic integrity. Section 3 of the Code of Honour of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"[2] defines the policy and principles of academic integrity.

Norms of ethical behaviour. Section 2 of the Code of Honour of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" defines norms of ethical behaviour of students and employees.

Inclusive education. The acquisition of knowledge and skills during the study of the discipline "Foundations of Sustainable Development" may be available to most people with special educational needs, except for students with severe visual impairments who do not allow to perform tasks with personal computers, laptops, and/or other technical means.

The use of other languages than English. Students may be encouraged to refer to Ukrainian-language sources to complete assignments during the semester.

Assignment of incentive and penalty points. According to the Regulations on the system of learning outcomes assessment, the sum of all incentive points may not

---

[2] "Kodeks chesti Natsionalnoho tekhnichnoho universytetu Ukrainy 'Kyivskyi politekhnichnyi instytut imeni Ihoria Sikorskoho'" Igor Sikorsky Kyiv Polytechnic Institute. Accessed: Jan. 10, 2023. [Online]. Available: https://kpi.ua/code

exceed 10% of the rating scale (Table 2).

Table 2 – Incentive and penalty points

Incentive points		Penalty points	
Criterion	Weighting points	Criterion	Weighting points
Publication of proceedings, articles, registration of a course work as a scientific work for participation in the competition of student research papers (on the subject of the discipline)	5-10 points	-	-
Participation in international, all-Ukrainian, and/or other events and/or competitions (on the subject of academic discipline)	5-10 points	-	-
Organization and participation in events to disseminate information about the Sustainable Development Goals in Ukraine with a certificate	5-10 points	-	-

Preparation for seminar classes and control activities is carried out during the self students' study with the possibility of consulting with the teacher at a certain time of consultations or using e-mail and messengers.

Types of control and rating system for assessing learning outcomes (RSA). Semester certification is conducted in the form of a test. A 100-point rating system and a university scale are used to assess learning outcomes.

Current control: frontal surveys, participation in seminars, reports, electronic reporting, modular test.

Calendar control is conducted twice a semester for monitoring the current state of compliance with the requirements of the syllabus.

Semester control: test.

If the semester rating is more than 60 points, the student may not complete the test, and get a grade "automatically".

Modular control work. Each of the four parts of the modular test contains eight complex questions, calculation or open (a question that requires a detailed text answer) type, which are evaluated in one point (Table 3). The student receives 1 point

for the correct answer to the question, incorrect – 0 points.

Table 3 – Evaluation of control measures

№	Control measure	%	Weighting points	Amount	Total
1.	Public report, participation in discussions and additions, e-reporting, frontal tests	68%	2;2;4;5;9	22	68
2.	Modular control work	32%	32	1	32
	Total				100

Weighing 68 points cover four components: participation in seminars, preparation of reports on selected topics as a speaker and co-speaker, electronic reporting, and the results of frontal tests.

The first component is participation in the seminar. Active participation is assessed in 2 points. Inactive participation, incorrect questions, and comments (that indicate unpreparedness for the class) reduce the grade for work in the seminar to 1 point or 0 points.

The second component is the preparation of a report on a given topic, which is evaluated at 9 points: "excellent", creative disclosure of the task, free possession of the material – 9 points; "good", deep disclosure of the task – 7-8 points; "satisfactory", reasonable disclosure of the task – 6 points. During the semester, each student prepares two performances. The co-report (opposition) is evaluated in 4 points: "excellent", free possession of the material, substantiated and reasoned questions, remarks, and comments – 4 points; "good", mastery of the material – 3 points; "satisfactory", poor mastery of the material – 2 points. During the semester, each student acts as a co-speaker twice.

The third component is two electronic reports on the results of self-studying of the ArcGIS cloud service and the "Sustainable Development Index" web service of WDC "Geoinformatics and Sustainable Development", which are evaluated at 5 points each.

The fourth component is eight frontal tests on the content of lectures evaluated in 2 points each.

To receive credit for the discipline "automatic" one needs to have a rating of at least 60 points as well as modular control work, credited one report and one co-report presented by the student in seminar classes, and at least one completed electronic report. Students who have a rating of fewer than 60 points at the end of the semester or do not meet other conditions and those who want to increase their grade perform a test. There are two options for writing a test of the student's choice.

Option 1. The test is performed on the distance learning platform for two academic hours and contains 120 closed test and open questions of varying difficulty with weight points from 0.5 to 2, the sum of which is 100 points.

Option 2. The written test performs within two academic hours. The test contains four questions of theoretical, systematic, and computational-analytical nature for each of the four topics of the discipline. Each question is evaluated in 25 points: "Excellent" – creative, systematic, and full disclosure of the question, free possession of the material – 24-25 points; "Very good" – disclosure of the issue, free possession of the material – 21-23 points; "Good" – sufficient disclosure of the issue, mastery of the material – 19-20 points; "Satisfactory" – reasonable disclosure of the issue, incomplete mastery of the material – 17-18 points; "Enough" – partial disclosure of the issue – 15-16 points.

Assessment of learning outcomes of higher education students is carried out according to the rating system. The rating system for evaluating students' learning outcomes for a certain academic discipline (educational component) is based on postoperative monitoring according to certain criteria and on accumulation rating points for the students' versatile educational and practical training activities in the learning process[3]. Evaluation of learning outcomes is carried out on a 100-point scale with further converting to assessments according to the University scale (Table 4).

The following part of the seminar class "Common issues of sustainable

---

[3] "REGULATIONS on the evaluation of learning outcomes at Igor Sikorsky Kyiv Polytechnic Institute," Igor Sikorsky Kyiv Polytechnic Institute, 2022. Accessed: Jan. 10, 2023. [Online]. Available: https://osvita.kpi.ua/sites/default/files/downloads/Regulation_RSO_2022.pdf

development" is the discussion of key headline statements on sustainable development. Students should be prepared to debated on sustainability issues, namely main society's development concepts, prehistory, background, milestones and principles of sustainable development, led by the teacher.

Table 4 – Compliance of rating points with University assessment scale

Student's rating assessment	University scale of the acquired competencies level assessments
100-95	Excellent
94-85	Very good
84-75	Good
74-65	Satisfactory
64-60	Enough
Less than 60	Unsatisfactory
Failure to comply with the conditions of admission to semester control	Not allowed

2. Summary and headline statements on sustainability

Today, the concept of sustainable development is recognized by the international community as one of the main trends of the growing needs of mankind by saving and sustainable use of economic, social and environmental resources. Thus, the final document "The future we want" of the UN Conference on Sustainable Development "Rio +20" (Rio de Janeiro, 2012) emphasizes the close interdependence of economic, environmental and social dimensions of human relationships and the inextricable relationship of such values as freedom, equality, unity, tolerance, respect for nature and shared responsibility.

There is no agreed definition on what sustainability (and sustainable development) means. In 1987, the United Nations Brundtland Commission defined sustainable development is

"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[4]

---

[4] "Report of the World Commission on Environment and Development: Our Common Future," United Nations, 1987. Accessed: Jan. 10, 2023. [Online]. Available: https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

It seeks to reconcile economic development with the protection of social and environmental balance.[5] Since then, there have been many variations and extensions on this basic definition. There are many different views on what it is and how it can be achieved. Here is another widely used definition of sustainable development from report of the 2012 High-level Panel on Global Sustainability[6].

> Sustainable development is not a destination, but a dynamic process of adaptation, learning and action. It is about recognizing, understanding and acting on interconnections — above all those between the economy, society and the natural environment. Sustainable development is about seeing the whole picture — such as the critical links between food, water, land and energy. And it is about ensuring that our actions today are consistent with where we want to go tomorrow.

But what is the difference between sustainable development and sustainability? Sustainability is often referred to a long-term goal (a more sustainable world), while sustainable development refers to processes and pathways to achieve it (sustainable production and consumption, sustainable agriculture and forestry, etc.).

Sustainable development, not as a term but as a concept, was recognized in 1972 at the UN Conference on the Human Environment (Stockholm). The Stockholm Declaration on the Human Environment proclaimed that "In the long and tortuous evolution of the human race on this planet a stage has been reached when, through the rapid acceleration of science and technology, man has acquired the power to transform his environment in countless ways and on an unprecedented scale. ... For the purpose of attaining freedom in the world of nature, man must use knowledge to build, in collaboration with nature, a better environment. To defend and improve the human environment for present and future generations has become an imperative goal for mankind-a goal to be pursued together with, and in harmony with, the established and fundamental goals of peace and of worldwide economic and social development."[7]

---

[5] "Sustainable_development," Publications Office of the European Union, EUR-Lex & Legal Information Unit. https://eur-lex.europa.eu/EN/legal-content/glossary/sustainable-development.html
[6] United Nations Secretary-General's High-level Panel on Global Sustainability (2012). Resilient People, Resilient Planet: A future worth choosing. New York: United Nations.
[7] United Nations (1972). Report of the United Nations Conference on the Human Environment - Stockholm, 5-16 June 1972. https://wedocs.unep.org/20.500.11822/30829.

High levels of pollution, ecological misbalance of the biosphere, resource depletion and other pieces of evidence of man-made harm to the environment as well as social and economic challenges are the background of the sustainability concept's appearance. In 2009, former director of the Stockholm Resilience Centre Johan Rockström, with a group of scientists, identified the nine processes that regulate the stability and resilience of the Earth system – planetary boundaries, crossing which increases the risk of generating large-scale abrupt or irreversible environmental changes[8]. The planetary boundaries framework was updated several times showing humanity has exceeded planetary boundaries of climate change, biodiversity loss, nitrogen and phosphorus cycles, land use, and one related to environmental pollutants and other "novel entities" including plastics (Fig. 1).
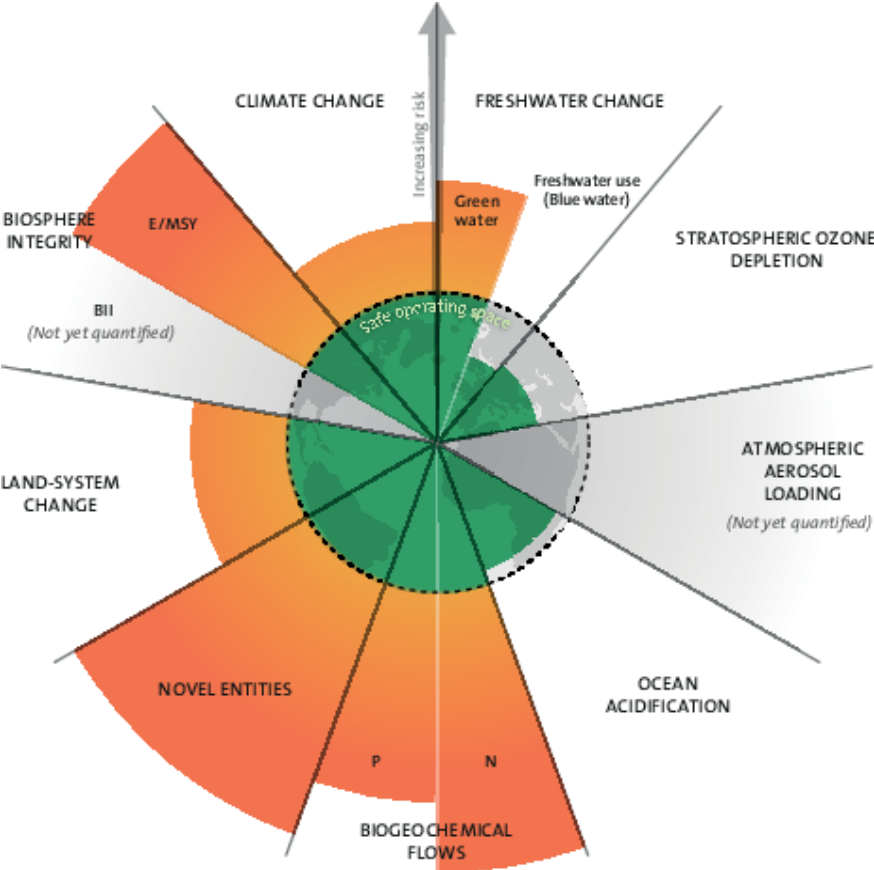

Figure 1 – The planetary boundaries[9]

[8] "Planetary boundaries," Stockholm Resilience Centre. https://www.stockholmresilience.org/research/planetary-boundaries.html

[9] Azote for Stockholm Resilience Centre, based on analysis in L. Wang-Erlandsson et al., "A planetary boundary for green water," Nature Reviews Earth & Environment, pp. 1–13, Apr. 2022, doi: https://doi.org/10.1038/s43017-022-00287-8. Available: https://stockholmuniversity.app.box.com/s/5rc9wwwzv3c03ghgawcjkflno77zptd0

Sustainable development milestones include many conferences, summits, forums, global agreements' adoption, and issuing of global reports as the establishment of the World Commission on Environment and Development in 1983 (see Appendix A), the UN Commission on Sustainable Development[10] in 1992 and the UN High-level Political Forum on Sustainable Development[11] in 2012, the 1994 Barbados Programme of Action adoption, or the 2023 SDG Summit[12] which marks the mid-point of the implementation of the 2030 Agenda and many others. But let's narrow milestones to following (see Appendix B for details).

1972 – the United Nations Conference on the Human Environment (Stockholm);

1987 – the report of the World Commission on Environment and Development "Our Common Future";

1992 – the United Nations Conference on Environment and Development (Rio de Janeiro);

2000 – the Millennium Summit (New York);

2002 – the World Summit on Sustainable Development (Johannesburg);

2012 – the United Nations Conference on Sustainable Development (Rio de Janeiro);

2015 – the United Nations Summit on Sustainable Development (New York);

2022 – the "Stockholm+50" UN high-level meeting (Stockholm).

The UN member states expressed numerous times their inclination to such global development vector that ensures balance between three spheres of coevolution of the Human and the Planet, economic, social, and environmental, for the purpose of prosperity of people, protection of the environment, peace, and global solidarity. This position is supported by the summary document of the 2012 UN Conference on Sustainable Development «The Future We Want», and, subsequently, in the new historical action plan «Transforming our World: the 2030 Agenda for Sustainable Development», approved at the UN Sustainable Development Summit in 2015. The new 2030 Agenda underlines the impossibility of sustainable development without

---

[10] "Commission on Sustainable Development (CSD)," Sustainable Development Knowledge Platform, United Nations. https://sustainabledevelopment.un.org/csd.html
[11] "High-Level Political Forum on Sustainable Development," United Nations. https://hlpf.un.org/
[12] "SDG Summit 2023," United Nations, 2023. https://www.un.org/en/conferences/SDGSummit2023

peace and safety, and, on the other hand, affirms that peace and safety will be jeopardized without sustainable development.

The 2030 Agenda for Sustainable Development is an ambitious and comprehensive plan to guide the humanity's development for 15 years to come. The sustainable development goals (SDGs) — components of the 2030 Agenda — are closely interrelated. Certain goals and targets interact with ones more than with others. Some tasks enhance each other, some contradict one another, and some enable fulfilment of others. 17 SDGs are following

(1) **No poverty** (SDG 1 is to: "End poverty in all its forms everywhere"),

(2) **Zero hunger** (SDG 2 is to: "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture"),

(3) **Good health and well-being** (SDG 3 is to: "Ensure healthy lives and promote well-being for all at all ages"),

(4) **Quality education** (SDG 4 is to: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"),

(5) **Gender equality** (SDG 5 is to: "Achieve gender equality and empower all women and girls"),

(6) **Clean water and sanitation** (SDG 6 is to: "Ensure availability and sustainable management of water and sanitation for all"),

(7) **Affordable and clean energy** (SDG 7 is to: "Ensure access to affordable, reliable, sustainable and modern energy for all"),

(8) **Decent work and economic growth** (SDG 8 is to: "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all"),

(9) **Industry, innovation and infrastructure** (SDG 9 is to: "Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation"),

(10) **Reduced inequalities** (SDG 10 is to: "Reduce income inequality within and among countries"),

(11) **Sustainable cities and communities** (SDG 11 is to: "Make cities and human settlements inclusive, safe, resilient, and sustainable"),

(12) **Responsible consumption and production** (SDG 12 is to: "Ensure sustainable consumption and production patterns"),

(13) **Climate action** (SDG 13 is to: "Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy"),

(14) **Life below water** (SDG 14 is to: "Conserve and sustainably use the oceans, seas and marine resources for sustainable development"),

(15) **Life on land** (SDG 15 is to: "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss"),

(16) **Peace, justice and strong institutions** (SDG 16 is to: "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels"), and

(17) **Partnerships for the goals** (SDG 17 is to: "Strengthen the means of implementation and revitalize the global partnership for sustainable development").

One can distinguish the following sustainable development principles such as

–   inter-generational and intra-generational equity as a commitment to equity and fairness (improvement of conditions for the world's poorest and accounting for the rights of future generations);

–   long-term view and the precautionary principle;

–   integration of economic, environmental and social development goals.

Sustainable development means the integration of the three components of sustainable development – economic development social development and environmental protection – as interdependent and mutually reinforcing pillars[13]. Poverty eradication, changing unsustainable patterns of production and consumption and protecting and managing the natural resource base of economic and social development are overarching objectives of, and essential requirements for, sustainable development. There is no single point of origin of the three-pillar model of sustainability[14] (Fig. 2, left) or the three circles (triple-bottom-line) model of

---

[13] "Plan of Implementation of the World Summit on Sustainable Development," UN, 2022. Available: http://www.un-documents.net/jburgpln.htm

[14] Purvis, B., Mao, Y. & Robinson, D. Three pillars of sustainability: in search of conceptual origins. Sustain Sci 14, 681–695 (2019). https://doi.org/10.1007/s11625-018-0627-5

sustainable development (Fig. 2, right), or the triangle model. The triple-bottom-line model sometimes is referred to as the three-pillar model.
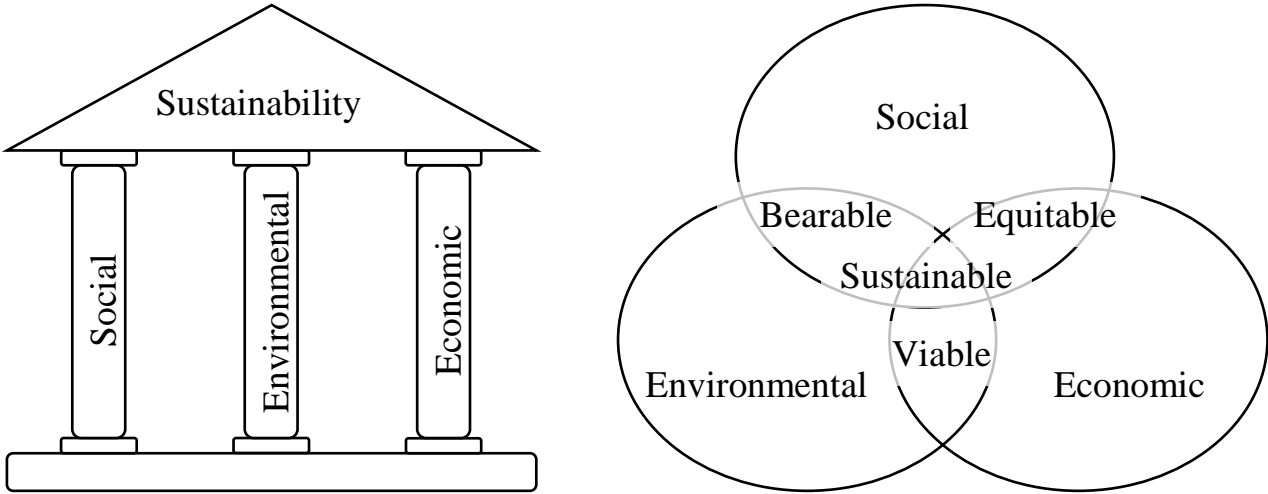

Figure 2 – The three-pillar model of sustainability

The three-pillar model of sustainable development can be called the "compromise" between weak sustainability and strong sustainability models of society's development (Fig. 3). Pelenc and Dedeurwaerdere in Brief "Weak versus Strong Sustainability"[15] for GSDR 2015 show main differences between weak and strong sustainability: weak sustainability postulates the full substitutability of natural capital whereas the strong conception demonstrates that this substitutability should be severely seriously limited due to the existence of critical elements that natural capital provides for human existence and well-being. Weak sustainability model is often referred to as "Mickey Mouse" model or business-as-usual model.

Published in time for the 4th United Nations Environmental Assembly, UNEP's 6th Global Environment Outlook[16] (2019) calls on decision makers to take immediate action to address pressing environmental issues to achieve the Sustainable Development Goals as well as other Internationally Agreed Environment Goals, such as the Paris Agreement. GEO-6 shows that a healthy environment is both a prerequisite and a foundation for economic prosperity, human health and wellbeing (Fig. 4). It addresses the main challenge of the 2030 Agenda for Sustainable

---

[15] Pelenc, Jérôme. (2015). Weak versus Strong Sustainability. 10.13140/RG.2.1.3265.2009.

[16] "Global Environment Outlook 6," UNEP. https://www.unep.org/resources/global-environment-outlook-6

Development: that no one should be left behind, and that all should live healthy, fulfilling lives for the full benefit of all, for both present and future generations[17].

a) b) c

○ – economic, ⊞ – environmental, and ◨ – social dimension of society's development.
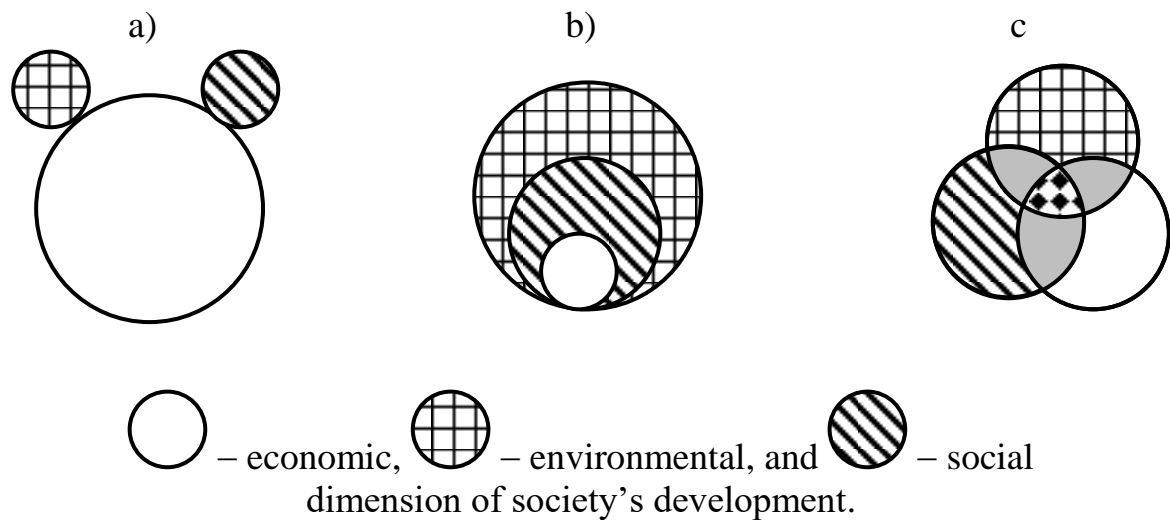
Figure 3 – Models of society's development:
a) weak sustainability, b) strong sustainability, and c) three-pillar model

GEO-6 proclaims that environmental degradation increases the burden of disease through exposure to harmful pollutants and reduced access to the ecosystem contributions from nature. Avoiding these problems will require protecting natural capital through detoxification, decarbonization, dematerialization and restoration of ecosystems to enhance planetary and human well-being. A healthy planet requires protection and sustainable management of natural capital, in the form of nature's contributions to people, and human capital. People's opportunities in life are affected by humanity's ability to generate sustainable, long-term economic and social prosperity from human, physical and natural assets, the extent of environmental degradation and resource depletion, pollution and climate impacts, in addition to disparities in income and wealth[18].
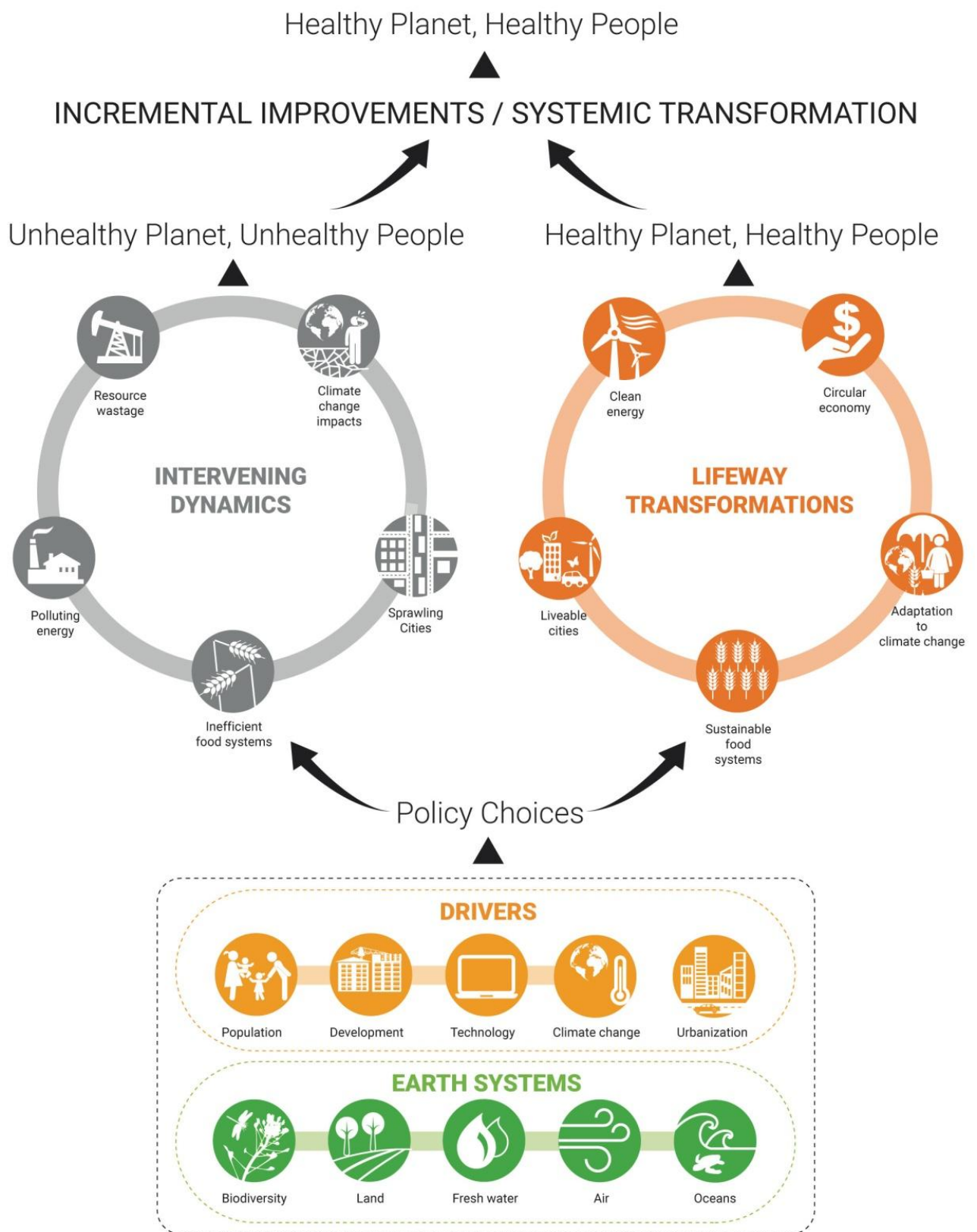
Figure 4 – Healthy planet contributes directly to healthier people by encouraging healthier lifestyles[19]

---

3. Quiz "Common misconceptions about the world"

This component of the seminar class includes an open quiz with a discussion on global society's development and sustainability issues. The Gapminder Worldview Upgrader[20] web resources may be used during the seminar class if a free network is available. Students led by the teacher may choose some questions from the 2020 Sustainable Development Misconception Study (url: https://upgrader.gapminder.org /t/2020-sustainable-development-misconception-study), the 2017 Gapminder Test (url: https://upgrader.gapminder.org/t/2017-gapminder-test), the UN Goals (url: https://upgrader.gapminder.org/tg/ungoals), or other. Students can use some results of this assignment to obtain Gapminder "Upgraded Worldview"1-year certificates.

If a free network is unavailable, the teacher can offer some questions among following ones for discussion (2021, 2022 data years).

Question 1. How many people in the world currently live in extreme poverty (less than $2.15 per day)?

Answer options

A: 5–10%

B: 11–15%

C: 16–20%

Question 2. What is the share of the richest people who own half of the world's wealth?

Answer options

A: less than 1%

B: 1–2%

C: 3–4%

D: more than 5%

---

[20]" Worldview Upgrader," Gapminder Foundation. https://upgrader.gapminder.org

Question 3. What is the leading cause of death for African teenagers (10-to-19-year-olds)?

Answer options

A: malaria

B: AIDS

C: malnutrition

Question 4. What share of girls are married before age 15 in the least developed countries?

Answer options

A: every 5th

B: every 10th

C: every 20th

Question 5. What share of one-person households in Germany?

Answer options

A: about 20%

B: about 30%

C: about 40%

Question 6. How many people do not have access to electricity globally?

Answer options

A: about 0.7 billion

B: about 1 billion

C: about 1.5 billion

Question 7. Do you think there are plants for sucking CO_2 using direct air capture?

Answer options

A: yes

B: no

C: plan to build

Question 8. What is an area of forest which the planet loses every minute due to anthropogenic factors?

Answer options

A: about 10 football fields

B: about 20 football fields

C: about 40 football fields

Question 9. What industry do you think emits the most greenhouse gases?

Answer options

A: energy (electricity, heat and transport)

B: agriculture, forestry and land use

C: direct industrial processes

Question 10. How sea level has changed over the past 100 years?

Answer options

A: it hasn't changed

B: It's risen 1 sm

C: It's risen 20 sm

Question 11. How has the number of vertebrates (here, population biodiversity) changed since 1970?

Answer options

A: decreased by 6–7%

B: decreased by 16–17%

C: decreased by 60–70%

Question 11. What is the fine for producing, selling and using plastic bags in Kenya?

Answer options

A: $40

B: $400

C: $4000

Question 12. What share of plastic bottles are recycled in Norway?

Answer options

A: about 50%

B: about 75%

C: about 95%

Question 13. How many litres of water do you think are hidden in one litre of milk (how much water is needed to get the product "one litre of milk")?

Answer options

A: 10 l

B: 100 l

C: 1000 l

Question 14. How much more women do unpaid care and domestic work than men?

Answer options

A: 50% more

B: twice as much

C: three times more

Question 15. Worldwide, how many children under age 15 do not achieve the required minimum skills in reading and math?

Answer options

A: about 20%

B: about 40%

C: about 60%

Question 16. What share of the world's population don't have enough food to meet their daily needs?

Answer options

A: about 11%

B: about 22%

C: about 33%

Question 17. How much of the excess heat from global warming is captured in the oceans?

Answer options

A: about 10%

B: about 50%

C: about 90%

Question 18. After water, which raw material is most used in the world in terms of volume?

Answer options

A: oil

B: sand

C: wood

Question 19. What was the share of electricity generated from renewable energy sources (excluding large hydroelectric facilities) in Ukraine as of December 2021?

Answer options

A: about 8 %

B: about 12 %

C: about 16 %

Question 20. What is the share of the population whose average per capita equivalent total expenditure is lower than the actual national subsistence minimum in Ukraine (2021), %

Answer options

A: about 10 %

B: about 20 %

C: about 40 %

4. Discussion session " SDGs achievement"

The last component of the seminar class "Common issues of sustainable development" is short discussion session led by the teacher on progress, successes and failures in SDGs achievement. The following and other information and data may be used as well as SDGs infographics (Appendix C).

SDG 1 "End poverty in all its forms everywhere"[21]

Between 2015 and 2018, global poverty continued its historical decline, with the poverty rate falling from 10.1 per cent in 2015 to 8.6 per cent in 2018. Nowcasts suggest that owing to the COVID-19 pandemic, the global poverty rate increased sharply from 8.3 per cent in 2019 to 9.2 per cent in 2020, representing the first increase in extreme poverty since 1998 and the largest increase since 1990 and setting back poverty reduction by about three years. The impact of the COVID-19 pandemic reversed the steady progress of poverty reduction over the past 25 years. This unprecedented reversal is being further exacerbated by rising inflation and the impacts of the war in Ukraine. It is estimated that these combined crises will lead to an additional 75 million–95 million people living in extreme poverty in 2022, compared with pre-pandemic projections.

SDG 2 "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture"[22]

In 2020, between 720 million and 811 million persons worldwide were suffering from hunger, roughly 161 million more than in 2019. Also in 2020, a staggering 2.4 billion people, or above 30 per cent of the world's population, were moderately or severely food-insecure, lacking regular access to adequate food. The figure increased by nearly 320 million people in just one year. Globally, 149.2 million children under 5 years of age, or 22.0 per cent, were suffering from stunting (low height for their age) in 2020, a decrease from 24.4 per cent in 2015.

SDG 3 "Ensure healthy lives and promote well-being for all at all ages"[23]

As of mid-2022, COVID-19 had infected more than 500 million people worldwide. The latest estimates show that global "excess deaths" directly and indirectly attributable

[21] "Goal 1: End poverty in all its forms everywhere," UN, 2022. https://www.un.org/sustainabledevelopment/poverty/
[22] "Goal 2: Zero Hunger," UN, 2022. https://www.un.org/sustainabledevelopment/hunger/
[23] "Goal 3: Ensure healthy lives and promote well-being for all at all ages," UN, 2022. https://www.un.org/sustainabledevelopment/health/

to COVID-19 could have been as high as 15 million by the end of 2021. The pandemic has severely disrupted essential health services, triggered an increase in the prevalence of anxiety and depression, lowered global life expectancy, derailed progress towards ending HIV, tuberculosis (TB) and malaria, and halted two decades of work towards making health coverage universal. As a result, immunization coverage dropped for the first time in 10 years, and deaths from TB and malaria increased.

SDG 4 "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"[24]

The COVID-19 outbreak has caused a global education crisis. Most education systems in the world have been severely affected by education disruptions and have faced unprecedented challenges. School closures brought on by the pandemic have had devastating consequences for children's learning and well-being. It is estimated that 147 million children missed more than half of their in-class instruction over the past two years. This generation of children could lose a combined total of $17 trillion in lifetime earnings in present value. School closures have affected girls, children from disadvantaged backgrounds, those living in rural areas, children with disabilities and children from ethnic minorities more than their peers.

SDG 5 "Achieve gender equality and empower all women and girls"[25]

There has been progress over the last decades, but the world is not on track to achieve gender equality by 2030. The social and economic fallout from the COVID-19 pandemic has made the situation even bleaker. Progress in many areas, including time spent on unpaid care and domestic work, decision-making regarding sexual and reproductive health, and gender-responsive budgeting, is falling behind. Women's health services, already poorly funded, have faced major disruptions. Violence against women remains endemic. And despite women's leadership in responding to COVID-19, they still trail men in securing the decision-making positions they deserve.

SDG 6 "Ensure availability and sustainable management of water and sanitation for all"[26]

---

[24] "SDG 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all," UN, 2022. https://www.un.org/sustainabledevelopment/education/

[25] "Goal 5: Achieve gender equality and empower all women and girls," UN, 2022. https://www.un.org/sustainabledevelopment/education/

[26] "Goal 6: Ensure access to water and sanitation for all," UN, 2022. https://www.un.org/sustainabledevelopment/water-and-sanitation/

Demand for water is rising owing to rapid population growth, urbanization and increasing water needs from agriculture, industry, and energy sectors. Decades of misuse, poor management, overextraction of groundwater and contamination of freshwater supplies have exacerbated water stress. In 2020, 74 per cent of the global population had access to safely managed drinking water services, up from 70 per cent in 2015. Still, two billion people live without safely managed drinking water services, including 1.2 billion people lacking even a basic level of service, in 2020. Between 2015 and 2020, the population with safely managed sanitation increased from 47 per cent to 54 per cent and the population with access to handwashing facilities with soap and water in the home increased from 67 per cent to 71 per cent.

SDG 7 "Ensure access to affordable, reliable, sustainable and modern energy for all"[27]

The global electricity access rate increased from 83 per cent in 2010 to 91 per cent in 2020. Over this period, the number of people without electricity shrank from 1.2 billion to 733 million. At the current pace, only 92 per cent of the world's population would have access to electricity in 2030, leaving 670 million people unserved. Between 2010 and 2020, the proportion of people with access to clean cooking fuels and technologies increased from 57 per cent to 69 per cent. 4 billion people still relied on inefficient and polluting cooking systems in 2020. The share of renewables in total final energy consumption reached 17.7 per cent in 2019, 1.6 percentage points higher than in 2010.

SDG 8 "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all"[28]

The COVID-19 pandemic precipitated the worst economic crisis in decades and reversed progress towards decent work for all. Although the global economy began to rebound in 2021, bringing some improvement in unemployment, recovery remains elusive and fragile. By the end of 2021, global economic recovery had been hampered by new waves of COVID-19 infections, rising inflationary pressures, major supply-chain disruptions, policy uncertainties and persistent labour market challenges. The global unemployment rate is

---

[27] "Goal 7: Ensure access to affordable, reliable, sustainable and modern energy," UN, 2022.
https://www.un.org/sustainabledevelopment/energy/
[28] "Goal 8: Promote inclusive and sustainable economic growth, employment and decent work for all," UN, 2022.
https://www.un.org/sustainabledevelopment/economic-growth/

projected to remain above its 2019 level of 5.4 per cent, at least until 2023.

SDG 9 "Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation"[29]

Economies with a diversified industrial sector and strong infrastructure sustained less damage and are experiencing faster recovery. In 2021, global manufacturing rebounded from the pandemic, although the recovery remains incomplete and uneven. Higher-technology industries performed better and recovered faster, providing a strong example of how important technological innovation is to achieving Goal 9.

SDG 10 "Reduce income inequality within and among countries"[30]

The effects of the COVID-19 pandemic appear to be reversing any positive trends of narrowing income inequality. The pandemic has also intensified structural and systemic discrimination. Emerging markets and developing economies are experiencing slow recoveries, widening disparities in income between countries. The number of refugees and migrant deaths worldwide reached the highest absolute number on record in 2021. Meanwhile, the war in Ukraine rages on, forcing even more people from their homes and creating one of the largest refugee crises in recent memory.

SDG 11 "Make cities and human settlements inclusive, safe, resilient, and sustainable"[31]

Today, more than half the world's population live in cities. By 2050, an estimated 7 out of 10 people will likely live in urban areas. Cities are drivers of economic growth and contribute more than 80 per cent of global GDP. However, they also account for more than 70 per cent of global greenhouse gas emissions.

SDG 12 "Ensure sustainable consumption and production patterns"[32]

Unsustainable patterns of consumption and production

[29] "Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation," UN, 2022. https://www.un.org/sustainabledevelopment/infrastructure-industrialization/
[30] "Goal 10: Reduce inequality within and among countries," UN, 2022. https://www.un.org/sustainabledevelopment/inequality/
[31] "Goal 11: Make cities inclusive, safe, resilient and sustainable," UN, 2022. https://www.un.org/sustainabledevelopment/cities/
[32] "Goal 12: Ensure sustainable consumption and production patterns," UN, 2022. https://www.un.org/sustainabledevelopment/sustainable-consumption-production/

are root causes of the triple planetary crises of climate change, biodiversity loss and pollution. From 2000 to 2019, total domestic material consumption rose by more than 65 per cent globally, amounting to 95.1 billion metric tons in 2019.

SDG 13 "Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy"[33]

The global temperature has already risen 1.1ºC above the pre-industrial level, with glaciers melting and the sea level rising. Impacts of climate change also includes flooding and drought, displacing millions of people, sinking them into poverty and hunger, denying them access to basic services, such as health and education, expanding inequalities, stifling economic growth and even causing conflict. By 2030, an estimated 700 million people will be at risk of displacement by drought alone.

SDG 14 "Conserve and sustainably use the oceans, seas and marine resources for sustainable development"[34]

Healthy oceans and seas are essential to human existence and life on Earth. The ocean absorbs around one quarter of the world's annual carbon dioxide emissions, thereby mitigating climate change and alleviating its impacts. Continuing ocean acidification and rising ocean temperatures are threatening marine species and negatively affecting marine ecosystem services. Between 2009 and 2018, the world lost about 14 per cent of coral reefs. In 2021, more than 17 million metric tons of plastic entered the world's ocean. The volume of plastic pollution entering the ocean each year is expected to double or triple by 2040.

SDG 15 "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss"[35]

Human activities have profoundly altered most terrestrial ecosystems: around 40,000 species are documented to be at risk of extinction over the coming decades, 10 million hectares of forest (an area the size of Iceland) are being destroyed each year, and more than half of key

---

[33] "Goal 13: Take urgent action to combat climate change and its impacts," UN, 2022. https://www.un.org/sustainabledevelopment/climate-change/
[34] "Goal 14: Conserve and sustainably use the oceans, seas and marine resources," UN, 2022. https://www.un.org/sustainabledevelopment/oceans/
[35] "Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss," UN, 2022. https://www.un.org/sustainabledevelopment/biodiversity/

biodiversity areas remain unprotected. Forest cover fell from 31.9 per cent of total land area in 2000 to 31.2 per cent in 2020. Agricultural expansion is driving almost 90 per cent of global deforestation, including 49.6 per cent from expansion for cropland and 38.5 per cent for livestock grazing.

SDG 16 "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels"[36]

High levels of armed violence and insecurity have a destructive impact on a country's development. Sexual violence, crime, exploitation and torture are prevalent where there is conflict or no rule of law. Governments, civil society and communities need to work together to find lasting solutions to conflict and insecurity. Strengthening the rule of law and promoting human rights is key to this process, as is reducing the flow of illicit arms, combating corruption, and ensuring inclusive participation at all times.

SDG 17 "Strengthen the means of implementation and revitalize the global partnership for sustainable development"[37]

The Sustainable Development Goals can only be realized with a strong commitment to global partnership and cooperation. Significant challenges remain. Official development assistance (ODA) has not reached the targeted level; private investment flows are not well aligned with sustainable development; there continues to be a significant digital divide; and there are on-going trade tensions. In 2021, net ODA flows amounted to $177.6 billion, an increase of 3.3 per cent in real terms from 2020, representing 0.33 per cent of donors' combined gross national income (GNI). Despite hitting a new peak, it still fell short of the 0.7 per cent target.

Depending on the seminar group size discussion can be organized by focusing each student on one goal or in three groups divided by SDGs wedding cake layers. Here it should be noted that former director of the Stockholm Resilience Centre Johan Rockström and board member Pavan Sukhdev pushed for a new way of viewing the economic, social and ecological aspects of SDGs[38]. The illustration

---

[36] "Goal 16: Promote just, peaceful and inclusive societies," UN, 2022.
https://www.un.org/sustainabledevelopment/peace-justice/
[37] "Goal 17: Revitalize the global partnership for sustainable development," UN, 2022.
https://www.un.org/sustainabledevelopment/globalpartnerships/
[38] "A new way of viewing the Sustainable Development Goals and how they are all linked to food," Stockholm Resilience Centre. https://www.stockholmresilience.org/research/research-news/2016-06-14-the-sdgs-wedding-cake.html

describes how economies and societies should be seen as embedded parts of the biosphere and is referred to as the three-layered SDGs wedding cake (Fig. 5).
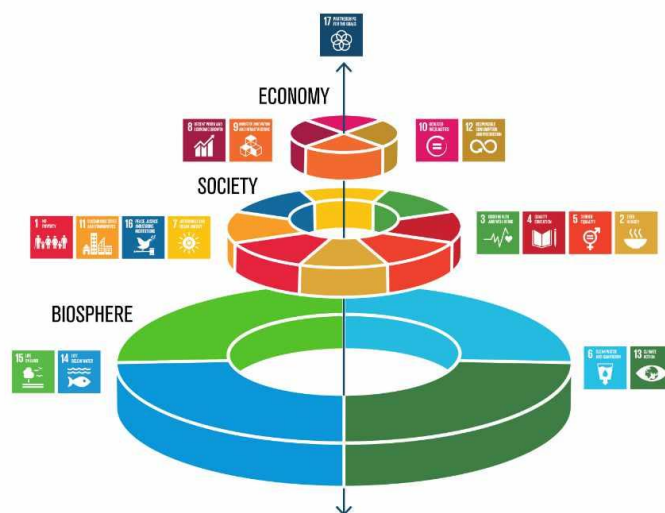

Figure 5 – The SDGs wedding cake

The results of the discussion led by the teacher can be presented as mind map(s)[39] with SDGs central pattern or concept map (or other information mapping tool may be used).

Control questions

1. Name at least to definitions of sustainable development.

2. What is referred to as the Brundtland Commission?

3. Can planetary boundaries be described as environmental background of the emergence of the concept of sustainable development?

4. List nine planetary boundaries.

5. Characterize the 2012 United Nations Conference on Environment and Development.

6. What is the main achievement of the 2010 Millennium Summit?

---

[39] Stalyi innovatsiinyi rozvytok. Stvorennia intelekt-karty (Sustainable innovative development. Creating an intelligence map) [Electronic resource] : study guide for master's degree holders / Igor Sikorsky KPI ; comp.: Karaieva N. V. – Electronic text data (1 file: 4.13 MB). – Kyiv : Igor Sikorsky KPI, 2021. – 70 p. Available: https://ela.kpi.ua/handle/123456789/41679 (in Ukrainian)

7. How do the "Stockholm+50" UN high-level meeting and the UN Conference on the Human Environment related?

8. When were the Sustainable Development Goals adopted?

9. Can one distinguish main Sustainable Development Goal among 17? Justify your opinion.

10. What are inter-generational and intra-generational equity as sustainable development principles?

11. Identify and briefly describe three pillars of sustainable development.

12. What are the main differences between weak and strong sustainability?

13. What is referred to as "Mickey Mouse" model?

14. How do you understand terms "detoxification", "decarbonization", and "dematerialization" in context of global society's development?

15. What is referred to as the SDGs wedding cake?

16. What are the core issues of an integrated framework of "The future we want" outcome document implementation in the post-2015 development agenda?

17. Identify the sequence of three key global meetings in the field of sustainable development.

18. What is known as the Anthropocene epoch?

19. What is referred to as the triple planetary crisis?

20. What is the difference between sustainable development and sustainability?

Recommended sources

The 17 goals | Sustainable Development. UN DESA, 2023. https://sdgs.un.org/goals

Dzhygyrey I. Sustainable Development: e-compendium for TØL4041course. Gjøvik University College, Norway. 2013. 255 pages. Available: https://do.ipo.kpi.ua/mod/resource/view.php?id=158735

"The Future is Now: Science for Achieving Sustainable Development. Global Sustainable Development Report," UN, 2019. Available: https://sustainabledevelopment.un.org/content/documents/24797GSDR_report_2 019.pdf

"Planetary Boundaries and Human Opportunities," SDG Academy. https://sdgacademy.org/course/planetary-boundaries-human-opportunities/

UN Conferences and High-Level Events related to sustainable development. UN DESA, 2023. https://sdgs.un.org/conferences

Agenda 21[40] is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations system, governments, and major groups in every area in which human impacts on the environment. Agenda 21 was adopted by more than 178 governments at the United Nations Conference on environment and development (UNCED) held in Rio de Janeiro in 1992. Agenda 21 outlined an action plan for sustainable development, covering a wide range of issues of sustainable development's three pillars, social, environmental, and economic, through integration and participation.

Anthropocene[18] is a term used by scientists to name a new geologic epoch (following the most recent Holocene) characterized by significant changes in the Earth's atmosphere, biosphere and hydrosphere due primarily to human activities.

Biocapacity[18] is the capacity of ecosystems to produce useful biological materials and to absorb waste materials generated by humans, using current management schemes and extraction technologies. The biocapacity of an area is calculated by multiplying the actual physical area by the yield factor and the appropriate equivalence factor. Biocapacity is usually expressed in units of global hectares.

Biodiversity[18] is the variety of life on Earth, including diversity at the genetic level, among species and among ecosystems and habitats. It includes diversity in abundance, distribution and behavior, as well as interaction with socio-ecological systems.

Biogeochemical cycles[18] are the flow of chemical elements and compounds between living organisms (biosphere) and the physical environment (atmosphere, hydrosphere, lithosphere).

Capacity development[18] is the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time.

---

[40] "Agenda 21," Sustainable Development Knowledge Platform, United Nations.
https://sustainabledevelopment.un.org/outcomedocuments/agenda21

Circular economy[18] is a systems approach to industrial processes and economic activity that enables resources used to maintain their highest value for as long as possible. Key considerations in implementing a circular economy are reducing and rethinking research use, and the pursuit of longevity, renewability, reusability, reparability, replaceability, upgradability for resources and products that are used.

Climate change[18] is a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

Ecological footprint[18] is a measure of the area of biologically productive land and water an individual, population or activity uses to produce all the resources it consumes and to absorb the corresponding waste, using prevailing technology and resource management practices. The ecological footprint is usually measured in global hectares.

"The **Future We Want**"[41] is a result of the UN Conference on Sustainable Development ("Rio+20") and a focused political outcome document which contains clear and practical measures for implementing sustainable development.

The **High-Level Political Forum on Sustainable Development**[42] (HLPF) was established by the United Nations Conference on Sustainable Development (Rio+20) through its outcome on "The Future We Want" in 2012. The HLPF is the central United Nations platform for the follow-up and review of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) at the global level. The Forum meets annually under the auspices of the Economic and Social Council and every four years at the level of Heads of State and Government under the auspices of the General Assembly.

Intragenerational equity[43] is concerned with equity between people of the same generation and aims to assure justice among human beings that are alive today,

---

[41] "The Future We Want," UN Department of Economic and Social Affairs. https://sdgs.un.org/future-we-want

[42] "High-Level Political Forum on Sustainable Development," United Nations. https://hlpf.un.org/

[43] "Glossary – Intragenerational equity," UNEP, the Law and Environment Assistance Platform. https://leap.unep.org/knowledge/glossary/intragenerational-equity

mandating particular priority for the special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable.

Intergenerational equity[44] in economic, psychological, and sociological contexts, is the concept or idea of fairness or justice in relationships between children, youth, adults and seniors, particularly in terms of treatment and interactions.

Millennium Development Goals (MDGs) are the eight global goals which were set out in the UN Millennium Declaration (2000) and ranged from halving extreme poverty rates to halting the spread of HIV/AIDS and providing universal primary education, all by the target date of 2015[45]: (1) Eradicate extreme poverty and hunger, (2) Achieve universal primary education, (3) Promote gender equality and empower women, (4) Reduce child mortality, (5) Improve maternal health, (6) Combat HIV/AIDS, malaria and other diseases, (7) Ensure environmental sustainability, and (8) Develop a global partnership for development.

Natural capital[15] is a set of complex systems consisting of evolving biotic and abiotic elements that interact in ways that determine the ecosystem's capacity to provide human society directly and/or indirectly with a wide array of functions and services.

The **Paris Agreement**[46] is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference in Paris, France, on 12 December 2015. It entered into force on 4 November 2016. Its overarching goal is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels." The Paris Agreement is a landmark in the multilateral climate change process because, for the first

---

[44] "Glossary – Intergenerational equity," UNEP, the Law and Environment Assistance Platform. https://leap.unep.org/knowledge/glossary/intergenerational-equity
[45] "United Nations Millennium Development Goals," United Nations. https://www.un.org/millenniumgoals/
[46] "The Paris Agreement," the UNFCCC secretariat (UN Climate Change). https://unfccc.int/process-and-meetings/the-paris-agreement

time, a binding agreement brings all nations together to combat climate change and adapt to its effects.

Strong sustainability[15] assumes that natural capital cannot be viewed as a mere stock of resources. There is a qualitative difference between manufactured capital and natural capital. Since manufactured capital requires natural capital for its production, it can never be a complete substitute for the biophysical structures of natural capital.

Sustainable development (1987 definition, the Brundtland definition) is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.[4]

Sustainable development (2012 definition, the Zuma and Halonen definition) is not a destination, but a dynamic process of adaptation, learning and action. It is about recognizing, understanding and acting on interconnections — above all those between the economy, society and the natural environment.[6]

Sustainable Development Goals[47] (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. The 17 SDGs are integrated – they recognize that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability. The SDGs are designed to end poverty, hunger, AIDS, and discrimination against women and girls.

"Transforming our world: the 2030 Agenda for Sustainable Development"[48] or the 2030 Agenda (2015) is the resolution A/RES/70/1 adopted by the UN General Assembly, the outcome document of the United Nations summit for the adoption of the post-2015 development agenda and a UN 15-year plan of action for people, the planet and prosperity, which seeks to strengthen universal peace in greater freedom. The Sustainable Development Goals (SDGs) identified under Agenda 2030 provide a universal, transformative and integrated ambition

---

[47] "What are the Sustainable Development Goals?," UNDP. https://www.undp.org/sustainable-development-goals
[48] "Transforming our world: The 2030 agenda for sustainable development," United Nations, 2015. https://sdgs.un.org/2030agenda

that will provide an aligned pathway for the activities of UN Members, international organizations within and beyond the UN system, as well as the entire sphere of entities and individuals having a stake in sustainable development.

The **triple planetary crisis**[49] is refers to the three main interlinked issues that humanity currently faces: climate change, pollution and biodiversity loss.

Weak sustainability[15] assumes that natural capital and manufactured capital are essentially substitutable and considers that there are no essential differences between the kinds of well-being they generate. The only thing that matters is the total value of the aggregate stock of capital, which should be at least maintained or ideally increased for the sake of future generations. Such a position leads to maximising monetary compensations for environmental degradations and technological progress is assumed to continually generate technical solutions to the environmental problems caused by the increased production of goods and services.

The **World Commission on Environment and Development** (WCED, 1983-1988) was a special commission that should make available a report on environment and the global problematique to the year 2000 and beyond, including proposed strategies for sustainable development[50]. The Commission was established by the UN General Assembly in its resolution 38/161 of 19 December 1983 and also called the Brundtland Commission after its Chairman Gro Harlem Brundtland. In 1987 WCED issued the "Our Common Future" report that introduced sustainable development concept and led to the first Earth Summit (see Appendix B).

---

[49] "What is the triple planetary crisis?," the UNFCCC secretariat. https://unfccc.int/blog/what-is-the-triple-planetary-crisis

[50] "WCED," Sustainable Development Knowledge Platform, United Nations. https://sustainabledevelopment.un.org/milestones/wced

1972, the United Nations Conference on the Human Environment[51] (Stockholm) or **the Stockholm Conference** was the first world environmental conference. The Stockholm Declaration, which contained 26 principles, and Action Plan for the Human Environment were adopted. The creation of the United Nations Environment Programme (UNEP) and the first steps to the emergence of the sustainability concept are some of the Stockholm Conference results. The "Stockholm+50: a healthy planet for the prosperity of all – our responsibility, our opportunity"[52] meeting convened by the United Nations General Assembly was held in 2022 in Stockholm to commemorate the 50 years since the UN Conference on the Human Environment.

1987, the report of the World Commission on Environment and Development "Our Common Future" or **the Brundtland Report** was written by an international group of politicians and experts on the environment and development established by the UN General Assembly in 1983 and chaired by former Norwegian Prime Minister Gro Harlem Brundtland. The concept of sustainable development was defined by the Brundtland Commission in the "Our Common Future" report as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs"[4]. The Brundtland Report was the basis for the Earth Summit five years later.

1992, the United Nations Conference on Environment and Development[53] (UNCED) or **the Earth Summit**, the Rio Summit (Rio de Janeiro) was the largest environmental conference at that time and brought together 30 000 participants from 179 countries. The Earth Summit concluded that the concept of sustainable development was an attainable goal for all the people of the world and recognized that integrating and balancing economic, social and environmental dimensions required new perceptions of the way we produce and consume, the way we live

---

[51] "United Nations Conference on the Environment, Stockholm 1972," United Nations. https://www.un.org/en/conferences/environment/stockholm1972
[52] "Stockholm+50," United Nations. https://www.stockholm50.global/
[53] "United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, 3-14 June 1992," United Nations. https://www.un.org/en/conferences/environment/rio1992

and work, and the way we make decisions. Agenda 21 (UN comprehensive plan of action to be taken in every area in which human impacts on the environment) and the Rio Declaration on Environment and Development were adopted at the UNCED. Among other summit outcomes were the Convention on Biological Diversity, the Framework Convention on Climate Change, and the Principles of Forest Management. The creation of the Commission on Sustainable Development (UN CSD) is one of the UNCED results.

2000, **the Millennium Summit**[54] (New York) presented a new development strategy for UN member states, the Millennium Declaration, in which the eight Millennium Development Goals (MDGs) were set out.

2002, the World Summit on Sustainable Development (WSSD, Johannesburg) or **the Johannesburg Summit**, sometimes referred to as Earth Summit 2002[55] and "Rio+10", focused the world's attention and direct action toward meeting difficult challenges, including improving people's lives and conserving our natural resources in a world that is growing in population, with ever-increasing demands for food, water, shelter, sanitation, energy, health services and economic security[56]. The Johannesburg Declaration on sustainable development and the Plan of Implementation of the World Summit on sustainable development, which included provisions covering a set of activities and measures to achieve development that takes into account respect for the environment were adopted.

2012, the United Nations Conference on Sustainable Development (Rio de Janeiro) or "Rio+20" defined pathways to a safer, more equitable, cleaner, greener and more prosperous world for all[57]. **The "Rio+20" Conference** focused on a green economy in the context of sustainable development poverty eradication, and the institutional framework for sustainable development. The outcome document on

---

[54] "United Nations Millennium Development Goals," United Nations. https://www.un.org/millenniumgoals/bkgd.shtml
[55] "Earth Summit 2002," United Nations. http://www.earthsummit2002.org/
[56] "WSSD," Sustainable Development Knowledge Platform, United Nations. https://sustainabledevelopment.un.org/milesstones/wssd
[57] "United Nations Conference on Sustainable Development, Rio+20," Sustainable Development Knowledge Platform, United Nations. https://sustainabledevelopment.un.org/rio20

sustainable development and a green economy, "The Future We Want", which called for the launch of a process to develop a set of SDGs, was adopted at the UN Conference on sustainable development.

2015, the United Nations Summit on Sustainable Development (New York) or **the UN Sustainable Development Summit** was dedicated to the adoption of the post-2015 development agenda, "Transforming our World": the 2030 Agenda for sustainable development, with 17 SDGs at its core for ending extreme poverty, fighting inequality and tackling climate change by 2030. The Sustainable Development Summit explored specific themes in interactive dialogues, including ending poverty and hunger, empowering women and girls and leaving no one behind, fostering sustainable economic growth, combating climate change, and building effective, accountable and inclusive institutions.

2022, The "**Stockholm+50**: a healthy planet for the prosperity of all – our responsibility, our opportunity" is the UN high-level meeting in Stockholm calling for bold environmental action to accelerate the implementation of the 2030 Agenda and the Sustainable Development Goals. The aim of "Stockholm+50" is to commemorate the 50th anniversary of the 1972 Stockholm Conference as well as to help increase the pace of the transition towards a sustainable and green society, more jobs and an environment in balance for everyone, where no one is left behind[58]. Anchored in the Decade of Action, "Stockholm+50" was designed to accelerate the delivery of the SDGs, the Paris Agreement and the post-2020 global biodiversity framework, and to encourage the adoption of green post-COVID-19 recovery plans[59]. It focused on tackling the triple planetary crisis – climate, nature and pollution (Fig. B.1).

---

[58] "Stockholm agenda shows way forward following Stockholm+50," the Government Offices of Sweden, Jun. 08, 2022. https://www.government.se/articles/2022/06/stockholm-agenda-shows-way-forward-following-stockholm50/
[59] "Stockholm+50. A global synthesis report of national consultations. 'A healthy planet for the prosperity of all – our responsibility, our opportunity'," UNDP, 2022. Accessed: Jan. 10, 2023. [Online]. Available: https://www.undp.org/sites/g/files/zskgke326/files/2022-11/UNDP-Stockholm-50-A-Global-Synthesis-Report-of-National-Consultations.pdf
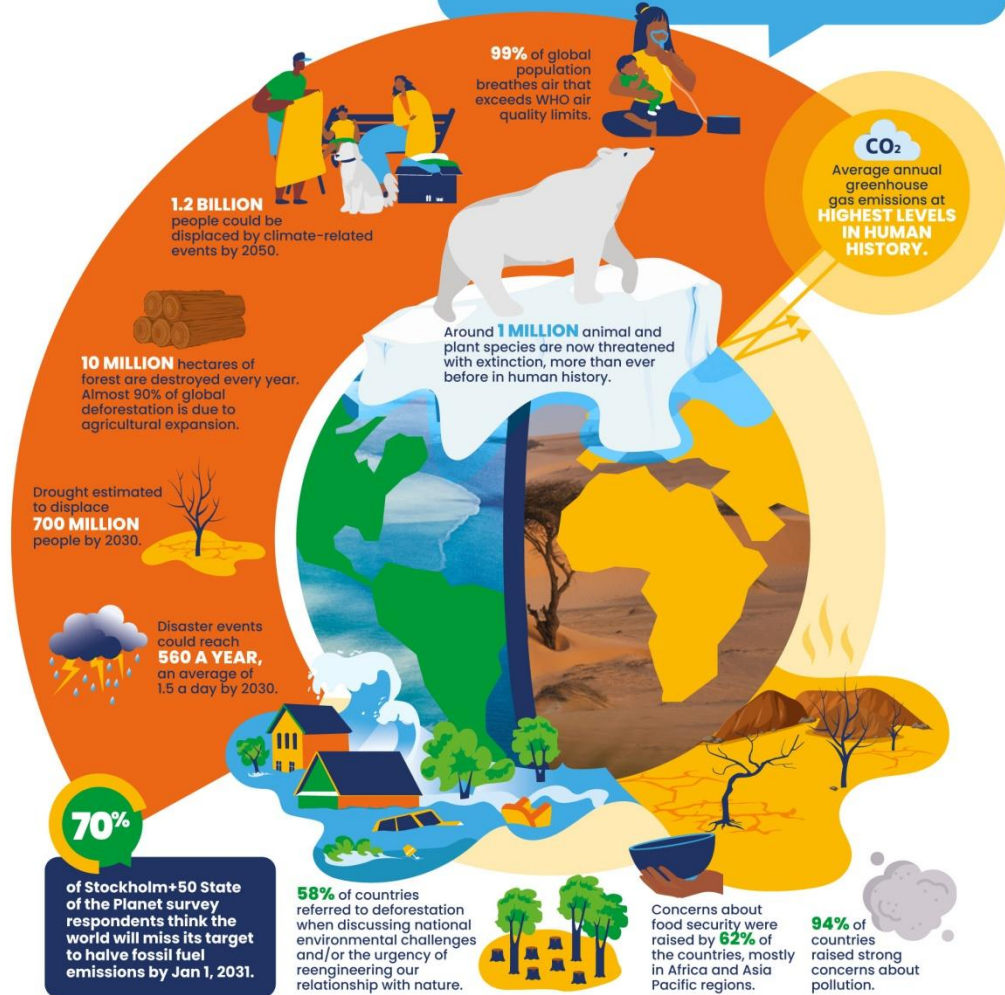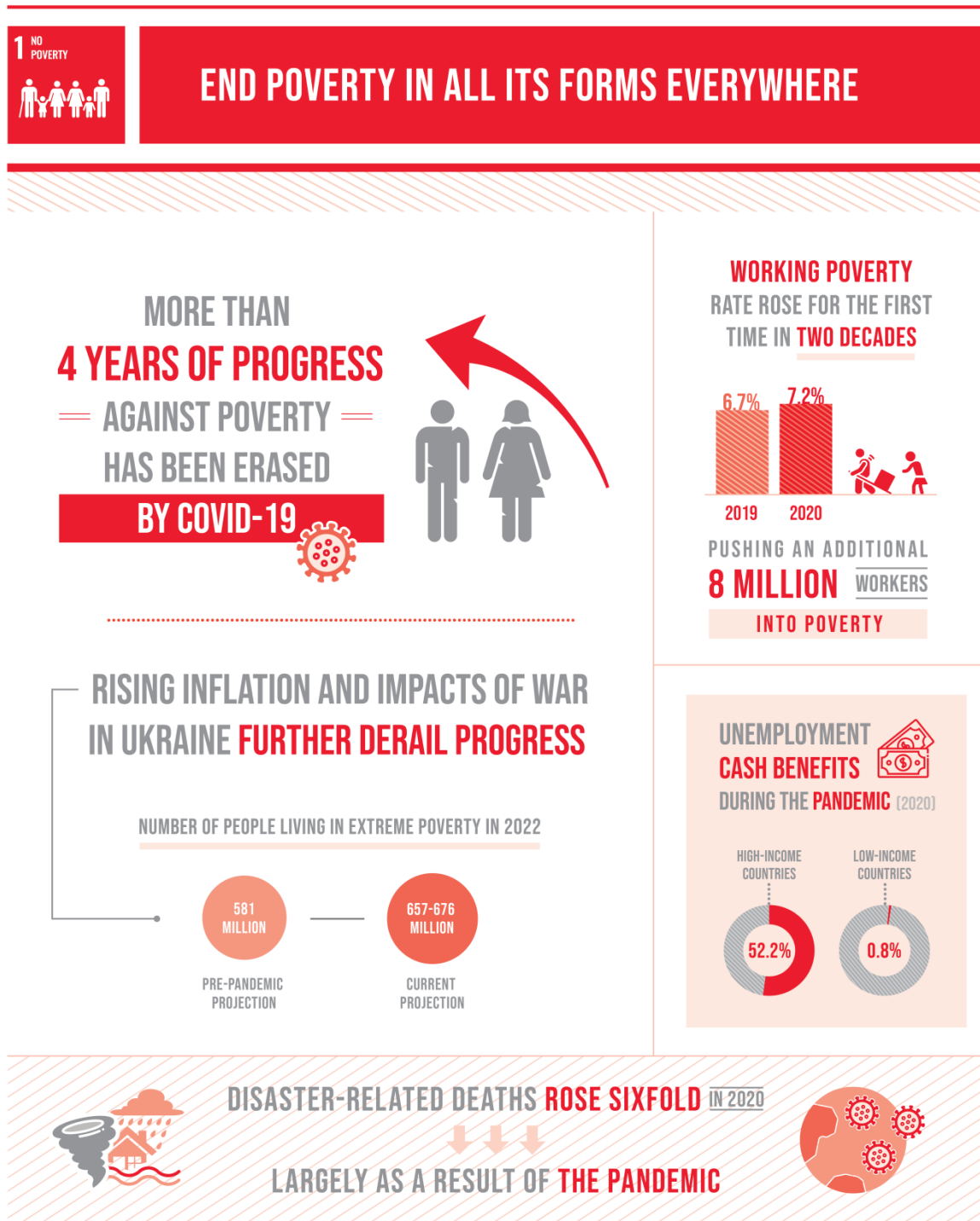
Figure B.1 – The triple planetary crisis[60]

___

[60] "Stockholm+50. National consultations. 'The triple planetary crisis'," UNDP, 2022. Available:

1 NO POVERTY

END POVERTY IN ALL ITS FORMS EVERYWHERE

MORE THAN
4 YEARS OF PROGRESS
— AGAINST POVERTY —
HAS BEEN ERASED
BY COVID-19

WORKING POVERTY
RATE ROSE FOR THE FIRST
TIME IN **TWO DECADES**

6.7% — 2019
7.2% — 2020

PUSHING AN ADDITIONAL
8 MILLION WORKERS
INTO POVERTY

RISING INFLATION AND IMPACTS OF WAR IN UKRAINE FURTHER DERAIL PROGRESS

NUMBER OF PEOPLE LIVING IN EXTREME POVERTY IN 2022

581 MILLION
PRE-PANDEMIC PROJECTION

657-676 MILLION
CURRENT PROJECTION

UNEMPLOYMENT
CASH BENEFITS
DURING THE PANDEMIC (2020)

HIGH-INCOME COUNTRIES
52.2%

LOW-INCOME COUNTRIES
0.8%

DISASTER-RELATED DEATHS **ROSE SIXFOLD** IN 2020

LARGELY AS A RESULT OF **THE PANDEMIC**

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.1 – SDG "No poverty" infographic[61]

---

[61] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%201%20infographic.png

2 ZERO HUNGER

END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

CONFLICT, COVID-19, CLIMATE CHANGE AND GROWING INEQUALITIES ARE CONVERGING TO UNDERMINE FOOD SECURITY WORLDWIDE

ABOUT **1 IN 10 PEOPLE** WORLDWIDE ARE **SUFFERING FROM HUNGER**

NEARLY **1 IN 3 PEOPLE** LACK REGULAR ACCESS **TO ADEQUATE FOOD (2020)**

SOARING FOOD PRICES
AFFECTED

47%
OF COUNTRIES IN 2020
(UP FROM 16% IN 2019)

149.2 MILLION CHILDREN UNDER AGE 5
SUFFER FROM **STUNTING**
(2020)
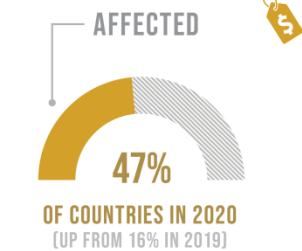
TO REDUCE STUNTING IN CHILDREN **BY 50% BY 2030,** ANNUAL RATE OF DECLINE **MUST DOUBLE**
(FROM 2.1 TO 3.9% PER YEAR)

UKRAINE CRISIS TRIGGERED FOOD SHORTAGES FOR THE WORLD'S POOREST PEOPLE

UKRAINE AND THE RUSSIAN FEDERATION SUPPLY GLOBAL EXPORTS:

30% OF WHEAT

20% OF MAIZE

80% OF SUNFLOWER SEED PRODUCTS

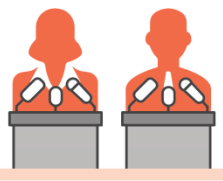THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.2 – SDG "Zero hunger" infographic[62]

---

[62] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%202%20infographic.png

3 GOOD HEALTH AND WELL-BEING

ENSURE HEALTHY LIVES AND PROMOTE WELL-BEING FOR ALL AT ALL AGES

COVID-19

IS THREATENING DECADES OF PROGRESS IN GLOBAL HEALTH

INFECTED MORE THAN
500 MILLION PEOPLE WORLDWIDE
(MID-2022)

LED TO
15 MILLION DEATHS
(2020-2021)

DISRUPTED ESSENTIAL HEALTH SERVICES IN
92% OF COUNTRIES
(END 2021)

HALTED PROGRESS ON
UNIVERSAL HEALTH COVERAGE

GLOBAL LIFE EXPECTANCY

IMMUNIZATION COVERAGE

PREVALENCE OF ANXIETY / DEPRESSION

DEATHS FROM TUBERCULOSIS & MALARIA
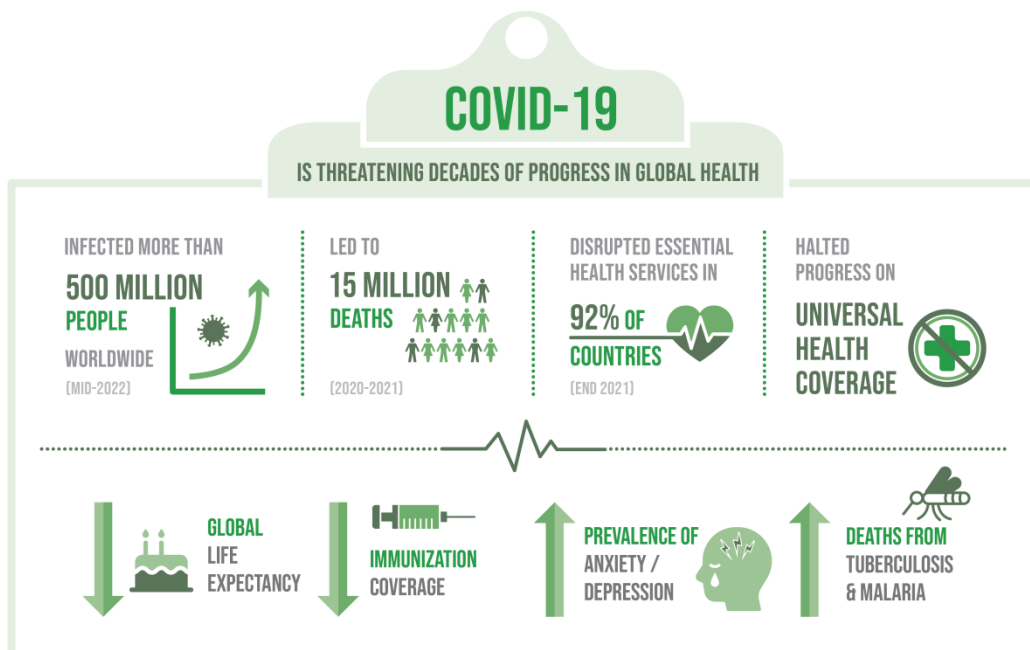
22.7 MILLION CHILDREN MISSED BASIC VACCINES IN **2020**

3.7 MILLION MORE THAN IN **2019**

PANDEMIC CLAIMED THE LIVES OF
115,500 FRONT-LINE HEALTH-CARE WORKERS
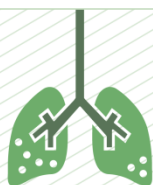
TUBERCULOSIS DEATHS RISE FOR THE FIRST TIME **SINCE 2005**

1.2 MILLION — 2019

1.3 MILLION — 2020
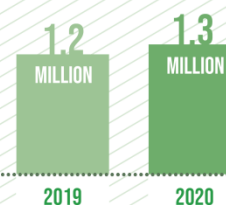
THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.3 – SDG "Good health and well-being" infographic[63]

---

4 QUALITY EDUCATION

ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL

COVID-19 PANDEMIC
— HAS DEEPENED A —
GLOBAL LEARNING CRISIS

147 MILLION CHILDREN MISSED OVER HALF OF IN-PERSON INSTRUCTION IN 2020-2021

ENTRENCHED INEQUITIES IN EDUCATION HAVE ONLY **WORSENED** DURING THE PANDEMIC

24 MILLION LEARNERS
(PRE-PRIMARY TO UNIVERSITY LEVEL)
MAY NEVER RETURN TO SCHOOL

EDUCATION IS A LIFELINE
FOR CHILDREN IN CRISES

REMOTE LEARNING IS OFFERED TO **3 MILLION** UKRAINIAN CHILDREN IN THE CHAOS OF WAR (APRIL 2022)

MANY COUNTRIES ARE **IMPROVING** SCHOOL INFRASTRUCTURE AS CLASSROOMS REOPEN

GLOBALLY, PRIMARY SCHOOLS (2019-2020)

25% LACK — ELECTRICITY — DRINKING WATER — BASIC SANITATION

50% LACK — COMPUTERS — INTERNET ACCESS

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.4 – SDG "Quality education" infographic[64]

---

[64] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%204%20infographic.png

45

5 GENDER EQUALITY

ACHIEVE GENDER EQUALITY AND EMPOWER ALL WOMEN AND GIRLS

IT WOULD TAKE ANOTHER
40 YEARS
FOR **WOMEN AND MEN** TO BE **REPRESENTED EQUALLY** IN NATIONAL POLITICAL LEADERSHIP
AT THE CURRENT PACE

WOMEN'S SHARE IN NATIONAL PARLIAMENTS

22.4% 2015
26.2% 2022

GENDER-RESPONSIVE BUDGETING
NEEDS TO BE STRENGTHENED

PROPORTION OF COUNTRIES WITH SYSTEMS TO TRACK GENDER-BUDGET ALLOCATIONS (2018-2021)

26% COMPREHENSIVE SYSTEMS
59% SOME FEATURES OF A SYSTEM
15% LACKING MINIMUM ELEMENTS OF SUCH A SYSTEM

WOMEN ACCOUNTED FOR
39% OF TOTAL EMPLOYMENT IN 2019,
BUT **45%** OF GLOBAL EMPLOYMENT LOSSES IN 2020

MORE THAN 1 IN 4 WOMEN
(15+ YEARS)

HAVE BEEN SUBJECTED TO INTIMATE **PARTNER VIOLENCE** (641 MILLION) AT LEAST ONCE IN THEIR **LIFETIME**

ONLY **57%** OF WOMEN (15-49 YEARS)

ARE MAKING THEIR OWN INFORMED DECISIONS ON **SEX AND REPRODUCTIVE HEALTH CARE**

(64 COUNTRIES, 2007-2021)

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.5 – SDG "Gender equality" infographic[65]

Figure C.6 – SDG "Clean water and sanitation" infographic[66]

---

[66] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%206%20infographic.png

7 AFFORDABLE AND CLEAN ENERGY

ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

IMPRESSIVE PROGRESS IN ELECTRIFICATION HAS SLOWED

DUE TO THE CHALLENGE OF REACHING THOSE HARDEST TO REACH

NUMBER OF PEOPLE WITHOUT ELECTRICITY

- **1.2 BILLION** — 2010
- **733 MILLION** — 2020
- **679 MILLION** — 2030 (BASED ON CURRENT TREND)
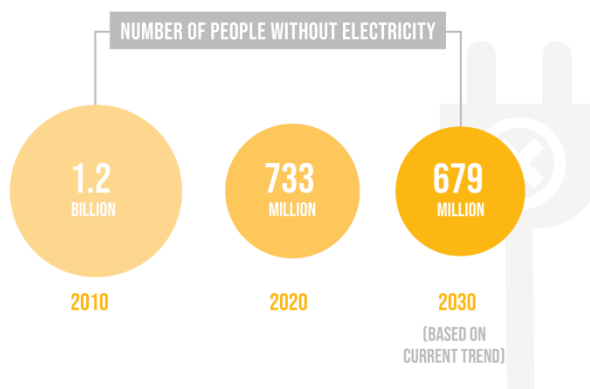
PROGRESS IN ENERGY EFFICIENCY NEEDS TO SPEED UP TO ACHIEVE GLOBAL CLIMATE GOALS

ANNUAL ENERGY-INTENSITY IMPROVEMENT RATE

- **1.9%** ACTUAL (2010-2019)
- **3.2%** NEEDED (TO 2030)
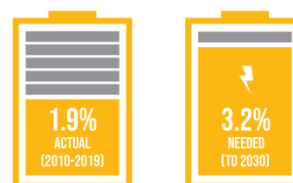
2.4 BILLION PEOPLE

STILL USE INEFFICIENT AND POLLUTING COOKING SYSTEMS
(2020)

INTERNATIONAL FINANCIAL FLOWS TO DEVELOPING COUNTRIES FOR RENEWABLES DECLINED FOR A SECOND YEAR IN A ROW

- **$24.7 BILLION** — 2017
- **$14.3 BILLION** — 2018
- **$10.9 BILLION** — 2019
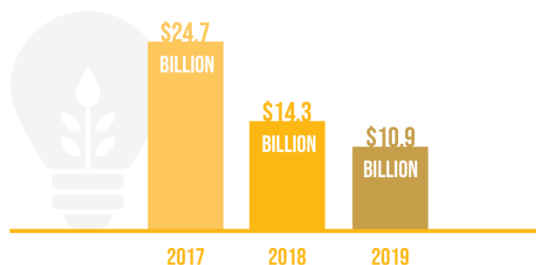
TOTAL RENEWABLE ENERGY CONSUMPTION INCREASED BY A QUARTER BETWEEN 2010 AND 2019, BUT THE SHARE OF RENEWABLES IN TOTAL FINAL ENERGY CONSUMPTION IS ONLY

17.7% (2019)
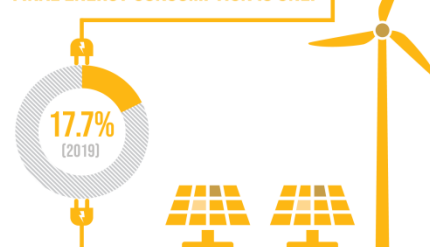
THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.7 – SDG "Affordable and clean energy" infographic[67]

8 DECENT WORK AND ECONOMIC GROWTH

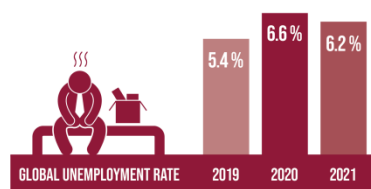**PROMOTE SUSTAINED, INCLUSIVE AND SUSTAINABLE ECONOMIC GROWTH, FULL AND PRODUCTIVE EMPLOYMENT AND DECENT WORK FOR ALL**

## GLOBAL ECONOMIC RECOVERY
— IS HAMPERED BY: —

NEW WAVES OF COVID-19

RISING INFLATION

SUPPLY-CHAIN DISRUPTIONS

POLICY UNCERTAINTIES

LABOUR MARKET CHALLENGES

GLOBAL ECONOMIC RECOVERY IS FURTHER SET BACK BY THE UKRAINE CRISIS

ANNUAL GROWTH RATE OF GLOBAL REAL GDP PER CAPITA (%)
(2018-2023)

2.1

4.4 — RECOVERY

3.0

2.1 — UKRAINE CRISIS

2.5

-4.4 — COVID-19

2018   2019   2020   2021   2022   2023
------- (PROJECTED) -------

GLOBAL UNEMPLOYMENT
TO REMAIN ABOVE PRE-PANDEMIC LEVEL UNTIL AT LEAST **2023**

GLOBAL UNEMPLOYMENT RATE

5.4 % (2019)   6.6 % (2020)   6.2 % (2021)
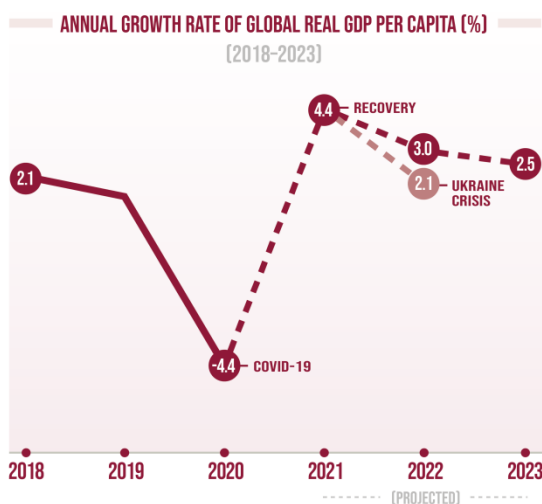
1 IN 10 CHILDREN ARE ENGAGED IN CHILD LABOUR WORLDWIDE

160 MILLION TOTAL CHILDREN (2020)

WORKER PRODUCTIVITY HAS REBOUNDED, BUT NOT IN LDCs

— GROWTH IN OUTPUT PER WORKER —

1.6 %

-0.6 %

3.2 %

■ 2015-2019   ■ 2020   ■ 2021
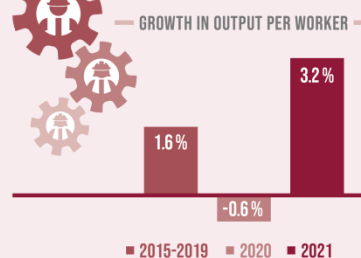
THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.8 – SDG "Decent work and economic growth" infographic[68]

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION AND FOSTER INNOVATION

GLOBAL MANUFACTURING
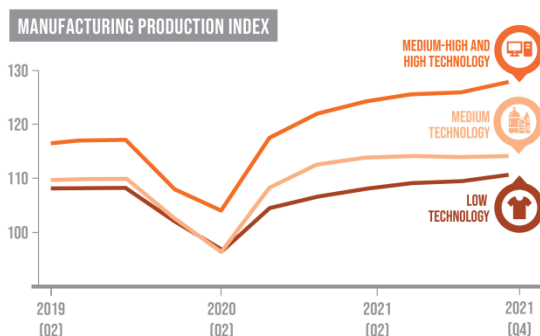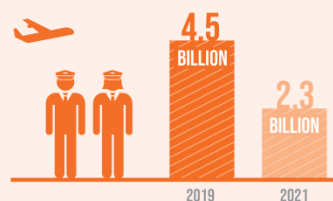HAS REBOUNDED FROM THE PANDEMIC
BUT LDCs ARE LEFT BEHIND

MANUFACTURING GROWTH

WORLD

LDCs

2015   2018   2021 [ESTIMATED]
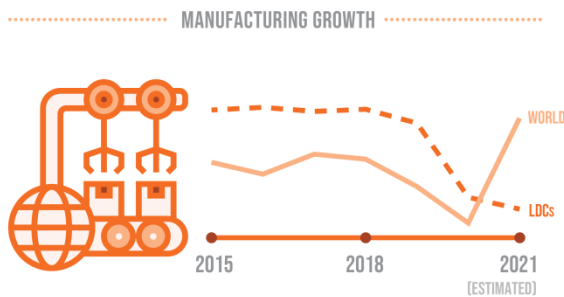
SMALL-SCALE INDUSTRIES
LACK ACCESS TO FINANCIAL SUPPORT FOR RECOVERY

ONLY 1 IN 3 SMALL MANUFACTURERS
ARE BENEFITING FROM A LOAN OR LINE OF CREDIT
[2020-2021]

PASSENGER AIRLINE INDUSTRY
IS STILL STRUGGLING TO
RECOUP CATASTROPHIC LOSSES

4.5 BILLION 2019
2.3 BILLION 2021

2.3 BILLION PASSENGERS IN 2021, COMPARED WITH **4.5 BILLION** IN 2019

HIGHER-TECHNOLOGY INDUSTRIES
ARE FAR MORE RESILIENT IN CRISES
THAN THEIR LOWER-TECH COUNTERPARTS

MANUFACTURING PRODUCTION INDEX

130 — MEDIUM-HIGH AND HIGH TECHNOLOGY
120 — MEDIUM TECHNOLOGY
110
100 — LOW TECHNOLOGY

2019 [Q2]   2020 [Q2]   2021 [Q2]   2021 [Q4]

1 IN 3 MANUFACTURING JOBS
ARE **NEGATIVELY IMPACTED** BY THE CRISIS

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.9 – SDG "industry, innovation and infrastructure" infographic[69]

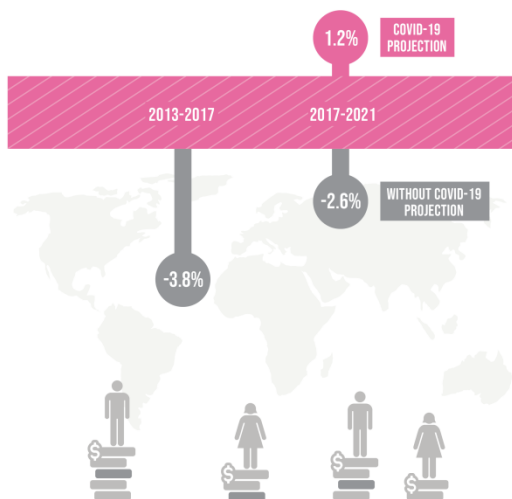**10 REDUCED INEQUALITIES**

REDUCE INEQUALITY WITHIN AND AMONG COUNTRIES

PANDEMIC HAS CAUSED THE FIRST RISE IN BETWEEN-COUNTRY INCOME INEQUALITY IN A GENERATION

CHANGE IN BETWEEN-COUNTRY INCOME INEQUALITY (2013-2021)

1.2% COVID-19 PROJECTION

2013-2017   2017-2021

-2.6% WITHOUT COVID-19 PROJECTION

-3.8%

5,895 MIGRANTS LOST THEIR LIVES IN 2021

THE DEADLIEST YEAR SINCE 2017 FOR MIGRANTS

1 IN 5 PEOPLE HAVE EXPERIENCED DISCRIMINATION ON AT LEAST ONE OF THE GROUNDS PROHIBITED UNDER INTERNATIONAL HUMAN RIGHTS LAW

GLOBAL REFUGEE FIGURE HITS RECORD HIGH — WAR IN UKRAINE PUSHES THE WORLD TOTAL EVEN HIGHER

NUMBER OF REFUGEES OUTSIDE THEIR COUNTRY OF ORIGIN INCREASED BY 44% BETWEEN 2015 AND 2021

216 PER 100,000 PEOPLE (2015)

311 PER 100,000 PEOPLE (MID-2021)

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.10 – SDG "Reduced inequalities" infographic[70]

11 SUSTAINABLE CITIES AND COMMUNITIES

MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

NUMBER OF COUNTRIES WITH LOCAL DISASTER RISK REDUCTION STRATEGIES

NEARLY DOUBLED

BETWEEN 2015 AND 2021
(51 TO 98 COUNTRIES)

— LEAVING NO ONE BEHIND —
WILL REQUIRE AN **INTENSIFIED FOCUS** ON

1 BILLION SLUM DWELLERS

AS CITIES GROW, MUNICIPAL SOLID WASTE PROBLEMS **MOUNT**

GLOBALLY,
MUNICIPAL SOLID WASTE

82% COLLECTED

55% MANAGED IN CONTROLLED FACILITIES (2022)

IN SUB-SAHARAN AFRICA,
LESS THAN 1/3 OF CITY DWELLERS HAVE CONVENIENT ACCESS TO **PUBLIC TRANSPORTATION**

99% OF THE WORLD'S URBAN POPULATION BREATHE **POLLUTED AIR**

ACCORDING TO NEW WORLD HEALTH ORGANIZATION AIR QUALITY GUIDELINES OF $PM_{2.5} < 5$ UG/M³

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.11 – SDG "Sustainable cities and communities" infographic[71]

---

[71] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%211%20infographic.png

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

UNSUSTAINABLE PATTERNS

OF **CONSUMPTION AND PRODUCTION** ARE ROOT CAUSE OF

— TRIPLE PLANETARY CRISES —

CLIMATE CHANGE

BIODIVERSITY LOSS

POLLUTION

TOO MUCH FOOD IS BEING LOST OR WASTED
IN EVERY COUNTRY EVERY DAY

HARVESTING · TRANSPORT · STORAGE · PROCESSING

13.3% OF THE WORLD'S FOOD IS LOST AFTER HARVESTING AND BEFORE REACHING RETAIL MARKETS

HOUSE · GROCERY STORE · HOUSEHOLD · RESTAURANT

17% OF TOTAL FOOD IS WASTED AT THE CONSUMER LEVEL

OUR RELIANCE ON
NATURAL RESOURCES
IS INCREASING

RISING OVER **65%** GLOBALLY FROM 2000 TO 2019

VAST MAJORITY OF THE
WORLD'S ELECTRONIC WASTE IS
NOT BEING SAFELY MANAGED

— E-WASTE COLLECTION RATES —
(2019)

1.2% LATIN AMERICA AND THE CARIBBEAN

1.6% SUB-SAHARAN AFRICA

46.9% EUROPE AND NORTHERN AMERICA

22.8% GLOBAL AVERAGE

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.12 – SDG "Responsible consumption and production" infographic[72]
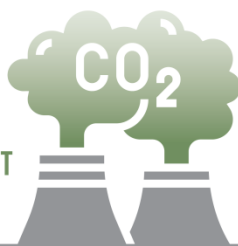
Figure C.13 – SDG "Climate action" infographic[73]

---

[73] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%213%20infographic.png

14 LIFE BELOW WATER

CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

OUR OCEAN

THE PLANET'S LARGEST ECOSYSTEM

IS ENDANGERED

PLASTIC/MARINE POLLUTION

OVER-FISHING

OCEAN WARMING

ACIDIFICATION

EUTROPHICATION
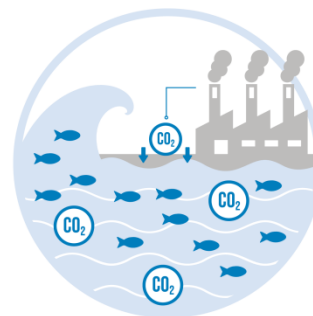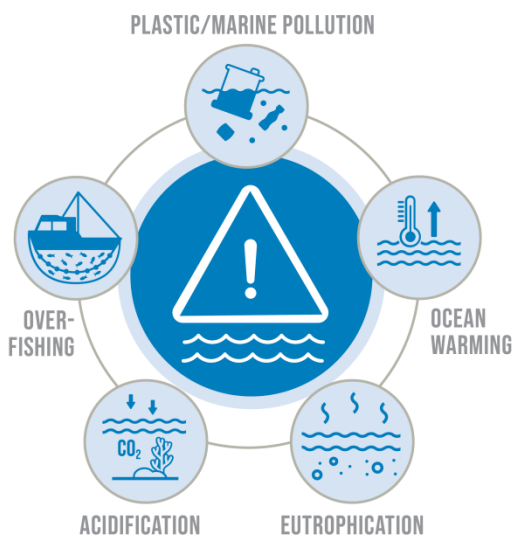
INCREASING ACIDIFICATION

IS THREATENING MARINE LIFE AND LIMITING THE OCEAN'S CAPACITY **TO MODERATE CLIMATE CHANGE**

THE OCEAN ABSORBS AROUND 1/4 OF GLOBAL ANNUAL CO_2 EMISSIONS

PLASTIC POLLUTION

IS CHOKING THE OCEAN

17+ MILLION METRIC TONS

OF PLASTIC ENTERED THE OCEAN IN 2021

PROJECTED TO **DOUBLE OR TRIPLE** BY 2040

90% OF THE WORLD'S FISHERS ARE EMPLOYED IN **SMALL-SCALE FISHERIES**

WHO NEED ACCELERATED SUPPORT DUE TO THE **PANDEMIC**

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.14 – SDG "Life below water" infographic[74]

---

[74] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%214%20infographic.png

15 LIFE ON LAND

PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS

10 MILLION

HECTARES OF FOREST ARE DESTROYED EVERY YEAR

ALMOST **90%** OF GLOBAL DEFORESTATION IS DUE TO **AGRICULTURAL EXPANSION**

49.6%
CROPLAND EXPANSION

38.5%
LIVESTOCK GRAZING
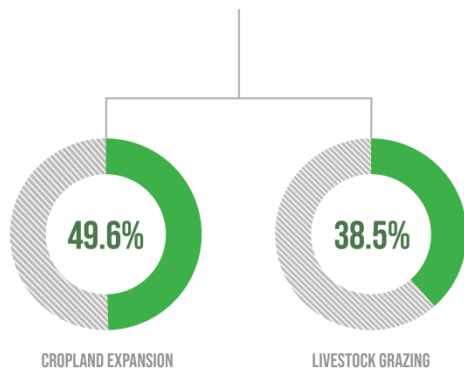
133 PARTIES HAVE RATIFIED **THE NAGOYA PROTOCOL,** WHICH ADDRESSES ACCESS TO **GENETIC RESOURCES** AND THEIR FAIR AND EQUITABLE USE
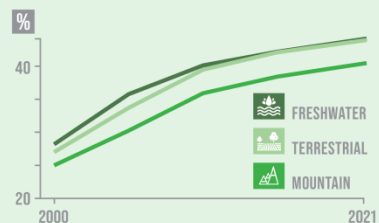
BIODIVERSITY IS LARGELY NEGLECTED IN COVID-19 RECOVERY SPENDING

AROUND **40,000 SPECIES** ARE DOCUMENTED TO BE **AT RISK OF EXTINCTION** OVER THE COMING DECADES

NEARLY HALF OF FRESHWATER, TERRESTRIAL AND MOUNTAIN KEY BIODIVERSITY AREAS ARE PROTECTED

%
40
20
2000   2021

FRESHWATER
TERRESTRIAL
MOUNTAIN

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.15 – SDG "Life on land" infographic[75]

---

[75] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%215%20infographic.png

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

PROMOTE PEACEFUL AND INCLUSIVE SOCIETIES FOR SUSTAINABLE DEVELOPMENT, PROVIDE ACCESS TO JUSTICE FOR ALL AND BUILD EFFECTIVE, ACCOUNTABLE AND INCLUSIVE INSTITUTIONS AT ALL LEVELS
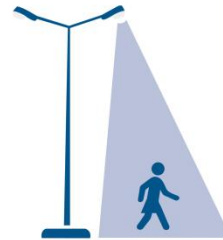
PLEAS FOR
GLOBAL PEACE
GROW LOUDER

WORLD IS WITNESSING LARGEST NUMBER OF VIOLENT CONFLICTS
SINCE 1946
AND

A QUARTER OF THE GLOBAL POPULATION
LIVES IN CONFLICT-AFFECTED
COUNTRIES (END 2020)

1/3 OF THE WORLD'S POPULATION
MOSTLY WOMEN
FEAR WALKING ALONE IN
THEIR NEIGHBOURHOODS **AT NIGHT**

A RECORD
100 MILLION PEOPLE
HAD BEEN **FORCIBLY DISPLACED** WORLDWIDE
(MAY 2022)

GLOBAL HOMICIDE RATE DECLINED
5.2% BETWEEN 2015 AND 2020
FALLS SHORT
OF THE **"SIGNIFICANT REDUCTION"**
BY 2030 TARGETED IN THE SDGs

CORRUPTION IS FOUND IN EVERY REGION
ALMOST **1 IN 6** BUSINESSES HAVE RECEIVED BRIBE REQUESTS
FROM **PUBLIC OFFICIALS**

THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.16 – SDG "Peace, justice and strong institutions" infographic[76]

---

[76] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%216%20infographic.png

17 PARTNERSHIPS FOR THE GOALS

STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALIZE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT

RISING DEBT BURDENS
THREATEN DEVELOPING COUNTRIES' PANDEMIC RECOVERY

DEBT TO GNI RATIO ROSE SHARPLY IN SUB-SAHARAN AFRICA COUNTRIES

43.7%

23.4%

2011   2020

INTERNET

UPTAKE **ACCELERATED** DURING THE PANDEMIC

% OF INDIVIDUALS USING THE INTERNET

54% 2019   **63%** 2021

IN 2021

≫ **NET ODA** REACHED A NEW HIGH OF **$177.6 BILLION**, LARGELY DUE TO COVID-RELATED AID

≫ **FOREIGN DIRECT INVESTMENT** REBOUNDED TO **$1.58 TRILLION**, UP 64% FROM 2020

≫ **REMITTANCES** REACHED **$605 BILLION**, UP 8.6% FROM 2020

ODA FOR SDG DATA **DECLINED** BY MORE THAN **18%** IN 2020
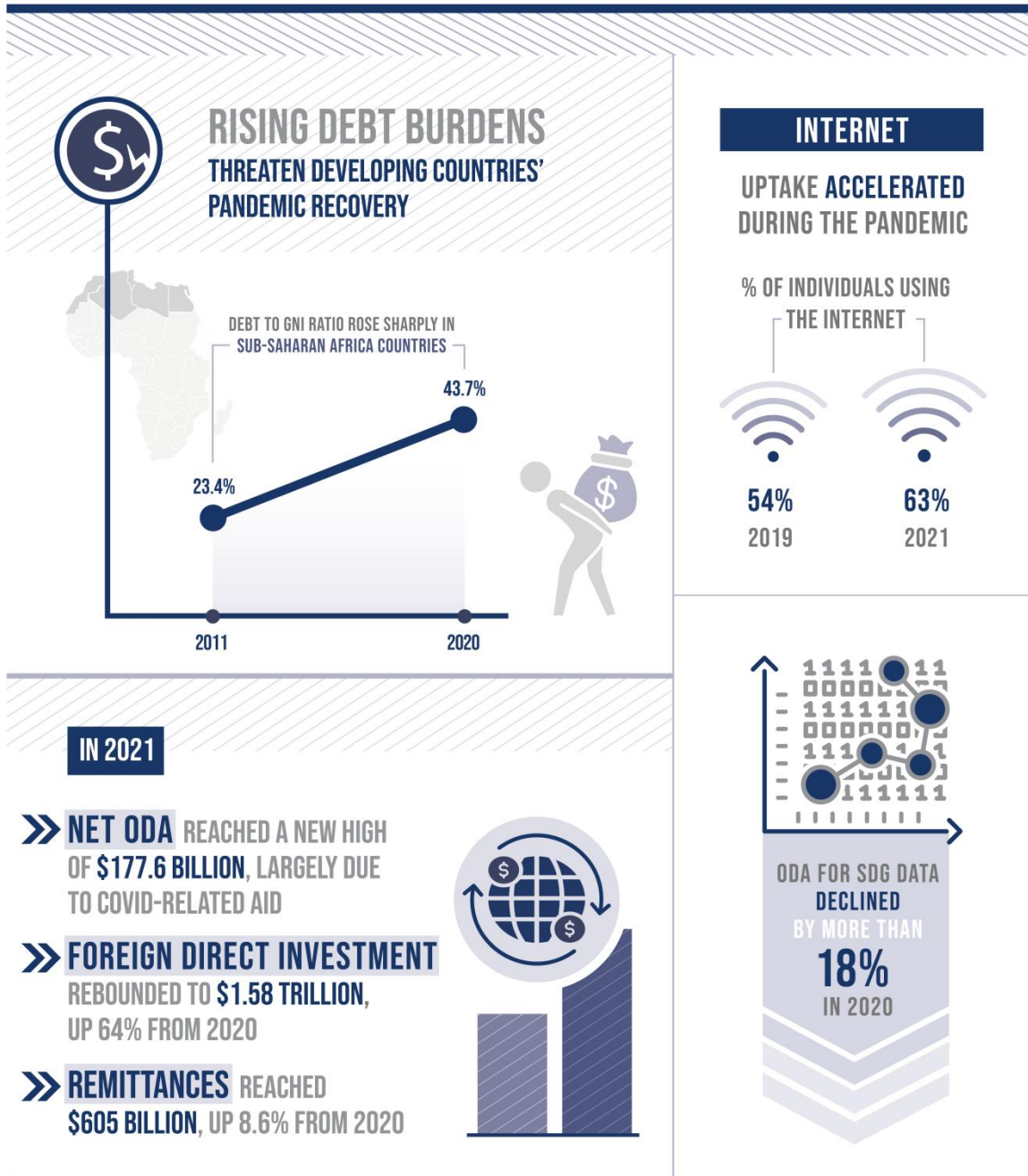
THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: UNSTATS.UN.ORG/SDGS/REPORT/2022/

Figure C.17 – SDG "Partnerships for the goals" infographic[77]

---

[77] Image's url: https://sdgs.un.org/sites/default/files/2022-07/SDG%20Report%202022_Goal%217%20infographic.png