

Lesson outline

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Global Warming impact on natural disaster - migrations

Key words:
global warming
natural disaster
migrations

Topic: Global warming, natural disaster, migrations

Students' age: 15-19

Time: 🕒 2 lessons

Subjects:
geography

LESSONS IDEA - Teacher's guide

Global warming is one of the main current threat for human life and well-being, as well as, for plant and animal species then ecosystems. The lesson 'Global Warming impact on natural disaster - migration' is a 5th part of a block of 5 lessons devoted to the problem of global warming and its direct and indirect impacts assessment using remote sensing techniques, modelling and other sources. The lesson length is 90 minutes. All parts can be realise as separated module.

The purpose of this lesson is to evaluate the impact of climate change on natural disaster and late on the migration, both human as well as ecosystems in different regions using different source of data. The regional analysis will be performed.

Lesson objectives

- Discovering the relation between a climate change and different natural disasters
- Active participation in the analysis of data of different sources
- Analysis of trends and prediction of natural disasters, population and migration
- Stimulating critical view of results

Results

- Students will get to know prediction of changes in distribution of climate related natural disasters.
- Students will get to know prediction of changes in world population density
- Students will know the current migration and world conflicts
- Student will know the current human displacement related to climate and future ecosystem disclaimant

ADDITIONAL MATERIALS:

- global warming vs natural disasters-migrations.pptx – **Appendix 1**
- Global Warming vs natural disasters – migrations_Worksheet.docx – **Appendix 2**

✍ *The lesson needs to be done in a computer room.*



DESCRIPTION OF THE LESSON

Theoretical part

The definition of natural hazards will be given and their basic classification: Geological hazards, Cosmic hazards, Meteorological or climate hazards, Hydrological hazards and Biological hazards. Later all these groups will be presented and students will discuss with teachers which of a specific natural disaster is directly connected to climate change and how.

Time required to complete this part of lesson: 20 min.

Practical part 1

The class is divided into groups (6), each group has a designated continent:

1. Africa
2. Asia
3. Australia
4. Europe
5. North America
6. South America

Students will analyse current and foreseen situation of natural disasters within continents using different source of data.

Time required to complete this part of lesson: 25 min.

Practical part 2 – Impact on human beings

The class is divided into groups (6), each group has a designated continent:

1. Africa
2. Asia
3. Australia
4. Europe
5. North America
6. South America

Students will analyse current and foreseen situation of population density, migrations, conflicts, ecosystem displacement, etc. within continents using different source of data.

Time required to complete this part of lesson: 15 min.

Discussion part

Students and the teachers discuss about the impact of climate change on natural disasters and human beings in different regions.

- What is the impact of climate change on natural disasters in different regions?
- How it will affect human population?
- What will be the directions of migrations?

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- Which migrations will be related to climate change?

Time required to complete this part of lesson: 15 min

 **What to do to stop global warming?**

Discuss with the students what they can do to stop global warming. Then, see the video.

Time required to complete this part of lesson: 10 min



Presentation Solutions:

Africa – Afryka

country kraj	heatwave ^a upały			flood ^b powodzie			forest fires ^c pożary leśne			crop failure ^d nieurodzaje			population density gęstość zaludnienia [people/km ²]				net number of migrants liczba migrantów [k]	conflicts ^e konflikty zbrojne	climatic displacement przemieszczenia związane z klimatem [k]	
	2030	2050	2080	2030	2050	2080	2030	2050	2080	2030	2050	2080	2020	2030	2050	2080	2015-2020		human ludzie (2008-2014)	ecosystems ecosystemy (1990- 2100)
Democratic Republic of Kongo	50%	75%	75%	25%	25%	25%	0%	0%	0%	0%	25%	25%	41	56	98	161	119	62	60	very low-low
Etiopia	0%	0%	0%	50%	50%	50%	0%	25%	25%	0%	50%	50%	104	132	193	263	150		600	high
Mauretania	100%	100%	100%	75%	50%	25%	0%	0%	0%	0%	0%	0%	4	6	9	13	25		6	low
Nigeria	25%	50%	50%	25%	25%	25%	0%	0%	0%	100%	75%	100%	229	288	420	562	-300	13	6100	very low
Zimbabwe	0%	0%	0%	0%	0%	0%	75%	75%	75%	0%	25%	0%	41	50	98	88	-584		60	medium
^a	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)			intensity intensywność			low niska		medium średnia		high wysoka									
^b	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)			intensity intensywność			low niska		medium średnia		high wysoka									
^c	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)			intensity intensywność			low niska		medium średnia		high wysoka									
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^e	years since conflict began liczba lat od początku konfliktu																			

Asia – Azja

country kraj	heatwave ^a upaly			flood ^b powodzie			forest fires ^c pożary leśne			crop failure ^d nieurodzaje			population density gęstość zaludnienia [people/km ²]				net number of migrants liczba migrantów [K]	conflicts ^e konflikty zbrojne	climatic displacement przemieszczenia związane z klimatem [k]	
	2030	2050	2080	2030	2050	2080	2030	2050	2080	2030	2050	2080	2020	2030	2050	2080			2015-2020	human ludzie (2008-2014)
China	25%	25%	25%	75%	75%	75%	0%	25%	50%	0%	0%	25%	151	150	138	103	-1742	15	58366	very low – very high
India	75%	75%	75%	50%	50%	50%	0%	25%	25%	0%	25%	25%	473	513	563	557	-2663	42	26564	low medium
Indonesia	50%	50%	50%	50%	50%	75%	25%	0%	0%	0%	0%	0%	146	157	169	167	-495	53	2966	low-very high
Pakistan	50%	50%	50%	50%	25%	25%	25%	25%	25%	50%	50%	50%	300	362	483	601	-1167	18	14568	medium-very high
Russia	0%	0%	0%	75%	75%	75%	25%	50%	50%	0%	0%	0%	9	9	8	7	912	0	60	very low – very high
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^b	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)			intensity intensywność	low niska	medium średnia	high wysoka													
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^e	years since conflict began liczba lat od początku konfliktu																			

Europe – Europa

country kraj	heatwave ^a upały			flood ^b powodzie			forest fires ^c pożary leśne			crop failure ^d nieurodzaje			population density gęstość zaludnienia [people/km ²]				net number of migrants liczba migrantów	conflicts ^e konflikty zbrojne	climatic displacement przemieszczenia związane z klimatem	
	2030	2050	2080	2030	2050	2080	2030	2050	2080	2030	2050	2080	2020	2030	2050	2080			2015-2020	human ludzie (2008-2014)
Finland	0%	0%	0%	100%	100%	100%	75%	75%	75%	0%	0%	0%	18	18	18	17	70	0	6	low
Germany	0%	0%	0%	100%	100%	75%	25%	25%	0%	0%	0%	0%	238	237	225	206	2719	0	6	low-high
Poland	0%	0%	0%	75%	75%	50%	100%	100%	100%	0%	0%	0%	125	127	113	89	-147	0	6	low
Spain	0%	0%	0%	25%	25%	0%	100%	100%	100%	0%	0%	0%	95	94	88	70	200	0	6	low-medium
Ukraine	0%	0%	0%	75%	50%	0%	75%	75%	75%	0%	25%	0%	76	67	56	42	50	8	6	low

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^c	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)	intensity intensywność	low niska	medium średnia	high wysoka
^d	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)	intensity intensywność	low niska	medium średnia	high wysoka
^e	years since conflict began liczba lat od początku konfliktu				

North America – Ameryka Północna

country kraj	heatwave ^a upały			flood ^b powodzie			forest fires ^c pożary leśne			crop failure ^d nieurodzaje			population density gęstość zaludnienia [people/km ²]				net number of migrants liczba migrantów	conflicts ^e konflikty zbrojne	climatic displacement przemieszczenia związane z klimatem	
	2030	2050	2080	2030	2050	2080	2030	2050	2080	2030	2050	2080	2020	2030	2050	2080			2015-2020	human ludzie (2008-2014)
Cuba	75%	75%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	109	106	96	74	-72	0	1365	medium
Canada	0%	0%	0%	75%	75%	75%	50%	50%	75%	0%	0%	0%	4	5	5	6	1210	0	60	very low-very high
Mexico	25%	25%	50%	50%	25%	0%	50%	50%	75%	25%	25%	50%	65	69	74	68	-300	16	2018	low-medium
Nicaragua	0%	0%	25%	0%	0%	25%	0%	0%	0%	0%	0%	50%	109	64	76	80	-106	0	60	low-medium
USA	50%	50%	50%	25%	50%	25%	75%	75%	75%	0%	0%	25%	37	38	41	43	4774	0	3196	very low-very high

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^b	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)	intensity intensywność	low niska	medium średnia	high wysoka
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^e	years since conflict began liczba lat od początku konfliktu				

South America – Ameryka Południowa

country kraj	heatwave ^a upały			flood ^b powodzie			forest fires ^c pożary leśne			crop failure ^d nieurodzaje			population density gęstość zaludnienia [people/km ²]				net number of migrants liczba migrantów [k]	conflicts ^e konflikty zbrojne	climatic displacement przemieszczenia związane z klimatem	
	2030	2050	2080	2030	2050	2080	2030	2050	2080	2030	2050	2080	2020	2030	2050	2080			2015-2020	human ludzie (2008-2014)
Argentina	25%	25%	25%	0%	50%	50%	50%	50%	50%	0%	0%	0%	16	17	19	17	24	0	6	low-high
Bolivia	50%	50%	50%	25%	25%	25%	25%	75%	75%	0%	25%	25%	11	13	15	17	-48	0	600	low-very high
Brazil	50%	50%	50%	0%	25%	25%	25%	50%	25%	25%	25%	25%	26	27	28	25	106	0	1501	very low-high
Peru	50%	50%	50%	50%	50%	50%	0%	25%	0%	0%	0%	0%	26	27	33	34	495	0	600	very low-very high
Venezuela	25%	50%	50%	0%	0%	25%	0%	0%	25%	25%	25%	50%	32	36	41	42	-3266	0	60	low-high
^a	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)			intensity intensywność			low niska	medium średnia	high wysoka											
^b	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)			intensity intensywność			low niska	medium średnia	high wysoka											
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^e	years since conflict began liczba lat od początku konfliktu																			

Oceania – Oceania

country kraj	heatwave ^a upały			flood ^b powodzie			forest fires ^c pożary leśne			crop failure ^d nieurodzaje			population density gęstość zaludnienia [people/km ²]				net number of migrants liczba migrantów [k]	conflicts ^e konflikty zbrojne	climatic displacement przemieszczenia związane z klimatem [k]	
	2030	2050	2080	2030	2050	2080	2030	2050	2080	2030	2050	2080	2020	2030	2050	2080			2015-2020	human ludzie (2008-2014)
Australia	25%	50%	50%	25%	25%	25%	25%	25%	25%	0%	0%	25%	3	4	4	5	791	0	6	very low-very high
Fiji	0%	0%	0%	100%	100%	100%	0%	0%	0%	0%	0%	0%	50	54	60	61	-31	0	6	low
New Zealand	0%	0%	0%	75%	75%	75%	0%	0%	0%	0%	0%	0%	23	21	23	23	74	0	6	medium-high
Papua New Guinea	25%	50%	75%	50%	50%	50%	0%	0%	0%	0%	25%	50%	16	26	33	39	-4	0	60	low-very high

^a	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)	intensity intensywność	low niska	medium średnia	high wysoka
^b	% of the area (25%, 50%, 75%, 100%) % powierzchni (25%, 50%, 75%, 100%)	intensity intensywność	low niska	medium średnia	high wysoka
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