CHAPTER 3

Resources and climate

Access to basic resources is one of the main interests of people. Water for drinking and farming, wood and oil for fuel, iron and stone for making tools and constructing buildings. With the advancement of technology, the need for more varied resources increased. Oil only became a prime interest from the 1920s onwards, when steam engines were replaced by engines working on diesel. The gradual replacement of oil by electricity since the 2010s increased the interest in rare ores like coltan and lithium, which were of little relevance until then but were now needed for batteries. Even if one were to argue that people today could very well do without a car or a mobile phone, these items are considered vital to the lives of human beings (see chapter 'Economy'), and consequently one is willing to go through great lengths and costs to gain access to the resources to produce them. It shows that the concept of 'essential needs' is subject to interpretation and depends on time and circumstance. Consequently, the resulting dependency on certain resources shapes the behavior of people, companies, and states.

Human considerations in changing resources

The shifts from the use of wood to coal to oil in the 19th and 20th century are usually explained in terms of technological improvement. But there were also social considerations. Water mills could have provided the necessary energy for the English industrialization in the nineteenth century, but the steam engine gave manufacturers more freedom: they did not have to negotiate intricate property rights to access running water, and they could set up their mills close to the labourers in urban centres. Social considerations also played a role in the move from coal (needed to produce steam) to oil: oil exploitation far away did not cause social unrest as was the case with the coalminers close at home.

(Andreas Malm, The Origins of Fossil Capital: From Water to Steam in the British Cotton Industry, *Historical Materialism*, 2013)

The need for access to resources has been a major cause of globalization throughout most of human history. This is particularly the case with natural resources that are location-dependent, like fossil fuels or ores and minerals, because access to them can become a problem when they are distributed unevenly across the world. For instance, the main reserves of oil and gas are in the Middle East, the main reserves of lithium (for batteries) are found in Australia, Chile and Bolivia, while Brazil holds more than ninety percent of the world reserves of niobium which is vital for nano-

electrics. Other natural resources, like foodstuffs or timber, are not that location-dependent because they can be grown elsewhere, but even then some countries may have a monopoly position in the production of these goods, as is the case with wheat, cotton or coffee. Similar monopoly positions may also be attained in the production of high-tech technology, such as microchips and weapons.

Fossil reserves in the world (in 2024)

Known oil reserves (in billion barrels):

1.	Venezuela	290
2.	Saudi Arabia	270
3.	Canada	170
4.	Iran	140
5.	Iraq	120
6.	Kuwait	100
7.	UAE	95
8.	Russia	75
9.	Libya	45
10.	Kazakhstan	40

Known gas reserves (trillion m2)

1.	Russia	49
2.	Iran	29
3.	Qatar	25
4.	Turkmenistan	8
5.	Saudi Arabia	8
6.	US	7
7.	UAE	7
8.	Venezuela	6
9.	Nigeria	5
10.	Algeria	4

To access resources and products that are not ubiquitous, the world has developed a dense global network of exploitation, production and transportation (which was the origin of the term 'globalization'). This globalization has also given rise to several global challenges, of which two will be discussed here: dependence on resources and environmental issues and climate change.

Coltan in Congo

Coltan is needed for smartphones, laptops and electric cars. Of the known reserves, 80 percent is in the Democratic Republic of Congo, located in the eastern part near Rwanda. However, the Congolese government has not been able to establish full authority over the exploitation and export of cobalt. This is mostly in the hands of the various rebel forces and Rwandese military that for years have been entangled in violent conflicts in the area.

Global challenge (1): dependence on resources

While the globalization of access, exploitation and distribution of resources may be considered beneficial to the world's well-being and economy, it has created

dependencies. These dependencies are usually experienced on an individual level (who wants to give up their mobile phone, car, cotton shirt, coffee?) and consequently on a national level (the state will indulge these individual needs by facilitating production, trade, tariff reductions). But many of these dependencies have also become a challenge with global implications. One such challenge is the dependence of peoples and states on certain resources that are scarce or monopolized by a few. For instance, in 1973, when the Arab oil-producing states declared a boycott of oil export to some countries and raised the price of oil significantly, this caused a worldwide energy crisis. The dependency on oil from the Gulf region has also been one of (some argue: the main) cause of the 1991 Gulf War to evict Iraq from Kuwait. To meet this challenge of oil dependency, the United States started developing new technologies to extract oil from American soil by the controversial means of 'fracking', and in doing so have become independent from oil production elsewhere since the 2010s. China, on the other hand, which is in great need of a steady oil supply to sustain its growing economy, secured access to oil in several countries in the Gulf region, and exerts diplomatic pressure to maintain stability in that region to guarantee continued access to that oil (for example, China arranged a peaceful settlement between Iran and Saudi Arabia in 2023, two of the world's main oil producers). China also pursues a determined policy of obtaining and maintaining direct access to rare natural resources used for electronic devices and batteries.

Monopolizing rare earth elements

The demand for rare earth elements that are vital for electronics, renewable energy technology and weapon systems was 125,000 tons in 2021 and is expected to reach 315 tons in 2030. China does not possess these elements, but through investments in countries with such elements holds an estimated 60% of the world's exploitation of these elements, and 85% of the world's processing capacity.

(BRINK News 7 August 2022, Brookings Institute 29 December 2022)

Another global challenge is the dependency on global transport networks. This challenge became evident with the Covid-19 pandemic of 2019-2022. As a result of massive lockdowns, the transport networks were shut down as well. Consequently, people across the world were deprived of certain basic goods, including elementary components for medicines. It raised an awareness that it may not always be advantageous to specialize in the production of a limited number of goods, as certain economic doctrines prescribe, but that diversification of production may allow states to maintain a degree of economic self-reliance.

'Food miles'

With globalization and the constant demand for out-of-season produce, it is estimated that the average meal travels 2,500 kilometers before it lands on your plate.

(Foodwise, 'How Far Does Your Food Travel to Get to Your Plate?)

Scarcity of fresh water

Almost 3/4 of the earth surface is water.
Of this water only 1/20 (3.5 % of all water) is fresh water.
Of this fresh water, 5/7 (2.5% of all water) is locked in the ice and ground,
and only 2/7 (1% of all water) is directly available.
Of this available fresh water, 3/4 is used for agriculture.

Global challenge (2): environmental issues and climate

Disputes over land, water or other resources are adressed at the negotiation table or in court, but also by hard power: a stronger country may build a dam in the river without having to care that the waterflow to the weaker neighboring country is being blocked; or it may send in the troops to occupy territory that is rich in minerals. This powerplay has been, and still is, part and parcel of human behavior in all three dimensions: local, national and global. In the 20th century, however, it gradually became clear that regional and international cooperation might be needed to address the accessibility and use of certain resources. This awareness targeted three concerns: the protection and depletion of, and pollution by resources.

International treaties on resources

- *The Antarctic Treaty* (1959): the continent of Antarctica shall not be subject to territorial claims, exploitation of resources, or ecological damaging.
- *The Outer Space Treaty or Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies* (1966): no country can claim sovereignty or exclusive rights over celestial bodies or the moon which shall be used exclusively for peaceful purposes; their exploration is free to, and for the benefit and interests of all countries.
- *United Nations Convention on the Law of the Sea* (1982): the deep see (beyond territorial waters) is free for peaceful and scientific exploration (as long as the acquired knowledge is made public afterwards); for mining and exploration, permission is required from the International Seabed Authority.

The **protection of environments** was the goal of international agreements on the protection of Antarctica, the deep sea and the moon. The aim of these agreements was to protect these environments against exploitation. Subsequent mostly national agreements aimed at protecting populations whose identity was closely connected to the land they inhabited. Safeguarding these environments was intended to ensure their survival, because in their belief system, removing them from their land would be tantamount to erasing their existence.

The 'personal' rights of natural resources

Natural resources like woods, rivers or mountains are commonly seen as inanimate objects that need protection from exploitation by means of international agreements. A new approach to such protection is to grant them the status as a **'legal personhood'** with its own rights. Often such rights are granted in recognition of claims of indigenous peoples to those places. Some examples of such legal personhoods are:

- the rainforest Te Urewera in New Zealand, as spiritual homeland of the Tūhoe people (2014).
- Whanganui River in New Zealand as part of the treaty settlement between the government and the Māori people (2017).
- Lake Erie in North America (2019): legal personhood granted by the city of Toledo (Ohio)
- Magpie River in Canada was granted nine rights, including the right to flow, the right to be safe from pollution – and the right to sue (2021).

The second concern relates to one of the effects of using resources: **pollution**. This is commonly dealt with bilaterally, like when states that share a river address pollution caused by factories upstream. It was carbon dioxide emissions, however, that generated awareness and concern globally. The cause of this pollution, it transpired, was largely human by excessive burning of fossil fuels and cattle farming. Scientists have unanimously come to the conclusion that this pollution is heating up the atmosphere which, in turn, is causing a **climate change**. These concerns have been voiced since the 1960s already but have only been treated by the international community as a global challenge since the 2010s. One of these challenges is the predicted large numbers of 'environmental refugees'.

A third concern that is on the mind of the international community is the **depletion of certain resources**. While one may consider this to be a global challenge, the international community has yet to address it as such. To date, the scramble for resources remains mostly a national and unilateral affair.

War or environment?

In 1992, 1,700 'concerned scientists' issued a warning that humanity had the choice to either spend its resources on war and violence, or on preventing catastrophic environmental damage. In 2017, the warning was reissued, this time signed by 15,000 scientists.

(Union of Concerned Scientists)

Actors: the role of the consumer

The source of the environmental and resource dependency problems lies with states and (state) companies, but also with the individual consumer. The production and use of consumer goods make up a large portion of the resource depletion and environmental pollution. This means that the consumers can also play a role in the solution. Here we see friction between *ideas* and *interests*: even if one strongly believes that something needs to be done, how far is one willing to go in changing a lifestyle to meet the requirements of sustainable resource usage?

State, civil society and individual consumers are playing different but interconnected roles. Some individual consumers take the principled decision to change their lifestyle and hope, by doing so, that it may inspire others to follow suit. These actions may turn into social trends, or even into movements and NGOs that raise awareness but also pressure governments. Consumers, when united in action, have shown an ability to make quite a lobbying impact, often by boycotting certain products or producers.

The governments are the ones that can take measures that force an entire population to comply, by means of taxation, obligation or prohibition. These measures, however, may result in opposition from the population or from the professional groups that are most affected (like farmers, for instance, when confronted with measures to stop the use of pesticides or nitrogen emission from cattle). Since the 2010s, the resulting confrontation of interests and ideas have become major issues on the political agendas and the subject of court cases. It has caused both politicians and activists to complain about the decelerating mechanisms of democracy in times when decisive and quick action is needed.

Nexus

Addressing the misuse, lack, or scarcity of resources is a global challenge with multiple issues. Concerted actions to solve any of these issues yield several nexuses. In the case of misusing resources, the (simplified) example of the case of climate

change may illustrate this. Addressing this global challenge is accomplished by focusing on its effects as well as its causes. Both generate several nexuses (see illustration). As regards the effects of climate change, one anticipates – and often already observes – rising sea waters, changing or disappearing agriculture, or freak weather events. These effects, in turn, may prompt people to migrate which then creates yet another nexus (and migration, as seen before, also has its own connections with security, economy, education, etc.). Addressing climate change, therefore, opens up a myriad of nexuses: the main culprit of climate change – carbon dioxide – is produced by cars (nexuses of transport, economy, leisure), by cattle (nexus of food production), by planes (nexuses of tourism, business), by industries (nexuses of economy, production of basic and consumer goods), by heating (nexuses of food production, personal well-being). Solutions are partly found in the requirement of people to abandon certain behavior (no meat, no cars, no planes), or by looking for alternatives (electric and nuclear power, meat substitutes).

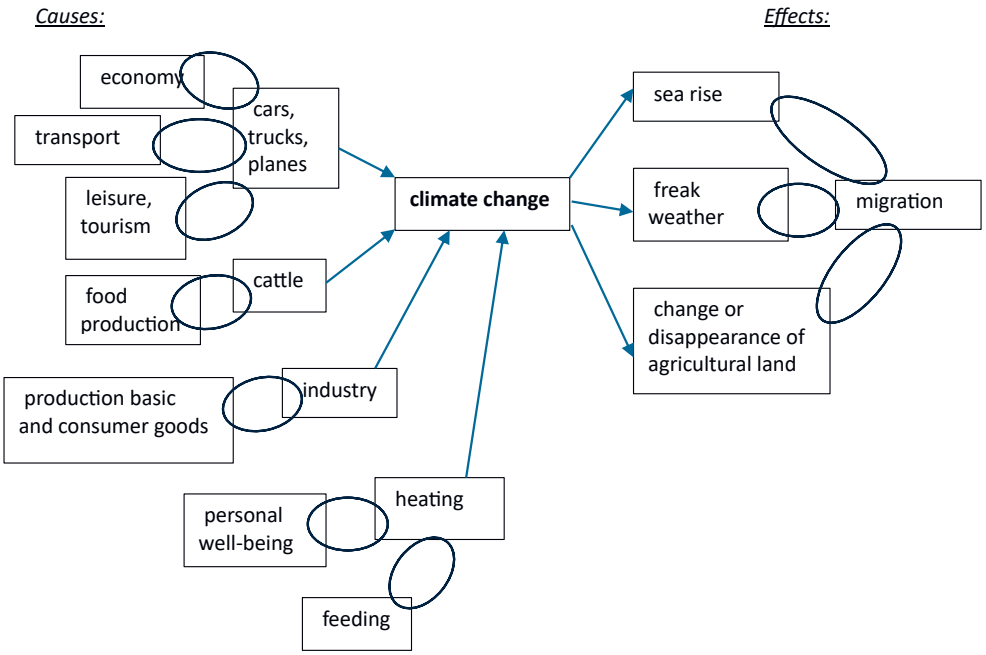

Figure IV.3.1 *Nexuses 'climate change'*

'Global' challenge?

While climate change and the (mis)use of resources are clearly affecting the world globally, it is less clear whether the concerted efforts needed to address this challenge should also be global. Many of the former colonized countries argue that it would be unfair that they should pay for the problems caused by their former colonizers. While this may be the case for carbon dioxide emissions, it is not necessarily the case for other types of pollution (like, for instance, plastic waste in the oceans - see text box).

Who is the polluter?

Carbon emission	*Plastics in the ocean*
1. China	1. China
2. United states	2. Indonesia
3. India	3. Philippines
4. Russia	4. Vietnam
5. Japan	5. Sri Lanka
6. Indonesia	6. Egypt
7. Iran	7. Thailand
8. Germany	8. Malaysia
9. South Korea	9. Nigeria
10. Saudi Arabia	10. Bangladesh

(https://www.worldometers.info/co2-emissions/co2-emissions-by-country/)
(https://www.statista.com/chart/12211/the-countries-polluting-the-oceans-the-most)

Another criticism that some former colonized countries level against the measures that are intended to stop climate change is that these measures will deny them the benefits from their upstarting economies while the Western countries have already reaped all those benefits. This is what has been referred to as the equity argument: rather than treating all countries equally (equal measures of carbon dioxide emission reduction, for instance), countries should be treated in accordance with their (in)capabilities. At the same time, for countries with less developed economies it is much easier to make the clean energy transition than it is for the developed economies. Some argue that this may even result in the less developed economies taking the lead in future developments.

Guyana's predicament

In 2015, vast reserves of oil were discovered in front of the coast of Guyana (South America). The income from the oil exploitation can be used for a much-needed development of the country. However, fossil fuels are also the cause for global heating and Guyana is one of the countries that is seriously threatened by rising sea levels.

Further reading

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