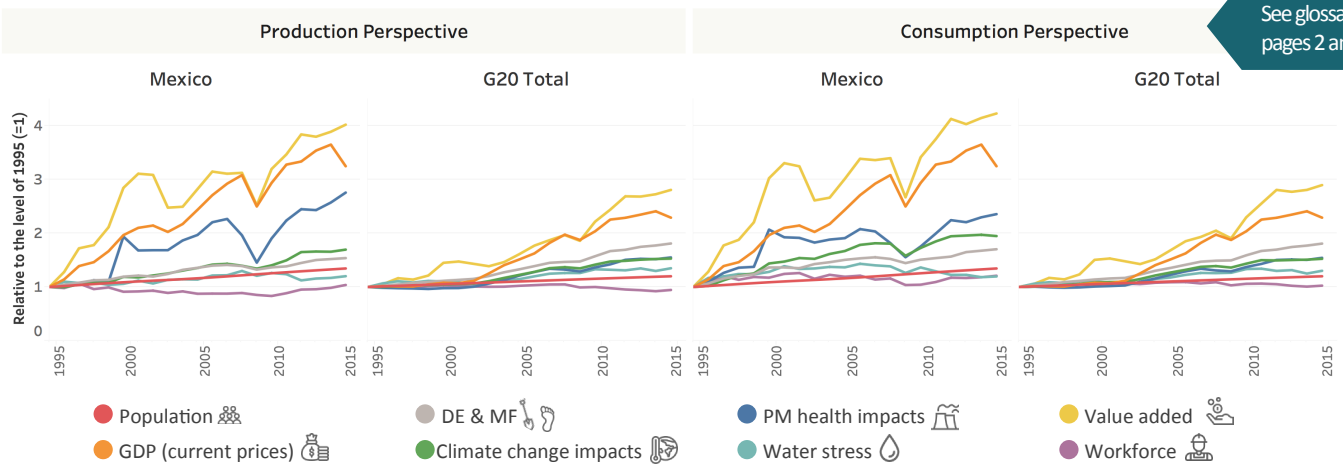
NATURAL RESOURCE USE IN THE GROUP OF 20

Status, Trends, and Solutions | Mexico

STATUS AND TRENDS OF NATURAL RESOURCE USE

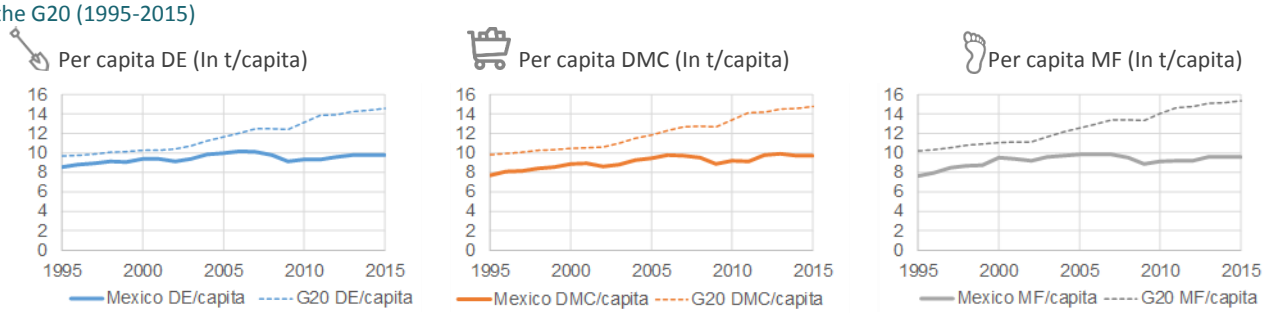
Figure 1: Socio-economic indicators, domestic extraction, material footprint, and material-related environmental impacts in Mexico and in the G20 (1995-2015)*

See glossary on pages 2 and 3



*Data after 2011 was nowcasted.
Source: IRP database, Exiobase v3.4 and Cabernard et al. 2019

Figure 2: Domestic extraction (DE), domestic material consumption (DMC), and material footprint (MF) per capita in Mexico and in the G20 (1995-2015)



Source: IRP database

From 1995 to 2015

Population grew by **35%** and GDP multiplied more than threefold.

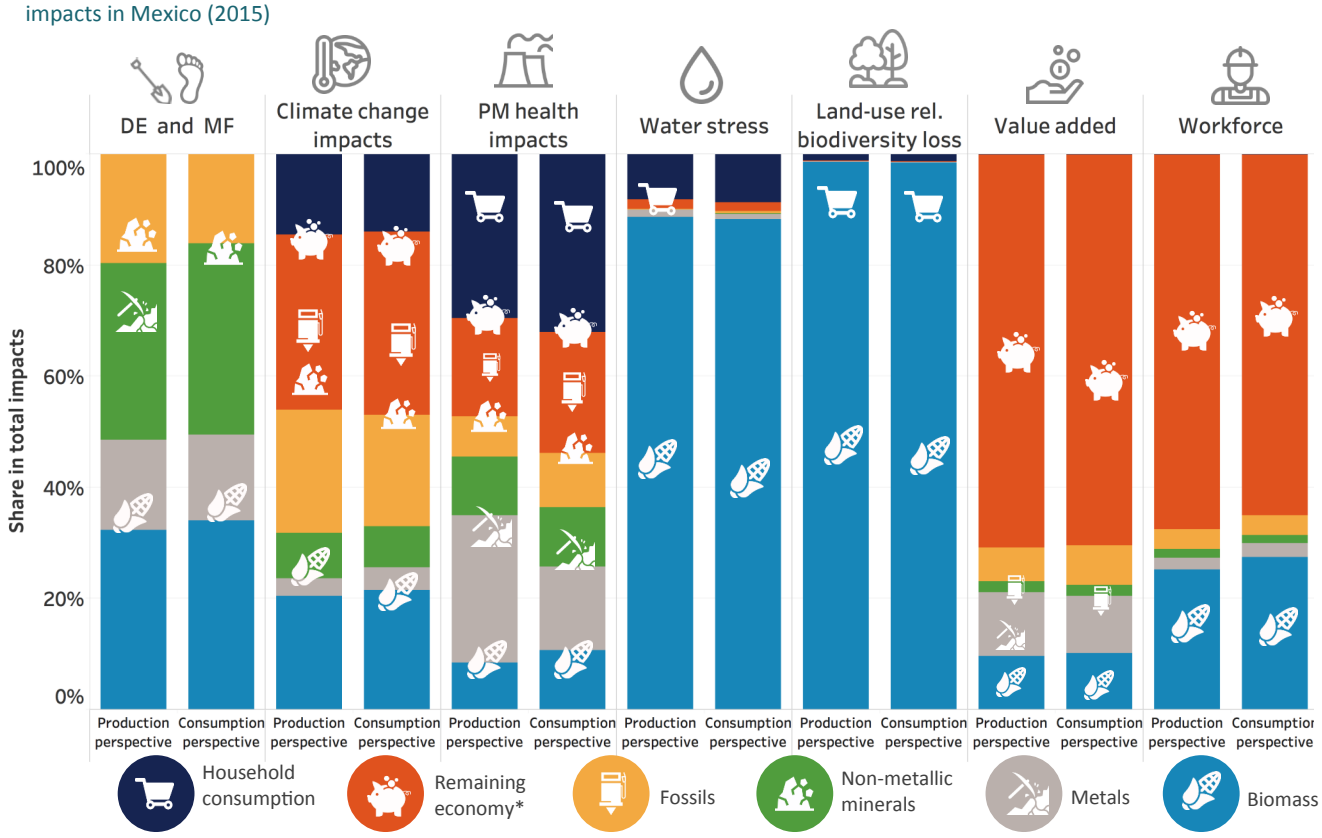
Domestic extraction, domestic material consumption and material footprint slightly increased (slower than G20 average).

In 2015, domestic extraction, domestic material consumption and material footprint were all at 10 tonnes per capita (below G20 average of 15 tonnes per capita for all three indicators).

There was relative decoupling of domestic extraction, domestic material consumption, material footprint and all environmental impacts from GDP. Outdoor particulate matter health impacts related to resource extraction and processing more than doubled and showed the lowest degree of decoupling.

Contribution of Natural Resources by Category

Figure 3: Contribution of resource types to domestic extraction, material footprint, and total environmental and socio-economic impacts in Mexico (2015)



*Remaining economy refers to activities other than resource extraction and processing (e.g. manufacturing of finished products, construction).
Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

Non-metallic minerals and biomass resources represented one third each of domestic extraction amounts and material footprint.

The extraction and processing of natural resources accounted for more than 50% of Mexico's total climate change impacts from both a production and a consumption perspective (similar to G20 average).

From a production perspective, about half of outdoor particulate matter related health impacts are caused by resource extraction and processing. This was higher than the G20 average.

Both from a production and consumption perspectives, households contributed to about 30% of particulate matter related health impacts.

In line with other G20 countries, Mexico's water stress and land use-related biodiversity impacts were caused mainly by biomass production.

The material sector contributed to approximately 30% of value added, slightly higher than the G20 average.

One third of the workforce in Mexico was employed in the resource extraction and processing sectors (most of them in agriculture).

Glossary

Consumption perspective: The consumption perspective allocates the use of natural resources or the related impacts throughout the supply chain to the region where these resources, incorporated in various commodities, are finally consumed by industries, governments and households

Decoupling: Decoupling is when resource use or some environmental pressure either grows at a slower rate than the economic activity that is causing it (relative decoupling) or declines while the economic activity continues to grow (absolute decoupling)

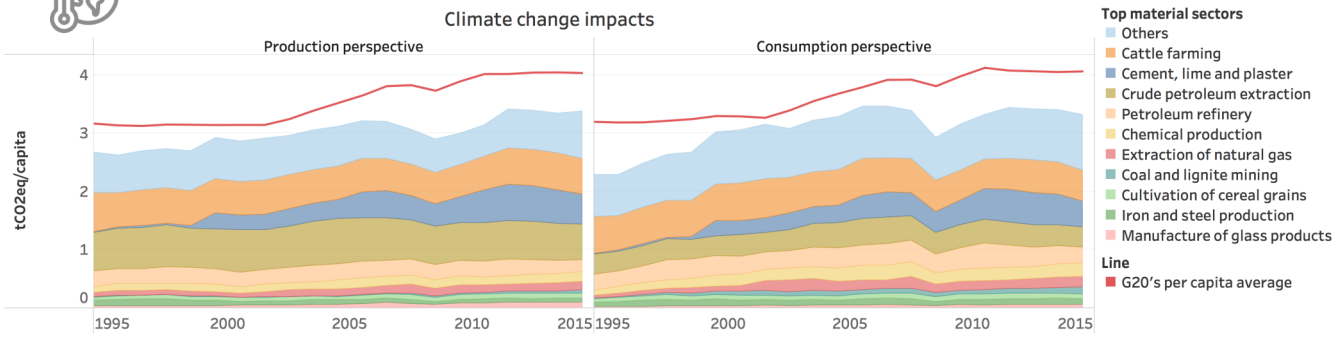
Domestic extraction (DE): Direct, gross physical extraction of materials within a country's territory (production perspective)

Domestic material consumption (DMC): Amount of materials directly used by an economy (DMC = DE + Material Imports – Material Exports)

Material resources:
- metals,
- non-metallic minerals,
- biomass,
- fossils

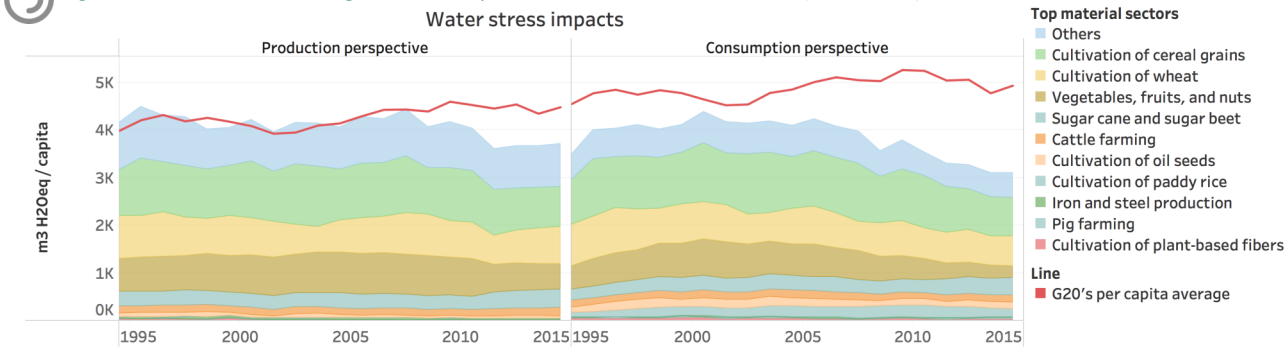
Key Sectors and Resources

Figure 4: Climate change impacts from material sectors in Mexico (1995-2015)*



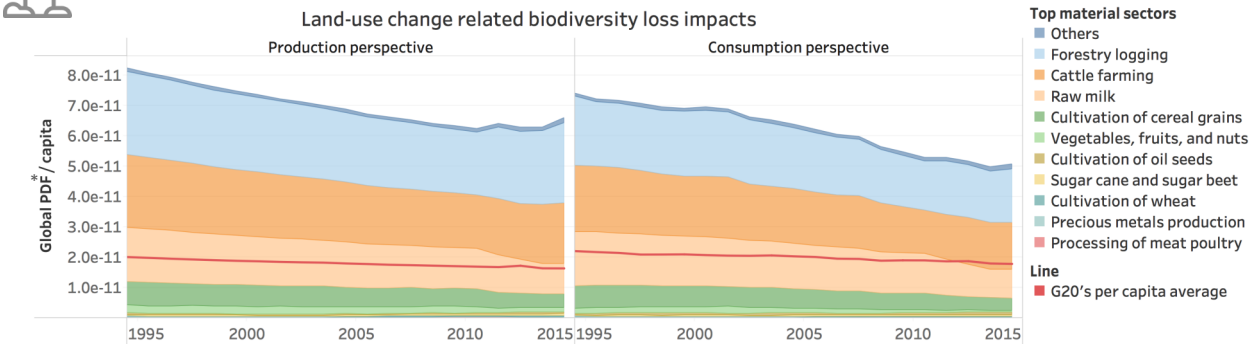
*Data after 2011 was nowcasted.
Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

Figure 5: Water stress from agricultural crop and material sectors in Mexico (1995-2015)*



*Data after 2011 was nowcasted.
Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

Figure 6: Land-use related biodiversity loss from agricultural crops and material sectors in Mexico (1995-2015)*



*Data after 2011 was nowcasted.
**PDF:* Potentially disappeared fraction of species
Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

- Material-related climate change impacts were mainly caused by petroleum extraction and refining, cattle farming and cement manufacturing.
- Material related climate change impacts remained below the G20 average (-20%) from both the production and consumption perspectives.
- Most materials with large climate change impacts (petroleum products, beef and other food) are directly consumed by households.
- Construction is the major industrial end-use sector of climate-intensive materials (16% of total material-related impacts), followed by manufacture of motor vehicles (6%) and furniture production (4%).
- Mexico has many water-scarce regions. Water stress impacts were comparable to the G20 average from a production perspective and lower than this average from a consumption perspective.
- Water stress was caused mainly by the production of cereal grains (mainly corn), wheat, vegetables, fruits, nuts, and sugar cane. Water stress was lower from a consumption perspective than from a production perspective. This was due to exports of vegetables, fruits, nuts and wheat.
- Land use related biodiversity loss was more than three and two times higher than the G20 average in the production and consumption perspectives, respectively. Biodiversity loss was mainly caused by forestry, beef and dairy production and reflects rich megadiverse status of Mexico.

Material footprint (MF): A nation's MF fully accounts for material extraction in other countries used for local consumption in the nation of interest (consumption perspective)

Material intensity (MI): Indicates efficiency of material use (MI = DMC / GDP)

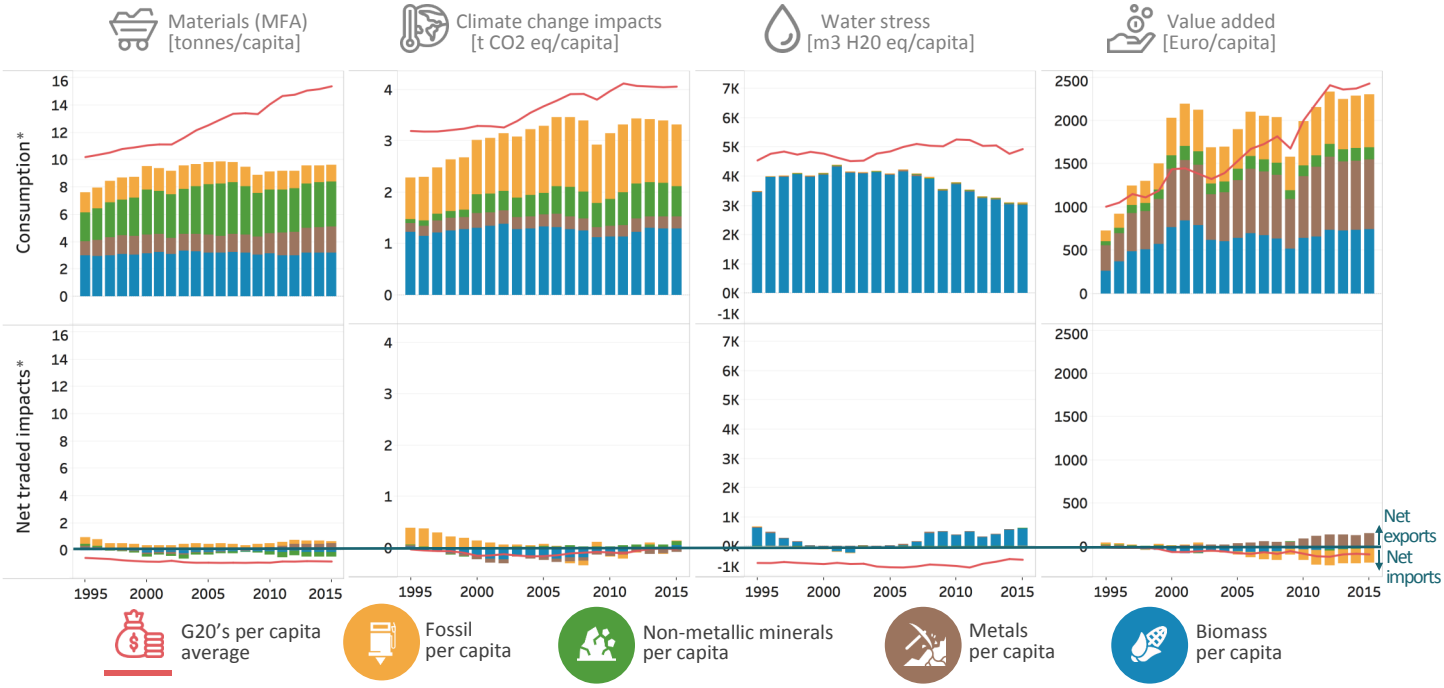
Material-related impacts: Impacts related to the extraction and processing of material resources (including the upstream supply chain, such as electricity generation and transport)

Net traded materials/impacts: Difference between material-related impacts from a production and consumption perspective. In the case of environmental impacts, a positive value means that the material-related impacts from exports are greater than the impacts from imports (and vice-versa: environmental impacts with negative values mean that the material-related impacts from imports are greater than the impacts from exports)

Production perspective: The production perspective allocates the use of natural resources or the impacts related to natural resource extraction and processing to the location where they physically occur

The environmental effects of trade

Figure 7: Per-capita consumption footprints (above) and net traded impacts (below) in Mexico (1995-2015)*



*Data after 2011 was nowcasted.
Consumption: Impacts throughout the supply chain from goods imported and consumed in Mexico.
Net traded impacts: Difference between material-related impacts from a production and consumption perspective.
Source: IRP database, Exiobase v3.4, Cabernard et al. 2019

- Mexico is a net exporter of fossils and metals and an importer of non-metallic minerals and biomass. Traded amounts are low in comparison to overall material consumption.
- Climate change impacts related to traded materials were low in comparison to overall consumption impacts.
- Only trade of metals created net value added within Mexico. For fossils and biomass, cheap resources were exported (e.g. crude oil) while more expensive ones were imported (e.g. refined oil and chemicals).

Future trends and potential Decoupling

- Scenarios developed by the IRP forecast a more than threefold increase of GDP and a population growth of between +9% and +25% until 2060.
- If ambitious resource efficiency policies are introduced, Mexico could achieve an absolute decoupling of domestic material extraction and domestic material consumption from GDP by 2060. Overall, domestic extraction and domestic material consumption are projected to increase until 2060 by ~20% and ~25%, respectively, in the resource efficiency scenario.
- Mexico harbors valuable ecosystems at high risk of biodiversity loss. Policies to protect biodiversity and regulate agriculture and forestry are critical.
- An increase in water use efficiency for agricultural production could reduce water scarcity impacts.
- Mexico suffers from particulate matter pollution caused by metal processing (iron and steel production), cement production and resource use (e.g. traffic from households). Installing air abatement technologies and improving transportation are essential steps to decrease pollution.
- Circular economy solutions, including proper waste management and increased material recycling rates would also be beneficial.
- A large build-up of infrastructure is anticipated in the next decades. This will result in enhanced resource demands and environmental impacts. Material efficient urban design is therefore critical.

This factsheet from the International Resource Panel, was prepared in cooperation with the Ministry of Environment of Japan and the Institute for Global Environmental Strategies, as a contribution to the G20 Resource Efficiency Dialogue 2019 in Japan. The document is based on research completed by the IRP for the report "Global Resources Outlook 2019: Natural Resources for the Future We Want." The data analysis and text for the G20 was prepared by Livia Cabernard, Stephan Pfister Stefanie Hellweg (ETH Zurich), and Maria Jose Baptista (UNEP) with inputs from Victor Valido (UNEP), Yingying Lu and Heinz Schandl (CSIRO). The layout and infographics were designed by Yi-Ann Chen with support from Qinhan Zhu on figure layout. Icons used are from Freepik.

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