

GRO 2019: Key Messages Facts & Figures

1. The use of natural resources has more than tripled from 1970 and continues to grow.

From 1970 - 2017:

- **Global population** has doubled (3.7 billion people in 1970 to over 7.5 billion people in 2017)
- **Global gross domestic product** has grown fourfold (from 18.9 trillion US\$ in 1970 to 76.5 trillion US\$ in 2016)
- **Global per capita GDP** doubled between 1970 and 2016, from 5,198 US\$ per capita to 10,606 US\$ per capita.
- Annual **global extraction of materials** grew from 27 billion tons to 92 billion tons (grew by about 2/3rds)
- Annual average **material demand per capita** grew from 7.4 tons to over 12.2 tons.¹

2. Historical and current patterns of natural resource use are resulting in increasingly negative impacts on the environment and human health.

- The extraction and processing² of materials, fuels and food make up about half of total global greenhouse gas emissions (not including climate impacts related to land use) and more than 90 per cent of biodiversity loss and water stress.
- An estimated 11 per cent of global species were lost by 2010 due to global land use.

Climate change impacts:

- Biomass: 17%
- Metals: 10%
- Non-metallic minerals: 10%
- Fossil fuels: 16%
- Remaining Economy: 30%
- Households: 11%

Water stress:

- Biomass: 85%
- Metals: 3%
- Non-metallic minerals: 1%
- Fossil fuels: 5%
- Remaining Economy: 2%
- Households: 3%

Particulate Matter/Health:

- Biomass: 6%
- Metals: 12%
- Non-metallic minerals: 8%
- Fossil fuels: 5%
- Remaining Economy: 21%
- Households: 46%

Land use related biodiversity loss:

- Biomass: 80%
- Metals: 1%
- Non-metallic minerals: 1%
- Fossil fuels: 5%
- Remaining Economy: 1%
- Households: 7%

3. The use of natural resources and the related benefits and environmental impacts are unevenly distributed across countries and regions.

- The ratio of high-income countries' per capita GDP to low-income countries' GDP per capita doubled over the period as a whole, signalling rising income and wealth inequality among and within wealthy and poor economies

¹ Materials include biomass, fossil fuels, metals and non-metallic minerals, while natural resources encompass all materials plus water and land. Material use can be measured by domestic material consumption or through the material footprint.

² The focus is on resource extraction and processing up to "ready-to-use" materials and fuels (including waste disposal processes in the extraction and processing phase). This is also termed 'cradle-to-gate'.

Domestic Material Consumption:

- While virtually none of the massive growth in materials consumption in the new millennium has gone to the wealthiest countries, neither has much of it gone to the poorest countries (despite the latter being the group in most urgent need of improved material living standards).

Country Groups	DMC (tonnes)		DMC per capita (tonnes)	
	1970	2017	1970	2017
High Income	14 billion tonnes	20 billion tonnes	16.387	17.056
Low Income	.7 billion tonnes	2.4 billion tonnes	3.4141	3.269
Lower-Middle Income	3 billion tonnes	17 billion tonnes	2.7857	5.8659
Upper-Middle Income	9 billion tonnes	51 billion tonnes	6.2105	19.807
World	27 billion tonnes	91 billion tonnes	7.3299	12.243

Material footprints:

- Material footprints³ in high-income countries are around 27 tons per person; 60 per cent higher than the upper-middle income group in 2017; and more than 13 times the level of the low-income group.

Country Groups	MF (tonnes)		MF per capita (tonnes)	
	1990	2017	1990	2017
High Income	20.5 billion tonnes	33 billion tonnes	20	27
Low Income	0.9 billion tonnes	1.5 billion tonnes	2.5	2
Lower-Middle Income	5 billion tonnes	14 billion tonnes	2.7	5
Upper-Middle Income	16.5 billion tonnes	44 billion tonnes	8	17
World	43 billion tonnes	92.5 billion tonnes	8	12

Impacts:

- Per capita impacts of consumption in high-income countries are, depending on the impact category, between three and six times larger than those of low-income countries.

Per capita impacts relative to the global per capita average (100%): [from figure 3.4]

	Climate change impacts	PM health impacts	Water stress	Land-use rel. biodiversity loss	Value added benefit	Employment benefit
High- income	224.02%	173.09%	146.90%	154.10%	315.90%	123.21%
Upper- middle income	123.88%	147.52%	116.42%	118.75%	97.72%	105.00%
Lower- middle income	48.51%	47.37%	87.63%	71.86%	37.37%	99.51%
Low- income	29.60%	24.64%	34.40%	61.20%	27.66%	61.41%

³ Material use can be measured by domestic material consumption or through the material footprint. Domestic material consumption is a direct measure of the materials that are consumed in a national economy, while the material footprint attributes all of the material resources mobilized globally to the final domestic demand of a country.

4. In the absence of urgent and concerted action, rapid growth and inefficient use of natural resources will continue to create unsustainable pressures on the environment.

- From 2015 – 2060, *Historical Trends* of natural resource use and management would lead to:
 - Global GDP: US\$ 216 trillion
 - Global material use more than doubles: 190 billion tons (from 92 billion)
 - Material use per capita: 18 tons per capita (from 12 per capita)
 - Greenhouse gas emissions: increase by 43 per cent
 - Area of agricultural land increases by more than 20 per cent (from 2010 levels: 15.4 million hectares to 18.6 million hectares)
 - Global pasture land increases by 25% (from 2010 levels of 30.9 million km² up to 38.6 million km²)
 - Forests reduced by over 10 per cent (decrease from 42.8 million km² in 2010 to 38.3 million km² in 2060)
 - Other habitat (such as grasslands and savannahs) reduced by around 20 per cent (from 25.8 million km² in 2010 to 20.7 million km² in 2060).

5. The decoupling of natural resource use and environmental impacts from economic activity and human well-being is an essential element in the transition to a sustainable future.

Absolute decoupling in high-income countries can lower average resource consumption, distribute prosperity equally and maintain a high quality of life.

Relative decoupling in developing economies and economies in transition can raise average income levels and eliminate poverty, while still increasing levels of natural resource consumption until a socially acceptable quality of life is achieved.

Decoupling will not happen spontaneously, but will require well-designed and concerted policy packages.

6. Achieving decoupling is possible and can deliver substantial social and environmental benefits, including repair of past environmental damage, while also supporting economic growth and human well-being.

[Resource Efficiency Policies] + [Climate mitigation and removal policies] + [Landscape and biodiversity protection] + [Healthy diets and reduced food waste] = *Towards Sustainability*

1. **Resource efficiency policies** can lead to the reduction in resources needed per unit of output and to an overall reduction in supply costs. Other policy measures target changes to regulations, technical standards and procurement policies.
 2. **Climate mitigation policies** include a carbon levy and financial support for two carbon dioxide removal technologies – bioelectricity with carbon capture and storage and direct air capture of carbon dioxide.
 3. **Landscape and life-on-land policies** protect biodiversity by ensuring that climate mitigation and energy policies are consistent with land and food system goals.
 4. **Shifts in societal behaviour** assumes the adoption of healthier diets and the reduction of food waste throughout the food supply chain. The healthier diets are consistent with international dietary guidelines, and feature a 50 per cent reduction in meat consumption – replacing animal protein with plant protein – except in regions where diets are already low in meat.
- From 2015 – 2060, with changes in policies and behaviours, *Towards Sustainability* can lead to:

- Global GDP: US\$ 233 trillion (8 per cent above *Historical Trends*)
- Global material use reaches 143 billion tons (25 per cent lower than under *Historical Trends*, equal to 47 billion tons of avoided resource extractions in that year alone)
- Domestic material consumption per capita:
 - High income: -19% (at 13.6 tons per capita)
 - Middle income: +42%
 - Low income: +44% (at 8.2 tons per capita)
- Greenhouse gas emissions: decrease by 90 per cent
- Area of agricultural land is 9% less than in Historical Trends
- Global pasture is 30% less than Historical Trends levels
- Area of forest and other natural habitat land increases by 11 per cent

Such projections are based on the understanding that growth rates in emerging and other developing economies must be balanced by absolute reductions in resource use in developed countries.

7. Policymakers and decision makers have tools at their disposal to advance worthwhile change, including transformational change at local, national and global scales.

The multi-beneficial approach includes the following policymaking considerations:

- a. **Indicators and targets.** National resource efficiency targets are an important first step, but international targets for sustainable levels of global resource consumption are also needed.
- b. **National plans.** Identify priorities and lay out a coordinated path to achieving national targets.
- c. **Policy mixes.** The success of the resource efficiency strategy is contingent on a combination of policy actions – the integration of natural resources legislation with biodiversity and climate policies, for example.
- d. **Sustainable financing.** Governments can provide tax incentives and bonds for environmental projects, and private sources can provide financing tools that are accessible at the local level.
- e. **Unlocking the resistance to change.** Targeted government support and revenue raised from any environmental taxes can help mitigate negative distribution effects.
- f. **Policies for the circular economy.** Policy considerations include establishing an effective infrastructure for waste management and recycling, incentivizing extended product life cycles and intelligent product design, and ensuring that current regulations create no barriers to the development or adoption of value-retention processes.
- g. **Leapfrogging.** By using the most advanced technologies industrializing countries need substantially fewer natural resources to meet their development demands.

8. International exchanges and cooperation can make important contributions to achieving systemic change.

International exchanges and cross-country cooperation can accelerate transitions towards sustainable natural resource use, support national decision-making and create a level playing field for goods and services from different countries.

These different aspects call for a global discussion.