Plastic Pollution

The pressing case of natural and environmentally-friendly substitutes to plastics

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Current trends in plastics trade

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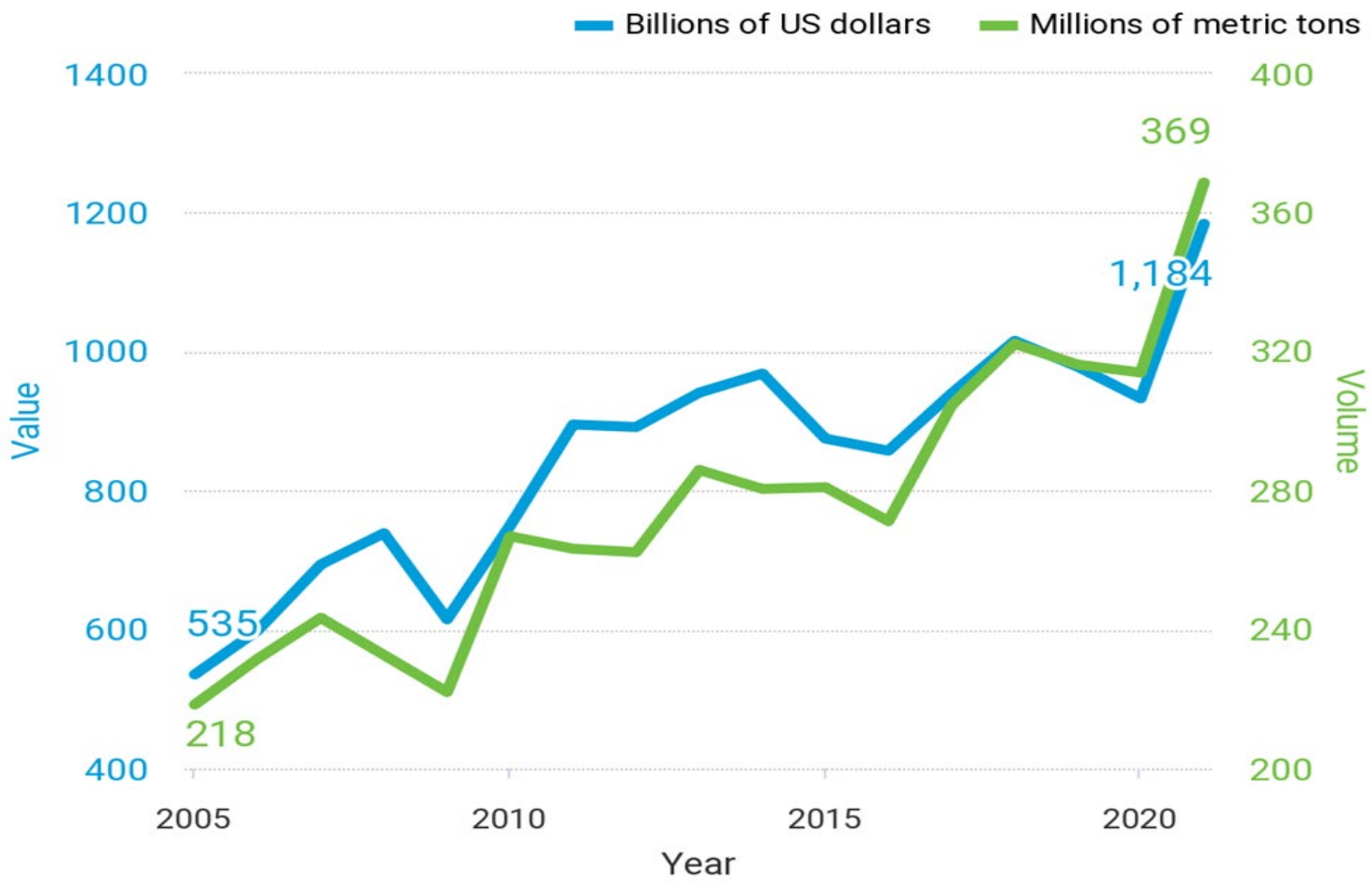
Current trends in plastics trade

369 million tons of plastics traded in 2020 alone, this is $1.2 trillion in value, a significant increase from $933 billion the year before



Source: UNCTAD Plastics Trade Stats (2022).

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Sustainable substitutes/alternatives to plastics

"Non-plastics" Plastics substitutes		Plastics alternatives "Better" plastic
Non-polymer natural materials; mineral, marine, plant or animal origin (also, by-products)		Bioplastics or biodegradable plastics (usually polymers from renewable biomass resources; also, by-products)
Similar properties with fossil-fuel based plastics		Vegetable fats and oils, cornstarch, straw, woodchips, sawdust, recycled food waste
Biodegradable, compostable/erodable, suitable for reuse, recycling or sound waste disposal		Recycled material and biodegradable or compostable in natural environment
Lower environmental impact during lifecycle (e.g., natural fibers, agricultural wastes, biomass, etc.)		Lower environmental impact than fossil fuel-based plastics, particularly at the end life of the product
Non-hazardous (humans and environment)		Non-hazardous (humans and environment)

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ILLUSTRATIVE LIST OF PLASTICS SUBSTITUTES FROM SELECTED CLUSTERS

Traditional substitutes	Mulch	Textiles/Pack/SUP*	Textiles	Packaging/SUP
Aluminium Ceramics Clay Cotton Glass Paper Wood Natural fibers and Wools	Hay Leather Ray Straw Seaweed film & fibers White clover Wood bark Woodchip Wool	Balsa Wood Bamboo Cellulose nanofibers Coconut Husks Coir Cork Corn-based Cotton Flax Fish skin or residues Hemp Jute Leather Microbial cellulose of mixed vegetables and bacteria Nettles Seaweed -brown and red algae by products Silk Sisal Sugarcane -bagasse Other plant materials Plant Waste Wheat Husks Wood Pulp Woodchip	Areca leaves Banana leaves, stem, or fibers Bamboo fibers Fruit peels Beeswax-coated cloth Down Grape waste Pineapple leaves Tofu waste Silk Various animal wools (alpaca, angora, cashmere, sheep, etc.)	Banana leaves and paper Calabash hard shell Casein Cotton linters Mushroom Ray Rice paper Seaweed and fruit peels Films & paper Wood bark

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245 HS codes identified for plastics substitutes

NOTE: For clarity purposes, description is at the HS-6 digit (as preferred to the chapter description [HS-2 digits]).

HS Chapter	Description	Count of 6-digit HS Codes
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, n.e.c.	1
05	Animal originated products; not elsewhere specified or included	4
07	Vegetables and certain roots and tubers; edible	8
08	Fruit and nuts, edible; peel of citrus fruit or melons	2
12	Oil seeds and oleaginous fruits, ..., industrial or medicinal plants; straw and fodder	6
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	4
15	Vegetable waxes (other than triglycerides); whether or not refined*	1
23	Food industries, residues and wastes thereof; prepared animal fodder	3
28	Inorganic chemicals; organic and inorganic compounds of precious metals…	2
32	Glass; glass frit and other glass, in the form of powder, granules or flakes*	1
41	Raw hides and skins (other than furskins) and leather	12
44	Wood and articles of wood; wood charcoal	40
45	Cork and articles of cork	7
46	Manufactures of straw, esparto or other plaiting materials; basketware…	7
47	Pulp of wood or other fibrous cellulosic material; recovered (waste and scrap)…	17
48	Paper and paperboard; articles of paper pulp, of paper or paperboard	28
50	Silk	10
51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	25
52	Cotton	3
53	Vegetable textile fibres; paper yarn and woven fabrics of paper yarn	19
54	Man-made filaments; strip and the like of man-made textile materials	4
56	Wadding, felt and nonwovens, special yarns; twine, cordage, ropes and cables…	4
63	Textiles, made up articles; sets; worn clothing and worn textile articles; rags	2
67	Feathers and down, prepared; and articles made of feather or of down	1
68	Stone, plaster, cement, asbestos, mica or similar materials; articles thereof	1
69	Ceramic products	4
70	Glass and glassware	9
76	Aluminium and articles thereof	16
95	Toys, games and sports requisites; parts and accessories thereof	4

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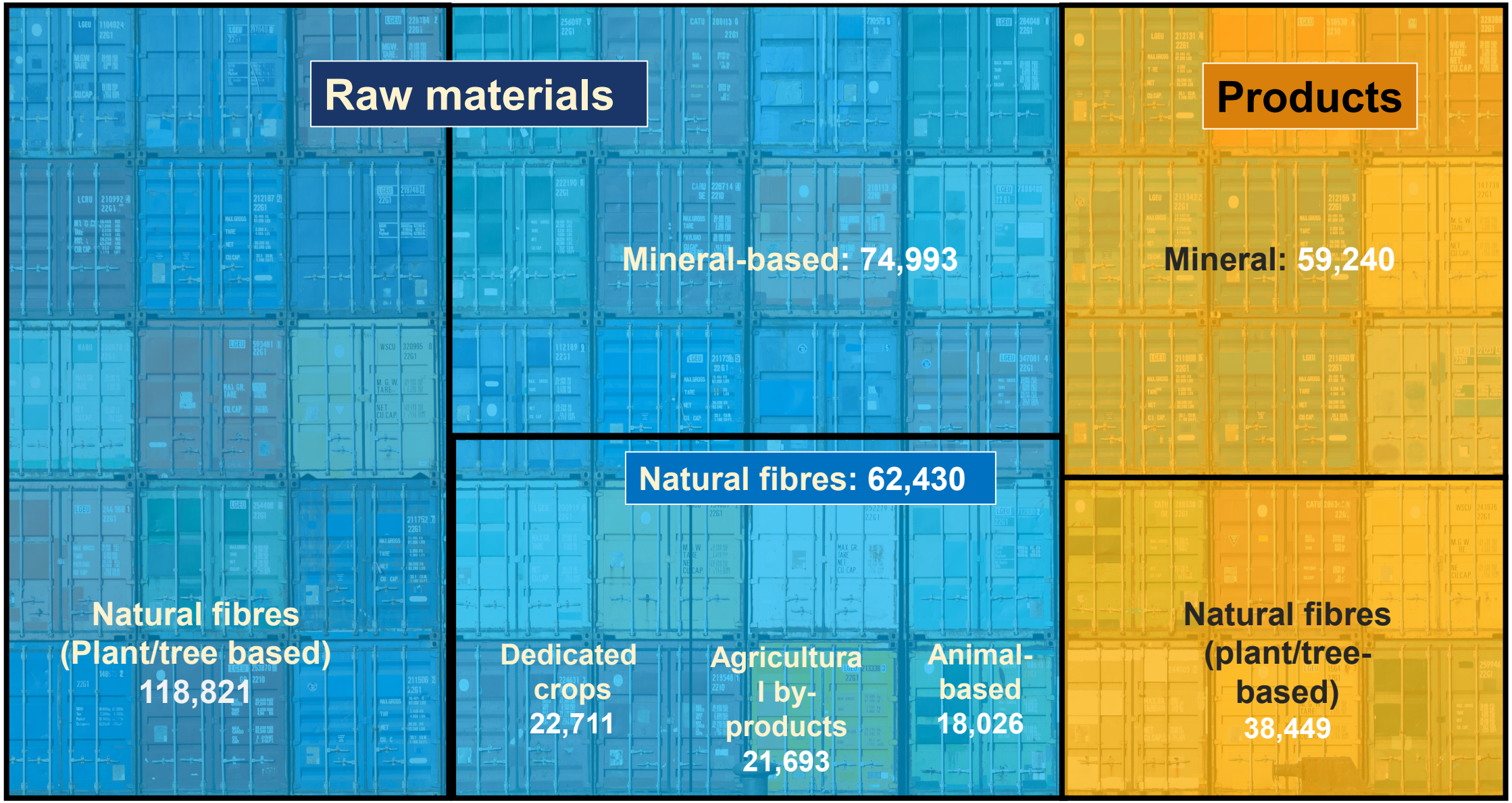
Trade in plastics substitutes

Trade value of plastics substitutes

Export represented $335 billion, approximately 2/3 represents exports of raw materials ($256 billion)



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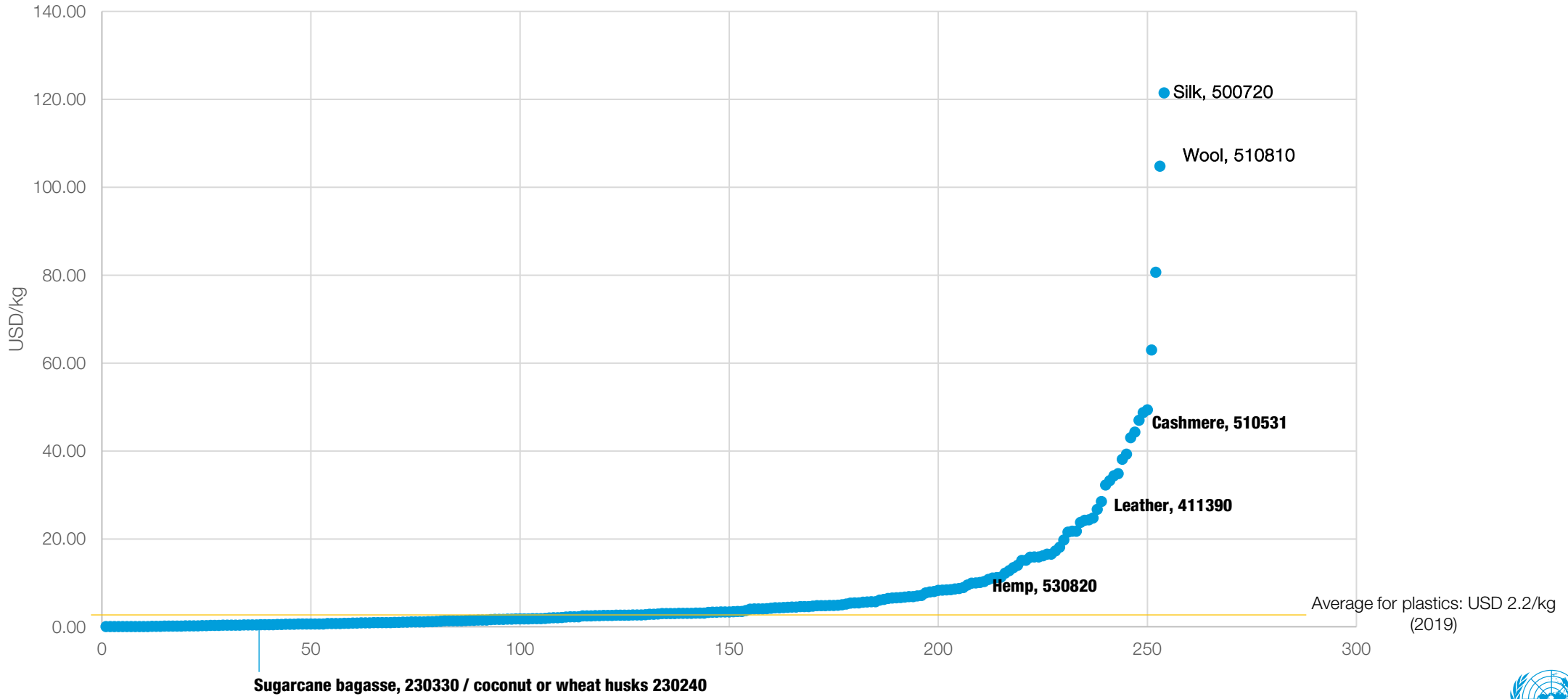
Unit prices of plastics substitutes (material and products in USD per kg)



Source: UNCTAD (2022) based on COMTRADE data 2019 and HS codes 2022.

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Comparison of world average import tariffs applied to selected plastics products vs. plastics substitutes

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Plastics substitutes can also have negative environmental footprints!

- **Careful analysis is important**
- **Substitutes can provide better socioeconomic outcomes (income generation/ productive capacities)**

Process-based Life Cycle Assessment

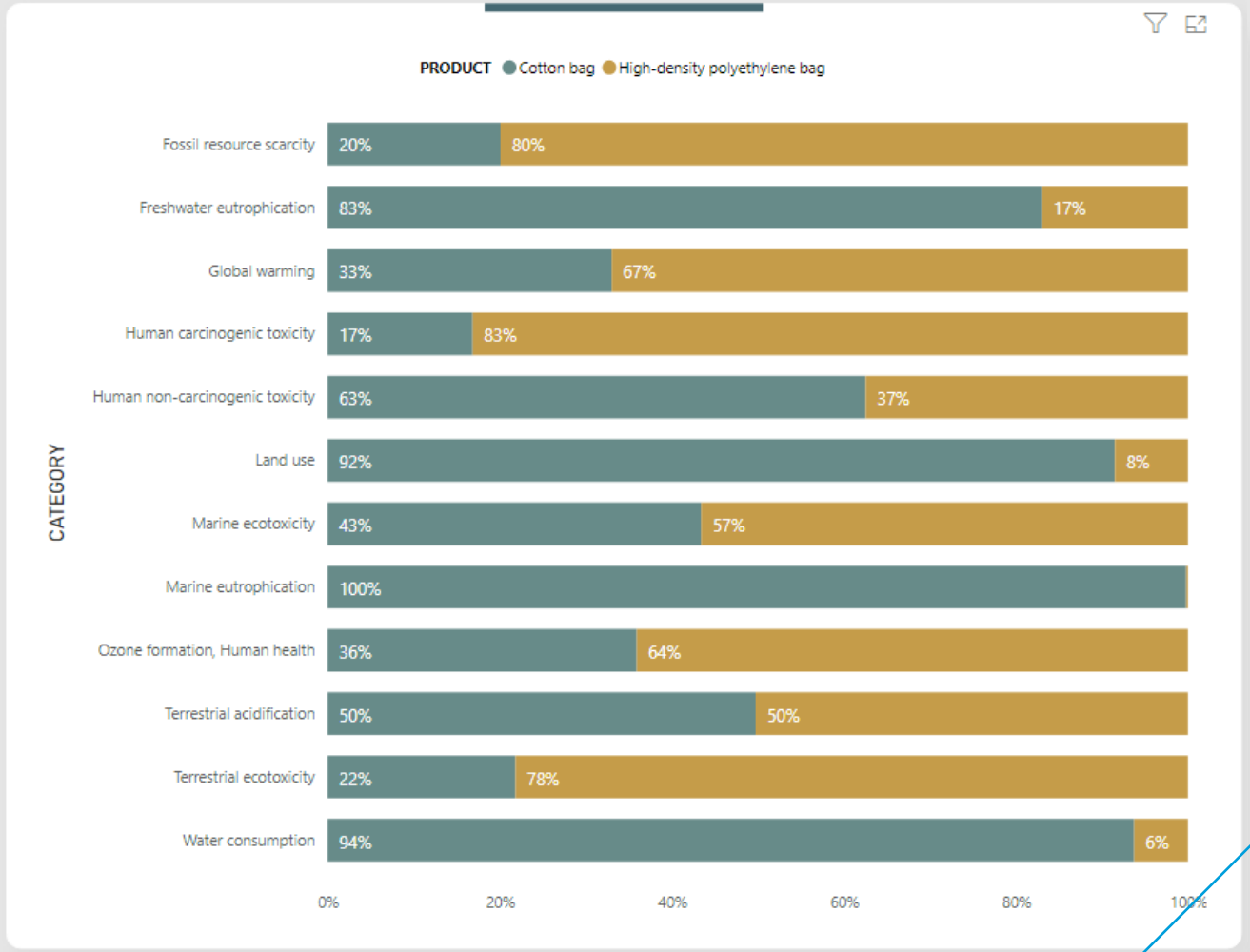
COUNTRY & SCENARIO

Please select only one scenario at a time for correct information

- Bangladesh
  - a) Reuse of substitute product (3-years)
- D.R. of the Congo
  - a) Reuse of substitute product (1-year)
- Ethiopia
  - a) Single use
- Ghana
  - a) Reuse of substitute product (1-year)
- Kenya
  - a) Single use
  - b) Reuse of substitute product (2-times)
- Nepal
  - a) Single use
  - b) Reuse of substitute product (4-times)
- Nigeria
  - a) Single use
  - b) Reuse of substitute product (2-times)
- Pakistan
  - a) Reuse of substitute product (3-years)
  - b) Reuse of substitute product (4-years)
- Rwanda
  - a) Reuse of substitute product (1-year)
- Senegal
  - a) Single use
- U.R. of Tanzania
  - a) Reuse of substitute product (3-years)
- Uganda
  - a) Single use
- Zambia
  - a) Single use

CATEGORY

- [x] Select all
- [x] Fossil resource scarcity
- [x] Freshwater eutrophication
- [x] Global warming
- [x] Human carcinogenic toxicity
- [x] Human non-carcinogenic toxicity
- [x] Land use
- [x] Marine ecotoxicity
- [x] Marine eutrophication
- [x] Ozone formation, Human health



FUNCTIONAL UNIT AND REFERENCE FLOWS

Functional unit	Plastic product	Substitute product	Uses
"Carrying 5 kg of items in three year's shopping (156 purchases) from the supermarket to the home"	156 High-density polyethylene bags	1 cotton bag	Reuse of substitute product (3-years)

Long reuse is key!

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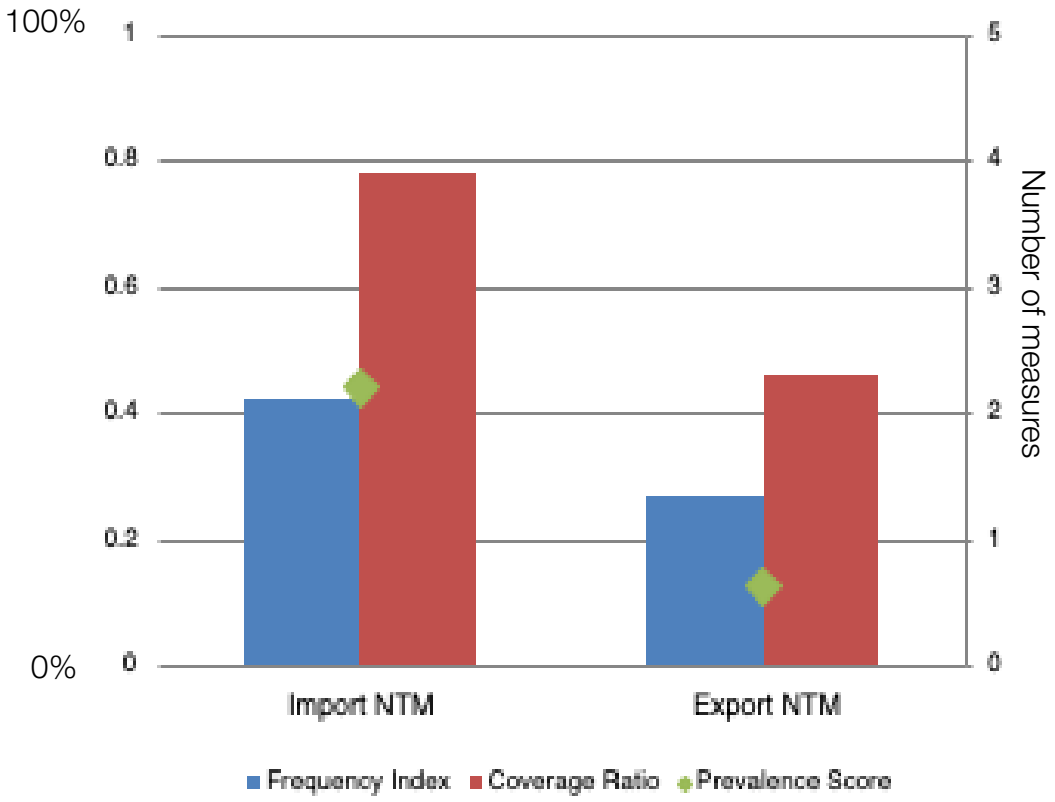
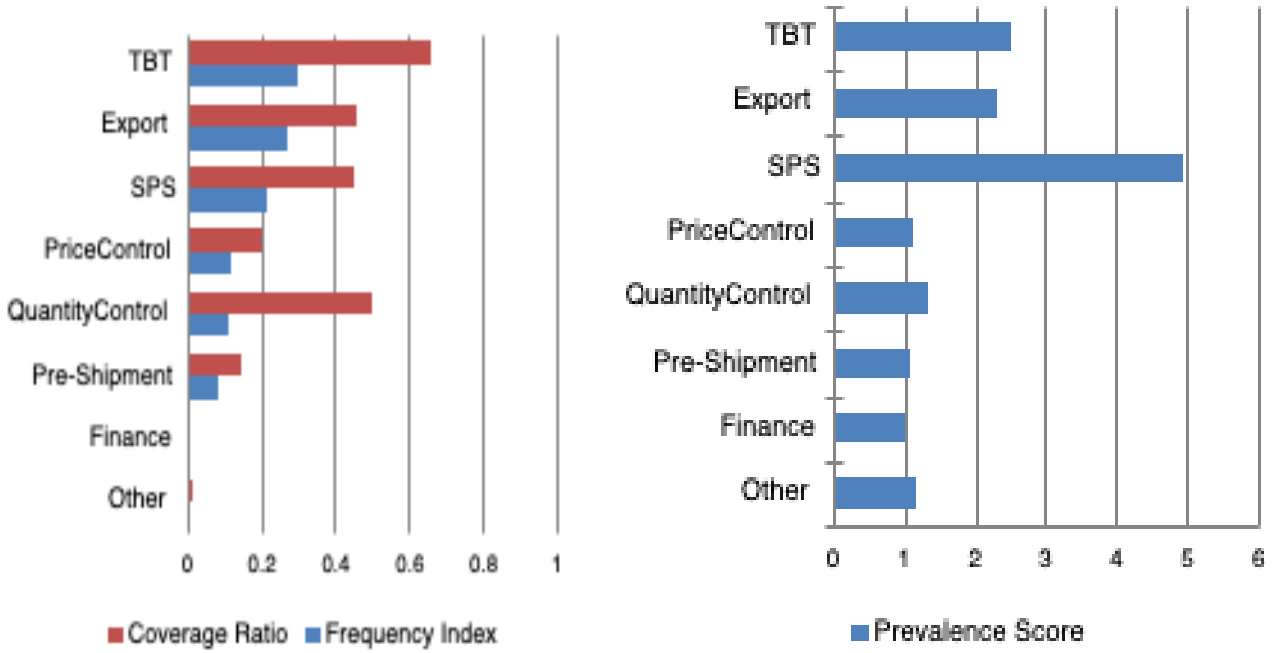
Non-tariff measures: Coverage, frequency and prevalence

Global results



NTM indicators by type of measure



Source: UNCTAD 2022, based on Trains database.

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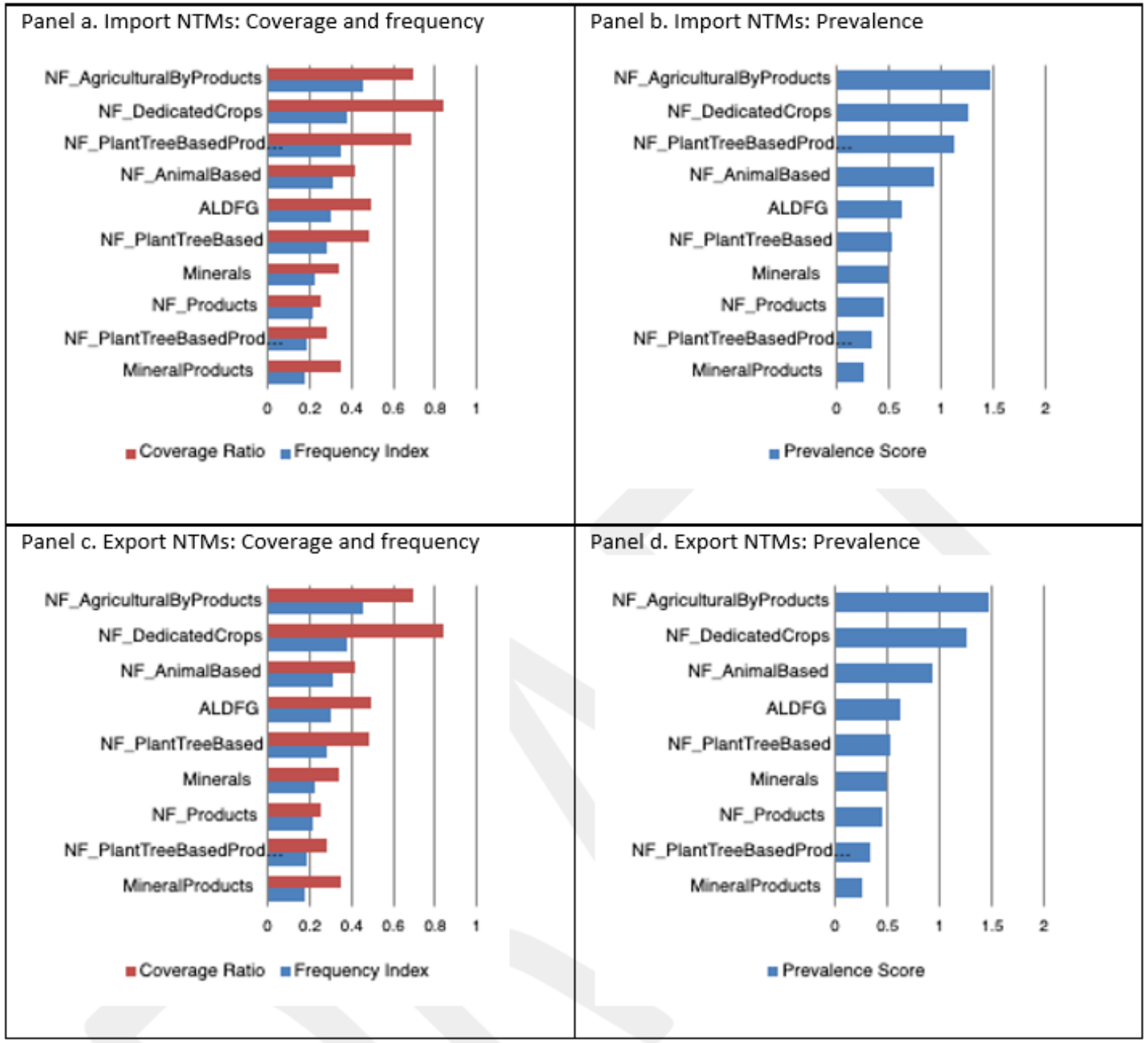
NTMs analysis on plastics substitutes



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The way forward

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The way forward: 7 steps

1. **Working definitions provided can be improved and used for the IDP and INC processes. Plastics substitutes are only one instrument in the policymaking toolbox for countries to address plastic pollution.**

2. **Identified clusters and corresponding identified HS codes for plastics substitutes can be a basis for countries to work on consolidated list of plastics substitutes.**

3. **Currently applied tariffs show that there is no level playing field between plastics substitutes and plastics. There is important space to reduce tariffs and to phase out fossil fuel subsidies to create economic incentives to move towards material substitution.**

4. **Most NTMs applied are on natural fibres from plants/trees, dedicated crops, and agricultural by-products.**

5. **Countries should consider exploring policy options to enable sunrise industries focusing on substitutes, especially where those can be competitive, scalable, recyclable, and promoting job creation.**

6. **Additional exploratory work is needed to identify existing innovative and scalable products (with the lowest carbon footprint possible) that can substitute plastics.**

7. **Countries need to agree on a minimum set of LCA indicators on which actionable policy can be based to define substitutes which should be produced.**

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Thank you!

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