

# The potential of non-plastic substitutes to reduce plastic pollution: Quantitative, qualitative & empirical evidence

**Informal pre-event to INC-3: Rethinking the future of single-use plastics**  
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# The distinction between plastic substitutes and plastic alternatives

Plastics substitutes are natural materials that have similar properties to plastics, while plastic alternatives include bioplastics or biodegradable plastics.

Plastic substitutes	VS	Plastic alternatives
Mineral, plant, marine or animal	ORIGIN	Bioplastics or Biodegradable plastics
Recyclable, reusable, biodegradable, compostable, or erodable	PROPERTIES	Recyclable, biodegradable, or compostable (end of life)
Should have lower environmental impact along their life cycle	IMPACT	Should have lower GHG lifecycle emissions when compared to plastics
Should not be hazardous for human, animal or plant life	SAFETY	Should not be hazardous for human, animal or plant life
<b>Non-plastics</b>		<b>Better plastics</b>

Source: UNCTAD Vivas Eugui & Pacini (2022). UNCTAD, based on presentation on plastic substitutes HS codes, Life-cycle analysis and tariffs considerations. WTO Dialogue on Plastics.



## Zero Draft text INC-3 on Non-plastic substitutes (Art.6)

- To take measures to foster innovation and incentivize and promote the development and use at scale of **safe, environmentally sound, and sustainable non-plastic substitutes**, including **products, technologies and services**, considering their potential for environmental, economic, social and human health impacts.
- To encourage the use of **regulatory and economic instruments, public procurement and incentives** to promote the development and use of **safe, environmentally sound and sustainable** non-plastic substitutes.

# WTO IDP on Non- plastic substitutes (draft WTO/W10)

- **Promote trade**, including through implementing trade-related measures such as those listed in Annex [X], that **contributes to ending plastic pollution and results in safe circularity**, including trade in:
  - **environmentally sustainable, safe, and effective** non-plastic substitutes and
  - **environmentally sustainable, safe, and effective** plastic alternatives and re-use, repair and
  - **re-fill systems** such as those listed in Annex [X],

With a focus on those of interest to WTO Members, in particular developing members, including **SIDS, and least developed members, and opportunities for their MSMEs.**

HS Chapter	Description	Number 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	3
07	Vegetables and certain roots and tubers; edible	8
08	Fruit and nuts, edible; peel of citrus fruit or melons	2
11	Products of the milling industry; malt; starches; inulin; wheat gluten	3
12	Oil seeds and oleaginous fruits, ..., industrial or medicinal plants; straw and fodder	7
13	Lac; gums, resins and other vegetable saps and extracts	4
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	4
15	Vegetable waxes (other than triglycerides); whether or not refined*	1
17	Sugars and sugar confectionery	2
20	Preparations of vegetables, fruit, nuts or other parts of plants	1
23	Food industries, residues and wastes thereof; prepared animal fodder	4
28	Inorganic chemicals; organic and inorganic compounds of precious metals...	2
29	Organic chemicals	2
32	Glass; glass frit and other glass, in the form of powder, granules or flakes*	1
39	Cellulose; Natural polymers...	5
40	Rubber	4
41	Raw hides and skins (other than furskins) and leather	12
42	Articles of leather, ..., articles of animal gut (other than silkworm gut)	1
44	<b>Wood and articles of wood; wood charcoal</b>	<b>43</b>
45	Cork and articles of cork	7
46	Manufactures of straw, esparto or other plaiting materials; basketware...	8
47	<b>Pulp of wood or other fibrous cellulosic material; recovered (waste and scrap)...</b>	<b>17</b>
48	<b>Paper and paperboard; articles of paper pulp, of paper or paperboard</b>	<b>31</b>
50	Silk	10
51	<b>Wool, fine or coarse animal hair; horsehair yarn and woven fabric</b>	<b>25</b>
52	Cotton	3
53	<b>Vegetable textile fibers; paper yarn and woven fabrics of paper yarn</b>	<b>19</b>
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
57	Carpets and other textile floor coverings	1
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	<b>Aluminium and articles thereof</b>	<b>17</b>
94	Furniture, ... not elsewhere specified or included	4
95	Toys, games and sports requisites; parts and accessories thereof	4
96	Miscellaneous manufactured articles	1

Reducing plastic use is the best way to prevent it becoming waste or hazardous waste. Substitutes can contribute significantly to this aim. A mapping of HS codes of potential plastic substitutes resulted in...

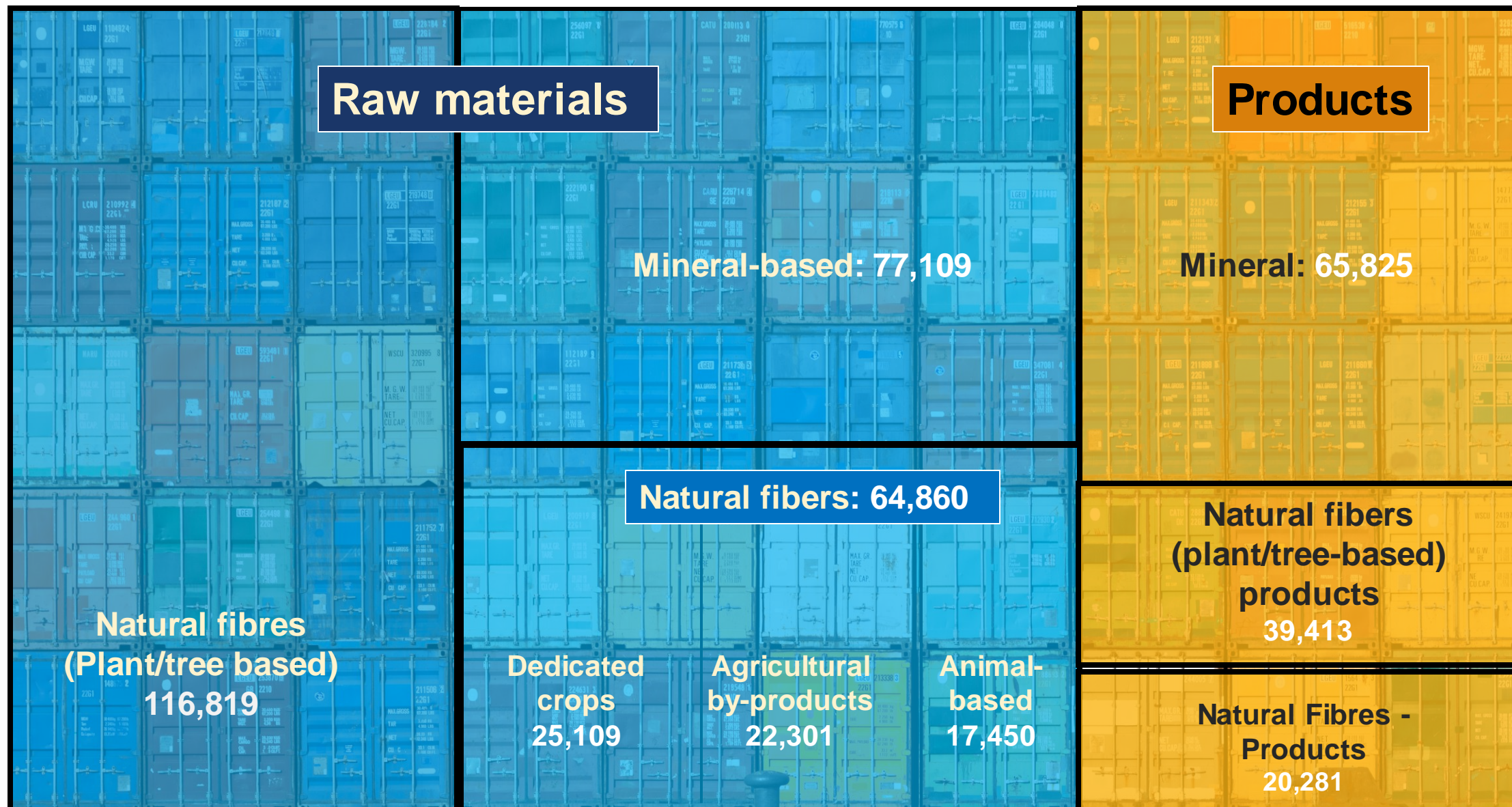
**282 HS** codes (6-digit) identified, where *health and environmental impacts analysis is needed.*





# Trade value of plastics substitutes

Export represented \$388 billion, approximately 2/3 represents exports of raw materials (\$258 billion)



**Raw materials**

**Products**

**Mineral-based: 77,109**

**Mineral: 65,825**

**Natural fibres: 64,860**

**Natural fibres  
(Plant/tree based)  
116,819**

**Dedicated  
crops  
25,109**

**Agricultural  
by-products  
22,301**

**Animal-  
based  
17,450**

**Natural fibres  
(plant/tree-based)  
products  
39,413**

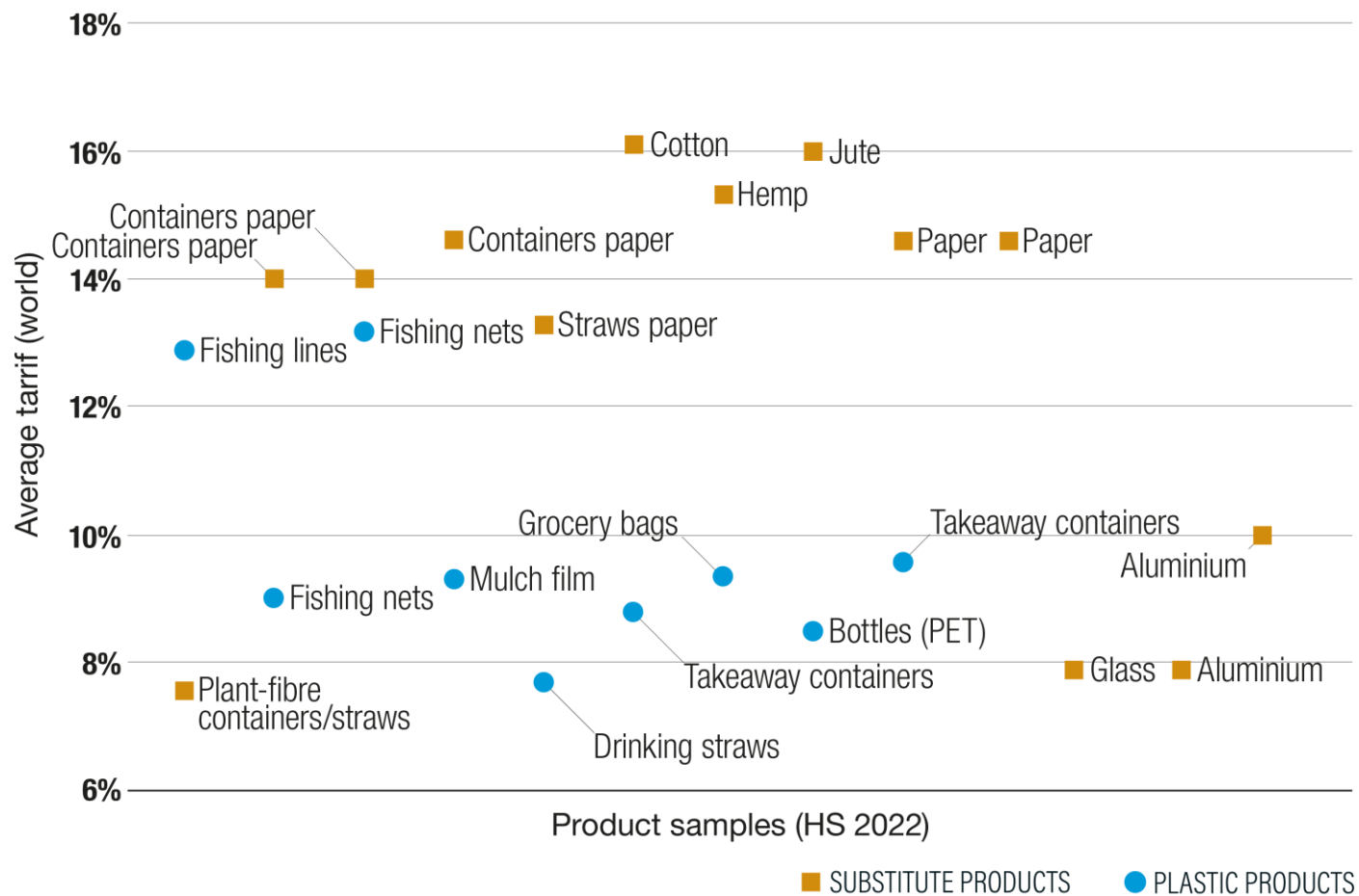
**Natural Fibres -  
Products  
20,281**



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# Average import tariffs on plastic products vs material substitutes

Substitutes often face higher import tariffs than their plastic equivalents.



Important to promote more policy coherence in tariff schedules vis-à-vis potential control measures and incentives

Source: UNCTAD, based on OEC data 2020 and HS 2022 codes.

Note: Aluminium, paper, container paper and fishing nets are repeated because of different items represented in different HS codes.



# Material substitution: Life-cycle views matter!

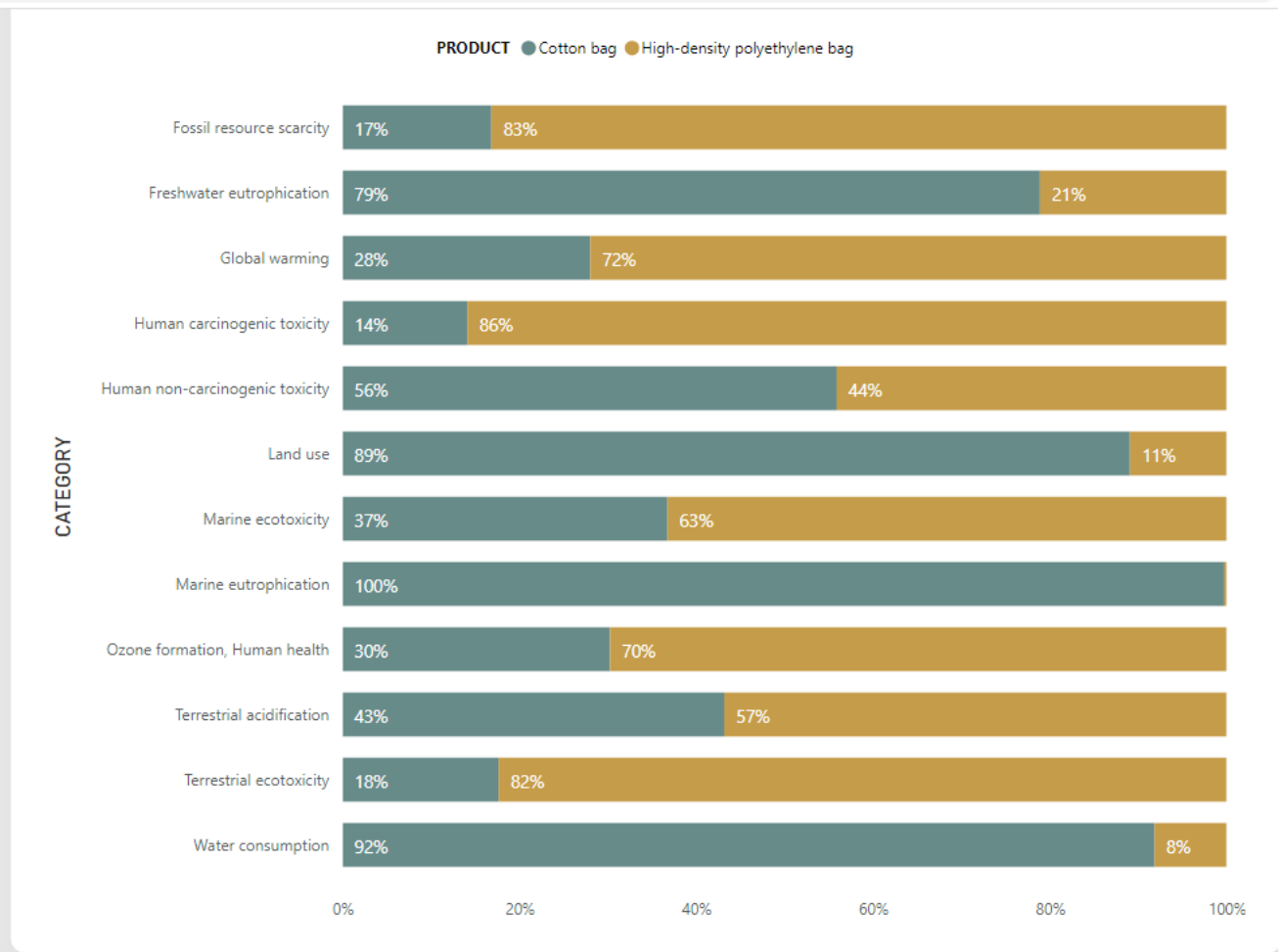
Please select only one scenario at a time for correct information

**COUNTRY**  
Please select or for cor

- 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

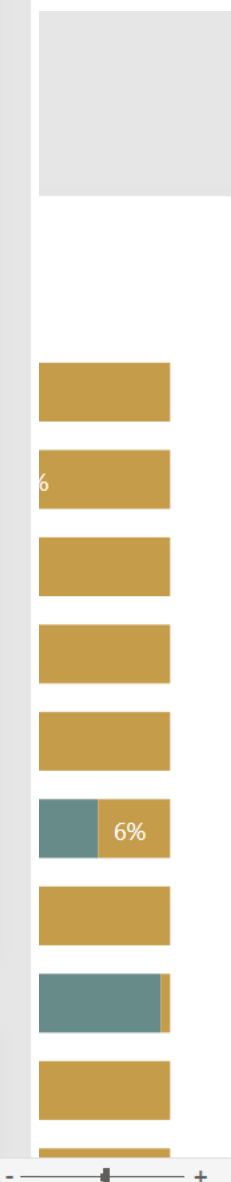
**CATEGORY**

- Select all
- Fossil resource scarcity
- Freshwater eutrophication
- Global warming
- Human carcinogenic toxicity
- Human non-carcinogenic toxicity
- Land use
- Marine ecotoxicity



FUNCTIONAL UNIT AND REFERENCE FLOWS

Functional unit	Plastic product	Substitute product	Uses
"Carrying 5 kg of items in four year's shopping (150 purchases) from the...	208 High-density polyethylene bags	1 cotton bag	Reuse of substitute product (4 years)







# Notpla

## Making packaging disappear

An all-natural packaging solution made from seaweed and plants that is naturally biodegradable and home-compostable, just like a piece of fruit.

One innovation is a takeaway food container coated with seaweed, a revolutionary move for the takeaway industry that has traditionally relied on plastic or chemicals to hold food.

Image source, NotPla: <https://www.notpla.com/products/>



# BIO-LUTIONS

## Fibre Based Solutions

Bio-Lutions converts agricultural residues into self-binding, durable natural fibres to make biodegradable and compostable single-use disposables and packaging.

The process uses a wide range of agricultural residues such as wheat straw, hemp shives, nettle, reed, banana stems, vine shoots and more.







# Gaia Biomaterials

## Biodegradable fishing nets

(alternative plastic)

UNCTAD-SMEP  
project developing  
renewable-based,  
biodegradable and  
compostable fishing  
nets.

Based on PBAT, PLA  
and Calcium  
Carbonate.  
(Biodolomer®)



Images source: UNCTAD

# Thank you Merci

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