

Young Innovators



Building a Case Study – Guide and Examples

One of the key preparatory activities before starting to work in class, will be to structure one or more case studies to provide students with the context and the basic information regarding the problem or challenge they are investigating. As such, the case study should allow the reader to:

- **analyze the context** before taking action
- **take decisions** or recommendations

A case study is a way to **help students to quickly make sense of the complexity around the challenge**, without offering shortcuts to a predefined solution.

The basic elements of a case study

- **Factual:** It should be based on facts and be **documented**. A short bibliography would allow students to dive deeper into the topic if necessary.
- **Analytical:** A case study should offer an **analytical perspective** on past situations and encourage **critical thinking** through an analysis of the situation and evaluation of the actions. In this perspective, describing a past failure in solving that particular challenge can be particularly effective in putting the reader in the right mindset.
- **Narrative:** A case study can be effectively structured as a story (hence, with an **opening**, a **body** and a **closing**) describing factual series of actions occurred in the past. A text capable of engaging the reader both intellectually and emotionally.

The case study will help students **define the context around the challenge**:

- it provides the necessary evidence to spark the discussion around the challenge
- It provides enough data – real, accessible data - to support the reflection

The case study should not provide ready-made solutions, instead, it should encourage critical thinking.

An effective case study:

- Tells a real story
- Raises thought-provoking questions
- Has elements of conflict

- Does not offer obvious or clear-cut right answer
- Encourages students to think and take a position
- Portrays actors in the moment of decisions
- Provides clear data about context, actor, actions...
- Is relatively concise

The expected learning outcomes from the use of the case study:

- Identification of the challenge
- Understanding and interpretation of data
- Information analysis
- Recognising assumptions and inferences
- Thinking analytically
- Exercise judgement
- Taking decisions and defending them
- Understanding interpersonal relations
- Communication ideas and opinions

Guiding questions to answer before writing a case study

- Who will be the **audience**? How **difficult** should the case be?
- How does it connect to **local actors and local challenges**? How can local actors/stakeholders be involved in shaping the case study?
- What is the **decision focus of this case**? Is there a protagonist? What is his/her urgent challenge?
- What **writing style** would work best?
- **What data is needed** and what data is **available**? Do we need to collect one or more Interviews? How can teachers support the process? (Are there synergies to be exploited?)
- What **key sections** should the document be made of?
- **Does the case include relevant controversial elements**, dilemmas or conflicting situations?
- What **key discussions** do I want to bring into the classroom?

Examples given below:

- E-WASTE** (*basic figures are provided through infographics in a .ppt format*)
- WATER CONSERVATION** (*a 3-page compact case study proposing video and web link to info*)
- TEXTILES** (*a thoroughly documented case study – structured as a paper*)

References

- <https://www.thecasecentre.org/educators&>
- http://www.rsm.nl/fileadmin/Images_NEW/CDC/How_to_Write_a_Good_Teaching_Case.pdf
- http://www.emeraldgrouppublishing.com/products/new/pdf/quick_ref.pdf

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A. From Smartphone to e-waste – a case study

Smartphones belong to a large family of electronic devices (PCs, laptops, tablets, IoT, music players, different portable electronics) which all share some common features:

- have an **extremely large market** (high penetration rate),
- share a **fast turnover** rate,
- need to adapt to **fast changing technology** (hardware and software are continuously upgrading),
- contain a number of **precious chemical elements** (e.g. copper, silver, gold, palladium, etc),
- are **not systematically collected** nor recovered through clear waste chains,
- once they enter the wrong chain contribute to **toxic waste** production

According to a recent study, the average lifespan for a smartphone is **21 months!** In other words, a smartphone operates for less than 2 years before becoming an **electronic waste**.

Behind this data, which is an average, there are different factors:

- **Damage:** devices that are not fixed or not fixable after breakage
- **Battery:** poorly performing battery
- **Usage:** the external materials get worn out, devices that reach their end of life
- **Obsolescence:** devices whose software is not updatable, but also working devices that are substituted for a new one.

Consumers are Using Smartphones More Than Ever:



Average use per day is
521 Minutes¹



75% of the world will
be using smartphones by **2020**²

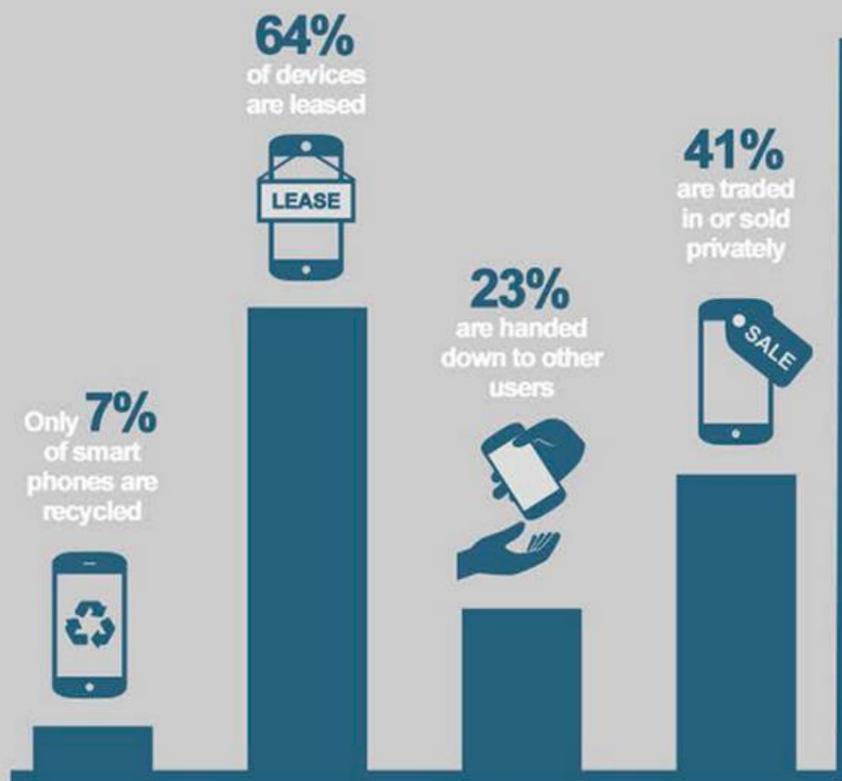


48% plan to buy a smartphone
within the next



1 Year³

What consumers do with old devices:⁴

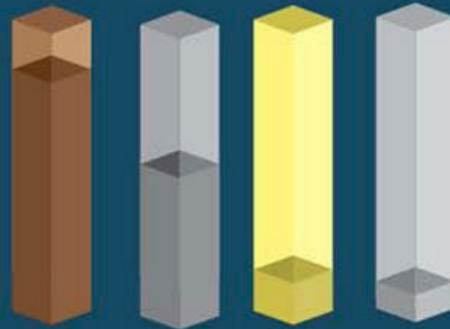


Amount of Gold and Silver dumped across the world in 2014:⁵



\$50 billion
worth of global
resources are wasted
each year

For Every 1 Million Phones, You Can Recover:



35,274 lbs of Copper
772 lbs of Silver
75 lbs of Gold
33 lbs of Palladium⁶

Your Phone, Your Identity: User habits of mobile device owners⁷



Text Messaging



Emails



Health & Medical



Mobile Banking

Are 21 months a reasonable lifespan?

It would be desirable to find strategies to extend the lifespan of such devices.

Several questions arise:

- What does it mean for a functioning smartphone to be considered **outdated**?
- What would it mean to have devices designed to be more easily repairable?
- What can we learn from pilot experiences such as the FAIRPHONE and the PUZZLEPHONE?
- How could we improve the Do-It-Yourself (DIY) repair solutions (knowledge, resources, spare parts)?

Sources

www.simsrecycling.com/Newsroom/Infographics/Infographic-Cellphone-Cycle

<https://www.dailymail.co.uk/health/article-2989952/How-technology-taking-lives-spend-time-phones-laptops-SLEEPING.html>

<http://www.ericsson.com/news/1925907>

<https://www.scientificamerican.com/article/how-to-reduce-the-toxic-impact-of-your-ex-smartphone/>

<https://www.rt.com/news/251045-300tons-gold-wasted-electronics>

<https://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015>

<https://it.businessinsider.com/how-long-people-wait-to-upgrade-phones-chart-2017-3/?r=US&IR=T>

<http://www.puzzlephone.com/>

<https://www.fairphone.com/en/>

B. Water conservation Peru

Aim: get an understanding about cooperation for climate change adaptation from a bottom-up approach

Problem definition

The Paramo ecosystem in the Andes of South America is threatened by subsistence land use of poor peasants and rising temperatures due to climate change. This ecosystem holds the capacity of storing water in the highlands (2,600m. -4,000m.) and controlling the regular distribution of water downstream during the whole year. These threats have a direct negative-effects in the growing water demand for agricultural purposes and household consumption. Traditional top-down water and land management in the country resulted in wicked problems generating conflicts with fatal results. The characteristics of a multiple institutional and social levels, political instability in the national and regional governments and high rates of poverty prioritize basic social demands, delaying the attention for research and conservation of these critical ecosystems. Models for the long term in the Andes region show impacts from climate change with potential reductions of these ecosystems due to increasing global temperatures.

The main stakeholders of the catchment after long processes of discussion and negotiation are currently exploring an alternative to cope with the complex scenario and to cooperate in a bottom-up project with the objective of conserving the high wetlands in the way of a mechanism of compensation for ecosystem services

Lines:

1. Paramo & water services
2. Threats : Land Use & CC
3. Top down approach failure

<https://www.youtube.com/watch?v=Jsk3JazBDPI>

Key point:

1. Building networks
2. Cooperation and Negotiation skills
3. Sensitivity to different values/cultures/perspectives
4. Power of persuasion and communication
5. Networking and lobbying skills
6. Visioning outside the box thinking

Conclusions

The water conservation in the Andean region is a complex matter of research, where social and natural scientists have to come together in order to tackle the problems with a "holistic approach", in that sense the issues that were analysed in depth can suggest their interdependency in understanding cooperation for water conservation.

“the complement to advanced technology for sound integrated water management must come from “a bottom-up approach”, the society itself, as the final user and direct affected by water management measures”

http://arcgisserver.hswt.de/landuse_catamayochira/



C. Sustainability of textiles

INTRODUCTION

The textile industry is the world's oldest branch of consumer goods manufacturing. It is a diverse and heterogeneous sector which covers the entire production chain of transforming natural and chemical fibres (such as cotton, wool, and oil) into end-user goods, including garments, household goods, and industrial textiles.

In terms of intensity of trade, textile and clothing is the world's second-biggest economic activity (\$353 billion in 2001)¹ and account for 7% of world exports². While a hundred years ago the majority of textile production was concentrated in Europe and North America, today, the bulk of textiles and clothing is manufactured in Asia, particularly in China and India. Despite this shift, the textile sector remains an important part of the European manufacturing industry. According to the latest structural data available, in 2006 there were 220,000 companies employing 2.5 million people and with a turnover of €190 billion. The textile and clothing sector accounts for 3% of total manufacturing value added in Europe³.

Textiles are heavily intertwined with environmental, social and governance issues. In the past, efforts of producers and retailers have primarily focused on improving the social aspects of textiles e.g. establishing fair working conditions, setting social standards, establishing minimum wages, ensuring occupational safety, imposing a ban on child and forced labour, etc.

Over the years, however, there has been growing concern about the environmental impacts of textiles. According to the EIPRO study⁴, clothing alone is responsible for 2 to 10 % of the EU's life-cycle environmental impacts. This results in textiles coming fourth in the ranking of product category which cause the greatest environmental impact, just after food & drinks, transport and housing.

The precise environmental impact of textiles varies significantly depending on the type of fibre the garment is made from. However, generally speaking they include⁵:

- energy use, greenhouse gas (GHG) emissions, nutrients releases (leading to eutrophication) and ecotoxicity from washing (water heating and detergents) and dyeing of textiles;
- energy use, resource depletion and GHG emissions from processing fossil fuels into synthetic fibres, e.g. polyester or nylon;

¹ <http://www.unep.fr/shared/publications/other/WEBx0008xPA/textiles.pdf>

² http://www.forumforthefuture.org/sites/default/files/images/Forum/Projects/Fashion-Futures/FashionFutures_2025_FINAL_SML.pdf

³ http://ec.europa.eu/enterprise/sectors/textiles/index_en.htm

⁴ http://ec.europa.eu/environment/ipp/pdf/eipro_report.pdf

⁵ More information regarding the environmental impacts over textiles' life-cycle and their relative significance can be found in the background and technical report developed for the revision of the EU Ecolabel criteria for textiles available at <http://susproc.jrc.ec.europa.eu/textiles/stakeholders.html>

- significant water use, toxicity from fertiliser, pesticide and herbicide use, energy use and GHG emissions associated with fertiliser generation and irrigation systems related to production of fibre crops, e.g. cotton;
- water use⁶, toxicity, hazardous waste and effluent associated with the production stage, including pre-treatment chemicals, dyes and finishes.

All actors along the supply chain have a role to play in reducing the environmental footprint of textile products. First of all, producers, because as explained above, considerable impacts might be generated during the fibre production, dyeing, printing and finishing; but also, consumers as considerable environmental impacts occur during the use phase. For example, most of the energy used in the lifecycle of a cotton T-shirt is related to post-purchasing washing and drying at high temperatures. It is also estimated that consumers, in the UK throw away as much as 1 million tonnes of textiles every year⁷.

Against this background, many voluntary initiatives to reduce the environmental footprint of textiles, especially for cotton and polyester, have been developed or are in the pipeline⁸. The uptake by retailers of the various initiatives in this domain are high. The “march” towards more sustainable textiles is well underway.

SCOPE

Either as a raw material, as a semi-finished product or as an end product, textiles are assimilated into, or constitute in their own right, a vast range of products used in different domains and for different purposes. This issue paper will look at the most common textiles sold by retail companies: namely clothing & accessories and interior & decoration textiles such as floor coverings, upholstery, curtains, mattresses, household textiles, etc.

This paper will primarily focus on the environmental aspects of textiles. However, unlike previous papers, the social impacts will also be addressed, where relevant.

Although the definition of “sustainable textiles” is still open to debate, and considering the relatively high impact that textiles have on the environment during their life-cycle, in the framework of this paper, “environmentally friendlier” textiles will be defined as textiles which minimise negative life-cycle environmental impacts along the supply chain, including production and consumer behaviour (care and disposal of clothing).

THE LEGAL FRAMEWORK

⁶ 20% of industrial freshwater pollution comes from textiles treatment and dyeing. In 2009, the world used three trillion gallons of fresh water to produce 60 billion kilogrammes of fabric. It takes 700 gallons of fresh water to make on cotton T-Shirt – 2010 Global Market Report on Sustainable Textiles

⁷ http://www.forumforthefuture.org/sites/default/files/images/Forum/Projects/Fashion-Futures/FashionFutures_2025_FINAL_SML.pdf

⁸ An important initiative in this sector is currently led by the Sustainable Apparel Coalition (SAC). More information available at www.apparelcoalition.org/

Most textiles specific EU legislation addresses the issues of imports from low-wage countries, sets standards for textile names or sets standards for the chemical analysis of textile fibres.

From an environmental perspective, the most relevant pieces of legislation are chemical related: the most important being REACH (Registration, Evaluation, Authorisation and Restriction of Chemical substances) (Regulation (EC) No 1907/2006⁹). For textiles produced in Europe, substances incorporated in the textiles, need to be registered. For imported (outside of the EU) textiles, importers need to notify ECHA if the textiles they import contain SVHC (substances of very high concern) in concentration above 0,1% (w/w) if the total annual volume in all products imported is greater than 1 tonne. Consumers also have the possibility to ask retailers if products contain SVHC in a concentration above 0,1%.

Other pieces of legislation include the recently adopted Biocides Regulation (Regulation (EU) No 528/2012)¹⁰, which establishes the regulatory framework for the making available on the market and use of biocidal products.

Unlike REACH and the Biocides Regulation, the Waste Framework Directive (Directive 2008/98/EC)¹¹ specifically refers to textiles. Besides defining the waste hierarchy i.e. prevention, preparation for re- use, recycling, energy recovery and disposal, the directive also calls for end of waste specific criteria for textiles to be developed.

For textiles, a number of different voluntary environmental labelling schemes exist on the market. They include the ISO 14024 "Type I" EU Eco-label¹², the Nordic Swan and the Blue Angel¹³. Other standards address environmental and social criteria along the supply chain e.g. Global Organic Textile Standard (GOTS).

Under the EU Eco-label, criteria have been developed for textiles (Commission Decision 2009/567/EC¹⁴, currently under revision), textile floor coverings (Commission Decision 2009/967/EC)¹⁵, footwear (Commission Decision 2009/563/EC)¹⁶ and criteria for bed mattresses (Commission Decision 2009/598/EC)¹⁷.

Other public and private initiatives establishing environmental and social standards have also been set up and taken up both by producers and retailers.¹⁸

⁹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:396:0001:0849:EN:PDF>

¹⁰ http://eur-lex.europa.eu/JOYear.do?year=2012&serie=L&textfield2=167&Submit=Search&_submit=Search&ihtmlang=en

¹¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0098:EN:NOT>

¹² <http://ec.europa.eu/environment/ecolabel/>

¹³ ISO 14024 "Type I" ecolabels have the advantage of being voluntary, multiple-criteria based, third party verified, based on life cycle considerations and multi-stakeholders participation. See Retail Forum issue paper on Labelling: http://ec.europa.eu/environment/industry/retail/pdf/labelling_issue%20paper_final.pdf

¹⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:197:0070:0086:EN:PDF>

¹⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:332:0001:0016:EN:PDF>

¹⁶ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:196:0027:0035:EN:PDF>

¹⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:203:0065:0080:EN:PDF>

¹⁸ In France, under the framework of Grenelle II law, there has been a pilot experience aimed at developing multi-criteria LCA based indicator to be used for communicating the environmental performance of textile to consumers. The results

A business-led initiative of relevance is currently being developed by the Sustainable Apparel Coalition (SAC). One of the objectives of this initiative is the development of the Higg Index, an indicator based tool for apparel that enables companies to evaluate material types, products, facilities and processes based on a range of environmental and product design choices¹⁹

To check compliance with fair working conditions in line with the ILO norms a broad range of social standard schemes were developed by retailers and producers. The most common are summarised under the umbrella of the Global Social Compliance Programme²⁰.

OPPORTUNITIES AND BARRIERS

Currently, it is the producers and retailers who are mostly driving the improvements in sustainability of textiles and are also working at raising consumer awareness. There is growing attention towards not only social, but also environmental impacts of textiles; especially for specific kind of products such as childrenswear, demand for more environmentally friendlier textiles is continuously increasing.

Permanent and quick changes in fashion can be an opportunity for rapid uptake of sustainable garments, but also a barrier since such trends could quickly be replaced by something else. In other areas like interior or underwear innovation cycles are much slower.

Opportunities

- By improving their environmental and social performances, brands can improve their reputation;
- Linking business to social and environmental projects enables companies to build a strong connection with consumers by involving them in sustainability initiatives;
- Technological innovation in production processes, along the supply chain which contribute to improve the environmental footprint of processes and which may save costs, enabling the use of more recycled materials i.e. end of life polyester can be recycled into new clothes;
- There are already well established environmental labels that producers can apply for to prove their superior environmental performances (such as the EU Ecolabel, Blue Angel, Nordic Swan, GOTS).

Barriers

- Complex and global value chains often with low traceability represent an obstacle for producers and brands who want to improve their production patterns;
- Socially and environmentally friendlier textiles might result in more expensive finished products;

of the testing have proven the feasibility of such an approach and have been welcomed by both industries and consumers. Retour d'expériences sur la filière textile/chaussure en Alsace, Bourgogne et Lorraine, available at <http://www.afnor.org/atlas/europe/france/alsace-lorraine-bourgogne>

¹⁹ www.apparelcoalition.org

²⁰ www.gscpnet.com

- The perception of some consumers that sustainable garments are not stylish or fashionable, and that the design and the appearance of eco-clothing is unfashionable and unattractive²¹;
- An insufficient consumer demand. Producers and retailers who want to promote more environmentally friendlier textiles need to develop the market;
- The market for recycled garments and fibres is still weak due to insufficient take-back systems and absence of convenient and reputable drop-off locations for unwanted clothing/textiles in many countries, which results in perfectly useable garments sent to landfill or incinerated;
- Low knowledge level about strategic sustainability among fashion and textile companies and their suppliers and lack of resources to upgrade and integrate new knowledge and new technologies, especially in small and medium sized enterprises;
- There are many labels on the market which can lead to consumer confusion.

CONCLUSIONS

Developing production processes using lower amounts of water, pesticides, insecticides, hazardous chemicals or lower releases of GHG etc. is as important as the measures adopted by retailers and consumers to select such textiles. However, consumer behaviour in how they care for and dispose of clothing and other textile products is of equal importance, e.g. selecting the appropriate washing temperatures, taking the right steps to significantly extend the lifetimes and encouraging recycling of garments once they have reached their end of life. These important issues are all areas where retailers can have a high degree of influence²².

Key challenges

- Continuing to improve the working and social conditions of workers outside the EU, while offering textiles at an affordable price for EU consumers whose purchasing power is declining;
- Improving the overall environmental footprint of textiles over their entire lifecycle and supply chain;
- Changing consumer attitudes of buying as cheap as possible and as many as possible;
- Providing consumers with relevant information concerning the environmental footprint of the textile products, based on harmonised systems at least at European level.

What can retailers do?

- Offer and promote more environmentally friendlier textiles;
- Demand more environmental and social accountability from producers;
- Communicate to consumers the added value of sustainability and inform them on more environmentally friendly behaviour e.g. encouraging the most efficient wash cycle

²¹ http://www.bsr.org/reports/BSR_NICE_Consumer_Discussion_Paper.pdf

²² See for example the NICE Consumer Report available at:
<http://www.nordicfashionassociation.com/41193/The%20NICE%20Consumer%20report>

programmes, lower temperatures etc. and how this can help them save money on energy bills and reduce water usage thus lowering overall environmental footprint;

- Encourage recycling of garments, promoting locally provided clothes banks/bins, etc.;
- For retailers who provide employees with working clothes, revert to more socially and environmentally friendlier textiles;
- Include sustainability issue in staff training.

What can producers do?

- Source their suppliers based on their social and environmental performances;
- Use best practices in technological innovation which contribute to improve the environmental footprint of processes;
- Substitute hazardous substances with safer substances;
- Increase information exchange with retailers, provide them with information about the latest innovative solutions that help them address their sustainability challenges/objectives;
- Support the development of Product Category Rules²³ for textiles according to a methodology at least harmonised at European level and use it as a basis for communicating the environmental performance of their products both in B2B and B2C;
- Develop and offer more environmentally friendlier textiles²⁴ ;
- Promote the use of more sustainable fibres like organic cotton, recycled fibres, etc.;
- Engage in research about new fibres and materials with lower environmental impacts compared to natural fibres;
- Improve care labels on products, and together with retailers increase focus on consumer communication to promote responsible care;
- Encourage the reuse/recycling of old clothes and textiles to produce new clothes, rather than using raw materials, promote remanufacturing and fashion upgrades;
- Communicate to consumers their sustainability efforts;
- Demand their suppliers to implement international social standards e.g. ILO standards.

What can policy makers do?

- Encourage initiatives, project innovation etc. and provide incentives for the development and take-up of environmentally friendlier textiles;
- Lead by example by purchasing environmentally friendlier textiles following the GPP criteria developed at European level²⁵

²³ As set out in the Communication from the Commission "Building the Single Market for Green Products - Facilitating better information on the environmental performance of products and organisations", COM/2013/0196 final, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0196:FIN:EN:PDF>

²⁴ See Retail Forum issue paper on Labelling: http://ec.europa.eu/environment/industry/retail/pdf/labelling_issue%20paper_final.pdf

²⁵ http://ec.europa.eu/environment/gpp/pdf/toolkit/textiles_GPP_product_sheet.pdf

- Support the inclusion of social criteria in the existing EU Ecolabel and take an active role in its on-going revision and GPP criteria developed at European level²⁶;
- Encourage the implementation of ILO norms;
- Support, implement and/or fund consumer awareness and behaviour change campaigns;
- Support industry and Member States in the development of Product Category Rules on textiles based on a harmonised methodology;
- Examine the use of economic instruments for promoting sustainable consumption of textiles/clothing;
- Develop measures for better tackling “greenwashing” i.e. false sustainability claims;
- Governments should revisit the approach and effectiveness of policy related to chemical use in the fashion and textile industry, including chemicals used in the fibre or garment production processes, no matter if they take place in the European Union or not. In addition, new technologies, such as nanotechnology and GMOs, should be thoroughly investigated to determine whether and to what extent they pose a risk to human health and the environment.

What can we do together?

- Launch and further promote collaborative initiatives to improve the environmental performance of textiles across the supply chain (sustainable design, fibres and fabrics, maximise reuse/recycling/end-of-life-management, sustainable cleaning);
- Start awareness raising campaigns and sharing of experiences in textile processing regions;
- Manufacturers (clothing, white goods, detergents, etc.), retailers, consumer groups, etc. should carry out campaigns and inform consumers on issues of common interest related to sustainable fashion consumption and work with designers, celebrities and NGOs to help spread the messages on how to be more environmentally friendly, e.g. reducing the temperatures of the wash cycle, etc.

²⁶ Information is available at: <http://susproc.jrc.ec.europa.eu/textiles/>