

**Innovations for Sustainable Production in the Global Textile Supply Chains:
Breaking the mould with scenario-analysis**

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1 Background

This contribution draws on results from a research project¹ aimed at supporting sustainable production in the textile supply chains (SDG 12), in particular by broadening the perspective of the relevant actors from a “reactive” position on regulatory compliance in the field of chemicals, always lagging behind the regulatory status quo, to a “proactive” beyond-compliance perspective, based on early warning signs which e.g. help to avoid regrettable substitution. One central hypothesis was that from the latter perspective, market opportunities for all players of the textile supply chain may result, and thus innovations for a more sustainable chemistry prevail.

For the purpose of this contribution textile production processes in the supply chains are deemed sustainable when human beings and the environment are not exposed, either from production processes or from consumer articles, to problematic chemical substances which may cause harm.

Viable design options for modified framework conditions in this respect can only be developed together with the relevant actors (transdisciplinary approach). In methodical terms, the project is therefore based on the transdisciplinary delta analysis developed by Society for Institutional Analysis (sofia).² This also involves intensive dialogue with representatives from the most relevant actors in the field, i.e. notably formulators of textile chemicals (organized, in Germany, in the TEGEWA association)³ as well as brands that manufacture and sell textile products, such as clothing and sporting goods (in Germany, among others, organized in BSI).⁴ On the one hand, transdisciplinary delta analysis allows actors to move beyond their individual perspectives, seeing the bigger picture and develop mutual solutions. On the other hand, the approach integrates an actor analysis, identifying impediments, standing in the way of sustainable development goals, and incentives as well which enable the actors to engage in the process of change.

Against this background the contribution analyses development perspectives for sustainable production innovations in the textile sector. In substantive terms it pursues the research question how such innovations in the global textile supply chains can emerge and what barriers currently impede such developments. In addition, in methodological terms, the contribution aims to answer how a culture of communication and cooperation between different actors emerge which enables and induces transformation processes in the direction of sustainable development. In this context the contribution introduces scenario-analyses as a method open self-centred perspectives for a more systemic view.

In what follows, the problem situation and the normative and societal objectives which are giving “momentum” to the issue at hand are briefly outlined. The main focus will then be on the status quo in the textile chains. In this respect, we differentiate the status quo thinking

¹ Funded by Deutsche Bundesstiftung Umwelt DBU (German Federal Environmental Foundation).

² Cf. <http://www.sofia-darmstadt.de/633.0.html>.

³ Cf. <http://www.tegewa.de/en/service/home.html>.

⁴ Cf. <https://www.bsi-sport.de/>.

from the perspectives of the individual actors as opposed to the “bigger picture” perspective gained through scenario-analysis. The contribution then closes with a brief outlook.

2 Problem Situation

According to the UN Environmental Programme, textile and clothing is the world’s second-biggest economic activity for intensity of trade. At the same time, textiles are heavily intertwined with environmental, social and governance issues. Textile supply chains are globally interwoven and volatile; production sites are traditionally located in countries with low environmental and occupational health standards. In the past, efforts of textile brands and retailers have primarily focused on improving the social aspects of textiles. Over the years, however, there has been growing concern about their environmental and health impacts: environment and workers are exposed to problematic chemicals used in the manufacturing of textile articles. In addition, the use phase disposal of these articles also entails exposure of the environment and, thus, eventually of consumers.

3 Normative and societal objectives

There are international, European and national efforts to reduce the risks to human health and the environment by chemicals. Keywords in this respect include the 2020 goal of the 2002 Johannesburg Summit (WSSD), the Strategic Approach to International Chemical Management (SAICM), the SAICM / UNEP Chemicals in Products Program (CiP), the Stockholm “POP” Convention, and the EU chemicals regulation REACH. Target 4 in the context of the Agenda 2030 Sustainable Development Goal (SDG) 12 summarizes all these efforts, which aims to “[b]y 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.”

These normative objectives also reflect altered expectations of societies as problematic chemicals in articles are increasingly moving into the consumers’ focus. Chemicals in textile articles and the manufacturing thereof are subject to public discussions not least due to the current “Detox” campaign by Greenpeace.⁵ Smartphone applications such as the ToxFox by Friends of the Earth Germany (BUND) are expected to foster increased demand and information about substances of very high concern (SVHC) in (textile) articles. In the coming years such “apps” will be available throughout Europe.

In the context of these normative and societal objectives, the BSI and TEGEWA actors involved in the project formulated the aim of developing a chemical management system that supports processes towards a more sustainable production in the global supply chain. In this respect one key concept refers to avoiding, to the extent possible, problematic substances in the manufacturing processes and thus increasing the chance that such substances are not present in the articles.

4 Analysis of the status quo

In workshops and interviews the actors involved in the project provided input as to their respective perspectives on the status quo. On this basis, however, establishing a common understanding of problem drivers and needs to tackle these, such as strategic measures, was not possible. Instead, professional patterns of thought and perception block this process. As a result, market opportunities linked to sustainable production remain concealed (section 4.1). In contrast, a scenario process opens up patterns of thought and argumentation of the

⁵ Cf. <http://www.greenpeace.org/international/en/campaigns/detox/>.

actors in the textile chain. Together they developed scenarios for the textile industry in the year 2030. In this process the actors gain a new view of the “system” of the textile supply chains and establish a common understanding of the factors that currently stand in the way of a more sustainable chemistry (section 4.2).

4.1 Status quo from the perspectives of the individual actors

TEGEWA manufacturers of textile chemicals assume they obtain the know-how to develop substitute products in terms of sustainable production and are also capable of leading these to market maturity. Indeed, many of such products are already on offer but, to some extent, market incentives to purchase them are missing. Rather, a large number of global textile customers are relying on cheap products which may contain problematic substances as there are no international quality standards effective along the global supply chains. According to TEGEWA manufacturers, internationally respected uniform certification systems, linked with monitored management of all substance inputs, would create the necessary incentives with a view to the sustainable alternatives.

As for textile brand actors, some BSI members pursue ambitious strategies towards "sustainable chemistry" in the supply chain and are also taking respective measures. When it comes to implementation they encounter many challenges, though. In fact, even with respect to well established supply chains, brands struggle to ensure REACH compliance (making sure that (1) certain restricted substances are not present in articles and that (2) presence of certain declarable substances (SVHC) is transparent), i.e. fulfilling the regulatory minimum requirements.

- According to the brand actors, one central barrier is that necessary changes in the supply chains are difficult to enforce as long as every brand pursues its own strategy. In particular, there are no sectoral approaches as regards a uniform standardised chemical management linked with e.g. standardized restricted and declarable substances lists (RSL).
- Most chemical substances enter the supply chain through wet finishing (wetchemical processes) which mostly take place in developing and newly industrialised countries. Hence, incentives for facilities located there to use less problematic formulations and adapt operations accordingly are needed to foster change in the supply chains. According to the brands, a more concentrated market demand and uniform demand mechanisms could at least support this transition.
- In addition, the issue at hand involves a very large number of problematic substances, of which the extent of use in the supply chain is often uncertain or not known. With a view to potential problem solutions, information on all substances used in the supply chains is necessary. This would involve improved exchange of information between the TEGEWA companies and those of the BSI. Other supply chain stakeholders, notably the wet finishing actors, also would have to contribute to the data exchange. Brands are however reluctant to have a closer look at such an option. They perceive obstacles such as confidential business information (CBI) issues with regard to recipes and procedures of textile chemicals. Besides, a large share of the BSI actors doubt that it is even possible to fundamentally change the procurement structures in the textile supply chain and thus provide the basis for a proactive approach. They do not feel entirely capable of influencing their suppliers' choice of raw materials and therefore commission 3rd parties (certifications services) to settle the problems.

- In addition, they expect the system transition causing high costs and they in this respect doubt consumers' willingness to pay.

4.2 Status quo identification enabled by scenario analysis

The scenario process⁶ involved representatives from BSI and TEGEWA as well as from other relevant stakeholder groups (authorities, NGOs, research). In workshops the experts together identified 113 factors influencing sustainable production in textile industries ("descriptors") and distilled the 18 most relevant descriptors, including, e.g., knowledge (of substances and processes), traceability, legislation, marketing. Next, the actors determined the relationships of descriptors (driving or driven factor, strongly or weakly interconnected). Taking into account this weighing of descriptors, as well as potential inconsistencies in their interplay, the actors developed two scenarios for the textile industry in 2030. Scenario 1 "muddling through" tells the story of how certain influences lead to a development of the textile sector which sticks to the status quo, with only gradual improvements in the handling of chemicals. In contrast, scenario 2 "boldly ahead" tells the story of the factors that change the chemical management of the textile supply chain and creates a value chain that is (largely) free of problematic substances. All actors agreed that they wish for scenario 2 to become real.

In a subsequent workshop the actors together developed strategies how to overcome the "muddling through" status quo and move "boldly ahead". In this respect, some descriptors have proven indispensable to change and move in the respective direction. From this, in turn, it can be conclude what factors in the status que impede progression in the direction of "boldly ahead":

- There is a lack of horizontal cooperation (brand and retailers level; regardless of initiatives such as Textilbündnis⁷ and ZDHC⁸) as well as vertical cooperation (along the supply chain actors).
- There is no unified standard for textile sector chemicals management which ensures compliance on a global scale (i.e. with respect to regulatory requirements from the EU but also from the US and, e.g., Asia).
- There is no sector solution supporting traceability and knowledge as to the chemicals used in the supply chains. Certification systems are of no help in this respect as their risk-based assessments are highly intransparent. Innovations in the direction of sustainable production can only emerge if brands are able to actively manage problematic chemicals in their supply chains, i.e. they must know what chemicals are used in the products and process steps. Hence, one central driver for sustainable textile economies is traceability and related chemical management instruments.
- With respect to enhancing traceability and knowledge there is a lack of IT-tools to facilitate the exchange of information. A system is needed where suppliers along the supply chains provide data on all substances used in articles (and the manufacturing process) – i.e. not only the problematic ones – because only this approach provides brands room to act and allows them to move beyond compliance.

⁶ Cf. Geschka, Hahnenwald, Schwarz-Geschka, Szenarien als Grundlage für Unternehmens- und Innovationsstrategien, in: Schönberger, Elbert (Hrsg.): Dimensionen der Logistik. Funktionen, Institutionen und Handlungsebenen, Wiesbaden (Gabler) 2010, S. 625 – 647.

⁷ Cf. <http://www.textilbuendnis.com/en/>.

⁸ Cf. <http://www.roadmaptozero.com/>.

- Normative impulses in terms of information rights and obligations are yet not strong enough (REACH 'right to know' on SVHC only effective for articles on sale in Europe, structural enforcement deficits as regards environment health and safety – EHS requirements in the supplier countries, but also as regards REACH in Europe)
- Consumer behaviour and their actual needs are of very limited significance for moving "boldly ahead."

5 Outlook

All actors agree on the findings presented in section 4.2. At the moment, the overall project results are disseminated and front runners are called upon to move to the phase of implementation.

Among the first steps is finding appropriate supportive tools. IT-supported information exchange systems providing for 'full material disclosure' in terms of chemical content of supplied (part) articles provide the arguably most advanced solution. The automotive sector, including most major original equipment manufacturers (OEM), has successfully implemented such an approach (called "International Material Data System", IMDS), designed to ensure compliance with chemical substance related requirements and at the same time facilitating circular mass flows. A new project kicked-off in September 2017 ("LIFE AskREACH") involves pilot studies with interested companies to test such communication tools also for other articles, including, but not limited to, textiles.