Eco fashion: fashion fad or future trend?

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Awareness of the impact current practices have on the environment is applicable to all spheres of life, industries, and countries, with emphasis placed on the wise and sparing use of resources. Similarly, eco fashion has become one of the lifestyle issues of the twenty-first century with some designers in the global and local fashion arenas, developing their collections around this concept. Yet, as pointed out by Lee and Sevier (2008) in discussions and debates on eco fashion, differing interpretations and endorsements of eco practices emerge. Does eco fashion refer to organic products, recycling, reuse, restoration? There are questions as to whether the concept could even be considered compatible with the idea of fashion. Breds, Hjort and Kruger (2002:27) maintain that many in the textile and apparel industry '… believe that there is a contradiction in working with sustainability [eco] and fashion'. This quote seems to be a true reflection of the fashion world where the consumer is constantly presented with seasonal and inter-seasonal changes. That consumers have an innate desire *to have the next best thing* is an idiom widely embraced in the fashion industry. How then, would it be possible to ensure, instil or develop eco-awareness and acceptance in the current consumer-based culture?

Kawamura (2005) argues that fashion is a collective activity created by all who contribute to its development and eventual acceptance. He further suggests that if the definitive essence of fashion is change, designers are the drivers of this change. Bower, Mallory and Ohlman (2005: 7) concur, and propose that 'it takes an informed designer to implement change, and one with enthusiasm to break boundaries and forge new directions'. By implication, it would seem that if eco fashion is to be a viable and widely accepted trend, design must be acknowledged as an essential force and key role player.

The article sets out to explain what fuels eco fashion through a discussion of components and processes, and how these influence designing. This is achieved by firstly comparing volume production, which is design-driven, to single production, which is consumer-driven. Secondly, the article investigates the development of products that adhere to eco criteria as set out in the definition of eco fashion given below. This is accomplished by considering all components an eco fashion product could consist of, as well as the production processes used in manufacturing eco fashion products. Thirdly, the article considers how the above factors influence the potential lifecycle of an eco fashion product.

For the purpose of this article, the concept eco fashion refers to ideas that are translated and developed into a product of clothing where the impact the product might have on the environment is taken into consideration. A generally assumed explanation of eco fashion is that it comprises of the following:

- Products whose components have a low environmental impact during their development, for example, the growing of organic cotton

- Products that ultimately lead to an improvement of the environment they pass through, for instance, working conditions in a manufacturing environment
- Products that exert a minimal impact on the natural environment (the landfill) once they have outlived their purpose.

Volume eco fashion production versus single eco fashion production

A schematic summary of the differences between design-driven and consumer-driven approaches to eco fashion is provided in Figure 1. In a design-driven approach, the concept of eco fashion becomes part of the decision-making process during the design stage. Such an approach *adds environmental value* to the fashion product at its design stage, and eco awareness is enforced through the design. This approach should be seen as instrumental in developing eco fashion as a sustainable trend for the mass market.

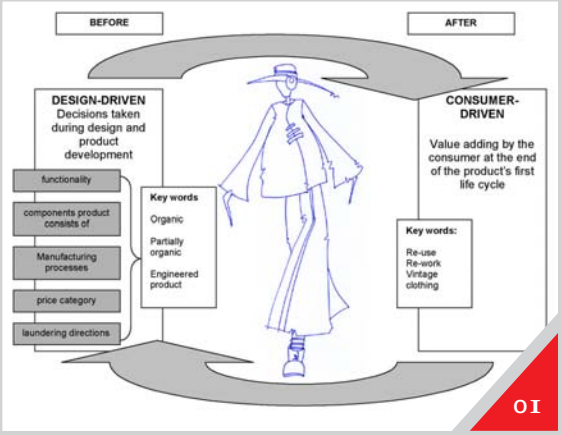

Figure 1: Design-driven versus consumer-driven: An approach to eco clothing.

In a consumer-driven approach, *eco awareness* is the deciding factor. This approach is only implemented to a product after it has fulfilled its intended lifecycle by an environmentally-conscious consumer or experimental designer and would only be feasible for very low volume production. This consumer-driven approach extends a product's lifecycle by converting the product into something else, thereby changing the functionality of the original product. The consumer driven approach could also supplement the original product in some way thereby extending its current use.

Figure 2: Alice Santoro (Bower, Mallory & Olhman 2005: 26)

Innovative re-use of existing products is employed by several designers as their medium of design. Some of these products are meant for a particular customer or intended to make a statement and will not be replicated (produced) in volume. A good example of a product intended to make a statement is a dress by Alice Santoro (in Bower, Mallory & Ohlman 2005:26-27) who developed a fabric woven from used Sony tapes.

Figure 3: Manual Wijffels
(Bower, Mallory & Olhman 2005: 111)

The garment itself made a sound when a tape head was moved over it. Dutch designer Manual Wijffels (in Bower, Mallory & Ohlman 2005:110-111) fused several synthetic shirts with a heated needle, resulting in an interesting design motif on the shirt. An additional focal point was formed by different fabric designs in the collar.

Spanish design house Domano (in Bower, Mallory & Ohlman 2005:118-119) produced bags from old advertising banners. Other examples could be reusing old denim jeans to make cushions or skirts; shrinking a woollen jersey for conversion to a handbag; embellishing an old item of clothing. All of the above examples are single products and the production method therefore is based on individual consumer (customer) requirements and the availability of materials. The product is developed according to an individual's specifications and the intended use of the product.

In contrast to this, eco volume production requires a changed approach to design. Some designers have already started to change the focus of their design considerations. Nina Valenti of naturevsfuture® believes in minimising waste and her designs are created to last longer (naturevsfuture 2008:1). She specifically uses fabrics that have a percentage of organic content made from cotton, wool, wood pulp, seaweed, hemp and a fibre derived from corn (Indigo®). She also uses Polartec®, a polyester fibre made from recycled plastic bottles. The clothes designed by EDUN, an eco label developed by Bono and Ali Hewson, has an emphasis on Fair Trade as well as a concern for the environment (Edun 2008:1-2). Bahar Shahpar (2008:1), a New York designer, claims to design only products that are made of ecologically sound materials and manufactured under conditions that try to minimise waste and overall energy consumption.

A local design label, Lunar, is the brainchild of fashion designer Karen ter Morhuizen, in partnership with Paul Harris (Lunarlife 2008:1). This label had a successful show at the Sanlam SAFashion Week, held in Johannesburg in August 2008.

The LUNAR label was also invited to take part in Aesthetica 2008, an eco fashion week concept in England. LUNAR tries to use only natural fibres and pigment dyes for their garments. Another label available in South Africa is Earthchild or Earthaddict. The label promises a '... sustainable future for the earth and her children' (Earthchild 2008: 1). Using organic fabrics, this label encourages socially responsible manufacturing in South Africa, as all products are produced locally. Earthchild has taken the eco fashion concept further by promoting eco as a lifestyle. Their website gives advice on eco laundering techniques, using resources responsibly, as well as offering education to under-privileged children through their Earthchild project, funded by a percentage of sales from their clothing.

All of the above examples are from designers that produce for the mass market where volume production is driven by design. Decisions the designer/design team make have a determining influence on components that are used in products and the manufacturing processes

Figure 4: Lunar (Lunarlife 2008: 1)

Table 1: Environmental impact during fibre, yarn and fabric development and manufacture

		Examples of components or processes	Negative impact on the environment	Type of environment
FIBRES	MAN-MADE	Polymers: Acetate, Viscose	Lubricants used during the manufacturing processes need to be washed off	Natural resources
		Polymers: Polyester, Polyamide, Acrylic, Elastane	Lubricants used during the manufacturing processes need to be washed off High temperatures use during manufacturing Removing residues that develop during manufacturing	Natural resources
	NATURAL	Animal fibres: Wool, Silk	Washing of impurities that have been added to the treatment of the raw material and could include oils, insecticides, removing the gum of the silk cocoon. High temperatures used during the processing of the fibres.	Natural resources
		Vegetable: Cotton	Contamination of ground water due to use of pesticides during the growing and harvesting process. Large volumes of water used.	Natural resources
YARN MANUFACTURE	MAN-MADE	Man-made fibres are usually produced ready for weaving or knitting as opposed to natural fibres that are harvested and need to be prepared in order to become yarns from which cloth can be produced.		
	NATURAL	Spinning of Wool and Cotton	Substances that are hard to degrade or could be toxic to the earth and aquatic life	Natural resources
CLOTH PRODUCTION	WOVEN CLOTH	Processes include warping, sizing and weaving	Cloth dust that accumulates during the manufacturing of the cloth. Additives that need to be removed. Additives that might be toxic or non-biodegradable.	Natural resources Human resources (immediate)
	KNITTED CLOTH	Process include waxing, warping and knitting	Short fibres released into the (similar to cloth dust). Additives that need to be removed.	Natural resources Human resources (immediate)

		Examples of components or processes	Negative impact on the environment	Type of environment
PRE-TREATMENT OF CLOTH	KNITTED AND WOVEN: natural and man-made	Processes could include singeing, desizing, scouring, mercerisation and bleaching	Dust, chemicals added to processes, removal of some chemicals (hydrogen peroxide, caustic soda, enzymes; to name a few) after process has been completed, neutralising these effluents in order to recycle/release into the environment, poorly biodegradable agents that are used air emission due to high temperatures that are required, or chemicals used.	Natural resources Human resources (immediate and surrounding)
DYIING	KNITTED AND WOVEN: Natural and man-made	Main dye categories include reactive, direct disperse, vat, azoic/naphtol chrome/mordant, metal complex, cationic/basic sulphur. Auxiliary processes are needed and include reducing agents, oxidising agents, salt carriers, levelling agents, complexing agents, wetting agents and dispersing agents	Some of the substances are absorbed into the fibres and some need to be removed from the cloth after dying. Some of the elements are hard to degrade or are non-biodegradable. This process requires the use of water, which will need to be re-used or discarded. Air emissions of chemicals also need to be considered.	Natural resources Human resources (immediate)
PRINTING	KNITTED AND WOVEN: Natural and man-made	Preparing and application of the print paste, drying and fixing and after treatments	Use of chemicals, some toxic and others less so, most have a poor biodegradability.	Natural resources Human resources (immediate and surrounding)
FINISHING	KNITTED AND WOVEN: Natural and man-made	Cloth is treated for: Easy care, flame retarding, softening, anti-static, moth proofing, bacterial and fungicidal anti-felting and water repellence	Chemicals are used in these processes.	Natural resources Human resources (immediate and surrounding)

Table 2: Environmental impact during clothing production

	Examples of components or processes	Impact it has on the environment	Type of environment
PRODUCT DEVELOPMENT	Decision made regarding all components that garment is made of, include: • Fabric • Lining • Interlining • Fastening methods • Thread • Additional components such as elastic, piping, ribbons	Biodegradability of components Re-cycle ability of components	Natural resources
MANUFACTURE	Method of production • Cutting • Sewing	Cloth dust during production Fair labour practices Safe working environment	Human resources
FINISHING and PACKAGING	Method of production • Finishing • Packing	Fair labour practices Safe working environment	Human resources
DISTRIBUTION	Method of distribution	Cloth dust that accumulates during the manufacturing of the cloth. Additives that need to be removed. Additives that might be toxic or non-biodegradable.	Natural resources Human resources (immediate)

used during the production of products. Volume production is based on consumer need and market preferences (trends). According to Bower, Mallory and Ohlman (2005:8), developing an eco trend is not necessarily a new design method, but a new approach to design – a new way of thinking. In every product, the designer needs to determine 'the hidden ugliness'. This implies that eco designers should closely investigate and be innately aware of all components and processes used in the development of eco clothing.

Cleaner production: components and processes

Cleaner production is often also referred to as waste minimisation, pollution prevention and eco-efficiency. The official definition by the United Nations Environment Programme UNEP (1990) states:

> Cleaner Production is the continuous application of an integrated preventative environmental strategy to process, products, and services to increase efficiency and reduce risks to humans and the environment (in Barclay 2008:12).

The National Cleaner Production Centre (NCPC) of the CSIR has developed two printed guides to assist South African textile mills and clothing manufacturers in developing textile components in an environmentally effective manner and in implementing mechanisms to ensure cleaner production methods in manufacturing processes. The first guide, published in 2004, refers to environmentally friendly fibre to fabric (textile) production. In the textile industry, this is described as Best Available (processing) Techniques; B.A.T. in short (Barclay 2004:9). The guide is derived from the European Commission BREF document for the Integrated Pollution Prevention and Control (IPPC) programme. According to the NCPC, the BREF document is cumbersome and prohibitive to some textile producers in South Africa. The quick reference guide was developed to 'act as an idea catalogue for B.A.T.' (Barclay 2004:9).

The second guide, completed in 2008, attempts to assist clothing manufacturers in defining cleaner processes in clothing manufacturing. Furthermore, the second guide assists clothing manufacturers in planning, assessing and identifying cleaner production opportunities in their manufacturing plants. The guide also aids manufacturers in implementing, reviewing, maintaining and sustainin cleaner production strategies in manufacturing (Barclay 2008:4-13).

The relevant information contained in the two guides has been summarised in two tables. Table 1 firstly gives examples of the components or processes that form part of the fibre/fabric construction. It secondly explains the type of impact these components/processes could have on the environment, and thirdly, specifies which environment will be affected. Table 2 gives information regarding the manufacturing processes of eco fashion products where fabric is transformed into a clothing garment, and the effect that these manufacturing processes could have on environments. As in Table 1, the information is a summary of components and processes used in manufacturing and the impact these processes have on the natural and working environment.

Low environmental impact could be controlled, for example, by:

- the manner in which fibres are cultivate naturally – organic cotton farming can be controlled in order to produce raw materials that will have a reduced negative effect on the environment
- controlling the manufacturing processes of man-made fibres
- the development of textiles through cleaner and more efficient spinning, weaving and knitting processes.

A hundred-per-cent organic cotton is the most commonly referred to example in organic fashion products. Hemp and rami fibres are increasingly being used, whereas other less considered organic material, such as the leaves of a pineapple and seaweed have also been applied with some success. Bamboo and wood-pulp are both organic compounds but in order to produce a textile from them, several chemical processes need to take place to derive a cellulose fibre that can be used to develop a piece of cloth.

Yet, the use of organic or other natural compounds is not the only method of developing fabric with a reduced or low impact on the environment. A recycled polyester

fibre manufactured from recycled PET (polyethylene terephthalate) or soda bottles, can also be considered as an eco fibre (EcoSpun) even though no organic components are included in the production of the fibre and ultimately, the polyester fabric (Collier & Tortora 2001: 524-527). Whether the fibre is organic or developed (such as EcoSpun), the *impact it has on the environment* remains the focal point. Eco fibres, natural or man-made, are spun to form yarns, which in turn are woven or knitted to create a piece of cloth/fabric. This process necessarily includes the use of chemicals and natural resources such as water. In the first guide Barclay (2004) outlines the impact the above-mentioned components have on the environment in detail, while the second guide (Table 2) (Barclay 2008) focuses more holistically on cleaner production strategies.

One of the cleaner production strategies discussed in the second guide is the reduction of waste during garment manufacturing. Depending on the production techniques and the product range, fabric waste and discarded threads and trimmings can equate up to twenty percent of the components used. Waste is everything that goes into the production process of the product, but which cannot be seen in the end product and could include solid waste such as excess fabric, thread and trimmings, and emissions during production that are released into the air, water or ground. Added to this is high-energy consumption during the production stage, as well as cloth dust and noise that could have a detrimental effect on staff in the working environment.

In the discussion on eco fashion, garment manufacturing processes can therefore not be separated from the fabric-textile pipeline as both affect the decisions to be made by the designer. The information contained in Tables 1 and 2 give a very brief summary of information covered extensively in the guides. The tables do, however, highlight what the designer needs to consider when developing a product that fulfils the criteria for low environmental impact.

Lifecycles of eco fashion products

Apart from adhering to aesthetics, shape and line, all clothing products are designed and developed to fulfil a specific function with the product's intended life span in mind. Some products are designed to only serve the current season, whereas others are designed to last for several. The colourful, fashionable and trendy t-shirt might last for two summers, but will actually only be fashionable this summer. A denim item bought as a trendy item this year, could be fashionable for the next four seasons. To understand the possible lifecycle of clothing products, it is useful to group them in the categories *cradle-to-grave* or *cradle-to-cradle.*

Figure 5 gives a schematic view of a cradle-to-grave product. In this figure, the product is produced and eventually ends up on the landfill, where it could degrade or not. Each of the components in the product's lifecycle could have an impact on the environment. McDonough and Braungardt (2002:27-30), describe this concept as having a linear approach that originated during a volume production era where all consumers were presumed to need the same product. Almost all products are still designed to be thrown away and therefore have obsolescence[1] built in. McDonough and Braungardt (2002) also refer to this as the monoculture approach, where other cultures such as the environment are not taken into consideration.

Bower, Mallory and Ohlman (2005:9-119) contend that eco design and products should adhere to the following characteristics: they should be cyclic, solar and safe, efficient and socially responsible.[2] Leading from the above, the cradle-to-grave concept could be transformed to a cradle-to-cradle[3] concept as illustrated below. Figure 6 gives a schematic explanation of a product that is fully or partially re-used at the end of its lifecycle. This type of product cycle can also be described as a developed/engineered product. In the cradle-to-cradle concept, at the end of its life cycle, the product is re-used to develop another, not always the same type of product.

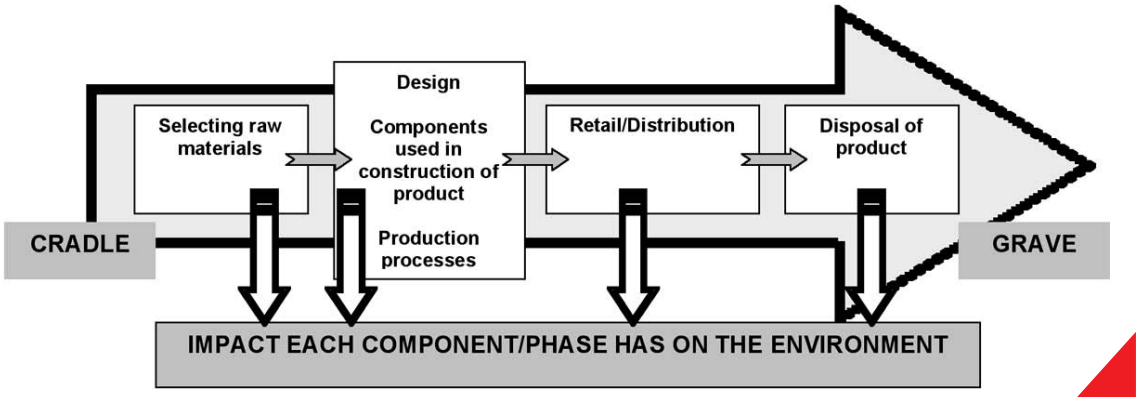

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Figure 5: Cradle-to-grave concept

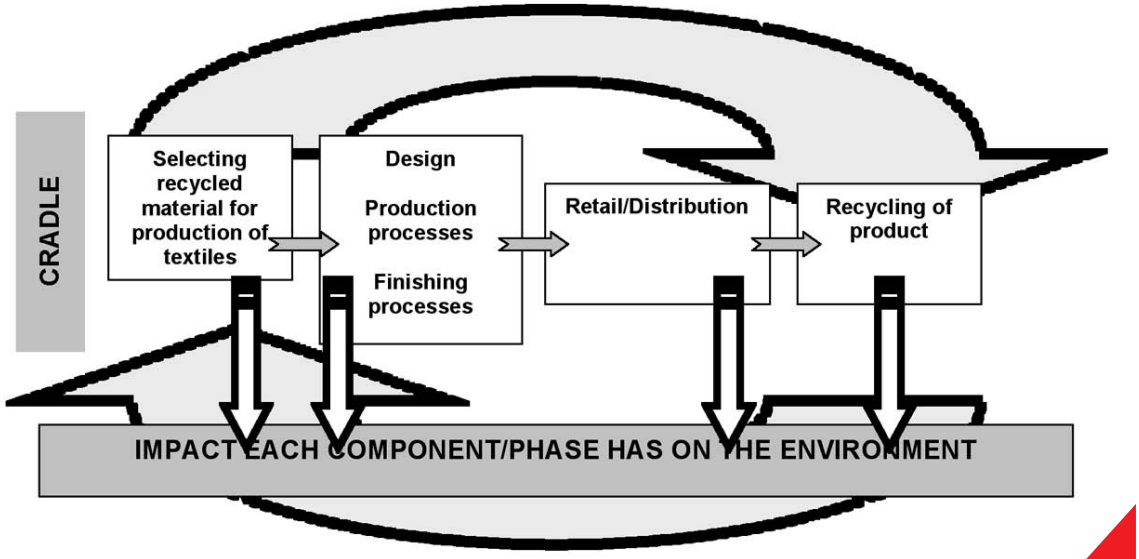

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Figure 6: Cradle-to-cradle concept

The most prominent example illustrating the cradle-to-cradle concept is the fleece products produced by Patagonia.[4] This manufacturer has used recycled plastic soda bottles to develop a polyester yarn for fleece[5] products. According to Lee and Sevier (2008), in the fourteen years that Patagonia has applied this particular technology in recycling, it has diverted 86 million plastic bottles from landfills. It is estimated that eleven recycled bottles are needed to make one man's size fleece top. In South Africa, Cape Union Mart has embarked on a similar process and produced a fleece range (K-Way) made of fifty-five to sixty-five per cent recycled materials. The fleece product was advertised as 'This Fleece is Rubbish' (This Fleece is Rubbish 2008:6).

Figure 7: K-Way product display (This Fleece is Rubbish 2008: 6)

The polyester fleece top is as much an example of eco clothing as the more accepted organic approach to eco fashion. One could therefore argue that eco fashion products could include products consisting of a hundred per cent organic components; products that are partially organic; and/or engineered products. An engineered product, such as the example of the fleece garment described above could be considered an eco product, only if the recycling processes have a lesser effect on the environment than producing the same product from scratch. Lee and Sevier (2008:6) mention that recycling plastic bottles to develop the fleece tops should use less oil than would be required to develop virgin polyester,

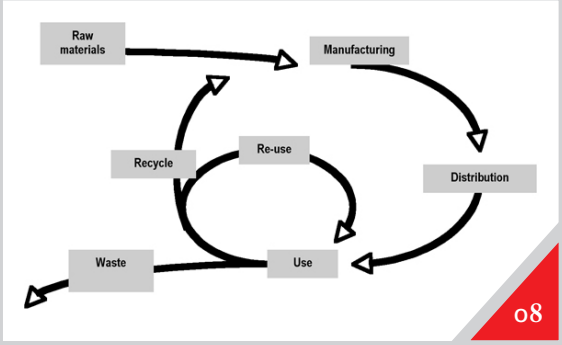

Figure 8: Circular Approach

and the oil saved is alleged to be enough to power a city the size of Atlanta for one year. Recycling cannot be an endless cycle. Whether fabrics are natural or man-made, the recycling process utilises chemicals that reduce the strength of the fibres. What recycling does accomplish is to keep a certain product, or components of a product, in circulation for much longer, as illustrated in Figure 8. Here the linear approach that is associated with the cradle-to-grave concept is replaced by a circular approach (Collier & Tortora 2001: 516).

Conclusion

The role of the designer has always been to develop collections that are current and have the correct degree of innovation to serve the market they are intended for. Decisions the designer makes in product development have an influence on the materials (components) that are selected as well as the manufacturing process a product will go through. It is believed that approximately 8 000 chemicals are used in the development of fabric, as well as high-energy consumption manufacturing processes. Apart from the above, many garments are not produced in the country where they are sold, leading to a high carbon footprint. Distribution processes and the impact they might have on the environment have not been part of the discussion in this article. Defining the carbon footprint of eco fashion definitely needs further attention as the South African textile industry largely comprises of imports of components and finished product. Developing eco fashion will put a far greater responsibility on the designer who has to contend with a whole range of challenges not usually encountered by other designers (Lee & Sevier 2008:2).

According to Lee and Sevier (2008:6), clothing sales in England increased by a third between 2001 and 2005, and approximately 1.1 million textiles are thrown away each year. Lester Brown (2006:4) notes the need for the current 'throwaway economy [to] be replaced by a comprehensive reuse/recycle economy'. He argues that products need to be developed and/or engineered in such a way that they can be disassembled and recycled. Is this possible with clothing? In addition, would it make sense to design a product in such a way that at the end of its lifecycle it could be 'disassembled'?

This article suggests eco fashion could address some critical issues and should be acknowledged for its potential to decrease negative effects on our natural and human resources, and be developed accordingly. The image (Figure 4) of the 2008 LUNAR collection could be of any designer, eco or not. The environmental elements designed into the products are not visible to the average consumer. Is that not what eco fashion should become – ordinary products required by the majority of the consumer group but that ultimately lead to the improvement of the environment? This could in due course lead to eco fashion developing into a sustainable future fashion trend and not merely a short-lived fashion fad.

Notes

1 Obsolescence is a term used for clothing products that have reached the last stage of the product life cycle and are then no longer needed or wanted by the consumer.

2 Bower, Mallory and Ohlman (2005:9-119) contend that eco design and products should adhere to the following characteristics:
Cyclic: refers to recycling or transforming materials or re-appropriated fabric.
Solar and safe: refers to responsible use of energy, taking the entire eco-footprint of the product into consideration, and cutting down on energy use during the manufacturing process.
Efficiency: refers to consideration given to other eco-systems, and instead of taking products that have reached the end of their cycle apart, to use them as is, in order to develop other products.
Socially responsible: socially responsible design means that the designer needs to be eco conscious when designing and taking responsible manufacturing processes into account.

3 Cradle-to-cradle concept is often referred to as the take-back programme. Bower, Mallory and Ohlman (2005:8-9) refer to this concept as end-of-cycle of a product or design.

4 Patagonia is an American based company that produces clothing for the outdoor market.

5 A fleece product (fleece top) is also referred to as a sweatshirt, a product that most consumers have as part of their leisure wear wardrobe and is most generally worn during colder months.

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