

# AN EVALUATION OF INTERPRETED TECHNICAL AND AESTHETICAL DESIGN SUITABILITY IN GARMENTS (AIMED AT A WESTERN MARKET) IN WHICH KALAHARI TUSSAH SILK WAS USED

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## Abstract

*Silk is a prestigious material, often used to produce textiles and clothing associated with rank, luxury, wealth and social status. In Africa silk is produced and used less extensively than cotton and wool – both geographically and socially. However, silk textile traditions in Africa have been sustained by the continuing demand for prestigious culturally significant clothes.*

*Kalahari tussah silk comes from a silk worm from the Kalahari, a vast region of red sandy soil extending across much of Southern Africa. The wild silk is a naturally occurring renewable resource used by the San, who are the original and oldest inhabitants of South- Africa. Small communities are located in a few areas like the Kalahari Desert region, and regions of Namibia (Lewis- Williams, 1991:6-11).*

*The aim of this project was to develop a range of garments suitable for the Kalahari tussah silk in order to utilize the silk in a sustainable way. The researcher incorporated design elements gleaned from the landscape of Namibia and the San culture in order to reflect aesthetic aspects of the San culture and of the Namibian landscape and to create awareness about the Kalahari tussah silk through the product designs.*

*The research question was; what are the findings of evaluating the interpreted technical and aesthetical design suitability in garments (aimed at a niche western market) in which Kalahari tussah silk was used?*

*The researcher used a qualitative research methodology for the study. In order to gain a better understanding of the how to incorporate design elements of the San culture into silk garments, literature concerning African silk, and the San tribes cultural costumes was included in the study. In order to incorporate design elements from the Kalahari a trip to Namibia was carried out in August 2008 and photographs of the landscape were used for inspiration. The researcher used this data to incorporate aesthetic design elements of the Kalahari and San culture into the designs. In order to gain a better understanding of what wild silk is a brief literature study of the properties and of wild silk was included. Experimentation with construction methods for the Kalahari tussah silk was done, and a range of six garments was constructed. The instrument for data collection was a structured face-to-face meeting held with a group of 6 participants using the Nominal Group technique in which the designs were evaluated for interpreted technical and aesthetical design suitability. The research population comprised of experts selected from the retail, design and fashion industry*

*The creation of the range of Kalahari tussah silk garments inspired by the Kalahari and the San culture could be a way of utilising a naturally renewable resource, of developing methods for the construction of Kalahari tussah silk fabric, and of increasing interest and awareness of Kalahari tussah silk by reflecting aesthetical aspects of the Kalahari landscape and the San Culture through the product designs. Findings indicated that, the range is technical suitable the Kalahari tussah silk fabric, and the designs (as interpreted by a western market) reflect aesthetic aspects of the Kalahari landscape and the San culture.*

**Key words:** *Cultural awareness, Kalahari Tussah Silk, Sustainable resource*

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## Introduction

Silk is a prestigious material, often used to produce textiles and clothing associated with rank, luxury, wealth and social status. In Africa silk is produced and used less extensively than cotton and wool - both geographically and socially (Spring & Hudson 2002:6). Although its use has been strongly

challenged by synthetic fibres it is still one of the important natural fibres of the fashion trade (Segroatt 1975:15). The worldwide demand for silk is increasing but production is decreasing and an opportunity exists for Southern Africa to use technical expertise to develop our own specialist silk industry (ICIPE 2007).

The creation of the range of Kalahari tussah silk garments inspired by the Kalahari and the San culture could be a way of utilising a naturally renewable resource, of developing methods for the construction of Kalahari tussah silk fabric, and of increasing interest and awareness of Kalahari tussah silk by reflecting aesthetical aspects of the Kalahari landscape and the San Culture through the product designs.

Therefore the researcher set do product development with the objectives of:

- Creating well constructed, beautifully designed ranges of garments
- Facilitating the utilisation of a natural renewable resource - wild tussah silk
- Incorporating design elements inspired by the Namibian landscape and the San culture into the garments, in order to reflect the beauty of the San culture and Namibian landscape through the product designs
- Collecting data to evaluate the interpreted technical and aesthetical design suitability in garments (aimed at a niche western market) in which Kalahari tussah silk was used.

In order to gain a better understanding of the cultural value of silk in Africa and how to incorporate design elements of the San culture, literature concerning African silk, and the San tribes' use of the wild silk cocoons, as well as the cultural costumes and the colours used by the San and other African cultures was included in the study. In order to incorporate design elements from the Kalahari a trip to Namibia was carried out in August 2008 and photographs of the landscape were used for inspiration. In order to gain a better understanding of what wild silk is a brief literature study of the properties and of wild silk was included. The researcher used this data to incorporate aesthetic design elements of the Kalahari and San culture into the designs. Experimentation with construction methods for the Kalahari tussah silk was done, and a range of six garments was constructed. The instrument for data collection was a structured face-to-face meeting held with a group of 6 participants using the Nominal Group technique in which the designs were evaluated for interpreted technical and aesthetical design suitability. The research population comprised of experts selected from the retail, design and fashion industry

## **Silk varieties, characteristics and production**

### **Silk**

There are many different types of silk; they can be differentiated as cultivated silk and wild silk. Cultivated silk is spun by silkworms that are raised on silk farms, while wild silk is obtained from cocoons of silkworms that grow in a natural uncontrolled environment. Cultivated silk is a beautiful luxurious fibre with a smooth luxurious hand feel. Wild silks are coarser in hand feel and texture (Willbanks 2005: <http://www.fabrics.net/amysilk.asp>). Silk fabrics have good absorbency. Fabrics made from silk are comfortable in the summer and warm in the winter. Silk fabrics have a moderate resistance to wrinkling. When dyed cultivated silk cloth has a deeper, richer appearance than many other dyed fabrics (Segroatt 1975:15).

Wild silk is a term used for both wild and less cultivated species. The latter includes Indian tussah (from Sanskrit *tasar*, a shuttle), eri and muga (Scott 2001:242). Wild silk is obtained from cocoons of silkworms that grow in a natural uncontrolled environment. The tannin inside the leaves that the silk worm consumes, gives the wild silk a pale brown colour (Scott 2001: 62). The most common type of wild silk is tussah silk (Willbanks 2005: art). Tussah silk is dark in colour, coarse in texture and is difficult to bleach because its natural colour is tan or brown. It is less shiny than cultivated silk (Dingle, et al 2005:9).

### **Wild Silk in Africa**

Some of the earliest written records of indigenous silk production of the *Bombyx Mori* (mulberry cocoon) in Africa come from Tunisia. This variety was also cultivated in Madagascar. Before production started, Chinese silk had been imported by Arab and Indian traders. As well as cultivated production several varieties of wild silk are known in Africa. In the highlands of Madagascar the indigenous *Borocera Madagascariensis* produces a coarse greyish-brown silk which resists dye. It is esteemed for its durability and used almost exclusively for weaving burial shrouds. The savanna

region of northern Nigeria is home to two varieties of wild silk collected from the cocoons of the *Anaphe Infracta* and *anaphe moloneyi* genus moths, which breed mainly on tamarind trees. The yarn is coarse, greyish-brown and lacking in luster. The *Anaphe Moloneyi* caterpillar produces clusters of whitish cocoons. The light-beige silk yarn is spun directly from these cocoons and is mainly used for embroidery (Spring & Hudson 2002:6-8).

### Tradition and change

It is often suggested that many African textile traditions are in imminent danger of disappearing in the face of mechanization, imported goods, changing social structures and modern fashions. However, while it may be true that certain traditions are in decline, others are taking their place just as rapidly. Throughout the continent there is probably more distinctively African cloth being manufactured today than at any other time. The use of silk and the traditions it has inspired have been associated with status and prestige, with the aristocracy and royalty and with ancestors. Silk textile traditions have been sustained by the continuing demand for prestigious culturally significant clothes, such as those worn at marriage in North Africa (Spring & Hudson 2002:19). These glamorous textiles are less exposed to competition from imported goods than more utilitarian textiles. On the other hand, silk weaving traditions in African countries may be more vulnerable to sudden social or political change, as with the disappearance of the *lamba akotofahana* in Madagascar. The *lamba* (generic name for cloth in Madagascar) is worn as a shawl for everyday wear, but the Merina peoples of Central Madagascar also use it as a shroud in which to wrap the dead during burial ceremonies. In the nineteenth century the Merina aristocracy developed a trend for wearing more complex designs, *lamba akotofahana*. This type of cloth was directly linked to a royal and aristocratic hierarchy that was largely dismantled during the colonial period. However in recent years silk weavers in both Tunisia and Madagascar, while continuing to make silk cloths for local people in styles to which they have become accustomed in the post-colonial era, are also experimenting with designs and patterns not used since the nineteenth century (Spring & Hudson 2002:19).

### Wild silk industry production in Africa

International demand for wild silk outstrips production by some twelve percent (CRIAASADC 2003:Art). Asian countries are no longer producing enough raw silk to satisfy demand but African farmers could reap the benefits of this market opportunity by supplementing their income with silk production, or sericulture (ICIPE 2007:Art).



Figure 1 *Gonometa postica* cocoon and Figure 2- *Gonometa postica* silkworm

### Kalahari tussah silk

The wild silk used for this study originates in the Kalahari - a vast region of red sandy soil extending across much of south-central Africa. "Kalahari Tussah silk" comes from a farm situated on the border between Namibia, Botswana and South Africa in the Southern Kalahari between the dry riverbeds of Nossob and Auob rivers. "Kalahari Tussah silk" is wild tussah silk from the *Gonometa Postica* silk worm (Oliver 2007). The Oliver family moved to Namibia in 1995 to raise livestock, and met the *Gonometa postica* when they lost cattle due to consumed cocoons. They learnt that the cocoons are actually wild silk, and started doing research about utilizing the silk. Kalahari Tussah has many of the properties of cultivated silk, but a series of unique problems of *Gonometa* cocoons had to be overcome; an excess of sericin and the spiky hairs protruding from the cocoons posed major obstacles. But after years of testing, production finally started in 2002 (Oliver 2007:Art).

The company 'Kalahari Tussah' was established to carry out product development and meet the needs of the community. Through utilization of the Kalahari tussah silk, Kalahari Tussah creates employment for people and supports scientists in the quest for a better understanding of *Gonometa Postica* (Oliver 2007:Art).



**Figure 3- Kalahari tussah silk and Figure 4 -Kalahari tussah silk fabric**

### **Processing and product development**

The only way to eradicate the threat posed to livestock agriculture by *Gonometa postica* is to collect and remove the cocoons from the branches of the Acacia trees.

Kalahari Tussah created the opportunity for individuals or groups to work collecting or cleaning cocoons, thus changing a problem into a resource. At a preliminary stage communities are encouraged to collect spent cocoons and sell them to depots. From the depot's the cocoons go to a degumming plant where the cocoons are prepared for degumming by hand. This is done by opening the cocoons and removing plant and animal matter from the inside of the cocoons. Cleaned cocoons are then washed, and degummed, yielding pure wild silk. Degummed cocoons are hand carded and sent to various spinners and weavers (Oliver 2007:art).

Kalahari Tussah is used in Yarns for fabrics and knitting. Blended with other fine fibres it enhances the texture and appearance with the qualities of silk. Currently Kalahari Tussah is used as a luxury fill for lightweight, anti-allergic duvets. Silk waste is used for fusing and paper making.

### **The San people of Namibia**

The San are the original and oldest inhabitants of South Africa. While few have managed to reclaim their traditional hunter-gatherer lifestyles, and the ancestral lands from which they were expelled, others are forging new lives as farmers and labourers in South Africa and remote regions in Southern Africa. Thousands of years ago the San were spread over a vast region, from the fertile areas of Southern Africa to the arid regions of Namibia. Due to displacement and subjugation, their numbers have dramatically dwindled, and they are now found only in very small communities in the Kalahari Desert region of the Northern Cape and North West Province in South Africa, and regions of Namibia, Botswana, Zambia and Zimbabwe (Lewis- Williams 1991:6-11).

### **Dancing costumes**

The dancers use various materials to aid them in their representation of the animals. They wear ankle-rattles to emphasise the rhythm of the animals' movements and make theatrical costumes to add another dimension to their performance. They create headdresses of feather to represent birds, and use horns, paint and animal skins to heighten their performances. Dances of animals are included on important occasions (Lewis-Williams 1991:9).

The San are known to be expert dancers. They tie ankle-rattles onto their feet and legs to aid their performances. The cocoons from the *Gnometa Postica* (Kalahari tussah silk) are found on thorn bushes all over Namibia. The San people collect them; remove the larvae in order to place small seeds or tiny pebbles inside. The cocoons are soaked in wet sand or wrapped in a wet cloth. Soft larvae are hooked or scratched out with a sharp object. Seeds or pebbles are pushed in through the opening which is then pressed closed. The cocoons are left to dry and then threaded using string or thread and a needle or long thorns. Sometimes colourful beads are threaded in between the cocoons (Mans 1997: 6-10).



**Figure 5 – Kalahari tussah silk cocoons and Figure 6 – San women wearing traditional clothing**

### **Clothing**

The Kalahari San men wear small loin-cloths. Occasionally sandals are also worn. Women wear skin aprons at the front and rear, and the front one often decorated with tassels or ostrich eggshell beads. In cold weather skin karosses are worn. They adorn their bodies or clothing with red ochre or charcoal for cosmetic and ritual purposes. Both sexes also smear fat and aromatic buchu powder onto themselves (Steyn 1990:69,73,83).

### **Rock paintings – colour with symbolic meaning**

When Bushmen want to express the elusive, multi-faceted nature of divinity, they turn to the diversity of the animal life around them. They express this in their shamanic dancing and rock paintings. The women clap the rhythm and sing ancient power songs, while the men dance around them. The clapping singing and dancing is believed to activate a supernatural potency that resided in the shamans themselves. The San chant animal names and compose songs to communicate to the stars and animals, celebrating their co-existence with them. Super natural power, and the dance that activates it, lies behind the rock paintings and engravings for which the Bushmen are justly famous. The shamans who were also painters took the powerful blood of the eland and mixed it with various pigments, some of which were likewise believed to have potency, and, in a now tranquil state, carefully painted their visions and their power animals on the rock face (Lewis-Williams 1991:6-11). Different substances were used to create rock art. Reds and browns, based mostly on iron oxides, are dominant colours in South African rock art. Limonite and plant pigments were sources of yellow, white silica, china clay and gypsum, among others, formed the basis of white paints. Charcoal was often used in black paint; while a variety of animal fats were used as binders (Steyn 1990:87). If one looks at the art through this perspective it becomes clear that it is much more than a mere colourful depiction of everyday life, but indeed scenes full of symbolic meaning (Steyn 1990:90).

### **Colours in cloth**

Colours add a dimension to the significance of cloth. For instance in Malagasy (the national language of Madagascar) colour symbolism is subtle; green is associated with mourning, and the term *lamb maitso*, literally 'green cloth' is one of the terms used to describe the mourning cloth. Similarly *lamba mena*, 'red cloth' is a term used to describe the shrouds used for burying the dead, though 'red' indicates its symbolic association with the ancestors, rather than the actual colour of the cloth. The colour red has been associated for centuries with royalty (who among the Merina were thought to be immortal), vitality and mystical power. Similarly *Rida ; ahmar*, the most prestigious of the silk textiles in Mahdia, Tunisia. The name literally translates as 'red shawl. In the 19<sup>th</sup> century white had been a colour associated with subordinate people, commoners and slaves, but in the post- colonial period the wearing of white silk *lamba* has become a mark of prestige and status (Spring & Hudson 2002:19). Similarly the red ochre or charcoal that the San use to adorn their bodies and clothing are for ritual purposes, the colours used in the San rock art reflect their symbolic meaning, and the tawny colour of Kalahari tussah silk reflects the earthy tones of the beautiful arid Namibia that is inhabited by the San.

### **Methodology**

Qualitative Research was used in this study, because it is used to answer questions of a complex nature and of phenomena with the purpose of describing, understanding, exploring and interpreting phenomena from a particular point of view (Leedy & Ormrod 2005). Exploratory research was used, because it focuses on exploring areas that have unanswered questions, and involved observation, and documentation of every step of the way to ensure no step of the unfolding of new knowledge is missed (Munro 2004:19). The instrument for collection of data was the Nominal Group Technique (NGT). The purpose of the NGT is to generate information in response to an issue that can then be prioritised through group discussion. Specific questions were addressed in depth among a sample population (Potter, Gordon & Hamer 2004). The format of the research was loosely structured and consisted of non-standardized observations and interviews, search themes and categories, acknowledgements and analysis, words, narratives and quotes. This way of reporting the data was chosen because it is an effective way of communicating when using qualitative research (Leedy & Ormrod 2005). Experimentation with construction methods was carried out to determine which methods would be most effective for the hand woven Kalahari Tussah silk.

### **Target population and sampling**

The population were experts selected from the retail, design and fashion industry. Quota sampling was used because it enabled the researcher to choose people with characteristics needed for the research. Six participants were used in a highly structured face-to-face meeting that lasted two hours (Potter, Gordon & Hamer 2004). These participants consisted of; a textile specialist, a fashion designer, the supplier of the wild tussah silk, an architect, a fine artist, and a financial expert. The nominal group was held in order to provide critical feedback concerning the designs and range development.

### **Data analysis and interpretation**

The constant comparative method of coding and pattern seeking was used to interpret data. This method was chosen in order to ensure that the range that was developed would visually communicate the right message, would be aesthetically pleasing, and would be marketable to the select niche of customers that frequent the boutiques in which the products may be stocked (Leedy & Ormrod 2005).

### **Trustworthiness of the research**

The researcher talked little, and listened a lot during interviews and while asking questions. Recording observations accurately, keeping up to date with reflections and records, recording them fully, in a candid way. To ensure the validity of the research, the correct criteria was selected, the extent to which the research instruments measure what they what they are supposed to was checked. To enhance the reliability of the research or extent that the research instruments yields consistent results when a similar characteristic is measured, standardization of processes was implemented (Salkind 2003: 107-120). Triangulation was used, by comparing a variety of data sources and different methods from one another in order to cross-check data and finally primary data was used from credible sources. To ensure the transferability and confirmability of the research, thick adequate descriptions were given to ensure no misunderstandings were possible, and feedback was received from experts in the field (Guba 1981:75-91).

The research took the following Ethical issues into account:

- Protection from harm- no undue physical /psychological harm to any persons participating or effected by the research was caused
- Informed consent- Participating in the study was strictly voluntary
- Right to privacy- The research respected the right of privacy that each person has.
- Honesty with professional colleagues- no fabrication of facts and plagiarism was committed (Salkind 2003:118-120).

In terms of philosophical issues of exploitation the researcher did not intend to steal ideas and styles from the San culture when creating the range, but appreciated, reinterpreted and drew inspiration from the San culture (Munro 2004:22).

### **Limitation of the research**

Due to the qualitative nature of the research findings they are susceptible to some degrees of bias, with an interpretative perspective of the complexities involved in the topic being almost inescapably related to ones subjective point of view.

This researcher did not carry out further research of the San culture; but utilised research that was already performed, and the scope of the range development was limited to items of clothing.

## Research findings



Figures 7 and 8 – Kalahari tussah silk and cotton design and wrap dress



Figures 9 and 10 – Kalahari tussah silk and wool design and jacket and trousers



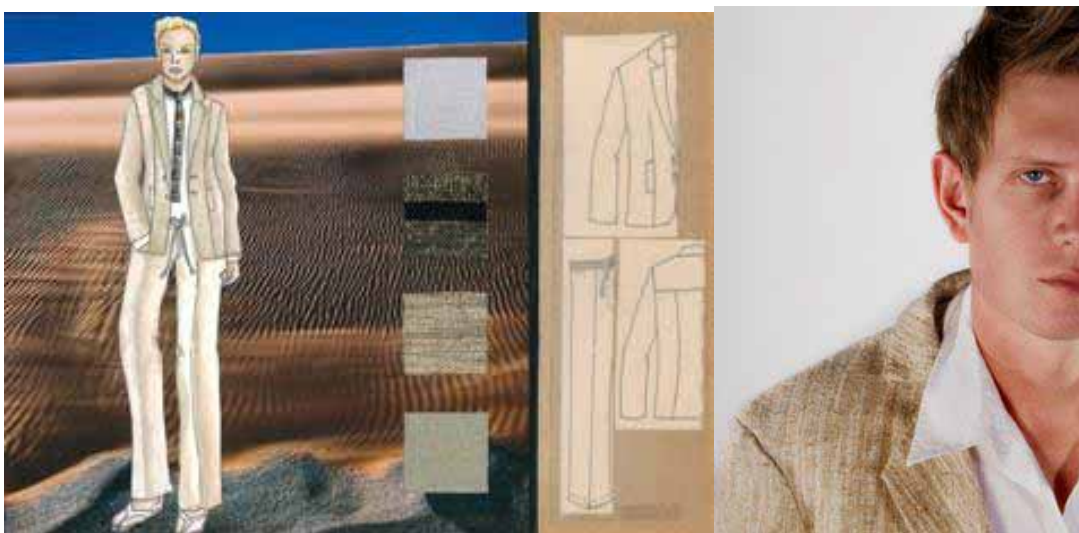
Figures 11 and 12 – Kalahari tussah silk and bamboo design and wrap dress



**Figures 13 and 14- Kalahari tussah silk and bamboo design and dress with jacket**



**Figures 15, 16 and 17- Kalahari bushman, Kalahari tussah silk and Indian silk design skirt with corset**



**Figures 18 & 19- Kalahari tussah silk and cotton men's design and suit**

During the nominal group the following interesting findings were determined when specific questions were directed at the sample group population.



## Question 1 – Design Elements

Write down your feelings, knowledge, and observations regarding the outcome of the *design elements* of the range of garments presented.

- Finding indicated that the designs suit the properties of the wild tussah silk
- The various textures and colours of the garments complement each other
- The designs are suitable for all body types and have interesting and elegant lines
- The designs reflect the Namibian landscape and aesthetical elements of the San culture
- The range is aesthetically suitable for a niche market

These findings indicated that the design elements of the garments did reflect the Namibian landscape and elements of the San culture. In figure 7 and 8 the garment is an asymmetrical wrap similar to the skins the San women tie around themselves. The front of the garment is beaded with handmade clay beads similar to the San use of beading on the front of their aprons. The red ocre colour and the patterns used on the dress are similar to the shapes and colours of the Kalahari desert dunes and the colour of the paint that the San use to adorn themselves. In Figure 9 & 10 the colours used are similar to those of the Kalahari landscape and the leather skins that the San use. Felted wool was used for embellishment in the abstract shape of a quiver tree. In Figure 11 & 12 the sand and cream colours are similar to the desert landscape. The shape of the shawl is similar to a kaross used by the San and the white mud beads used to embellish the garment are similar to the ostrich eggshell beads. Ostrich feather which the San used for fans were also incorporated into the belt. Asymmetrical seamless wraps are similar to the leather skins used by the San. In figure 13 & 14 the appliquéd patterns on the dress are similar to dried mud cracks in the Kalahari. The simple seamless design of the dress and the charcoal colour of the silk is similar to the charcoal colours of the paint that the San use to adorn themselves and to the colours in the landscape of the Kalahari. The jacket represents a kaross. In figure 18 & 19 the sand colour of the suit is similar to the colour of sand dunes in Namibia. The wood buttons used are similar to the natural wood and seed embellishments used by the San. The design has simple lines and the pants are comfortable and casual. In figure 15, 16 & 12 the silhouette of the skirt is similar to the silhouette of the quiver trees found in the Kalahari, and to the silhouette of a San man with dreadlocked hair. The ruffles at the top of the corset represent the leaves of a quiver tree. The layered skirt is similar to the layers of the skins the San women wear. The textures of the silk represent the textures of the quiver tree bark.

Most of the participants voted that the garments are suited to the properties of the Kalahari tussah silk fabric and that the colours, textures and designs complement each other. That the garments are aesthetically suitable for a niche market, have interesting, elegant lines and suit all figure types.

## Question 2 - Construction

Write down your feelings, knowledge, and observations regarding the outcome of the *construction* of the range of garments presented.

- Findings indicated that the construction methods used are applicable for the Kalahari tussah silk fabric
- The garments should be constructed for more than one size by using bias cuts or wraps
- Construction takes into account the nature of the woven fabric
- All materials should be fused with interfacing to help reinforce construction
- Specialised construction is for a niche' market , not for mass production

In terms of the construction of the range of garments, most participants indicated that the garments and accessories are constructed specifically for the Kalahari tussah silk. Participants found the construction methods used as applicable for the Kalahari tussah silk fabric, and that the garments do take into account the nature of the woven fabric. They also indicated that the garments are designed specifically for the Kalahari tussah silk.

Most of the garments in the range are designed without side seams and are cut on the bias to prevent the hand woven silk from fraying and to cater for different sizes. They stated that all materials should be fused with interfacing to help reinforce construction, due to the specialised construction processes the garments are for a niche' market. All the garments were fused with interfacing for reinforcement.

### Question 3 – Physical Characteristics

Write down your feelings, knowledge, and observations regarding the outcome of the *physical characteristics* of the range of garments presented.

- Findings indicated that unique, unusual weaves complement the silk
- Wear and tear of garments, and friction distorting certain areas should be considered
- Label instructions must be suitable and informative
- The textured silk is well contrasted with silk chiffon

In terms of the physical characteristics of the range of garments presented, most participants found that unique, unusual weaves complement the silk and that the wear and tear of garments, and friction distorting certain areas should be considered. Also label instructions should be suitable and informative, and that textured silk is well contrasted with the silk chiffon used in the range. Based on the findings elicited from the participants of the Nominal group the following conclusions were made.

### Conclusions and recommendations

In terms of findings regarding the construction, design elements and physical properties of the silk the following was concluded:

- The garment designs are suitable for all body types and therefore can be marketed to customers with all body types.
- Garments should be marketed to a niche market because they were found to be aesthetically suitable and specialised construction was found to be unsuitable for mass production.
- It is recommended that more unique and unusual weaves are used in constructing the silk fabric, because it was found that these types of weaves complement the silk.
- All materials must be fused to reinforce construction of the Wild Tussah silk fabric.
- Label instructions must be informative in order to educate potential customers about the silk.
- Chiffon and other contrasting fabric complement the silk when incorporated with it.
- The garment designs can be used specifically for Wild Tussah Silk Fabrics because it was found that they suit the properties of the Wild Tussah Silk.
- The construction methods were technically suitable because the construction methods were found to be appropriate for the wild tussah silk
- It was found that the designs do reflect the Namibian landscape and aesthetical aspects of the San culture.

It is recommended that the research findings are taken into account when considering the design elements, construction, and physical characteristics of future product ranges. There is a broad scope for further studies that could be undertaken;

- The evaluation of the benefits that the Kalahari tussah silk could provide for the community and potential customers.
- How the construction of the silk fabric can be improved to complement garment development and construction
- Dye processes and colours specifically for the Kalahari tussah silk
- How people perceive the Kalahari tussah silk and other organic, naturally sustainable fibres.

To conclude the range of products developed for the Kalahari tussah silk products was successful in achieving the main aims of; creating aesthetically and technically suitable designs (for the western market) while reflecting design elements of the Namibian landscape and the San culture.

### References

CRIAASADC- Centre for Research Information and Action in Africa, South Africa Development and Consulting,2003.*Wild Silk*. [http://www.criaasadc.org/wildsilk\\_tech.htm](http://www.criaasadc.org/wildsilk_tech.htm) [1 May 2008]

Government of Australia.Dingle, Hassan,Gupta, George, Anota,Begum. 2005: Silk Production in Australia. Australia: Rural Industries Research& Development Corporation (05/145 ,UQ-96A)

Guba, E. G. 1981 Criteria for assessing the trustworthiness of naturalistic inquiries. *Education communication and technology*, 29(2)

- ICIPE - International Centre of Insect Physiology and Ecology In a spin for silk. Windhoek <http://www.new-agri.co.uk/99-3/focuson/focuson7.html> [10 May 2008]
- Kamarad, L. Ladislav Kamarad [http://www.horolezec.cz/galery/a\\_gal\\_66/namibia/galnamba.html](http://www.horolezec.cz/galery/a_gal_66/namibia/galnamba.html) [10 April 2008]
- Leedy, P.D. & Ormrod, J.E. 2005: *Practical Research: Planning and Design*. (8th ed.) New Jersey: Pearson Merrill Prentice Hall
- Lewis-Williams, D. 1991: *Bushman: A changing way of life* (2nd ed.) Cape Town: Unifoto (Pty) Ltd
- Mans, M. 1997: *Ongoma! Notes on Namibian Musical Instruments*. (2nd ed.) Namibia:Garnaberg Macmillian Publishers (Pty) Ltd
- Munro, A. 2004. *An introduction to research in the arts*, Arts faculty, Tshwane University of Technology.
- Oliver, G. 2007.Kalahari tussah. [O] <http://kalaharitussah.com/index.php> [1 May 2008]
- Potter, M., Gordon, S. & Hamer,P. 2004. *NZ Journal of Physiotherapy*. University of Western Australia 32(3)
- Salkind, N.J. 2003. *Exploring Research*. (5th Ed.) New Jersey: Prentice Hall.
- Scott, P. 2001. *The book of silk*. United Kingdom: Thames & Hudson
- Schoeman, A. 2003. *Kalahari Wild silk*. <http://www.holidaytravel.com.na/index.php?fArticleId=499>[10 April 2008]
- Segroatt ,M. 1975. *A basic textile book:fibres,yarns,spinning,weaving,dyeing,printing*. New York: Van Nostrand Reinhold Company.
- Spring, C. & Hudson, J. 2002. *Silk in Africa*. London: The British museum Press
- Steyn, HP. 1990: *Vanished Lifestyles: The early Cape Khoi and San* Pretoria: Unibook Publishers(Pty) Ltd
- Willbanks,A . 2005 *Fabric Properties and distinctions: Silk* <http://www.fabrics.net/amysilk.asp> Textile Fabric Consultants, Inc.[10 April. 2008]

## Short Biography

**Lisa Slegtenhorst** is a lecturer of Fashion Design at the Central University of Technology. She was awarded the Higher Diploma in Fashion (cum laude) in 2008, and received the best student award. From 2005 until 2007 Lisa worked in the fashion industry as a Merchandiser. Currently Lisa is studying towards a Diploma in Higher Education, and plans to continue with her master's degree in Fashion in 2010.

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