EXCELLENCIA
INTERNATIONAL MULTI-DISCIPLINARY JOURNAL OF EDUCATION
Volume 02, Issue 05, 2024 ISSN (E): 2994-9521

Different Sources of Textile and Diverse Ways of Upcycling of Textile and Clothing Waste in Akampka Local Government Area in Cross River State

Myrtle Usen IBOKETTE, Ph.D,
Department of Home Economics
University of Uyo, Uyo

Mfoniso Ezekiel UDO, Ph.D
Department of Home Economics
University of Uyo, Uyo

Ngozi NWONYE, Ph.D
Department of Home Economics
University of Uyo, Uyo

Abstract

The study sought to assess the different sources of textile and diverse ways of upcycling of textile and clothing waste. The study adopted a descriptive survey design. The research area was Akampka Local Government Area in Cross River State. The population of this study comprised 438 fashion industries and customers. A sample size of 44 respondents was selected from the entire population. The instrument for data collection is a structured questionnaire that was developed by the researcher titled "Upcycling Materials in Clothing Construction (UMICCHPAD)". The data obtained were analysed using Cronbach's Alpha reliability coefficient which portrayed a correlation coefficient of

0.7, indicating the reliability of the instrument. From the study and finding it was concluded that Upcycling offers significant potentials to the textile and clothing industry to reduce environmental impact while creating desirable products. One of the recommendations made from the study states that end users of textile and clothing products should take their textile and clothing waste to industries or upcycling centres instead of wasting them.
Keywords: Clothing Waste and Upcycling

INTRODUCTION

Upcycling is often considered as a process in which waste materials are converted into something of higher value and/or quality in their second life. It has been increasingly recognized as a promising means to reduce material and energy use. The Practice of upcycling has been actively promoted and practiced by increasing number of entrepreneurs (Rissmann, 2018).

Upcycling involves taking materials or garments that would otherwise be discarded and transform them into new, higher value products. Upcycling is reinventing, reworking and trying to obtain new forms out of materials and products without losing their original qualities that identify them. When you recycle something, it loses its original form. With upcycling, you can still identify the original object after it has assumed its new function.

There are several ways in which materials v=can be incorporated into clothing construction, for example: Small scraps or leftover fabric pieces can be to create patches or appliqués on clothing. These can also add unique and artistic touches to garments. Fabric Panels and Inserts which involves the process of incorporating upcycled fabrics as panels or inserts in garments which can also create visual interest and add texture to the clothing. Trims and Embellishments, also used upcycled materials like ribbons, lace, buttons, and beads as trims and embellishments and can be added to collars, cuffs, hems, or pockets to give garments a personalized and individual look. Upcycled Denim helps in transforming old denim jeans into new garments like skirts, jackets or bags. One can repurpose the original denim fabric to create unique pieces with added elements like patches, embroidery, or distressing. Missed-Textile Garments combine different upcycled textiles in a single garment to create a patchwork effect. Mix fabrics of varying textures, patterns, and colors creating visually striking and one-of-a-kind pieces. Reconstructed Clothing Take apart of old garments and repurposes the fabrics and details to create new clothing items. For example, transform an old shirt into a new dress or use the sleeves of an old sweater to make fingerless gloves. Textile waste such as damaged or unwearable garments, can be upcycled by cutting them into smaller pieces and using them as patches, appliques or fabric for new designs. This approach helps to extend the life span of the materials and reduces the amount of textile waste sent to landfills.

Statement of Problem

One of the pressing issues in the fashion industry is the wastefulness and environmental impact caused by the constant production and disposal of clothing. The majority of clothing is made from virgin materials, requiring vast amount of resources and energy, while also contributing to pollution and waste generation. Additionally, the post-consumer waste from discarded garments further exacerbates the problem. Upcycling, the process of transforming discarded materials into new products of higher

value, has emerged as a potential solution to address this problem. By utilizing materials that would otherwise end up in landfills or incinerators, upcycling offers a more sustainable approach to clothing production.

Objective of the Study

The study sought to:

1. Determine the different sources of textile and clothing waste.
2. Determine diverse ways textile and clothing waste can be upcycled.

Research Questions

1. What are the different sources of textile and clothing waste?
2. What are the diverse ways textile and clothing wastes can be upcycled?

LITERATURE REVIEW

Concept of Upcycling

Upcycling is a sustainable practice that involves transforming waste materials or old products into new and higher-value items. It is a creative process that relies on innovative design techniques to give new life and purpose to discarded materials, rather than simply breaking them down or turning them into raw materials.

Unlike recycling, which typically involves breaking down products into basic materials for remanufacturing, upcycling focuses on adding value and extending the lifespan of existing materials. It promotes resourcefulness, creativity and the reduction of waste by utilizing materials in new and unconventional ways.

Upcycling in clothing construction can take many forms, such as repurposing old garments into new designs, using discarded fabric scraps to create patchwork designs, or incorporating unconventional materials like bicycle inner tubes or coffee sacks into clothing construction.

Overall, upcycling offers a sustainable and creative approach to clothing construction, promoting resourcefulness, reducing waste, and fostering individuality. It encourages us to rethink our relationship with fashion and waste, embracing the potential of discarding materials to create something new and valuable.

Concept of Textile and Clothing Waste

Waste is an unwanted or unstable material. Waste is any substance discarded after primary use., or is worthless, non-effective and of no use. A by-produce, by contrasts is a joint product of relative minor economic value. A waste product may become a by-product, joint product or a resource through an invention that raises a waste product value above zero.

In most of the manufacturing processes, waste is inevitable. The trash left out after each process during production remains waste. It is the difference between the amount of input and the amount of output expresses in percentage. In context to the fashion industries, textile waste is a material that is deemed unusable, for its original purpose by the owner. Textile waste also includes fashion and textile industry waste created during fiber, textile and clothing production, and consumer waste created during consumer use and disposal. Some wastage of materials takes place due to a different reason like trial run, machine breakdown, poor quality raw materials, inferior workmanship, shrinkage, evaporation, etc.

Types of Textile and Clothing Waste

Textile and clothing waste can come from different textile and clothing manufacturing department like spinning, weaving, dyeing, finishing, garment manufacturing and even from the consumer end. Now we will know about the details from the below points.

Spinning Waste

Cotton fiber bale a lot of wastage such as foreign particles, dust, seeds, short fibers, etc. and so when processed through different sections of spinning mill then different types of wastage are produced in different sections. The wastage % in blow room is 3% and blow room waste is called lap waste, carding section wastage % is about 10%. The wastage of carding sections are called dropping-1, dropping-2 and silver waste. The wastage % in the comber section is about 14-15% and the wastage are called noils, lap and vacuum waste. The % of wattage in the simplex section is about 0.5% and the wastage are called roving and silver waste.

Weaving Waste

Like spinning mills, different types of wastage are found in weaving also. Now we will know about it. Residual yarns which are left on the cones after warping are considered wastage in the wrapping creel section it is not possible to empty all the cones and there will always be a little amount of yarns left on the cones.

Dyeing Waste

Textile dyeing factories are the most common factories to generate waste water which is a great threat to our environment. Many machines manufacturing companies are trying to introduce new technologies to reduce waste water. Some are trying to develop waterless dyeing methods. Textile dyes significantly compromise the aesthetic quality of water bodies, increase biochemical and chemical oxygen demands (BOD and COD) impair photosynthesis, inhibit plant growth, enter the food chain, provide recalcitrance and bioaccumulation and may promote toxicity, mutagenicity and carcinogenicity.

Source of Textile and Clothing Waste

The main sources of textile and clothing waste in municipal solid waste (MSW) is discarding clothing, although other smaller sources include Tins, Rubbers, Old cloths, Towels, Plastics, Jeans, etc. In the world today, there has been a growing awareness of the damage caused to the environment by the haphazard use of chemicals, some of which are very poisonous and carcinogenic. Textile industry has been strongly criticized as being part of the words was law breakers in terms of pollution because it demands a large amount of water and chemicals. Although air, water and noise pollution are created at every step of fabric treatment, most problem-filled fabric wet processing, in terms of the huge amount of water and the goodly number of chemicals used in wet processing and on completion of the process, leftover dyes and chemicals together with water are discharged as effluents. As the amount of sludge created by wastewater treatment increases, effective reuse as saw disposal of sludge becomes most important.

Classification of Textile and Clothing Wastes

Textile and clothing waste can be divided into three main groups: Production waste, Post-production waste and Industrial waste. Production waste can also be referred as pre-consumer waste while the post production waste can be known as post-consumer waste. Below is a detailed classification of such cloth waste.

Production Waste

These are basically raw materials of each production step which cannot be put into end product due to different reasons. Production waste or pre-consumer waste are generated throughout the first stages of the supply chain. This type of waste can be generated at any point of the production line, from spinning in weaving in cut-make-sew operations. It includes silver cute, filter waste, comber noil, pneumafil waste and yarn waste, garment cutting excess, trimmings, print trials, and errors in dye lots, production surplus and end of rolls. For yarn spinners, these wastes can occur during clearing of the filters in different machines of spinning. These clean/unclean wastes in fiber form or not can be reused (Dam, et. al., 2020). It should be noted that production waste can be soft waste or hard waste.

Post-Production Waste

Post-production waste is also referred as post-consumer waste. These are mostly household waste. It is the waste generated and collected after the consumer has used and disposed of it. Second handed clothing waste is clothing or fashion accessories that have been used as discarded by consumers. Post-consumer textile waste originates from household sources and consist of garments or textiles which the owner no longer needs.

Ways to Dispose Textile and Clothing Waste

Incinerating textiles is not ideal, it seem like the best options to endure cloths do not pile up in landfills: however, these can result in many negative health efforts.

When cloths get incinerated, they release carbon dioxide methane and other greenhouse gases which diminishes air quality and contributes to the growing climate crisis and that is not the worst of it. Incineration also release toxin which the dyes and chemicals used in clothing. Some incinerators do have vacuum systems to keep the harmful vapors contained: however, most are vented directly into the atmosphere.

Exposure to even the lowest levels of methane can cause headache, dizziness and nausea. In addition, most dyes and solvents used in fast clothing is considered carcinogenic, so when these textiles are burned, the toxin are released into the air or left as ash which again, ends up in landfills (Moorhouse & Moorhouse, 2017). If incineration is skipped, and clothing ends up in landfill, fibres can take hundreds, even thousands of years to breakdown. And as most fibres are not compostable, so after years of decomposing, the chemicals and dyes begin to leach out of the clothing and into the soil and groundwater. There are plenty of graphics in the media depicting overflowing landfills, how much water it takes to create a piece of clothing. However, there is still very little information on the effect waste has our health.

Waste Management Methods in the Textile and Clothing Industry

The methods and actions required to manage garbage from its beginning to the end are referred to aa waste management. This encompasses waste collection, transportation, treatment and disposal as well as waste management process monitoring and control, as well as waste related laws, technologies and economic systems. The presences of humans on earth is the outcome of a fortunate series of situation in which prerequisites for species development were there, allowing evolution to occurs and for us to achieve or current state of being. Changes in these conditions could imperil our frail existence at any time, and this far reaching effect could emerge from modifications that appear minor by cosmic measures. They could, for example, cause our inability to breath, stay warm or cool, or grow the food we require. As a result, we can only exist because our planet provides all of the food we require with little work on our side. As our environment, we can generally define the set of conditions to which we are exposed (Chatterjee, 2008).

Commercially, the manufacturing of textile goods influences textile waste generation the more the output, the larger the amount of trash. This, in turn, is a function of consumer demand, which is determined by economic conditions. While this may have a minor impact on trash output in the manufacturing sector, it has a considerable higher impact on home textile waste production. Consumers respond to changes in fashion in both apparel and home interior design. Clothing can become outdated extremely fast due to seasonal changes in fashion, which encourages the substitution and disposal of outdated, high quality apparel. As a result, in reaction to a throwaway society, manufactures will increasingly produce large quantities of low durability apparel. Economic success also have an impact on this tendency as consumer spending increases, so those waste output from both the manufacturing and home sector (Woolridge, 2006).

Upcycling Textile and Clothing Waste

Patchwork and quilting: Patchwork involves using small fabric pieces to create a larger piece of textile often by sewing them together in a decorative pattern. Quilting refers to stitching multiple layers together, resulting in a thicker, warmer fabric (Alden, 2019).

Clothing reconstruction: Transform old garments into new creations by cutting, combining, and sewing them together. This method allows you to create unique pieces such as skirts, bags, or accessories from old clothes (McDonough & Braungart, 2013).

Textile embellishment: Add decorative elements like embroidery, appliqué, or fabric paint to old garments to give them a fresh and unique look. This method can significantly transform plain or worn-out textiles.

Textile upcycling: Convert clothing waste into new textiles. This can involve techniques such as fiber extraction, where fibers from discarded clothing are processed create new yarns or fabrics. Another method includes shredding old textiles to create filling for pillows or pet beds.

Dyeing and printing: Give a new life to old textiles by dyeing them using natural or eco-friendly dyes. You can also experiment with fabric printing techniques like block printing or stenciling to create custom designs on old clothing (Cutting, & Irvine, 2017).

There are just a few examples of upcycling methods for textile and clothing waste. Remember, the possibilities are endless, and you can get creative and tailor these methods to suit your specific needs and resources.

METHODOLOGY

The study adopted a descriptive survey design. The research area was Akampka Local Government Area in Cross River State. The population of this study comprised of 438 fashion industries and customers. A sample of 44 was selected from the entire population. The instrument for data collection is a structured questionnaire that was developed by the researcher titled "Upcycling Materials in Clothing Construction (UMICCHPAD)". The data obtained were analysed using Cronbach's reliability coefficient which portrayed a correlation coefficient of 0.7 which indicates the reliability of the instrument.

RESULTS AND DISCUSSIONS

Research Question 1

Table 1:

Mean response of respondents on the different sources of textile and clothing waste n1=15, n2=29

S/N	Sources of Textile	Male		Decision	Female		Decision
		Mean	SD		Mean	SD	
1.	Textile and Clothing waste can be obtained from household	3.33	488	Y	3.17	384	Y
2.	Textile and Clothing waste can be obtained from companies	3.20	414	Y	3.31	471	Y
3.	Clothing factories produce Textile and Clothing waste	3.47	516	Y	3.59	501	Y
4.	Textile and Clothing waste can be obtained from boutiques	3.40	507	Y	3.59	501	Y
5.	Textile and Clothing waste can be obtained from fashion designers	3.20	414	Y	3.59	501	Y
6.	Textile and Clothing waste can be obtained from embroiders	3.53	515	Y	3.45	506	Y
	Cluster Mean	**3.36**	**476**	**Y**	**3.43**	**478**	Y

Source: Field Survey, 2023

Y = Yes and N = No

Table 1 showed the response of respondents on the different sources of textile and clothing waste. All items were above the cut-off mark of 2.50 for male and female respondents. Therefore, they accepted all the above items as sources of textile waste. The findings reveal that the source of textile and clothing waste can be obtained from: households, companies clothing factory, fashion designers, boutiques, embroiders, etc. this finding was obtained from (Kar Duraisamy & Thangavel, 2013)

Research Question 2

What are the diverse ways of upcycling textile and clothing waste into sustainable products?

Table 2:

Mean response of respondent on the diverse methods of upcycling textile and clothing waste into sustainable products.

n1=15, n2=29

S/N	Methods of upcycling Textile and Clothing waste	Male			Female		
		Mean	**SD**	**Decision**	**Mean**	**SD**	**Decision**
1	Textile and Clothing waste can be upcycled sustainable products through bleaching	3.40	507	Y	3.24	436	Y
2	Textile and Clothing waste can be upcycled into sustainable products through shredding	3.47	516	Y	3.41	501	Y
3	Textile can be upcycled into sustainable products through sewing	3.53	3.516	Y	3.55	506	Y
4	Textile can be upcycled into sustainable products through braiding	3.20	414	Y	3.52	509	Y
5	Textile can be upcycled into sustainable products through dyeing	3.26	458	Y	3.34	484	Y
	Cluster Mean	**3.72**	**482**	**Y**	**3.41**	**487**	**Y**

Source: Field Survey, 2023

Y = Yes, and N = No.

Table 2 shows the diverse ways upcycling textile and clothing waste into sustainable products. All the items were above the cut-off point of 2.5. this means that both males and female agreed that the above methods used for upcycling textile waste into sustainable products can be gotten from upcycled textile waste materials. This finding also reveals the reverse ways textile and clothing waste can be

upcycled, bleaching, shredding, sewing, braiding, dying. This finding was sourced from (McDonough & Braungart, 2002).

Conclusion

The findings were based on the research of the upcycling of clothing waste which showed that there are diverse ways clothing waste can be upcycled to acceptable products. In conclusion, it is true that upcycling offers significant potentials to the textile and clothing industry, helping them reduce environmental impact while creating desirable products.

Recommendations

Based on the findings and conclusion the following recommendations were made:

1. End users of textile and clothing products should take their textile and clothing waste to industries or upcycling centres instead of wasting them.
2. Textile and clothing waste should not be disposed to the ecosystem rather be upcycled.

REFERENCES

1. Alden, M. (2019). *"Textile Upcycling".* The New York Times. Available at: https://www.nytimes.com/guides/smarterliving/how-to-upcycle-clothing.
2. Chatterjee, K. N., Khandual, A., & Jindal, R. (2008). Fabric usage and various fabric losses in cutting room. *Indian Textile Journal,* 118(10), 37. https//indiantextilejournal.com /article/FAdetails.Asp?Id=1307
3. Cutting, R., & Irvine, V. (2017). *"Sustainable Fashion and Textiles: design Journeys."* Routledge.
4. Dam, R. F., and Siang, T. Y. (2020). 5 stages in the design thinking process. *Interaction Design Foundation.* Retrieved April 10, 2020, from https://www.interactiondesign.org /literature/article/5-stages-in-the-design-thinkiing-process.
5. Kar Duraisamy, G & Thangavel, K. (2013). *Impact of textiles on environmental issues* Part III. 10. 40-43.
6. McDonough, W., & Braungart, M. (2013). *"The Upcycle: Beyound Sustainability---Designing for Abundance."* North Point Press
7. Moorhouse, D., & Moorhouse, D. (2017). Sustainable design: circular economy in fashion and textiles. *The design journal*, 20(sup1), s1948-S1959. http://dio.org/1080/14606925.2017. 1352713 Article Google Scholar.
8. Rissmann, J. (2018). *Upcycling Textile Waste: Delivering Better Textile Recycling in New Zealand.* Otago Business School.
9. Woolridge, A., Ward, G., Philips, P., Gandy, S., (2006). Life cycle assessment for reuse/recycling of donated waste textiles compared to use of virgin material: an UK energy saving perspective. *Resources, Conservation and Recycling*. 46:94-103. DOI:10.1016/J. resconrec.2005.06.006.