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Processing of Locally Obtainable Materials for On-Loom Basketry: A Means of Recycling Waste from the Environment

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ABSTRACT

The study was to find out how feasible materials from the environment can be processed manually and used on the broadloom for basketry products. The research was based on qualitative methods. Interviews were conducted and responses were collected from basketry producers as to the appropriate materials used for basketry and their processing. Observation was done since researchers have to observe the nature of the materials during processing. The researchers again used descriptive method to describe the various processing procedures. Purposive sampling technique was used for selecting producers of basketry. The research has revealed that when pliable materials from the environment are processed well, they can be used on-loom for basketry products in the form of mats which can also be converted into three dimensional shapes as basketry product.

KEYWORDS: *On-loom; Straw; Polythene; Raffia*

1. INTRODUCTION

Basketry is practiced in almost every part of Ghana. This is probably because basketry materials are widely available and can be obtained at little or no cost. There have been a declined in the study of basketry in Ghanaian schools, especially in the Junior and Senior High schools, although it forms part of their syllabus.

This may be due to the fact that there has not been enough variation in terms of materials and processing. For instance, most of the baskets are made up of either rattan (cane) or palm frond and in other areas, for example, in the Northen part of Ghana straw from the flower stalk of guinea grass (*Panicum maximum*). These materials are normally used off–loom. In order for Ghanaian students and indigenous basket makers to have an interest in basketry there was the need to add other materials to the existing ones, such as rattan, palm frond and straw from flower stalk of guinea grass (*Panicum maximum*) and processed for on - loom basketry. Students as well as basket makers need to be creative in exploring the environment for different basketry materials in order to bring variations in their final products and also contribute to the reduction of littering in the environment.

Material such as fabric pieces, are thrown away by fashion designers as waste; polyethylene sheets are also scattered everywhere in the Ghanaian environment; farmers after cultivation of

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land also burn Guinea grass (*Panicum maximum*) and spear grass (*Imperata cylindrica*). Sisal is used as ornamental plants for decoration at home. Banana trunk after harvesting the fruit is discarded. The researchers realized that these materials can be used for basketry when they are processed well.

Croes (1977) noted that the acquisition of basketry materials are determined by the basket makers who have the knowledge about selection of materials for basketry. Croes explained further that specific plant, its parts and how to get it ready for use are all considered by the basket makers, and mentioned some parts of plant as the root, bark, leaf or stem and stated that it can be prepared by splitting, thinning and sectioning. Anderson (1999), talked about shrubs and trees as basketry materials used in some traditional societies in California for work basket. Croes mentioned specific parts of plant such as the root, bark, leaf or stem, and again how it can be prepared, Anderson mention shrubs and trees for basketry but how it should be prepared was not mention. Researchers exploring for different basketry material for on-loom basketry noticed banana stem fibres as suitable.

According to Nicemo and Parukuttyamma (2008), banana fibers can be extracted by using chemical, mechanical and biological methods. They further explained the effect of the methods, that the use of chemical method will pollute the environment, the use of mechanical method will not help in the removal of the gummy substance from the fibres, but the biological method will help in getting more fibres. Although various methods of banana fibre extraction and its effects have been mentioned by Nicemo and Parukuttyamma, detailed explanation of the methods were not given to know how it affected the fibre extraction.

Atul. et al. (2013), were of the same view as Nicemol and Parukuttyamma by using manual and mechanical means of banana fibre extraction. Atul. et al mention scrapper a com-like structure and Banana Fibre Extractor for fibre preparation. But no effect of using the device was mentioned.

Craig (1982), explained that basketry materials are first soaked for some minutes before the start of the actual work. Craig gave different ways of preparing basketry materials. By trimming of strands to get uniformity in terms of width and thickness and scraping to achieve even diameter, splitting of roots and shoots these are bound into coils and used as sewing strands. Redbud (*Cerisoccidentalis*), maple (*Acer macrophyllum*), willow, briar and bulrush (*Scirpussp*) were also mentioned as basketry materials. Research on basketry materials and its preparation according to researchers differs from one area to another based on the materials available, the type of basket one wants to produce, function or purpose of the basket.

2. METHODOLOGY

Quasi-experimental as well as descriptive research methods were employed in the study. The quasi - experimental method of research was used by the researchers to find out the feasibility of preparing local materials to be used on the loom for basketry production. The descriptive method was used to describe the various processes for the preparation of the local materials for on-loom basketry.

In terms of population, only people who have knowledge in basketry and in the trade were selected for the study. In all twenty (20) basketry producers, representing 100% of the population

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was accessible for the study. In order to obtain the necessary data from the respondents, interview and observation were used as an instrument for the study. Interview used in the study was to find out the kinds of materials used by the indigenous basketry producers. Such materials were mentioned as palm frond, rattan and bamboo. Observation as a data collection instrument was used to study procedures for basketry materials preparation such as scratching the back of rattan, splitting of palm frond and removal of inner tissue and polishing.

3. Materials and processing

3.1 Banana (Musa sapientum) fibres

There are different varieties of banana. Some have very long stem while the stem of others is quite short. According to Unternehmensberatung (1975), the stem of different varieties can grow up to the height of 2-7m and have a diameter of up to 40cm. When the stem is critically observed, 11-15 closely layered leaf sheaths can be found. The part of the plant which contains the fibers is the trunk. The diameter of the trunk consists of vertical channels and these channels are filled with sap and air.

3.2 Fibre extraction

Since the fibres form an integral part of the sheaths, there was the need for the researcher to remove them for use. The layers had to be first separated from the main stem. The extraction of the fibres was done by beating the fibres out of the stem sheath using mallet and mallet board. Fibres were combed after using a domestic comb to remove unwanted materials and also to remove shorter fibres. Washing was carried out to remove dirt and other particles inherent in the fibres. Drying of fibres was the last stage of this manually extracted fibre from the banana stem. Sample of product after processing and weaving is shown in figures 1(a) and (b).

3.3 Flower stalks of Guinea grass (Panicum maximum)

Guinea grass is a perennial grass that grows in tussocks. It has long, narrow, leaves. The leaf blade and sheath have soft hairs on the surface. It has a stalk (straw) which flowers to produce seeds at the top of the plant. The flower stalks are pulled out and processed for basketry.

3.4 Preparation of straw (Guinea grass)

The fresh stalks are pulled out and dried in the sun for two weeks depending on the condition of the weather. Each of the dried stalks is split into two with the teeth and placed on the leg and rolled with the palm of the hand to give it a twist. Figures 2(a) and (b) is the resultant product from the loom after weaving in a mat form.

3.5 Sisal fibres

Sisal is one of the materials which can be used for basketry. According to Willson (1971), it is one of the most extensively cultivated hard fibres in the world. Willson further states that it accounts for half the total production of the textile fibers, and at the same time it may be used as basketry materials. The plant is composed of numerous elongated fusiform fibre cells that taper towards each end of the leaf.

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3.6 Extraction of fibres

The leaf of the sisal plant was harvested using a kitchen knife. The leaves were retted in a container to soften the tissues, making it ready for beating. The retted leaves were placed on the mallet board and beaten gently with the mallet in order not to break the fibres combing was done to straighten the fibres. The mass of fibres was then washed using the detergent Omo, which also acts as a bleaching agent to bleach fibres. Fibres was turned into rope form which served as a yarn for weaving on the loom. Figure 3(a) and (b) show the next product from the sisal plant after weaving.

3.7 Kenaf rope

Kenaf is one of the bast fibres. The kenaf ropes, bought from the market, were unraveled and dyed with green *suede dye*. The dye was mixed with water and salt and boiled for fifteen (15) minutes. The dyed materials were removed and dried. The next step was to weave the prepared rope on the loom and see the effect and how the effect can be used to serve a purpose (figure 4a and b).

3.8 Fabric pieces

Pre-experimental work revealed that waste fabric pieces can be used as a basketry material on the loom. Different fabric pieces were collected from the tailoring shops and cut into strips. Afterwards, the strips were given a slight twist to form a coil-like rope and used as weft on the loom for basketry product which can be used to decorate living room furniture as in figure 5(a) and (b).

3.9 Polythene strips

Waste polythene bags were collected and washed to remove dirt. Afterwards, the washed materials were dried and cut into strips to be used as weft during weaving for production of hand bag as shown in figure 6(a) and (b).

3.10 Raffia

Raffia was obtained from the leaflets of the raffia palm. The process of extraction was done by using a traditional method to separate the heavier, green layer of the leaflet and the lighter, creamy yellow layer and peel them apart. The creamy yellow material called raffia, was then dried. In order to give it more aesthetic appeal, the resultant film was dyed with suede dye, using hot dyeing method. Interesting colour and weave effect was achieved after dyeing and weaving figure 7(a). The woven mat was used for a folder figure 7(b).

3.11 Spear grass (Imperata cylindrica)

This grass is one of the most dominant and harmful weeds because it is very difficult to control (Boadi, personal communication, September 22, 2010). The researchers speculated that the leaves of this grass could be used to serve a good purpose in basketry and it was processed and used for table mat figures 8(a) and (b).

3.12 Preparation of spear grass

After cutting them from the field the grasses were dried under a shed. Drying under the shade helped to maintain the greenish brown colour of the grass material.

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3.14 Dyeing of the Materials

Natural plant dyes were used to dye the sisal and banana fibres. The fresh root of the *Morinda lucida* plant which is known to yield red and yellow dyes known in Akan as *ngo ne nkyene* was harvested and chopped into pieces and boiled in a sauce pan for thirty (30) minutes to get a good shade of colour red and yellow. Six spoonfuls of common salt were added as a mordant. The sisal and banana fibres were immersed in the hot dye for 30 minutes each. After the fibres had obtained a good shade of natural yellow, the fibres were then removed and dried. The resultant colour was natural yellow.

Another dye, green *suede*, was used to dye the kenaf rope. The dye was mixed with water and boiled for fifteen (15) minutes. After the fifteen minutes, three (3) spoonful of common salt was added to the dye to serve as a mordant to fix the colour. The fibres were boiled in the dye for another fifteen minutes and then removed and dried.

4.1 RESULT AND DISCUSSION

Fibres from Banana (*Musa sapientum*) stem

The sheathes of the banana stem were subjected to retting in order to soften them for easy removal of the fibres. Due to the water-proof nature of the sheathes, retting became difficult. The sheathes resisted water penetration which was needed to aid fermentation of the tissue surrounding the fibres. The sheathes had to be beaten to obtain the fibres. Some of the fibres broke off when the sheathes were beaten hard.

Washing of fibres for the removal of unwanted materials resulted in entanglement of some fibres. Therefore combing was done to align the fibre and also to remove other tissues. The combing process resulted in waste of fibres. The breakage of fibres as a result of combing made it impossible to obtained long rope to use as yarn.

4.2 Flower stalk of guinea grass (Panicum maximum)

The preparation of straw (flower stalk of guinea grass) which involved the use of the human thigh and the palm of the hand for twisting eventually affected the skin. Continuous twisting using the bare skin of the leg gradually affected the skin due to persistent rubbing of the outer layer of the skin. The drying process made the straw a little harder. The drying process made the straw a little tougher.

4.3 Sisal fibres

Fibre processing was similar to the processing of banana fibres. Washing of fibres entangled some of the fibres together, and in trying to separate the fibres a lot of short fibres were wasted. It was noticed that fibres from sisal dyed well with some natural dyes.

4.4 Polythene strips

It was difficult to cut the polythene strips into regular sizes because of their slippery nature. They resisted dyeing because they repelled water. Therefore the original colours had to be maintained.

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4.5 Raffia

Raffia yarns had a characteristic film-like nature which is creamy in colour. It is highly pliable, making it easy to control. The dyeing test conducted using swede dye gave good results. Therefore it can enhance the aesthetic quality of any basketry work.

4.6 Spear grass *(Imperata cylindrica)*

After the primary processing stage, natural brown colour was obtained. The spear grass from the cutting stage to the drying stage needs careful preparation because it can cause body itching. The grass should be well dried to avoid shrinkage after use.

4.7 Fabric pieces

They were easily twisted into rope form ready to use as weft. The strips obtained after cutting were very short in length. Some of the fabric pieces were also very difficult to twist into rope form for use.

4.8 Kenaf rope

The rope which was in a 3-ply form was untwisted to obtain single yarn. During this process it was observed that some loose fibres fell out. It was also observed that the single yarns were weak and easy to break. The fibres have good affinity for natural dyes. The dyed roped after drying becomes ready for weaving.

5. CONCLUSION

Care should be taken in the preparation of banana fibres and sisal fibres in order not to lose more fibres. To make fibre lie parallel and for avoidance of waste, open-up domestic comb should be used during processing.

Dyeing using natural plant dyes such as *Morinda lucida* plant can enhance the aesthetic value of the final product. Also it may not have any effect on the fibres unlike the synthetic dyes.

Plant which contains fibres can be processed for basketry production as well as any flexible materials which can be controlled on the loom.
Processing waste from the environment for basketry production may not only clean the environment but can also create job for people.

6. Recommendations

Ghana Education Service should revisit their curriculum and make changes in the basketry programme so that students can explore their environment for materials to be used for basketry.
Manpower looms such as broadloom and table looms should be made available to Junior and Senior High Schools in Ghana to start on-loom basketry.

Basketry producers can start using other materials such as sisal, fibres from banana trunk, and polythene sheets for basketry products so that there can be variations in their production.

National Youth Authority can adopt this research as a module and train people to process materials mentioned in this research for on-loom basketry.

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Fig. 1(a) Woven mat (Banana fibres)
Source: Osei and Osei-Poku(2014)

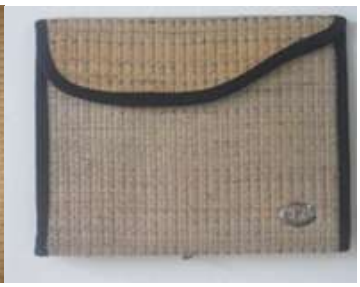

Fig. 1(b). Folder
Source: Osei and Osei-Poku(2014)

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Fig. 2 (a) Woven mat (guinea grass)
Source: Osei and Osei-Poku (2014)

Fig. 2(b) Curtain
Source: Osei and Osei-Poku(2014)

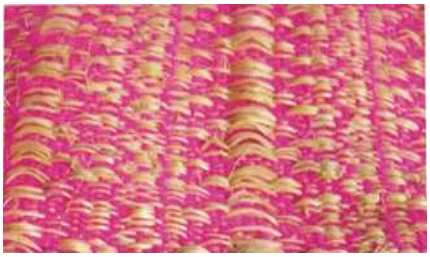

Fig. 3 (a) Twill weave mat (sisal fibre)
Source: Osei and Osei-Poku(2014)

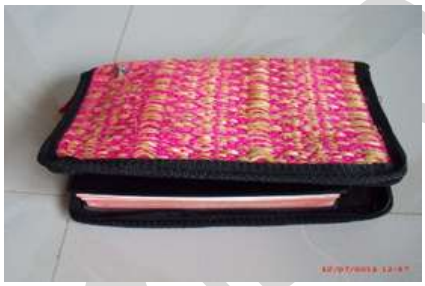

Fig. 3 (a) Bible case
Source: Osei and Osei-Poku(2014)

Fig. 4 (a) Diamond twill mat (Kenaf rope)
Source: Osei and Osei-Poku(2014)

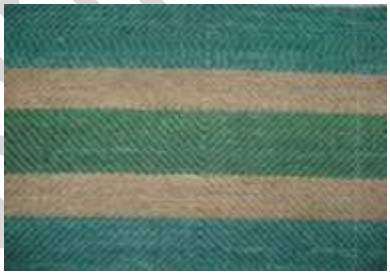

Fig. 4 (b) Bed mat
Source: Osei and Osei-Poku(2014)

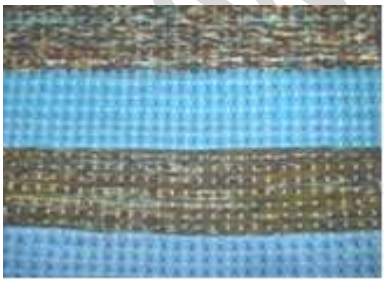

Fig. 5 (a) Woven mat (fabric pieces)
Source: Osei and Osei-Poku(2014)

Fig. 5 (b) Chair mat
Source: Osei and Osei-Poku(2014)

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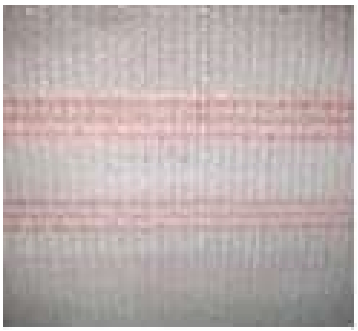

Fig. 6 (a) Woven mat (Polythene strips)

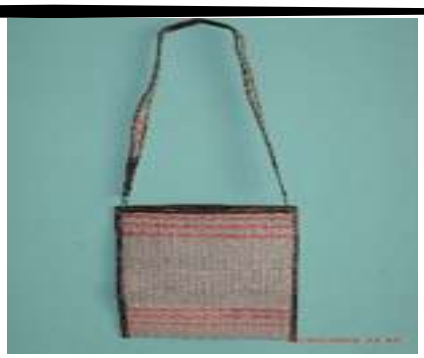

Fig. 6 (b) Hand bag

Source: Osei and Osei-Poku(2014)Source: Osei and Osei-Poku(2014)

Fig. 7 (a) Plain woven mat (raffia)

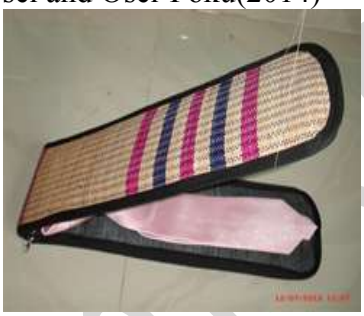

Fig. 7 (b) Flying –tie case

Source: Osei and Osei-Poku(2014)Source: Osei and Osei-Poku(2014)

Fig. 8 (a) Plain weave mat (spear grass)

Source: Osei and Osei-Poku(2014)

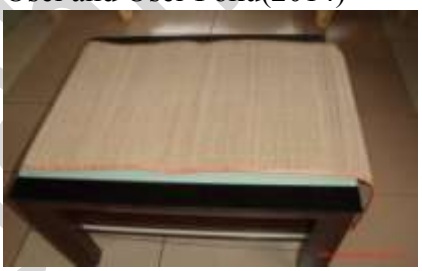

Fig. (b) Table mat (spear grass)

Source: Osei and Osei-Poku(2014)