Research Application Summary

Local processing of plant fibres: Current status of the industry in Swaziland

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Abstract

A variety of natural fibre based products are made in Swaziland for local and export markets. Minimal or no treatment is done to the fibres to improve quality and hence their low comfort properties which reduce their marketability. The aim of the study was to explore enzymatic treatment of fibres from sisal (*Agave sasilana*), century plant (*Agave americana*) and pineapple (*Ananas comosus*) with the objective of developing comfortable and environmentally friendly (green) products. The specific objectives of the study were to establish the current status of the plant fibre industry, the demography of the stakeholders (industry players) and the problems and concerns encountered with the idea of improving the industry. A qualitative and quantitative study was carried out in the Hhohho, Manzini and Shiselweni regions. Participatory rural appraisal (PRA) tools and questionnaires were employed in the study. The findings revealed that women and men of varying age groups were involved, various crude techniques were used in fibre extraction, raw material was sourced from abandoned plantings, various dyes used were obtained from indigenous plants and that some marketing problems were encountered.

Key words: Exports, fibre extraction, natural plant fibres, plant dyes, products

Résumé

Une variété de produits à base de fibres naturelles estfabriquée au Swaziland pour les marchés locaux et d'exportation. Le traitement minimal ou nul est fait pour les fibres en vue d'améliorer la qualité et donc leurs propriétés de confort pour augmenter leur valeur marchande dans le monde entier. Le but de cette étude était d'explorer le traitement enzymatique des fibres de sisal *(Agave sasilana)*, de la plante du siècle*(Agave americana)* et de l'ananas *(Ananas comosus)* avec l'objectif général de développerdes produits confortables et respectueux de l'environnement (verts). Les objectifs spécifiques de cette étude préliminaire étaient d'établir l'état actuel de l'industrie de la fibre végétale, la démographie des parties prenantes

(acteurs de l'industrie) et les problèmes et les préoccupations rencontrées avec l'idée d'améliorer l'industrie. Une étude qualitative et quantitative a été réalisée dans les régions de Hhohho, Manzini et Shiselweni. Les outils d'évaluation rurale participative (PRA) et les questionnaires ont été utilisés dans l'étude. Les résultats ont révélé que les femmes et les hommes des groupes d'âge différents ont été impliqués, que les techniques bruts différents ont été utilisées dans l'extraction des fibres, que les matières premières provenaient de plantations abandonnées, que les différents colorants utilisés ont été obtenus à partir de plantes indigènes et que certains problèmes de commercialisation ont été rencontrées.

Mots clés: Exportations, extraction des fibres, fibres végétales naturelles, colorants végétaux, produits

Background

In Swaziland, part of the handicraft industry is made up of a well organised formal sector that works with rural women in product development and exports most of its products to developed countries like Europe, America and Japan. On the other hand, there is an informal sector that mainly sells its products locally at tourist attraction sites. A wide range of products including baskets, floor mats, fruits and vegetable preservation mats, among others are made from natural fibres and serve as the rural women's source of livelihood (Zwane and Masarirambi, 2009). *Agave sisalana* fibres are the most used raw material for craft items in the country. Other plant fibres such as those derived from *Agave americana* and *Ananas comosus* plants, whose raw materials are largely abundant in the Kingdom of Swaziland, are currently not utilised extensively, yet they have a great potential for producing agro-based products. Additionally, alternative value-added products can be made from the plant fibres and need to be explored. Furthermore, more eco-friendly processing procedures and methods need to be utilised in order to produce competitive products in the global market. The aim of this study was to explore the current operations of the local fibre industry in northern Swaziland.

Literature Summary

The consumption of natural fibres decreased from the 1960s to 2005 (Anandjiwala, 2006) largely because they were replaced with synthetic fibres from petroleum. Reserves of petroleum fossils have been reducing over the past decades, as a result, there is a renewed interest in green fibres like cotton, sisal, jute, flax, kenaf and allied fibres (Kozlowski, 2000). Some of these

were predominant fibre sources in the 1930s. Plant fibres are green and environmentally friendly. The challenges on the ecosystem with the two industrial revolutions have rekindled the interest in green fibres in both developing and developed countries (Kozlowski, 2000). Developing countries are mostly concerned with value-addition of local natural resources for economic gains with little consideration on the negative impact their exploitation may have on the environment.

Enzymatic processing of plant fibres has not gained popularity particularly in developing countries, despite being eco-friendly (Anandjiwala, 2006). Enzymatic processing degrades the lignocellulosic complex in fibre swelling, lowers the degree of polymerisation, making fibres more pliable and softer (Zwane, 1997; Dutta *et al*., 2000). A group of enzymes that include cellulase, pectinase and hemicellulase have been used to control hydrolysis of the constituents in jute and have made the fibres soft, more pliable and spinnable than untreated fibres (Dutta *et al*., 2000). Soft fibres are relatively easy to work with and products made from them are comfortable to wear.

Study Description

A Participatory Rural Appraisal (PRA) is currently underway to gather data on the current situation and identify challenges experienced by the plant fibre weavers. Four areas with women fibre processors were visited; two in the northern and two in the southern part of the country. Methods for fibre extraction currently being used by rural women are being assessed. Data are also being collected on the type of raw materials, source of raw materials and challenges in countered in the industry.

Research Application

The Mayiwane area, in the northern part of the country had young married women in the association. Such an occurrence has been rare before due to the arduous nature of the work involved. Furthermore, strategies had been devised on how to deal with the itchiness impacted on the human body from the sisal extracts on the skin when decorticating, which include the use of rubber gloves or application of vaseline ointment. The procurement of sisal leaves is taxing and at times limits the production of allied products. There is a huge need for hand tools to assist rural people to increase productivity of their income generating activities. In addition, there is a great need to form plant fibre weavers associations in the southern part of the country and to establish markets; small initiatives with minimal financial implications in the local markets should also be explored. A suggestion was made for the women to plant the sisal plants

at the periphery are of their fields because the plants growing in the wild at times burnt by wild fires. Establishing their own plantings would improve the ease of procuring the leaves.

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