ENSURING ENFORCEMENT PERFORMANCE IN THE TEXTILE, WEARING APPAREL, CARPET, LEATHER FOOTWEAR SECTORS

By

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In the year 1992, Nigeria produced about 500 million linear meters of all types of fabrics representing 72 per cent of the West African production, with existing installed spinning capacity of 500,000 metric tons per annum from 26,000 rotors and 810,000 spindles of which 60 per cent is cotton and 40 per cent synthetics. Nigeria has a share of 24 per cent installed short staple ring spinning capacity, 31 per cent open-end spinning capacity and 35 per cent and 29 per cent for shuttleless and shuttle looms respectively; of the sub-Sahara Africa installed capacity.

The textile industry which then employed more than 300,000 direct employed Nigerians, run chain of activities as fibre production (cotton and synthetic fibres), spinning, weaving, dying and finishing, printing, made-up textile goods, knitting, carpet furnishing, sacks/bags, etc., which its major production process including ginning, spinning, weaving, knitting, dying, printing and finishing. The manufacturing companies are located within the country at Lagos and environs, Kaduna, Katsina, Kano, Edo, Delta, Aba and other Southeastern states. 50 per cent of the spinning mills and 60 per cent of the weaving mills are concentrated in Lagos and environs. Kaduna and Kano account for 24 per cent of the spinning mills and 27 per cent of the weaving mills. While the southeastern states account for 16 per cent of the spinning mills and 13 per cent of the weaving mills.

The introduction of regulatory framework and increased public pressure for improvement in river quality standard is forcing some textile processes under new

or stricter pollution controls. The awareness of the environmental damage caused by textile production has provoked a different response from the industry. Consequently, the industry has had to address pollution caused by the various processes as direct response to pressures from environmental legislation.

Man-made fibres have implications of energy use and resource depletion because they come from oil, and natural fibres. Particularly, wool and cotton require pesticides and herbicides to ensure quality, healthy growth and efficient harvesting. Environmental damage caused by cotton production has led to a number of alternatives such as unbleached cotton, 'green' cotton and naturally coloured cotton. We have also seen the revival of old traditions in the cultivation of hemp, nettle and peat fibres. Currently, new processes for the recycling of cellulosics and synthetics are being developed, opening the path to new design ideas and new aesthetic values. An interesting development is the production of synthetic fibres made from recycled PET plastic bottles igniting the growing interest in the marketing potential of recycled products, particularly in the active sportswear market.

Although, these developments heightened some of the pollution problems, it is still very much a 'niche' market and barely impinges upon a wider problem inherent from the industry. If we take organic cotton as an example, it is only grown in very small quantities (if at all in the country) and the costs of production are double that of standard cotton. 'What we have to do is to reduce the impact of manufacturing on the other 90% of textiles and these sort of gimmicky things tend to be very expensive anyway and I don't think people will accept undyed items or dull natural colors as a result of poor performance of vegetable dyes.

Can be argued that a situation must arise where the notion of 'green textiles' no longer exists, in which all textiles would cause minimum environmental damage.

This will require producers and retailers, along with the designers, to work together, not apart as is practiced.

From the early days of the industrial revolution, the textile industry has been seen as major polluter of rivers. Textile effluents were generally all directed to watercourse, often with no prior treatment to remove contaminants. Dye houses at one time could easily be identified by the rainbow colors drifting downstream in the rivers which many still use for their water supply. Or the small of chlorine from the bleach works. Water bodies are often covered with foam produced by the local scouring operations.

However, in the first decade of this century, it has been encouraged that the industry connect to municipal sewage systems, wherein discharged effluent is treated together with domestic sewage to remove contaminants before reaching water-courses. Whilst this has been an effective way of reducing traditional contaminants such as biological oxygen demand (BOD), suspended solids and grease, concern has now focused on other pollutants.

Due to the rapid progress in the analytical capability to measure contaminants, substances that were previously assumed absent, or which could not be measured, are now being found, and are shown to be causing significant environmental damage. Worrisome is the difficulty in finding information on the plausible environmental impacts of yarn and fabric manufacture. Correspondingly, there is little or no observed participatory role of the wearing apparel/textile manufacturer in helping to control pollution. Published material which is available is neither easily accessible, nor well structured nor adequately cross-referenced. Because the subject is so new, there is little quantitative or qualitative data. Making authoritative manufacturing process comparisons is difficult if not impossible as a result of business secret/competition.

If we turn to the leather sub-sector, Nigeria has the third largest livestock population in Africa (approximately 15.4 million cattle, 44.2 million goats and kids, 28.0 million sheep and lamb, and 92,500 camels). The major hides and skins producing states in Nigeria are: Bornu, Kano, Katsina, Sokoto and Bauchi. (with livestock carrying capacity of about 9.2 million cattle, 13.5 million sheep and goat heads. The hides and skins production in the five major producing states between 2001 and 2002 is estimated at 0.47 million cattle hides, 7.9 million sheep and 6.6 million goat skins.

With 30 mechanized and over 100 traditional tanneries all over the northern part parts of the country with processing capacity of well over 310,000 bovine hides and 26.5 million sheep and goat skins per annum. The estimated current capacity of tanneries in the country is about 25.6 million pieces of hides and skins per annum. The finished leather production in 2001 was estimated at 40,000 – 60,000 sq.ft. of hide leather designed for the local market and 130 – 135 million sq.ft sheep and goat skins leather of which 95 per cent exported to Europe.

Consequently, the effluents from the tanneries as a result of tanning process using inorganic substances such as Sodium Sulphide, hydrated lime, caustic soda, acids chromium sulphate and dyestuffs is causing very high in environmental pollution.

It is on this premise that leather globally is undergoing paradigm shift from chemical to bio-based leather making to meet the growing environmental challenges. Enzymes have found useful in many areas of leather processing, enzyme-only dehairing and fibre opening, presents a breakthrough approach. This methodology is being explored to avoid obnoxious sodium sulphide and to eliminate lime sludge.

Traditional tanning methods, unfortunately results into high levels of pollutants being released into the water but recently, researchers found that simply reversing the order of the tanning and the post-tanning steps can drastically improve the process. By also promoting non-chemical-based pre-tanning methods, they have reduced the amount of chemicals released by 82% and made an energy saving of nearly 40% (journal of Chemical Technology and Bio-technology, doi:10.1002/jctb.1727).

Biotechnology is being increasingly adopted by several chemical companies to improve manufacturing sustainability and profitability as regards energy consumption and feed stock access as well as the production of high-value chemicals. Industrial bio-transformations generally centered around natural compounds such as carbohydrates and fats in many sectors in the industrialized world. Eco-friendly and Benign Technologies are practical alternatives to the traditional organic synthesis. Biotechnology and in particular enzymatic catalysis is weighed against chemical catalysis.

WAYS OF ENSURING COMPLIANCE:

Implementation of cleaner production processes and pollution prevention measures can provide both economic and environmental benefits. Wider and stricter legislative policies enforcement of pollution controls, greater chance of prosecution; high fines and clean-up costs will definitely have severe consequences for industries. But with the recognition of the fact that the adoption of environmental factors in product development relies to some extent on coincidence of need between adding value, maintaining performance and quality, and reducing environmental impact, outweighs the negative consequences then product development ought to accommodate greater integration between specialists including: environmental specialists, production, design, marketing and sales.

There is a need to develop a broader more holistic view which embraces ethical, environmental and social concerns. Manufacturers/designers will require new tools and techniques to assess and reduce the environmental impact of their decisions. Such approaches might include:

- Strengthening public / private sector partnership in environmental management and training.
- All existing industries should be given target to set up primary treatment plant of their effluent with necessary bench mark, while new industries must put in place their treatment plant before commencing production.
- Federal / State Governments should provide secondary treatment plants to complete the circle of treating effluents from domestics and industrial pollution.
- Benchmarks for profitable environmental improvement.
- Computer based learning tools and systems
- Training material for workshops an seminars, videos, booklets and performance guides.
- The development of product improvement checklists and guidance notes for designers seeking to improve a products environmental performance.
- Communication and information exchange networks so that those 'traditionally excluded from the product innovation process are drawn into the centre of the communication process'
- A central resource centre. There is a major role for universities and research institutes in the 'evolution of this knowledge base as there are as yet few centers of excellence providing high quality training, education, information and research.

MECHANISM FOR ENSURING ENFORCEMENT:

Institutional Strengthening of the private sector for economic development by focusing on industrial governance; strengthening capability for policy development, including competitiveness, analysis for policy actions, establishing strategic alliances between the public and private sectors and strengthening capabilities for collecting, processing and disseminating industrial information and statistics.

Supporting the country's Service Framework for an Environment and Energy Integrated Programme which will address urban and industrial pollution, industrial energy efficiency comprising cleaner production, waste management, energy management, environment and energy information, system, climate change and clear development mechanism.

Approving and ensuring the use of embedded-DNA-Based security solutions Textile Marker System Technologies as a Key Solution to Combat Illegal Textile/product Imports-a cost-effective system to "mark" textile raw materials and finished goods. Applied DNA Sciences 'DNA textile marker would identify both the country of origin as well as the specific factories where a garment, other textile products and / or its components were produced or assembled. The company's marker technologies could also be used to protect brands, trademarked products and other intellectual property that are critical to the textile products industry. Applied DNA Sciences' textile solution cost-effectively inserts DNA markers during the textile manufacturing process. It is believed that DNA marker will remain embedded in the fabric or yarn for more than 100 years. DNA markers will be able are expected to withstand extremely harsh textile processes including desizing, scouring, bleaching, mercerizing, dyeing, finishing, etc. The origin of raw textile materials and finished goods can be verified using Applied DNA 'Sciences' proprietary DNA detection methods.

Other technologies that can be used to ensure standard and any other environmental related quality of products are: (1) ultra-violet fluorescent marks; and (2) Nano bar codes.

Aside the above mentioned approaches, Establishing an effective enforcement programme with a strong commitment on the part of government and a stable leadership in the Enforcement Agency in its formative years is one way of ensuring the sustenance of the acceptability, practice and economic survival of existing and emerging industries with respect to the environmental challenges and available opportunities. A clear-cut mandate for enforcement must be established. Job description of participatory agencies distinct, to avoid inter-agency squabbles. Requests for technical assistance from developed countries for capacity building should be unequivocal to avoid impediment, and used to compliment internal resources. An EPA organizational structure staunchly entrenched in the country's EPA Act maximizes the enforcement under an unstable political set-up.

The government can also establish an Interagency Working Group on compliance, enforcement and performance in meeting the environmental based challenges and opportunities in the interest manufacturing sectors (Working Group). The Working Group should be headed by a Director from the Federal Ministry of Environment with members drawn from relevant Federal Parastatals (research institutes inclusive) and agencies, each with unique and critical environmental safety responsibilities. This group will use a risk-based approach consisting of three Organizing Principles (1) Prevention (starting from raw material assessment right from farms and petrochemical and allied plants), (2) Intervention (fibre, textile, leather processing, apparel, carpet and footwear production plants/industries) and (3) Responses (effluent / waste discharge points).

The group should maintain a number of separate laboratories around the country, with a 24/7 technical reach back centre using a bottom-up network system of information gathering, monitoring, testing, analyzing and reporting. Employing locals (farmers), chemists, biologists, agricultural specialists engineers, and

environmental scientists. The workforce should be empowered to mount rapid and effective responses by utilizing the available specialized expertise of constituent members.

CONCLUSION

World-Class performance and promotion of business excellence through performance measurement, benchmarking and best practice dissemination will satisfy the need for businesses to be competitive and sustain profitability in the face of today's global challenges.

With the inherent environmental issues emanating as a result of increasing consumer demand and impact assessment awareness, it becomes very imperative that for a sustainable environmentally friendly industrial frame work to be cultivated, the challenges and opportunities existing within the manufacturing sector has to be contained and not avoided. A careful and close monitoring of processing technologies and approaches ought to be implemented from a grass root level.

We need to position performance measurement and benchmarking, from the SME perspective, as a credible and feasible technique and to encourage its appropriate use. This means starting from the raw material production or processing stages up to the finished goods stage.

Thanks for your cooperation.