LEATHER SCIENCE AND TECHNOLOGY TRAINING PROGRAMS AT THE UNIVERSITY OF NAIROBI

Prof. Jackson N. Ombui, PhD
Chairmamn, Department of Public Health, pharmacology and Toxicology, Faculty of Veterinary Medicine, University of Nairobi.
Email: jombui@uonbi.ac.ke

Overview

The leather industry in Kenya is one of the key agricultural subsectors with a high potential to contribute towards achieving economic growth through an expansion of export market of both semi-processed and finished leather products. The Government of Kenya included leather development in the Vision 2030 to spur its growth. The industry depends largely on locally available large livestock resource base. The industry has for a long time suffered from lack of skilled manpower due to inadequate training opportunities locally. Training of leather development officers had for a long time been done outside the country causing great financial constraints within the Ministry's budgetary allocation and unattainable training targets. Despite the effort, man power demand for the leather subsector was not met. The technical capacity of the leather industry development in the country has therefore been inadequate. In order for the leather industry to prosper, there was need to have enough highly qualified manpower.

Training at various levels in Leather Science and Technology started in earnest in 2012/2013 academic year at the University of Nairobi, Faculty of Veterinary Medicine to bridge the existing gaps in manpower development needs. This followed a successful development of training curricula in 2007 with the help of the then Ministry of Livestock and Fisheries Development and various stakeholders in the leather industry. Training started in 2012 at diploma, bachelors, masters and PhD degree levels.

Justification

The livestock industry contributes 42% of the Agricultural Gross Domestic product (GDP) and 10-15 percent of total GDP. It employs over 50 % of the agricultural labour force, employs 90 percent and contributes 95% of family income of the people in Arid and Semi Arid Lands(ASALs). It employs about 5 million people in high and medium potential areas. The sector provides milk, meat, wool, hair, manure, hides and skins, animal traction, insurance against crop failure, as well as socio-economic services. Over 70% of the National Livestock herd including camels and donkeys is kept in arid and semiarid lands. Kenya's development goals as outlined on vision 2030 focuses on attaining an economic growth rate of 10% annually in order to create wealth and employment and to reduce poverty. The vision identifies agriculture as a strategic key driver for delivering the envisaged economic growth through transformation into innovative, commercially oriented, competitive and modern sector. The vision further recognizes that agricultural sector is the mainstay of the Kenyan economy, representing 24% of GDP, 65% of its total exports and 18% of formal employment in the country. To support the sector, the Government launched the Agricultural Sector Development Strategy (ASDS 2010-2020), which seeks to address the issue of value addition and marketing of agricultural produce as a major component.

The country's economy has potential for growth through the leather sector which has rich resource base consisting of livestock population of about 17.46 million cattle (14.11 million beef and 3.35 million dairy cattle), 18.925 million sheep, 25.945 million goats and 2.97 million camels (2009 livestock census, MOALF). In addition, emerging livestock such as ostrich, crocodile, guinea fowl, donkeys, fish and snakes are yet to be developed.

The government identified the leather subsector development as the flagship project for the livestock sector in its Vision 2030 Programme which aims to promotes industrialization and value addition in key sectors. The leather industry is one of Kenya's main agricultural sub-sectors that can contribute to economic growth through expanding exports of both semi-processed and finished leather/leather products. There has been minimal value addition in the livestock sector and most Kenya's exports have been in the form of unprocessed products including, raw hides and skins. The development of the leather sub sector will involve improvement of the raw material base (especially the quality of hides and skins), boosting the tanning sub-sector, producing and marketing of leather goods and products.

Situational Analysis

Technical capacity for leather industry in the country is inadequate since the existing manpower comprising hides and skins inspectors, assistant leather development officers and leather development officers are few. The country has therefore been unable to fully exploit hides and skins as a locally available renewable resource to achieve the expected productivity in the leather sector to provide the much needed employment, wealth creation and foreign exchange earning. Indeed there has been a gradual decline in perfomance of the sub-sector throughout the production chain starting with raw material, leather processing, footwear and leather products manufacture and marketing. This scenario is mainly attributed to high processing costs and lack of qualified manpower in the sub-sector. The heavy local demand of leather products including 28 million units of leather shoes is mainly served by imported supplies due to the existing deficit of more than 24 millon units against the current local supply of less than 4 million units annually. This is due the the inadequate technical capacity for leather industry development in the country in terms of the existing manpower and inefficient production capacity.

In order for the leather industry to prosper, there is need to have enough highly qualified manpower and improve on production capacity. The establishment of training programs at the Faculty of Veterinary Medicine arose from the need to increase highly qualified manpower to support the envisaged industrialization in the subsector. Continued reliance of external training institutions was not tenable and could not realize the quality and quantity of manpower required for development of the leather subsector. These programs are based at the Faculty of Veterinary Medicine and are being coordinated from the Department of Public Health, Pharmacology and Toxicology. Currently staff from AHITI Kabete, Kenya Industrial and Research Development Institute (KIRDI) and Industry players are supporting our few staff in the training of our students. The University is developing key staff through the postgraduate training programs. Student **e**nrolment in the various programs is as shown in table 1 below.

Table 1: Student enrollment to various Leather Science and Technology Programs todate

Program	Year	Number of students
Diploma in Leather Technology	2012/2013	13
"	2013/2014	7
"	2014/2015	0
"	2015/2016	0
BSc in Leather Science and Technology	2012/2013	21
	2013/2014	36
	2014/2015	32
	2015/2016	33
MSc in Leather Science	2012/2013	2
	2013/2014	3
	2014/2015	2
"	2015/2016	1
PhD	2013/2014	1
"	2015/2016	1
	Total	**152**

Practical training

The University of Nairobi is grateful to the following institutions who are supporting in the practical training of our students:

- Animal Husbandry and Industry Training Institute (AHITI) Kabete
- Bata Shoe Company Ltd, Limuru
- East African Tanners Ltd, Njiru
- Alpharama Tanners ltd, Athi River
- Zingo Tanneries, Industrial Area, Nairobi.
- Sagana tanneries in Kirinyaga County

- Department of Veterinary Services, Ministry of Agriculture, Livestock and Fisheries
- Kenya Industrial and Research Development Institute
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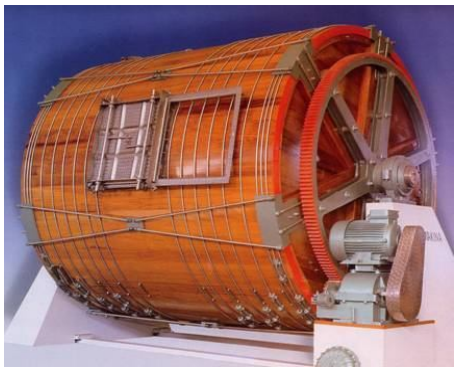

Tanning drums

Challenges facing training at the University of Nairobi

Since the leather science and technology is a totally new and specialised area of training that has never been offerd in the Universy, training has had a number of challenges that include the folowing:

1. Inadequate training facilities: teaching space, laboratories, tannerry, leather goods manufacture workshop etc.
2. Inadequate teaching staff and technologists
3. Lack of a research facilities: AAHITI and KIRDI are currently supporting research activities of our postgraduate students..
4. Inadequate funding for postgraduate training especially for staff development: The State department of livestock, Ministry of Agriculture, Livestock and Fisheries Development has sponsored todate three staff to undertake a masters degree in leather science, while six others have joined the masters program as privately sponsored students. The University of Nairobi is sponsoring two PhD students.
5. Inadequate books and other reading materials: University is in the process of procuring more, while students can access e-resources
6. Low student enrolment due to inadequate public awareness of the existence and importance of the course.

First graduation for leather programs

The first group of 13 Diploma students who qualified were awarded diplomas during the graduation ceremony held on Friday 29 August, 2014. The first BSc class will graduate in 2016/2017 academic year. The first masters student has already defended his theis and will graduate in December 2015. There is need to facilitate placement of graduates immediately to apply their skills for the benefit of the industry. This will also stimulate enrolment to the various programs

Need to develop a Centre of Excellence in Leather Science and Technology

In order for the leather industry to prosper, there is need to establish a centre of excellence for training and research in leather science and techonology to produce enough highly qualified manpower and undertake research in the subsector. The centre of excellence will facilitate development of appropriate training and reaserch facilities and programs that are responsive to the needs of industry. This will stimulate development of the leather industry, create employment and increase household incomes.

Objectives of the centre

1. Develop physical facilities for training and research in leather science and technology
2. To provide skill enhancement short-term training programs in leather technology, leather fashion and design, and leather goods manufacture
3. Develop and promote demand driven research programs in collaboration with leather industry players.
4. Source for funds to enhance training, research and development activities
5. Promote patnerships between the University, industry and other stakeholders
6. Continuously review and develop curricula suitable for the leather industry
7. Capacity building for trainers through targeted staff development program
8. Organize stakeholders forums to exchange ideas affecting the leather sub-sector
9. Equip teaching and research laboratories with modern and appropriate technology
10. Carry out training and research exchange programmes with universities outside Kenya
11. Develop a leather goods manufacturing workshop to promote leather utilization through promotion of small and medium size enterprises in the subsector.

Development of industry responsive training programs

There will periodically review the existing training programs with a view to developing industry responsive training programs for all cadres of personnel with the required technical skills. Appropriate demand driven industry responsive training programs will be developed and implemented. In addition to the long term academic programs, short term skill enhancement courses will be develped targeting skill enhancement of industry staff. The following short-term skill enhancement training programs will be developed:

a. Certificate in leather processing

b. Certiticate in leather goods fashion and design

c. Certificate in footwear manufacture

d. Certificate in leather goods manufacture

Development of research facilities and programs

Research is key to any sector for enhanced development. Establishment of a centre of exellence for research in leather science and technology will facilitate development of research facilities and programs required to help the faculty in training of postgraduate students for staff development and production of experts who will solve problems facing the leather industry in the country and the region. Some of the planned research projects requiring funding include:

a) Identification and evaluation of tannin content and tanning strengths of various plant species available in the country that can be utilized in leather tanning.

b) Identification and evaluation of various locally growing plants for their dye content for use in dyeing of leather

c) Development of technologies for utilization of tannery wastes

d) Improvement of traditional tanning technologies to enhance incomes of communities for poverty alleviation

e) Initiate programs for improvement of the quality of hides and skins

f) Develop and promote clean tanning technologies.

Scholarship for postgraduate training

Scholarships are required to support postgraduate training and short-term training programs for industry staff. We plan to train at least 15 postgraduate students at both Masters and PhD levels in the next 5 years to enable us get qualified academic staff for the programs in future. Potential students are encouraged to apply.Currently, seven (7) students are pursuing the Masters in Leather Science and two (2) are pursuing their PhD in Leather Science.

Funding for research

A research fund will be created to facilitate fundraising from donors and industry stakeholders to facilitate research activities. Researchers will also write research proposals and submit them to donor agencies for funding. Prospective funding agencies are encouraged to support our postgraduate research programs.

Collaboration and partnerships

The university is ready to sign memoranda of understanding to collaborate in training and research with various stakeholders including industry players, line ministries, local, regional and international universities and institutes of higher learning as well as research institutions.

Outreach Activities

The university will develop and implement outreach programs to create awareness and visibility of the training programs.

Employment opportunities in the leather sector

Opportunities abound in the leather subsector. Graduates from Leather Science and Technology Programs can find work opportunities in the following areas:

1. Ministry of Agriculture, Livestock and Fisheries as leather development officers to oversee improvement of raw materials
2. Tanneries (procurement of raw materials and leather processing)
3. Chemical industries especially those manufacturing tanning chemicals and dyes
4. Leather products manufacturing industries
5. Fashion and design industry for leather goods
6. Private enterprises: e.g. in for hides and skin procurement and leather products manufacture.
7. Tannery waste water treatment facilities
8. Research and development institutions such as KIRDI
9. Training institutions as tutors, lecturers and technologists

THE FOLLOWING ARE ENTRY REQUIREMENTS FOR THE VARIOUS PROGRAMS

DIPLOMA IN LEATHER TECHNOLOGY

Admission Requirements

Applicants to this course shall be required to have the following minimum qualifications:

1. Holders of Kenya Certificate of Education (KCE) aggregate of C and a grade of at least C- in Chemistry,
2. Biology and any other one Science subject.
3. Holders of Kenya Certificate of Secondary Education (KCE) division II with at least a credit in Chemistry, 4. 4. Biology and any other one science subject.
5. Holders of an "A" level Certificate with a minimum of one principal pass and at least a subsidiary pass in biology and chemistry.
6. Holders of a Certificate in Leather Technology from recognized institutions.
7. Holders of a Diploma in a Biomedical discipline recognized by senate.

8. Any other qualification recognized by the senate.

BACHELOR OF SCIENCE IN LEATHER SCIENCE AND TECHNOLOGY

Admission requirements

1. Kenya Certificate of Secondary Education (KCSE) with mean grade C+ or equivalent with at least a C in Chemistry, and either one of the following subjects; Biology, or Biological Science, or Physics, or Physical Science or Agriculture or Mathematics.
2. KCSE mean grade C – or equivalent plus a Certificate and Diploma in a relevant field from an institution recognized by the Senate.
3. 'O' level Division II or equivalent with the subjects indicated in 2.1 above; plus a Diploma in a relevant field from an institution recognized by the Senate.
4. 'O' level Division III or equivalent plus a Certificate and Diploma in a relevant field from institutions recognized by the Senate.
5. Diploma in Leather Technology or relevant field from the University of Nairobi or institutions recognized by the Senate and a mean grade of C in KCSE or equivalent.
6. 'A' level with two principal passes or equivalent in Chemistry, and Biology, or Physics or Mathematics, or Geography.
7. Higher National Diploma in Leather Technology, Laboratory Technology or relevant field from institutions recognized by the Senate and should have attained a mean grade C in KCSE or equivalent.
8. Bachelor of Science degree from an institution recognized by the Senate.
9. Equivalent qualifications to the above from institutions recognized by the Senate.

Course duration: 4 Years

MASTER OF SCIENCE IN LEATHER SCIENCE

The course leading to the award of the degree of Master of Science in Leather Science is an advanced course designed to produce skilled personnel with principles and techniques of scientific research in leather science and technology.

Admission requirements

1. Holders of at least an upper Second Class Honours degree of Bachelor of Science in Leather Science, Chemistry, Biology, Animal Science, Biochemistry, Biomedical Technology or Animal Production of the University of Nairobi or from other institutions recognized by the Senate.

2. Holders of at least a Lower Second Class Honours degree in any of the disciplines listed in (2.1) above, with at least two years work experience.
3. Holders of a Pass degree in any of the disciplines listed in (2.1) above, with a least five years work experience.
4. Holders of the Bachelor of Veterinary Medicine degree of the University of Nairobi.
5. Holders of any other appropriate degrees approved by the Senate.