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NATIONAL INDUSTRIAL RESEARCH AND DEVELOPMENT AGENCY

Leather Value Chain Technology Audit Report

September 2017

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Abbreviations

CET	Common External Tariff
CEPGL	Economic Community of the Great Lakes Countries
CETP	Common Effluent Treatment Plant
COMESA-LLPI	Common Market for Eastern and Southern Africa, Leather and Leather Products Institute
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
ETP	Effluent Treatment Plant
EDPRS	Economic Development and Poverty Reduction Strategy
EFICCOS	Ethio International Footwear Cluster Cooperative Society
GDP	Gross Domestic Product
HS	Harmonised System
LLDC	Land-Locked Least Developed Country.
LLPI	Leather and Leather Products Institute.
LODA	Local Administrative Entities Development Agency
MINICOM	Ministry of Trade and Industry.
MTI	Ministry of Trade & Industry
NEA	National Environment Agency
NGO	Non-Government Organisation
NIRDA	National Industrial Research & Development Agency
OSBP	One Stop Border Post
PPP	Public / Private Partnership
RAB	Rwanda Agricultural Board
RAPROLEP	Rwandese association for the promotion of leather and Leather Products
RBS	Rwanda Standards Board
RDB	Rwanda Development Board
REMA	Rwanda Environmental Management Authority
RRA	Rwanda Revenue Authority
SHC	Second Hand Clothing
SMEs	Small and Medium Enterprises
TVET	Technical and Vocational Education and Training
WDA	Workforce Development Authority

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The consultants wish to stress that in line with UNIDO policy, all information obtained in the course of this audit exercise as well as that contained in this report, will be accorded the strictest confidentiality.

Executive Summary

That there is great opportunity in Rwanda's leather goods value chain is well established. The main question we need to answer is: "how to monopolise on the benefits available from developing it?" Selecting the right blend of industry support to create the movement towards industrialisation is the subject of this project. Similarly, as a national resource is developed, there poses a question of how Rwanda maintains control of the new industry and achieves the development necessary, without giving the majority of the potential benefits to the national economy away in the process. The methodology applied was an initial desk review enriched by consultations with sector stakeholders, visits to manufacturing companies and Government Agencies. The data provided, filtered through the expertise of the team, forms the basis for the recommendations made in this report.

Starting with the effectiveness of animal rearing and raw material production, it is common to find influences from Government policy on husbandry and farming practice which directly impact the volume and quality of raw material available in Rwanda. This influence is discussed, as are the downstream impact on the value chain. It was positive to find better standards in abattoirs inspected than was imagined prior to the visit programme; there has obviously been a deal of development capital targeted at this sub-sector. Having understood this, the business model adopted by the entrepreneurs can be augmented as most just provide a "slaughtering service" for a fee per head, without developing the potential for adding value or developing by products from the activity. There is a whole layer of by-product development that can result in production of bio-fuel, natural oils for further processing and agricultural fertilisers to help boost food production.

The sub-sector for leather production is almost completely absent from Rwanda in the current state of play. It will be necessary to develop professional tannery companies in order to optimise the value chain. As a consequence of not being able to process and absorb the existing raw material, over 90% is exported within the region by traders who do not add any effective value to the product, only cost. Given a thriving tannery sub-sector in Rwanda, it may be possible to persuade them to keep the resource within the country. The current state of export tariffs comes under scrutiny here and it is easy to imagine how taking the principles used in Ethiopia (where a much more highly developed industry exists), there could be incentives developed to grow leather production from within. For a country with high ecological principles and an international reputation for environmental awareness, it will only be practical to embrace international best practice in Rwanda's industrial development process. This will mean ensuring that any processing plant established will work to the highest of standards for the treatment of waste water and solid materials output from the industry. It has been discussed to establish a leather business park with full central treatment facilities that would be built to attract industrialists and consortia to start new tanning businesses. Wastewater treatment in

leather production is a significant cost to the tanner and in some countries still viewed as a "cost that can be avoided". The consequences of this are very serious and many National Environmental Authorities have had to close-down plants in other parts of the world based on the weight of detrimental environmental impact they have had by indiscriminately disposing of untreated waste to the local environs. Regulation and control of tannery licensing are particularly hot topics in many countries, with China refusing permission for a company to establish and run a beamhouse and tanning plant – directly due to the environmental impact. Waste water treatment is fully understood and high degrees of success can be achieved in remediation of environmental risk, the processes are well established and controllable at the most fundamental level. Still, in some countries, there is little effective policing of the industry, even where the stated standards are among the best in the world. This leads to indiscriminate tanning companies breaking the principles and the rules on a regular basis. Clearly, Rwanda cannot be put in a position where this would have to be the case. Economies of scale provide more cost-effective treatment for tannery waste, so it would be good to establish a cluster of processors who all benefit from a shared treatment resource and thereby share in the economies of scale. This is a model promoted on many continents by UNIDO, where Central Effluent Treatment Plants (CETPs) allow the industry to move forward by sharing the cost of volume treatment. Thus, as the industry expands, it is sensible to adopt a conceptual view of a modular system that will be easy to expand and control capital cost, without providing speculative massive over-capacity that may not be fully taken-up. Any CETP runs best and is most cost-effective when running at or close to the original design parameters and volume loadings for the plant. Taking an opposing view, it could be decided not to do beamhouse working in Rwanda, but to contract tan in a neighbouring country, bringing back the tanned material without having to take the responsibilities of the waste treatment to the same degree. More value is added between tanned and finished leather than between raw and tanned, so Ministries and Government agencies could decide to develop the production of leather in what would effectively be reverse order, with dyeing and finishing plants (which produce far less waste comparatively) being established first, in order to feed the manufacture of finished goods.

A major influence on the environmental performance of tanning is the use of salt in curing the raw material. Common salt is the single worst aspect of waste water in ETP processing. In many countries, it has been replaced by icing or chilling of raw hides and skins, because removal of the salt from the waste stream is very expensive to do. It is however difficult to see a Rwandan system that could work without salt for the foreseeable future, until better and faster collection infrastructure and practices are evolved. It would take installation of cold rooms, blast chillers and possibly ice plants at abattoirs and refrigerated transport capacity between there and the tanneries.

To describe a new and industrialised tanning sub-sector means that we need to recognise the skills gap and imagine how this could be filled. Since there is no training in tannery processing currently, it might be necessary to bring-in expertise from outside the country, while perhaps sending Rwandan candidates to be educated overseas. Modern leather production incorporates a blend of science and technological skills that begin with heavy chemistry and a need for understanding of the behaviour of proteins in aqueous phase. This moves on to the chemistry of tanning and how to impart particular physical and chemical attributes to the product by choice of tanning agent and structure of the process. On again to the technology of dyestuffs and high polymers and substantive oils used in retanning and fat liquoring, it needs to be fully understood how they will influence the aesthetics and suitability for purpose of the product. And then, finishing the leather is a further discipline that relies on the understanding of surface coating technologies and how to blend materials to produce the right appearance and physical properties. Simply knowing how the process works is not enough, it will be necessary to have individuals who can also measure and steer the process variables to ensure that the product comes out consistent and regular, so as to be saleable in bulk quantities. Currently all of this is absent from the skills base in Rwanda and will take a long time to develop from within. The current training set up is under the process of formalisation with a crucial ongoing consultation regarding the establishment of National Vocational Qualifications being developed with the assistance of COMESA/LLPI in Addis Ababa.

Thus, it is envisaged that the development of the tannery sub-sector will have to be carefully structured and phased, so as to build on each stage already established. In terms of volumes produced, the indication would be for 1 medium-sized bovine tannery and 1 tannery for small skins (sheep and goat). It may be possible to attract overseas companies to set-up factories in Rwanda, which could provide a potential short-cut, but this should be done with extra special care in the terms and conditions of any arrangement, because technology transfer should have defined benefits and timing. The risk in any joint-venture is that the direct benefits of developing the value chain may be lost to outside influences and agents.

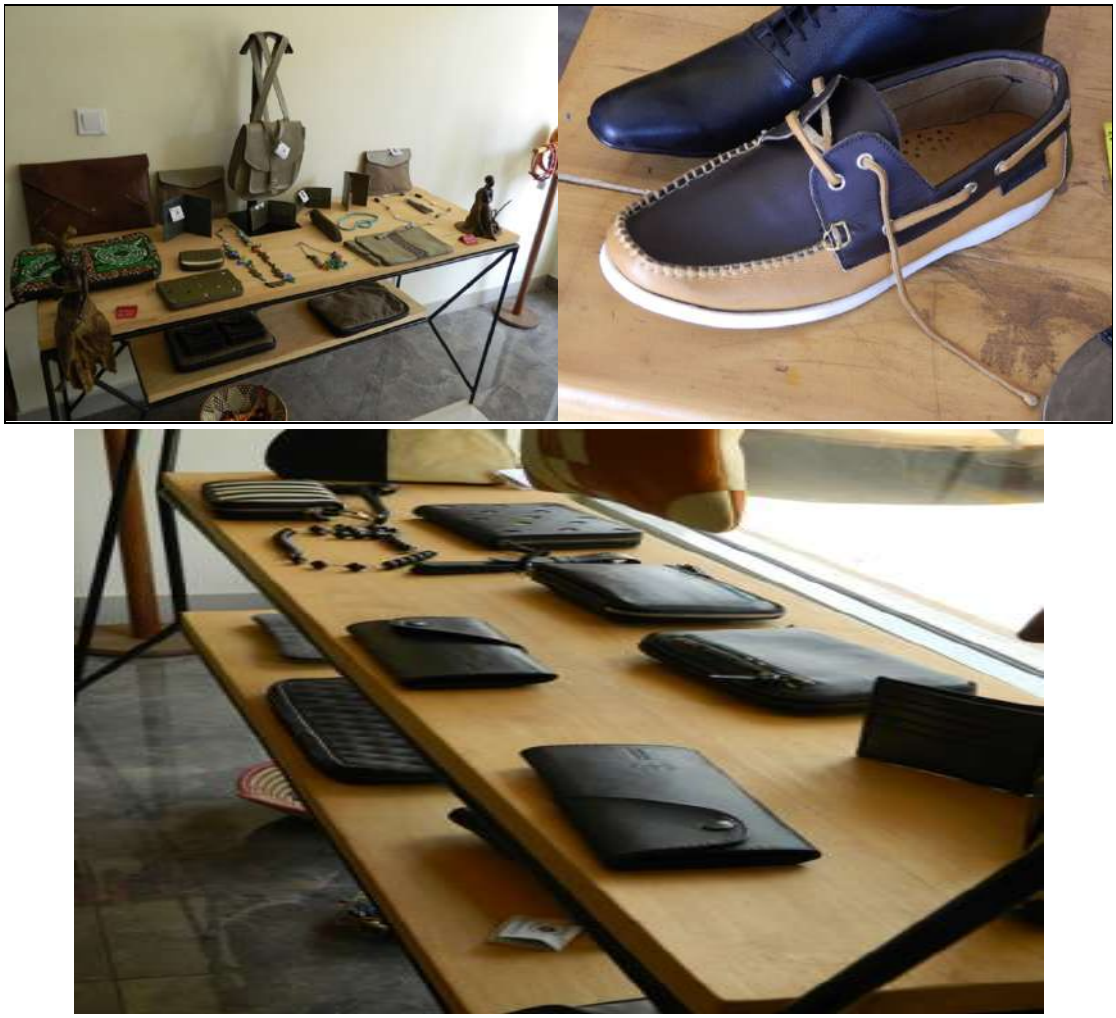
In shoemaking and leather goods production a large number of artisans - up to 300 by estimation of the Chairman of the Association of Shoemaking Artisans, operate from small premises in Kigali and each town around the provinces. Very resourceful individuals, they continue to find local substitutes for materials they cannot get in the right quantities and at the right sort of price. Leather is almost exclusively imported and bought direct from producers around the East African Region and other supplies are also provided by local stockists, who maintain a short order and quick response, at a price. Operating out of their street-side shops, the shoemakers generally have a sales function, a repairs service and a new shoe manufacturing activity under the one roof. They often operate in poorly lit

and cramped conditions with the few old and difficult to maintain machines that they have acquired over the years, but still manage to find trainees and apprentices keen on learning the trade. There is quite obviously a hunger and keenness to get involved in the sector, so we should judge that there would be no shortage of people to train in order to build larger enterprises. Many of the roadside cobblers achieve more than 50% of their company turnover from repairs. The new shoes and sandals they make often incorporate local materials such as ingeniously-reworked sidewalls from redundant truck tyres for soling material and local timber for heel risers. The skill in the handiwork observed is undeniable, but not up to accepted international standards of course. To further observe these activities would be to note that working alone, with their 4-6 person shops, they have little strength in buying power, so will always be subjected to paying top price for anything they need. They get little or no current information about the markets and trends, what is likely to sell and how they could make improvements, so the general situation is that they are all making similar commodity products with little design flair or distinctive features.

The desire is to move from this disparate situation though to smooth factory production, so the first steps may need to be to encourage the artisans to start cooperating with each other and move together to develop greater strength in numbers that develops a joint identity as well as allowing them to keep working to maximise their individuality. This may be a difficult concept for some who have been used to being in charge of every single aspect personally, but it will identify those with the ability to work together and improve product, quality and volumes on a progressive basis. A manufacturing village could be envisaged here so that suppliers and engineering support for servicing machines may also be attracted by the higher concentration of potential business. This cluster could be based around a central training facility, in the shape of a national academy for the sub-sector, which would provide access to critical machines on a hire by the hour basis as well as training to build the skills in the workers. The incentive that this would offer the artisans would be tangible. From this base, it could be imagined that several artisans may get together and establish a more line-based production method, with assistance of the training school staff perhaps. The first such village could be based in Kigali, but would also provide much better sales and marketing platforms for the artisan members than they can currently achieve themselves, working alone. This model could then be rolled-out into the provinces.

Observed in Ethiopia, a cooperative by the name of EFICCOS allows artisans to operate independently, have better access to better materials at more attractive prices due to higher demand and buying power from the suppliers incorporated in the collective.It allows a much more professional atmosphere and conditions while also allowing for bigger orders to be processed on a collaborative basis between members. This pushes up volumes and quality of output.

Photos 1 : Products and tools in the Rwanda Leather value chain.



Source: Field Survey

Section 1 Introduction

1.1 Project background

Rwanda's leather industry value chain is target for a move towards higher productivity and value addition by increasing the level of industrialisation. UNIDO/NIRDA have commissioned a study to help focus on the realistic support that can be given to the sector and where this help should be targeted in order to gain maximum sector growth and productivity. This will have a direct and beneficial effect on the national economy, through added value development of a natural resource which is currently not properly exploited. Employment will rise, wealth will be created and export substitution will result in a boost to the Rwandan balance of payments. The size of the domestic market is significant driver for industrialisation in that almost all footwear consumed nationally comes from outside Rwanda's borders.

There is a significant resource in raw materials (hides and skins) available to prospective industrialists, but currently almost all of it is exported with no value addition as shown in report. It is common knowledge in the industry that value addition of 20-times or more can be achieved by sound processing and the making (and selling) of shoes and leather goods. This is why successive emerging economies have highlighted the leather goods chain as offering significant benefits to the national economy if developed correctly. UNIDO has promoted this concept internationally over many decades as a sensible step to take between an agri-based economy and a manufacturing based economy. We also know from history, that for every job created in a tannery, up to 6 downstream employment opportunities are created - many of which support the status of women in the workplace. The leather value chain frequently lists in the top 5 of all possible industries in terms of beneficial industrial growth. The current situation evident in Rwanda is of a leather value chain, whose entry into the global arena is at the primary stage, through exporting raw hides and skins. Under developed and therefore with little added value, the potential earnings which could have been raised through value addition, amounting to US$118 million, are forgone. It is important to note that the export of raw hides and skins is very important to the Rwandan economy, as its income earnings is among the top ten income earners. The true challenge is how to change the emphasis on this and move to selling more highly developed "value added" products.

In addition to this with a country that has an international reputation in conservation, ecology and environment, it will be critical that any industrial development is accompanied by the most responsible methods and processes, to conserve the environment.

Currently, with 2 tanneries, one in a dormant state and one running, taking an indiscriminate toll on the local environment ***(see annex),*** it is obvious that there needs to be a fundamental increase in

responsible leather processing in Rwanda to enable the available raw materials to be accommodated. Similarly, with shoe making being done on a purely artisan level out of street-side shacks in many cases, there is a primeval gulf between the status quo and a well-organized industrialized shoemaking sub-sector. All of the individual artisan enterprises encompass the making of belts, bags and other leather goods too.

If we take the future (National) market for shoes to be 1.5 pairs per year – as publicised by COMESA, per person and the population (although rising) at 11.5 million, then the demand for shoes is in the order of 17.5 million pairs per year (although actual offtake is more like 0.5 pairs per year currently). With 300 artisans, producing 5-7 pairs of shoes per day, this equates to just over a half a million pairs annually. This is the magnitude of the gulf that needs to be addressed, as the theoretical gap in supply could be 17 million pairs or more. To cover national demand, it would take 7 shoe factories, each producing around 2.5 million pairs per year to satisfy. These would be a significant size of factory, making each over 52,000 pairs per week, almost 8700 pairs per day (a greater number of smaller units could also cover this). With average industrial productivity of around 1.8 pairs per man/day in a developing scenario, this indicates the need of 4800 personnel for each factory. In all, it would require 33,600 for this level of production, trained, of course to a sufficient level to be able to handle the machine operations, where today, the hundreds of cobblers we have do almost every individual operation by hand. Although full potential is rarely completely achieved, this is the magnitude of the opportunity for Rwanda to become more industrialised. Given that the majority of footwear originates outside Rwanda, the swing in the balance of payments for substituting even 50% of imports for indigenous-manufactured product is significant; 8,500,000 pairs at 18,000 Frw per pair, totaling 153Bn Frw annually.

Similarly, with 17.5 million pairs requiring an average of 2.5ft^2 of leather per pair to make, the requirement for leather to make 50% of shoes from leather is in the order of 21.9 million ft^2 per year of leather. Area yield of leather per hide is around 24ft^2, so this indicates demand of 912,500 hides per year. The majority of shoe upper leather derives from bovine hides, but for lighter duty or women's or children's shoes, there could be some substitution for goat perhaps.

912,500 hides at average weight, give a tannery processing opportunity of 15,512 tonnes per year – which offers 323 tonnes per production week – almost 54 tonnes per day, based on a 6-day working week. 50 tonnes per day is judged as a medium-sized bovine tannery that might employ around 200 to 250 people if the product were developed to the stage of finished leather. This is just to meet national demand for shoes.

The raw material availability figures for hides and skins, taking an average age at slaughter of 2 years currently suggests that the potential for leather production using indigenous raw material stands in the region of:

Table 1: Rwanda Leather production potential

	Herd size	Annual slaughter rate	Average leather yield	Annual potential for leather production
Bovine	1,349,792	449,930	24ft^2	10,798,320
Caprine	2,532,277	844,092	4.5ft^2	3,798,414
Ovine	630,860	210,287	5.0ft^2	1,051,435
TOTAL				**15,639,169 ft^2**

Based on National herd sizes published in 2017 by RAB

1.2. Objectives and Scope of the Study

To undertake a technology audit review for the leather value chain in Rwanda,

a) Identification of SMEs/Companies/Cooperatives across the various stages of the leather value chain in Rwanda as well as their location.

b) Administration of Questionnaire designed to collect data and information, including

   (i) Technological capacity,

   (ii) Production methods, and

   (iii) Needs of SMEs/Companies/Cooperatives operating in the leather products value chain.

c) Analyse and synthesise the data and information collected and submit a summary report containing an analysis of the collected data, drawing conclusions.

d) Making recommendations to the Project Steering Committee.

1.3. Project Deliverables

The following were the key deliverables for this survey;

- Database of all enterprises across the various stages of the leather value chain in Rwanda.
- Diagnosis Report on leather products manufacture
- Final report and Summary report containing an analysis of the collected data and conclusions
- Presentation of the final results to the Project Steering Committee

1.4. Methodology

For this survey, the team adopted a mix of Primary and secondary data collection and review in order to compliment and collate the information that was required.

The steps followed in order to fulfil the requirements of the study were

- A desk review where secondary data was collected, with a view of obtaining opinions and findings of previous surveys and studies.
- Consultations with sector stakeholders.
- Visits to various players in the Value chain.
- Administration of questionnaires to the players.
- Key informant interviews, in both the public and private sectors.
- All the provided data that has been collated in order to develop this report, forms the basis for the recommendations made in this report.

Section 2. Background

Embarking on a whole sector study requires a deal of planning in advance to define the particular information that will be useful to the project. We started with a pre-written questionnaire template which very soon was identified as sub-optimal. Many of the meetings and interviews conducted were with companies engaged in small artisan activities, where the business owners are neither highly educated in business practices nor able to generate the sort of corporate data that a big company might be able to. Most of the artisans work with absolute minimum paperwork and would never be able to produce the detail that was desired in the original concept of the survey. It was necessary for the interviewer(s) to ask a great many questions in order to get the artisans to focus on what we really needed to know about in the most basic representation of their activities. Interviewing larger enterprises, some of the interviewees did state that they were uncomfortable to share commercially sensitive information as it might get into the hands of competitors. The result of this is that the data analysis activities, after the meetings were concluded, had to be based on part questionnaire and part additional notes. These were studied and amalgamated to produce the overview of the value chain that we have. During most of the visits made, we were encouraged to take photographs of the methods and conditions but, in one particular tannery, we were refused permission to take photographs of the factory.

The general observations made when walking around the plant made it evident that the owners did not want pictorial evidence of what we saw. It did, however, lead to very fundamental conclusions being drawn regarding their approach and methods according to the experience of the team.

The results gained produce a “snap-shot” of the industry for the period of our two-week study; from this, we were able to draw from the data a range of critical and situational observations that will assist NIRDA in the best way to target capital for sector improvement.

We aim to demonstrate the potential of the market that can be exploited for the good of local and national benefit and may indicate some adjustment to policy and targeted investment. Some of the recommendations herein will help to “push” the industry into faster and more structured development by making it commercially attractive to build in the way that Government desires. Other measures will be proposed to help the industry to develop its own appetite for change and exert a “pull” on the systems, demanding different types of support to help it grow from within. In balancing the “push” and “pull,” NIRDA, the Ministry of Trade and Industry and the other agencies will be able to steer the sector in the direction of improvement.

As we are addressing a developing economy with a very low level of industrialisation in this sector, it will be necessary to bear in mind at all times that the level of technology that will allow achievement

of the next steps, must be appropriate to abilities within the sector. While it is easily possible to propose “state of the art” solutions to identified problems on the ground, it is not appropriate to install systems and maybe machinery that cannot be maintained by local skills in engineering and technical support. It has been observed in other countries that high-tech machinery, once it breaks-down in a scenario where there is no corresponding level of technical support, lies broken, unable to be serviced effectively and so becomes unused and realistically a complete waste of money, resulting in “no overall progress”. Clearly, this is not what is required here. We intend that “appropriate technology” some steps below “state of the art” as the rest of the world understands it, should be proposed. It is perfectly possible to make high quality products using older technology on a reliable basis, if it can be supported and serviced within the skill of local engineers and technicians. Given the extremely steep nature of the learning curve that we are dealing with, the team thinks it only reasonable to walk before trying to run. As a direct consequence of this thinking, the majority of modern machines that rely on software, PLC controls and computer links should be avoided in favour of more basic functionality. Electro-mechanical machinery is favoured from a support standpoint, since even hydraulic engineers are in short supply in Rwanda. If we desire an industry that can run and keep running while it is learning, this is the direction to go in; robust and easy to maintain plant that will give good results and can be supported locally. This will be the way to energise the value chain. In the case of tanning and of leather working, we are starting from a point of almost absolute zero, so to expect to go to world class technology and standards in one step is not a realistic concept to hold. Focusing on retaining Rwanda’s resources and refining them to meet local (national) demand first of all, will help to establish sound practices in production and methods.

Many countries have been able to use Government Contracts to energise production – for the likes of army boots, police and security service shoes and even children’s school shoes. These contracts can be critically important in building manufacturing volumes and production confidence and robustness. It is advised to offer such work to Rwandan companies so that all of the benefits stay within the country.

2.1 Industry Structure and Value Chain Map

According to Kaplinsky and Morris (2000), mapping the range of activities in a value chain provides the capacity to decompose total value chain earnings into the rewards which are achieved by different parties in the chain. The Rwandan leather value chain is made up of livestock farming, livestock traders, butcheries, slaughter facilities owners, hides and skins traders and exporters and artisanal footwear and leather goods manufacturing. Thus, there is a missing link between production of hides and skins and production of leather goods, as there are no tanneries, which are operational. The schematic presentation of the leather value chain in Rwanda is illustrated in the Figure below:

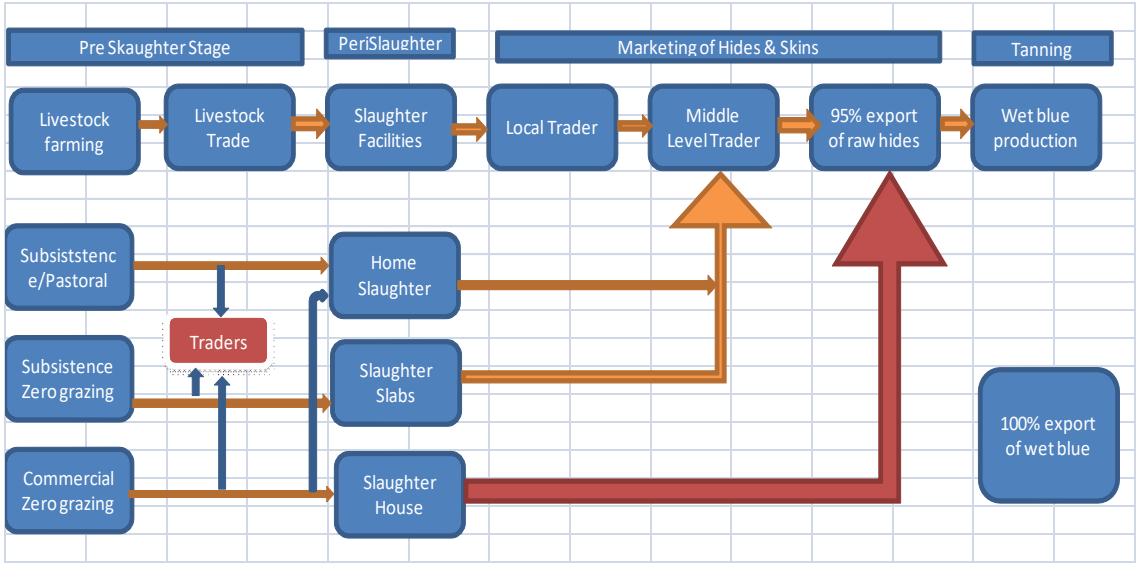


Figure 1 : Rwanda Hides and Skins Value chain

Source: COMESA/LLPI 2015/Consultant

2.1.1 Value Chain Volume Mapping

In this section, the team wishes to establish the understanding of potential for the industry, by taking the figures we have been given and laying them out for comparison. We must consider the potential end uses of the hides and skins, because due to inherent qualities raw material can be processed as having a "predisposition" towards particular product types.

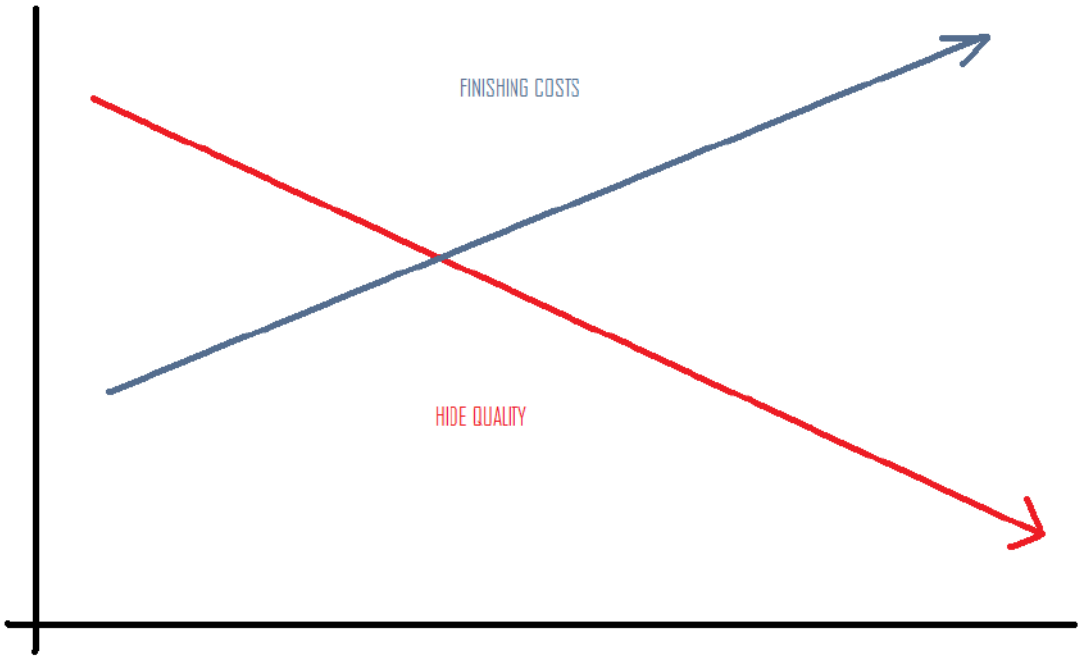
Bovine can be processed into firm, structurally sound leather that will be good for shoes or bags / luggage, although depending on the thickness (substance) of the hides at a given age of generation, production of especially thick leathers may be precluded. It is also possible to produce soft and pliable leather from bovine, by engineering the detail of the processing. The primary end use for this material will most probably be for shoe upper material, with some being diverted during the process for vegetable tanning perhaps for belts and light equestrian uses.

Of the small skins, goats are more numerous. They are reported to offer a good percentage of suede quality grades so, although they will tend to be on the thin side, may produce reasonable sales. The biggest problem with the goat skins is the high proportion of small skins in a batch – related to breed and age at slaughter. Light footwear for the ladies and children's' market might absorb some of this material, with the rest going into bags and small leather goods such as wallets, purses and handbags. Sheep material is reported in smaller numbers and is generally predisposed towards garment and gloving uses.

The way in which all leather is dyed and finished can offer the tannery an opportunity to upgrade leather by effectively disguising surface faults. Innovation in process design is critical to being able to achieve a level of sales with the lowest grade material. Tanneries run processes that make conversion times as long as several weeks, so the amount of capital tied up on the factory floor as stock can be significant. Commercially, the best leather made from the best quality hide or skin is always in demand and very little effort has to be put into selling such product.

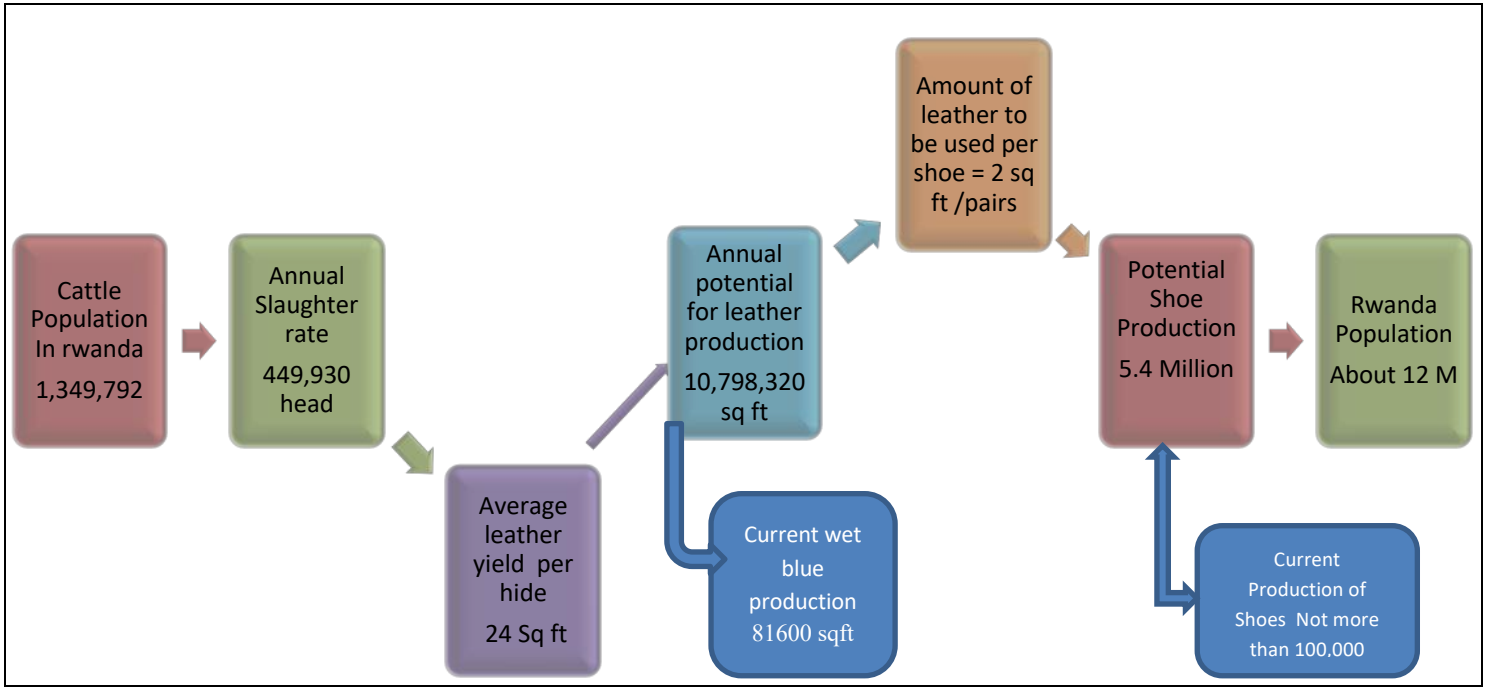
When the hides or skins are not of the quality suitable for the best products, there is an inverse relationship with manufacturing cost. The worst skins take more work and chemicals to convert into quality that is saleable, so often need to be produced at slim or no margin, just to get the capital back.

Figure 2: Inverse relationship between quality & cost:



Starting with a good quality raw material can help to give tanners a chance of success. Tanning companies are high capital, low margin enterprises in most cases, with gross margins often 5-7% at best. This is why it is so essential to always have a reliable outlet for the low grade material, otherwise working capital is choked-off and cash flow stops due to unsold stockholdings. The dilemma for the tanner is that it is not possible to grade the surface quality of the hide or skin before it is part-way through the manufacturing process – by which time it is too late to complain to the supplier or to send it back for a refund. Hides and skins have a distribution of qualities within each batch and processing needs to be set-up to accommodate this heterogeneous nature.

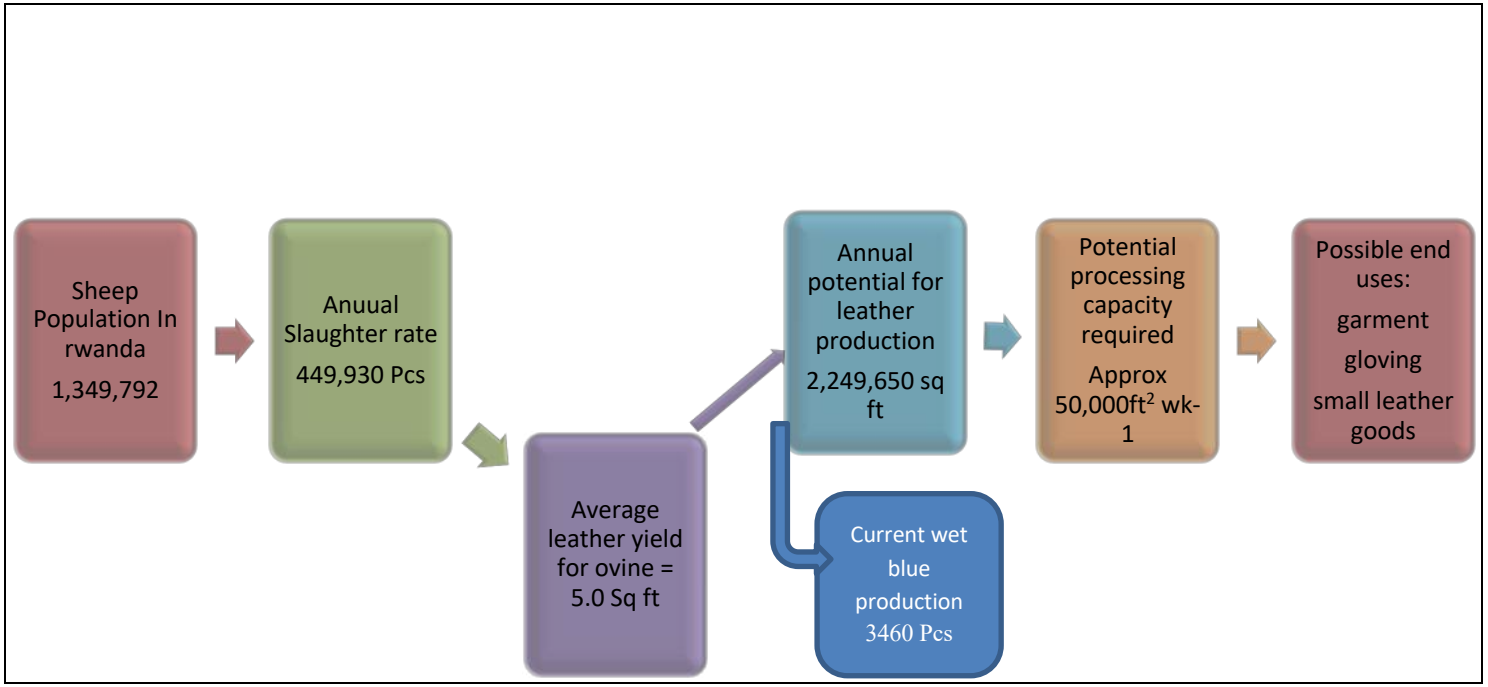
Figure 3: Volume Mapping for Bovine Hides, annual figures calculated from the information provided by interviewees



Source: Consultants 2017

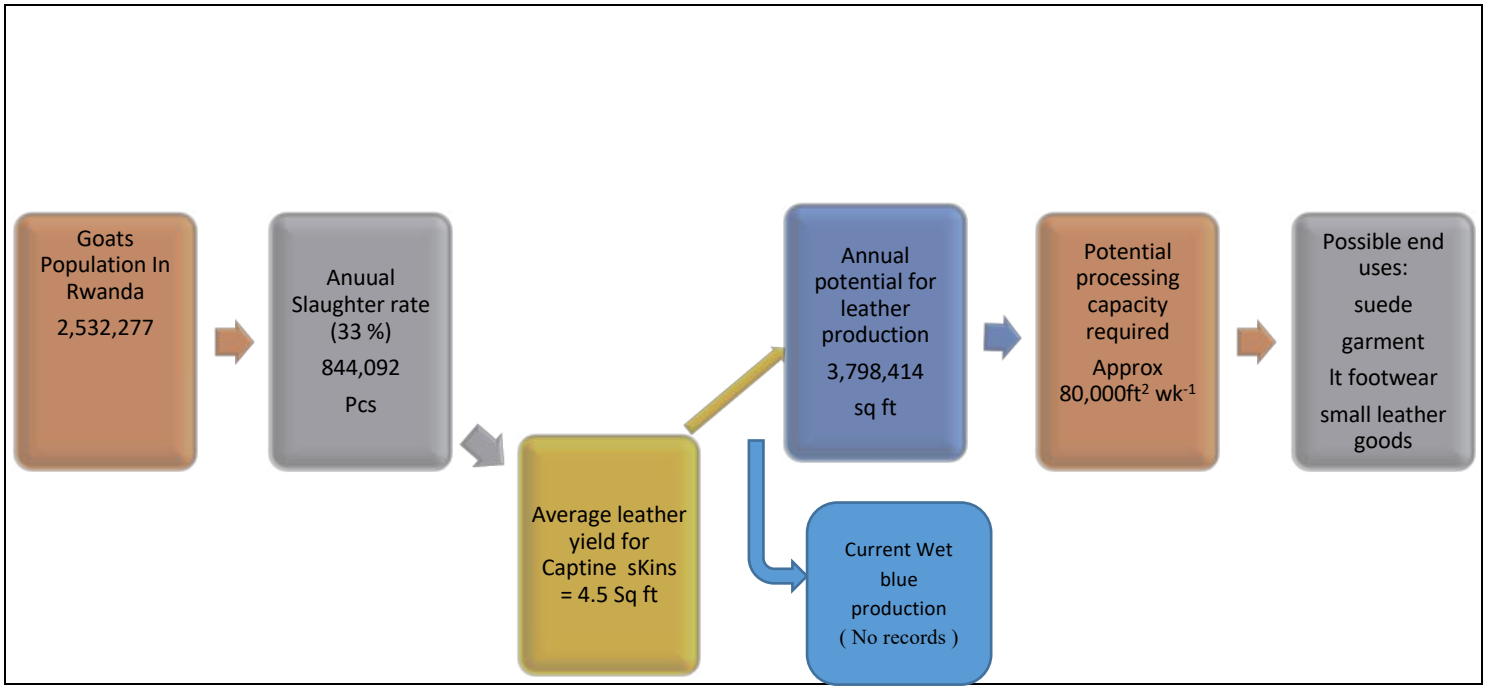
It can be seen from these figures that domestic bovine material may be able to provide for approximately two-thirds of national demand alongside synthetic products used in log grade sandals, flip-flops and similar, with demand at 0.5 pairs per capita, per year (ie. One pair purchased every two years). This demand is set to increase however, so there will still be a push for higher volumes of raw material or selected shoe imports. Capacity provision for approximately 250,000ft^2 per week indicates a medium-sized bovine tannery will be able to handle all available hides.

Figure 4: Volume Mapping for Rwanda Sheep



Source: Consultants 2017

Figure 5: Volume Mapping for Rwanda Goats



Source: Consultants 2017

Combined processing capacity for sheep and goats combined (approx. 130,000ft^2 weekly) would influence the overall provision of tanning capacity. Processing plant of different size and scale is required for bovine and small skins, so it may be desirable to establish 2 separate plants or to build one plant with two parallel processing systems, one for bovine and one for all material. After the crusting activities (dyeing and drying) it would be possible to employ the same finishing machinery for all leather types, so a single finishing department could be designed to cope with the whole production.

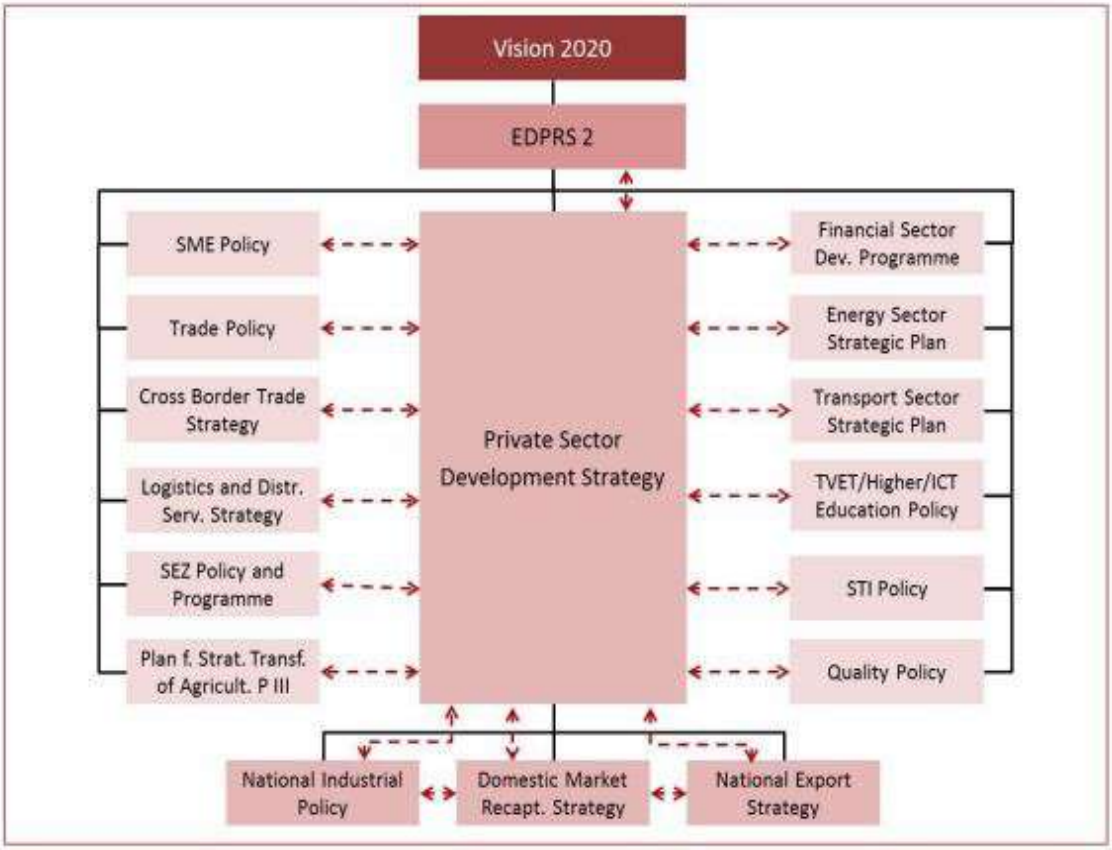
2.2 The Influence of Existing Government Policy throughout the Value Chain

The vision and aspirations of the Rwandan Government is elaborated in detail in Vision 2020 document. In this document, it is stated that "the Vision 2020 is a reflection of our aspiration and determination as Rwandans, to construct a united, democratic and inclusive Rwandan identity, after so many years of authoritarian and exclusivist dispensation; we aim, through this Vision, to transform our country into middle - income nation in which Rwandans are healthier, educated and generally more prosperous; the Rwanda we seek is one that is united and competitive both regionally and globally".

2.2.1. Policy and Legal Framework in the Leather Value Chain in Rwanda

Rwanda has over the last 20 years put in place policies and strategies which have a link to the country strategic focus of being a middle-income country by the year 2020. The policies and strategies put in place for the leather value chain and overall development of the industrial sector have a strategic relationship or a logical link with the overall development vision and aspirations of a country. This policies are best captured by the Figure 1 the Policy Map for Rwanda's Domestic Market Recapturing Strategy which well highlights key policies and strategies that affect the leather value chain. The development of the leather value chain to improved status is focused on ensuring that the local production units met the needs of the domestic markets and even go beyond though exports of their final products. Thus, earning and saving the country a lot of the foreign exchange that goes to this particular value chain.

Figure 6: Policy Map for Rwanda's Domestic Market Recapturing Strategy



Source: Domestic Market Recapturing Strategy 2015

2.2.2 Regional Integration Policy Issues

The main goal of any African country's membership to African Economic Blocks/communities is mainly to further socio-economic co-operation and integration, as well as political and security linkages among all member states within the same geographical location in African Region. Rwanda therefore considers regional economic integration as one of the crucial elements of achieving the vision 2020. To this end, Macro Unit analyses the economic impacts (benefits and costs) of Rwanda's accession to the regional economic bodies (Rwanda is full member of COMESA, CEPGL and EAC) has been undertaken

Rwanda is a member of the following economic regional bodies/blocks:

- East African Community (EAC) an intergovernmental organization of 5 states (going to six with addition of South Sudan)
- Economic Community of the Great Lakes Countries (CEPGEL)
- Common Market for Eastern and Southern Africa (COMESA)
- African UNION (AU)

What has a key significant impact to the local leather value chain are the current activates of EAC. The Ongoing components relevant to Rwanda within the EAC include:

- **Freedom of Movement for Capital and Goods**: Reduction in Tariff Barriers to Trade. An important component of this is the One-Stop Border Post (OSBP) while ensuring that the regulations of the countries that share borders are complied with, will improve intra-regional trade in Africa by reducing bottlenecks and avoiding duplication of clearance procedures at borders for people and goods. EAC is considered as local market for all the EAC industries and production units.
- **Unification of Currency**: En Route to the African Monetary Union
- **Labour Mobility**: The Status of Freedom of Movement Protocol
- **Common External Tariff**. On imported good
- Ban of Imports of second hand clothes and shoes. (SHC).

Other Relevant Polices and Documents local and regional oriented include

- Seven Year Government Programs (2010-2017).
- National Livestock Policy.
- Rwanda Leather Value Chain Comprehensive Strategic Framework 2015 to 2024
- **A** Draft Policy Proposal on Modalities for the Promotion of Leather and Footwear Industry in East Africa Community
- The EAC Vision 2050.

2.2.3 Status of EAC Policy Implementation

Several policy options have been adopted by Rwanda in the implementation of the Summit Decision so as to reduce the influx of Second Hand Clothes (SHC), and boost the growth of the textile, apparel and leather industry. The specific elements that affect the Leather sector include as outlined in MTI (2016) are as follows[1]:

A) Fiscal Measures: Progressive phase out of SHC imports using the following tax measures to discourage SHC importation.
   - Duty increment on SHC: beginning with US$ 2.5 per kg by December 2016, $4 per kg by July 2017 and $5 per kg by July 2018.
   - The introduction of a minimum charge of US$ 5 for every pair of used shoes imported into the EAC region.
   - Reduction on Import Duty: To 0% on import duty on fabrics and accessories not produced in EAC by July 2016 to promote domestic production.

[1]Katende–Magezi, 2017

b) Public Procurement: Issue of Ministerial instructions/ guidelines to all procuring entities to give preference to the local manufacturers for highly demanded products such as school uniforms, police and army uniforms, school shoes, boots and others.

c) Enforcement of pre-shipment inspection for all imported SHC to comply with the sanitary requirements in the destination country.

d) The introduction of a ban on export of raw hides and skins outside the EAC region since 2016.

E) Increase domestic production of fabrics and support domestic production of finished leather.

2.3 Institutional Framework

In order to review the needs and players in the manufacturing industry and how this relates to the leather value chain this will be an interplay between six types of institutions shown in Figure 7 below. As agents of delivery, it is important that these institutions be aligned efficiently to achieve their objectives.

Figure 7 : Institutional Framework in the Rwanda leather sector

Source: Consultant

Table2 Participating institution in the leather sub-sector

Institutions	Participants	Role
Consumers and Suppliers	Rwanda Population	Consumption of leather Good and supply of Livestock.
Professional Institutions	RAPROLEP (Rwandese Association for the promotion of Leather and Leather products), Rwanda Leather Value Chain Platform (RLVCP), Private Sector Federation (PSF)	Advocacy and sector mobilisation
Investors and Private Sector	Abattoirs , Tanneries , Artisans	Investment and training in production units
Vocational Training Institutions	• WDA-TVET institutions • Informal Training	Training of Science and Technology on Leather and Leather Products Manufacturing
Government and Related Institutions	Districts , LODA , Minagri /RAB , MINICOM , NIRDA , RSB , RDB , Ministry of Finance, RRA , Ministry of Education and WDA.	Policy and legal guidance, Policy and strategies implementation
NGO and International Institutions	COMESA/LLPI, UNIDO, GIZ, Swiss contact.	Support in the development of the industry.

Source Consultants 2017

Section 3. Raw Materials (Hide and Skin Sub-Sector)

Photos 2 : Showing Preserved raw materials

The general condition and quality of raw material observed during the information gathering has been relatively good. Small skins are generally free from the major detrimental effects of flaying cuts, due to indiscriminate knife-work and the abattoirs we visited were all of a reasonable standard of design, layout and equipped with hide pullers for processing of bovine animals. These greatly reduce the need for excessive knife work during the flaying operation, giving a direct boost to the quality of leather that can be made from the hides generated. Speed of curing (delay before getting into salt) was observed to be a little variable, with some material being salted at the hide and skin trader's premises and not done as soon as practically possible at the abattoir. Breed-wise the incidence of hump-backed bovines (zebu and relatives) was not high in our observations, so the strains being bred currently give hides which can be processed as full hides, without "siding" to reduce the compound curvature of the hump. This gives a possibility of processing as either sides or as full hides – which may enable upholstery leather to be made from them. The average age of bovines at slaughter was said to be 2 years. Tanned material inspected in the wet blue offered bovines with a fine grain and of reasonable clear grain area. Goats appear on the small side of average, compared with other international sources (average 4.5 sqft) but again, seem to be of reasonable grain quality too(high Percentage of Suede) . Sheep were not available to inspect during our travels.

Table 3: Rwanda Livestock Population 2015

PROVINCES	**Bovine**	**Caprine**	**Ovine**
Total SOUTH	399,472	805,333	158,926
Total WEST	218295	511,821	205,107
Total NORTH	254060	408899	194369
TOTAL KIGALI CITY	54,774	130,211	8,252
Total EAST	423,191	676,013	64,206
Grand Total	**1,349,792**	**2,532,277**	**630,860**

Source: RAB/MINGARI 2017

It was not possible given the actual access to material and numbers inspected, to assess the incidence of natural defects and overall grading of material though we depended on the previous experience of the known local material and the reports of our interviewees. Of course, being a natural product, hides and skins display the impact of activities, treatment and attack from parasites etc. during the lifetime of the beast. Compared to the materials in the East African region the Rwanda material has been known to be higher quality especially the relatively tight grain and minimal defects. Therefore, it can only be assumed that because customers in neighbouring countries like to buy this material, it must have a decent intrinsic value in production and upgrading to finished leather.

Our value chain will live or die on the ability for Rwanda to retain these materials and develop forward processing for newly-established Rwandan enterprises .Current influences on the availability of raw materials are as follows:

- An increase in the populations of goat and sheep is resulting from the reduction of cows held by family groups. The “zero grazing” policy for milk cattle designed to reduce the risks of famine are directly impacting this.
- Reduction in family stock of animals and a push towards the small ruminants, rather than bovines for meat.
- Fewer cows are going to slaughter.
- A move towards beef production on a more intensive system will eventually bring more of hides into the system.
- Calves surplus from the milk production cycles are mostly consumed locally or fed to animals.

3.1 Hide and skin supply

The Rwanda Hides and skins sector suffer from the well-known problems facing the sector in general which can be categorized into three;

a) Pre-slaughter defects – any damage caused by different factors like poor management genetic make-up, disease and nutrition etc. occurring in the live animal.

b) Peri-slaughter defects: any defect that occur by several reasons, like failure to rest animals for certain period of times before killing, incomplete bleeding poor flaying of hides and skins.

c) Post-slaughter defects- groups of defects that take place after the hides/skins are flayed and include poor curing, poor handling, improper storage and poor tanning process.

Hides and skins are produced from the various abattoirs spread over the country. A discussion with Rwanda Agricultural Board (RAB) that there are 9 big abattoirs in the country and of which we visited 4 of them (three of them being located in Kigali). These abattoirs each process between 250 – 300 Cattle per day. It was noted that 4 further abattoir construction projects are currently under examination for the Provinces (Rusizi in Western Province, Ngoma and Kayonza in Easthern Province, Kamonyi in Southern Province).

A lot of slaughter takes place in slaughter slabs where the Ministry of Agriculture has undertaken an evaluation of their status in survey in 2016 (Appendix 2). From this survey, the Ministry noted that many Slaughter Houses and Slaughter Slabs have to be rehabilitated or closed. The Annual Off-take (kill) rates are estimated as 8.3% for cattle, 30% for sheep, and 33% for goats (COMESA /LLPI, 2015).

Table 4: Slaughterhouses visited

Name of the Slaughter house and Location	Key issues	Capacity	Current operation
Rusororo (Rugano) Gasabo	➢ New Modern abattoir ➢ Increase of second cold room.	100 -150 Animals per day	20- 25 animals per day
Niboye (SATRA), Kicukiro	➢ Needs improvement and investments in modern machinery. ➢ Needs rehabilitation or relocated (As located in a settlement and wetland area)	200/300 Animal per day	50 – 180 animals per day
(SABAN)Kimisagara Modern abattoir Nyarugenge	➢ To be rehabilitated or relocated (In settlement and business zone today)	400 Animals per day	70-100 days per day
Gakenke Modern Slaughter house ,Gakenke	➢ Modern abattoir	100 Animals per day	15 - 20 animals per day

Source: Consultants 2017

3.2 The key subsector challenges

➢ Storage of the raw material and the "man-made" defects that result from this, creating significant raw material quality problems- and therefore, reduction of potential value (Post mortem defects).

- Size of the hides being small compared to international Standards 20-25 Kgs green and 13- 15 kgs wet salted weights. This is breed-related and linked to age of the animal at slaughter.
- Salt for preservations has to be imported from Tanzania
- Wastage of raw hides and skins especially in the rural areas estimated currently to be 5%
- Price fluctuations which are currently dictated by the export market activities.
- Lack of hides processing facility to take in all the hides and skins produced in the country. Therefore, no real incentive to retain the raw material resource within Rwanda.

A majority of the hides and skins produced in Rwanda are exported raw taking into account that there is only one Tannery (Kigali leather Ltd) that is operational. The data from the Rwanda Agricultural Board (RAB) shows the following levels of exports:

Table 5: Summary Hides and skins export 2013 – 2016 by value.

	2013	2014	2015	2016
Value in USD	16,022,533	14,222,236	10,375,209	7,443,474
Volume in KG	10,298,266	9,616,585	8,265,091	6,194,29
Price USD/KG	1.56	1.48	1.26	1.2

Source BNR 2017

Table 6: Summary of hides and skins export 2013 -2017 by volume

Summary Hides and skins export 2013 -2017				
	Hides		Skins	
	Pcs	Kg	Pcs	Kgs
7/2013-6/2014	510213	7142982	2793749	2234999
7/2014-6/2015	414600	6011696	2484173	2732590
7/2015-6/2016	343721	4806330	2541773	2291215
7/2016-6/2017	288113	3973312	1148488	1162332

Source RAB 2017

In the year 2014, the data shows that they were close to 10 exporters of hides and skins from Rwanda. The active ones in terms of export of the raw material were about 6 during the visit. It is important to note that one of the Exporters Kigali Leather has now constructed a tannery in order to export wet blue to China without tariffs being applicable.

Table 7: Exports of hides and skins

Exporters	Value (Frw) in 2014	Quantity exported (Kgs)
BRR COMMODITIES LTD	26,793,943	12,569
IMPU- MAHIU RWANDA LTD	240,693,721	200,000
KIGALI LEATHER LTD	72,085,967	150,000
MWOGO TRADING LTD	81,435,596	61,757
NYABARONGO HIDES & SKINS LTD	36,354,546	27,000
SAIDI AND SONS LTD	16,621,770	60,000
SHENZAKA TRADING CO LTD	4,992,219	18,000
SKINEX LIMITED	19,949,681	72,000
VISION BUSINESS COMPANY ENTERPRISES	250,960,356	175,000
Grand Total	**749,887,799**	**776,326**

Source RRA Trade 2015

3.3 Sub-sector SWOT

Strengths

- Good resources base.
- High quality hides and skins with minimal Defects.
- Supportive Government policy on promotion of Made in Rwanda and reduced Imports.
- Most of the animals which are slaughtered in the Formal slaughterhouses lead to yielding of high quality hides and skins
- Readily available labour force, reasonably well educated
- A large number of graduates on the market to recruit from
- Common acceptance of the National policies of improvement and development from within Rwanda

Weakness

- Policy that is limiting the local stocks and replacing them with more genetically superior breeds with a focus
- Rwanda is a small country with a large and growing population, putting pressure on land use.
- Limited available land for livestock use directly limits the size of herd that a farmer can keep.
- Improper animal handling facilities during transportation.
- Poor slaughtering practices: unskilled labour force, inappropriate technology especially in less well-controlled, regional slaughtering units.
- Poor storage and preservation techniques and infrastructure.
- Importations of salt for preservation
- Prices of hides and skins not related to the quality of hides and skins. Based more on weight basis this reduces the need for farmers /butchers to take good care of the animal.
- Lack of incentive for farmers / butchers to consider the quality of the hide or skin during farming/ husbandry and at the abattoir.
- Absence of hide and skin grading standards and lack of implementation of the same

	➢ No incentive to retain the raw material resource, due to lack of domestic processing capacity. ➢ Lack of tariffs encourages exporting of goods as commodities rather than developed, value-added product.

Opportunities
• Promotion of Beef lost in order to have meat for export and thereby increasing the volume Hides produced.
• Impose a tariff on wet blue exports outside of the regional trading bloc to encourage full development inside Rwanda
• Changing balance between hides from milk and beef cattle will improve hide quality and upgrade potential for leather
• Common marketing through the formal collaboration among the hides and skins traders though the association of Hides and Skins collectors.
  • Plentiful raw material available to establish industrial leather making
  • Ready domestic market for leather products and goods
  • Reduction of imports by producing "at home"
	Threats
	• Export of Live animals to the neighbouring country especially DRC)
	• Free Export of hides and skins especially due to lack of full implementation of the Export policy on hides and skin where it's at 0% for export to East Africa , 80% levy for export to outside East Africa
	• Tariff-free international export of wet blue risks loss of the potential to upgrade and add value to the material

Source Consultants 2017

3.4 Suggested support

Based on the above, the following support is proposed:

- ➢ Training of the flayers and slaughterhouse staff especially in the non-formal slaughter units.
- ➢ Better understanding of the potential for developing animal by-products: "the fifth quarter" economics[2].
- ➢ Enhanced quality control in slaughterhouses through the implementation of the HACCP standards through RSB which are at the infancy stages.
- ➢ Sensitisation of the beef farming community (feed lots) and support of the same though both policy development and financial support for establishment.
- ➢ Training of the hides and skins collectors in grading and proper curing and storage of raw hides and skins. The COMESA grading standards can be used.

[2] Refers to Animal by-products: The fifth quarter is an attempt to describe those parts of the animal that are not directly consumed by humans as food.

- Development of legislation for the specification of suitable hide and skin storage facilities, including the formal licensing of hides and skins collectors.
- Improved institutional support for the hides and skins collectors association.
- Encouragement to establish industrial tanning and finished leather production to provide incentive to retain the raw materials within the country and produce goods with many times the value.
- Better control of hide and skin exports as raw (salted) and part-processed commodities.

Photos 3: Wet blue Skins from a Tannery

Section 4. Leather Manufacture

Leather manufacture is an ancient activity. It is the world's first industrial recycling process and is approximately 5000 years old. It is fully understood at the technical and chemical level today due to the advent in the late 19th century of leather science and its development to the present day, firstly to explain what is going on and then to offer the ability to steer processing to produce refined and unique products that are specifically engineered to fulfil a particular purpose. As a control mechanism, leather science offers full disclosure of the process inputs and outputs so that no tannery should place a burden on the environment. Leather is an engineered product that is made to meet a particular set of performance requirements in use (a specification). All the EAC Partner States process leather up to the wet blue stage with few organisations undertaking the Leather finishing. Between 80 to 90 percent

of the wet blue leather is exported and only 10 percent is left for processing to finished leather, which caters for the footwear and artisan shoemakers[3].

4.1 Tanneries

Rwanda has 2 tanneries (Kigali Leather Ltd and New RUCEP RWANDA Ltd) – with New RUCEP RWANDA Ltd in a dormant state with no current activity – and none planned for the foreseeable future due to lack of working capital. It will take significant capital to re-commission the New RUCEP RWANDA plant in-line with best practice methods, so a buyer may be difficult to find.

The other tannery, Kigali Leather Ltd is in an active and volume processing situation making wet blue leather for export. Raw (salted) hides and skins carry an 80% export tariff outside the East African region, but wet blue is currently zero-rated as to international trading. This tannery is reported to export four container-loads of wet blue per month and intends to expand. The inside of the factory was poorly laid-out with many unguarded machines with exposed moving gears and flywheels, belts too. Workers were loading drums by climbing up on pallets, hoisted up to significant height by the fork-lift truck without safety cages or harnesses to prevent a potentially fatal fall. This painted a picture of bad practice, with hazards all around, even though the banners on the factory wall were emblazoned with the message “safety first”.

The wet blue goes to China where some of it is recovered to Rwanda for making shoes once it has been dyed and finished and presumably been selected to retain the most valuable hides in China. The tour of facilities was wholly incomplete as far as the production process went, so we had to make assumptions as to where the finished leather came from for making shoes in the upstairs department. While the tannery was not able to show us production departments for dyeing, drying, softening and finishing, the owners were keen to show us the modern and well-equipped shoe making lines and the large stockpile of (claimed) 20,000 pairs, all carrying the “made in Rwanda” tag and destined for the local market.

The factory does not have a laboratory for monitoring production, so no testing is done to verify fitness for purpose of the products produced. The general appearance of the products we were shown is superior to the shoes and sandals made by local artisan producers. The products also displayed more intrinsic design content and differentiation of styles in a range. The owners of the company are currently looking for a suitable retail store in Kigali where they can feed this stock of 20,000 pairs (at time of survey) into the local market. Impact of this development on the artisans could be significant.

[3] Source: Kigali Leather Company.

A separate confidential report has been prepared on the environmental aspects of the operation of Kigali Leather Ltd. for NIRDA's consideration in conjunction with REMA.

Table 8: Wet blue export 2016

Date	Pcs	Kgs
Jul-16	0	0
Aug-16	3020	21795
Sep-16	9300	73377
Oct-16	9380	73495
Dec-16	9490	73120
Jan-17	12220	91235
Mar-17	13500	95879
Apr-17	10620	74353
May-17	10500	74845
Jun-17	3460	25120

Source RAB 2017 (These are presumably all from Kigali Leather Ltd)

Export on this scale of approaching 100 tonnes per month in some cases, will need to be controlled as Rwanda expands processing capacity and moves towards the production of finished leather with which to energise the rest of the value chain.

4.2 Rural Tanning Activities

Photos 4: Rural Tanning set up and products.

Leather production is generally a volume-based batch production system by definition. It is however noted that some "cottage industry" does exist, with two entrepreneurs Nova Leather and "Impu Z'iwacu" cooperative. They each are setting up their own micro-processing plants behind the home in Kamonyi and Gakenke Districts. Nova leather intends to process wet blue bought from the neighbouring country, Uganda to the finished leather state. Key in the set-up is a home-designed and made dyeing drum that is intended for the wet chemistry of converting the commodity wet blue into a defined product with specific purpose in mind. The entrepreneur who is trying to get this activity off the ground once held a senior role in a Kigali tannery that closed down sometime earlier.

Impu Z'iwacu a local shoemaker in Gakenke also does some rudimentary vegetable tanning of one hide at a time in a small shed. Liming and unhairing takes 5 days in a barrel and then the inside of the hide is cleared of flesh tissue by hand operation, with a large knife over a wooden pole. The hide then is put forward into a tanning solution of mimosa bark in another barrel for 5 days. After this time, the leather is washed and free-air dried while being treated with oils to impart softness to the material. This cottage industry allowed him to make leather for belts, the vegetable tanning character giving a superior product in that use as compared with using imported chrome leather. This cottage industry activity demonstrates an understanding of the process fundamentals, even if the end product is not of a particularly high standard.

This report must develop on wastes in leather value chain (Source of pollutants, its management and implication to the environment), findings on established treatment system of effluent from the two tanneries even in SMEs producing leather goods; referring to the volume of waste produced, suggest the adequate technology to be applied to protect the environment.

4.3 Imported Goods

From the survey, there was evidence of imported finished leather for all the currently leather goods manufactures apart from Kigali Leather Ltd. We had to make assumptions that the leather they were using for shoe manufacture on their own in-house lines was coming back from a proportion of the wet blue exported by the company, or material that is produced in China.

The government has allowed some of the local producers (12 of them) to import finished leather tax free in order to spur local production. The imports were noted to be coming from Kenya, Tanzania and Ethiopia. Though out of this firms only about 4-5 are doing this directly. In addition to this there are at least two key dealers in finished leather in Kigali (Kazi ni Kazi and Munanira) these are companies who are effectively serving the artisans as stockists, importing leather and other materials from Tanzania and Kenya.

In addition to this, almost all the chemicals for leather production are imported from various sources regionally or from the Asia. This leads to high cost of production due to shipping costs, small order surcharges and taxation amongst others.

4.4 Sub-Sector SWOT

Strengths	**Weakness**
➢ Availability of good quality local resource (Raw Hides and skins). ➢ Positive Government attitude on support for the leather sector. ➢ Export ban/Levy helping to improve the availability of raw hides and skins. ➢ Large pool of trainable human resources with the Rwanda population being a young population.	➢ Massive lack of domestic processing capacity with only 1 foreign-owned tannery *in situ* ➢ High investment costs to establish industry. ➢ Lack of Skills in the Leather production sector. ➢ Inadequate technical training facilities ➢ Inadequate technical skills. ➢ Limited access to finance. ➢ Loan repayments are often scheduled to start before the new facilities are installed and running (to create the additional earnings) ➢ High cost of electricity. ➢ High cost of inputs (Chemicals which are all imported and hides and skins which are competed for with local exporters of raw material). ➢ Poor location of the tanneries which would hinder further growth and development
Opportunities	**Threats**
➢ Identified leather park project proposed in Bugesera will be designed to deal with environmental issues through a Common Effluent Treatment Plant. (CETP) ➢ Any new factory design can incorporate the use of renewable energy sources such as solar water heating and solar PV to offset the size of the demand on the National Grid and imported fuels. ➢ Growing domestic and regional demand for finished leather. ➢ Improve retention of raw material by enforcing levy on raw hides and skins and wet blue going outside the EAC ➢ Government interest to develop a sector specific policy. ➢ Potential Government procurement for military, police and other Government institutions offers useful production volumes ➢ Expectation of the ban on the importation of second-hand shoes ➢ Concentration of activities in one area offers development of by product outflows ➢ Higher proportion of ox (beef) hides in the production system will improve quality potential for leather making	➢ Environmental Matters: risk of pollution of ground, ground water aquifers, streams, rivers and neighbouring countries if full treatment is not demanded and policed ➢ High minimum environmental standard requirements are necessary due to Rwanda being a land-locked country ➢ The only currently operational tannery works “dirty” producing threat from environmental pollution ➢ Export of the Rwanda Material to the more developed leather sector countries in the region. ➢ High prices of hides and skins, dictated by external markets ➢ Competition on price from hides and skins exporters ➢ High cost of production for tanneries almost all the chemicals have to be imported from outside the country. ➢ Tight border controls on even the most basic process chemicals (reported) ➢ Delays and long lead times of importing due to materials being impounded at customs ➢ Lack of structured National research for the sector.

	➢ Lack of strong Government / Private sector and inter-institutional collaboration in research (Triple Helix concept)

4.5. Suggested Support

The almost complete lack of industrial activities in this sub-sector is both a blessing and a curse, because it is so expensive to build leather manufacturing from scratch, and there exists an unwillingness to make the first move. Hides and skins are available but the current players export most of them, so if significant capacity was provided, how would the raw material be diverted into local production unless the existing traders had a stake in the enterprise? The free market nature of this scenario provides a chicken and egg situation. Which should come first, securing the raw material or building processing capacity? It is clear that the raw material provides a nationally important resource which if properly developed can provide a range of benefits for the national economy. These include:

- Reduction of imported leather for artisans to use.
- Reduction of imports by ensuring that there are Rwandan shoes and leather goods in the domestic market.
- Potential to develop volume shoe and leather goods production for retail.
- Establishment of downstream opportunities for employment, in supply, support, manufacturing industry and retail.
- Improvement in earnings ability for employees.
- Boost to local economy through improved spending power.

One of the biggest challenges is how to retain and maximise the benefits of processing and adding value without having to give-away control of the resource to a third party on an open-ended basis. It may be reasonably easy to invite a foreign company, perhaps from another continent to build a tannery and make leather from Rwandan raw materials, but the profits would not necessarily remain in Rwanda. Given that the quality of the raw material is reasonably high and international demand for good leather is extremely high, an outside agent with an established business would probably be very keen to be able to ring-fence another potential quality source of raw material. Care will need to be exercised as this will not produce much in the way of economic benefit for the Rwandan Economy. Without first having a plan to secure the resources, there will not be any development possible in terms of adding value.

Chief among the concerns related to leather production is the effective treatment of the waste produced. In the case of a landlocked country, the presence of salt in the effluent poses the biggest single issue. If Rwanda had tidal estuaries or a costal location, salt-bearing liquid effluent after processing for solids, metals and biological activity could be simply let out to sea. This is not possible and release of salt effluent into surface waters or the ground around a tannery is a serious pollution risk. The risk extends to fresh water aquifers supplying drinking water for the population and for animals, streams, rivers with the flora and fauna that they support and thereby directly downstream to neighbouring countries. This necessitates that a fully effective treatment regime would need to be established before any tanneries can operate at volume. In order to attract leather manufacture into a concentrated area, the building of a common effluent treatment plant (CETP) is probably indicated. It is recommended that this be done on the basis of a modular design, since there is a risk in building a big plant, that the capacity is not effectively filled enough to allow economies of scale in the process of treatment. The parameters in force according to NEA sources are defined by RS 109: 2016

Table 9: Table of Effluent loadings permitted in Rwanda for Industrial Waste water

S/N	Parameter	Permissible limits	Test methods
1	pH	5-9	ISO 10523
2	Temperature Increase ^{o}C	<3	Thermometer 1
3	Total suspended Solids mg/l	50	ISO 11923
4	Total Dissolved Solids mg/l	200	ISO 7888
5	Oil and Grease mg/l	10	ISO 9377
6	BOD mg/l (20^{o}C	50	ISO 5815
7	COD mg/l	250	ISO 6060
8	Faecal Coliforms cfc/100ml	400	ISO 4831
9	Ammonia (as N) mg/l	20	ISO 6778
10	Phosphates mg/l	<10	Analytical tests (capillary electrophoresis)
11	Free Chlorine mg/l	<1.0	ASTM D1253-14
12	Arsenic mg/l	0.01	ISO 11969
13	Benzine mg/l	0.1	ISO 11423
14	Cadmium mg/l	0.01	ISO 5961
15	Hexavalent Chromium mg/l	0.05	ISO 23913
16	Copper mg/l	3	ISO 8288
17	Cyanide mg/l	0.1	ISO 6703
18	Iron mg/l	3.5	ISO 6332
19	Lead mg/l	0.1	ISO 8288
20	Mercury mg/l	0.0002	ISO 5666
21	Nickel mg/l	3	ISO 8288
22	Phenol mg/l	0.2	ISO 8165
23	Sulphide mg/l	1.0	ISO 13358
24	Zinc mg/l	5	ISO 8288
25	Selenium mg/l	<0.02	ASTM D3859-15
26	Pesticides mg/L	Not detectable	ASTM D8025-16

Source RBS RS 109: 2016

Immediately evident in the figures above is that there is no recognition of chromium III as a potential pollutant. While chromium VI is a common input of some other industries, tanning is based on the

trivalent molecule. It is rare for a tannery to generate CrVI from CrIII and CrVI is very difficult to assay at the lowest limits of test sensitivity. While CrIII is not carcinogenic (like the hexavalent version) it is still a notifiable element of effluent testing in other parts of the world. It is advised that this be addressed by the Authority immediately and new guidelines be published. Nevertheless, should the above parameters in current form actually be applied to the existing tannery and correctly policed, it would be closed-down as soon as the National Laboratory analysis report had been handed-over. Of that, there is no doubt. National Guidelines and limits are only as good as their level of application, policing and the Agency's insistence on conformance.

The potential for production of leather against national procurement requirements for the National armed forces footwear and police shoes, security companies, even school shoes for children would be a powerful incentive for new industry to become established. These leather types are not especially difficult to make and would allow a new business to get properly established and set the production cycle before it started to look for additional and more varied products to make. These products make good, regular production possible, on which a new company could get properly established. Government Departments would be wise to take care of how such procurement is allocated, because the knock-on effects depending on how it is done could be negative as well as positive. It will be necessary to try to maximise the national Interest by being judicious in this area.

- **Government policy / legislation** needs to create a climate for industrial development so that processing capacity can be provided. Engagement at all levels will be key to promote the understanding that this is all about empowering "made in Rwanda" and helping Rwandan people to do it for themselves.
- **Public/Private Partnerships** to establish home-grown Rwandan industry with joint share companies where technical stewardship and managerial experience might be provided by contract agreement at a technical stewardship level from an overseas supplier. Hired-help and skills bought-in over a defined period would help to develop leather manufacturing process capacity, without having to relinquish complete control of the material and value addition. Government would put up a significant proportion of the capital, with Rwandan stakeholders (probably current members of the value chain) as joint shareholders and overseas technical and managerial input would train Rwandans in-situ while production runs-up. When capacity is reached, the earnings of the business would help the minor shareholders to buy-out the Government interest. Hide and skin traders should be encouraged to buy-in to the value-added model, since when the industry changes, they have the most to lose – but also potentially the most to gain.

- **Skills Development:** There is a shortage of technicians in all the stages of the leather industry. The government and stakeholders could and should create opportunities for formal training in Leather technology at least at the vocational level. Currently these skills are almost non-existent.
- **Industrial Transformation**: though the players are all different, there is a need to have a very holistic approach to the whole sector in order to create a fully vertically integrated leather and leather products industry. The configuration of leather manufacturing companies can differ, depending on which part of the process they deal with:
  - some work raw material to tanned
  - some take the tanned material and produce finished leather
  - some only concentrate on the finishing activities and surface coating for aesthetics and protection of the surface
  - others cover the full production cycle from raw material to finished leather.

  It could be proposed to develop first of all from wet blue to finished leather production, because this is where the majority of value addition takes place. Rwandan hides could be contract tanned by arrangement with a neighbouring country that has established capacity and effective environmental controls. The wet blue on return to Rwanda could be dressed and finished without the massive investment need of a full CETP.
- **General upgrade their machinery and equipment**: One tannery (currently inoperative) had only been established for the processing of goatskins so if the new owners plan to process bovine material, it will need to be comprehensively re-equipped if required to make finished hide or side leather[4].
- **Access to finance:** Business start-up loans would help keen individuals to establish new enterprise, based on approval of a comprehensive business plan and judgement of projected earnings.
- **Incentive to expand production** could be boosted by offering cheap loans for companies that are able to demonstrate real capacity growth, where additional capital expenditure on equipment could be subsidised on a conditional basis. Perhaps a scheme that would part-finance plant purchases for zero interest if 20% capacity improvement is achieved by installing new / better equipment. Perhaps the business owner would potentially put up 20% of the cost, then the rest would be a zero-rated loan, underwritten by the Ministry of Trade and Industry through one of the National Financial Institutions over a term if 20% production increase is shown by the deadline. (A Future Vision "20:20" growth loan scheme). It would help the

[4] A side is half a hide cut in 2 down the backbone

entrepreneurs greatly if the structure of loans didn't insist on repayments starting before new facilities were up and running.

- **Limited collaboration with upstream and downstream chain players and amongst the various institutions in the sector**: Though the Rwanda leather value chain platform is currently in place as focal point for the sectors there need to be more formalised relationships and the role amplified in order to assist in advocacy. The same goes for the other associations. In addition to this there is a need to have a common Joint Action Development Forum for the leather sector bringing together all the Institutional players and the private sector in order to enhance the improvement of the sector. A "pan-industry" steering group with representation from all levels would ensure that upstream and downstream impacts of change are thoroughly weighed and considered.

Section 5. Shoe and Leather Goods Manufacture

Photos 5: Leather Good manufacturing units

There is a significant demand for footwear in the region, but 80 percent of the demand is met through imports out of which 60 percent are second-hand shoes. Clearly, the footwear industry in the East African region is still underdeveloped and suffering greatly from the importation of second-hand shoes and synthetic imports[5].

As noted indigenous trade in footwear in Rwanda is largely based on imported shoes, a significant proportion of which are second-hand and repaired and refurbished pairs. This gives a great opportunity for Rwanda to industrialise to cover the forecast demand of 1.5 pairs per person per year (17,500,000 pairs in total). By reducing imports significantly, there would be a boost to the National Economy. While there is not much in the way of developed industrial practice in this sub-sector, the opportunities are very big. It is not practical to expect that Rwanda could become an exporter of

[5] Esther Katende - Magezi : The Impact of Second Hand Clothes and Shoes in East Africa.- 2017

footwear overnight, but the industry could be developed initially based on local demand alone. Leather goods producers are numerous, most working on a small scale and artisan level. They produce a variety of leather goods

There is no reason at all why the sub-sector could not become more industrialised if the national hides and skins resource can be processed into leather within the country and sold-on downstream to the shoemakers and leather goods manufacturers. During the development of volume shoemaking, the vision and ability will be learned on how to address standards and produce reliable quality. These aspects are not available to Rwanda currently, because there has been no need for them to be developed. It was observed that many artisan shoemakers also produce bags, belts and other leather accoutrement.

Table 10: Breakdown of the percentage contribution in value of each activity to the value chain as a whole[6]

	%
Raw Hides and Skins	8
Wet-blue	6
Crust and finished leather	21
Leather shoes	46
Leather products	19
Total trade	100

Source COMESA /LLPI 2016

5.1 Artisan Shoemakers

There currently exits an Association for the Leather Artisan RAPROLEP which has approximately 130 members, who are spread all over the country though the majority are in Kigali. The Chairman of the Artisan Shoemakers Association estimates that in all, around 300 individual small businesses exist around the country and many of whom are not members of the Association.

Visits were structured during the mission to cover all aspects of the value chain, however, by the time that 10 artisan enterprises all every single one had made the same comments, it was clear that we

[6] : Mwinyihija Mwinyikione, 'Performance Brief-Leather and Leather Products Division'. Unpublished Paper, Using UN Commodity Trade Statistics.

could spare more time to diversify the meetings and interviews. Please see the visits log in appendix 2.

Table 11. Prices of New and Second hand Shoes

Type of Shoe	New Shoes in Frw (average prices)	Second Hand Shoes in Frw (average prices)
Men's footwear	20,000 to 100,000	500 to 10000
Women's footwear	10,000 to 50,000	3000 to 20,000

Source: Consultations 2017

5.2 Imported and Exported Goods

5.2.1 Footwear Imports

The statistics for import of shoes shows that Kenya provides the largest value of new footwear imports to Rwanda, with a value of $8.2 million during 2015. This is followed by China, with $5 million worth of imports and Uganda with a value of $ 2 million. Table 13 shows the total imports into Rwanda. The key observation here is that this represents lost income to Rwanda if the production was being undertaken within the country. It would therefore be safe to say that the footwear sector in Rwanda represents a potential of close to $ 20 million industry annually.

Table 12: Volume and costs of Imported Footwear in Rwanda

	2012	2013	2014	2015	2016
Value in USD CIF	12,836,81	13,186,855	14,789,708	18,622,509	18,573,201
Volume in KG	6,672,746	7,007,920	8,104,948	9,276,147	10,800,490

Source BNR 2017

5.2.2 Footwear Exports

The statistics show that there were exports of footwear from Rwanda worth about 1.8 Million USD, however, from the survey this could not be confirmed thus it's taken to be re-exports that could have emanated from Rwanda to the neighbouring countries.

Table 13 : Volume and value of Exported footwear from Rwanda

	2012	2013	2014
Value in USD	1,215,424	149,943	440,824
Volume in KG	667,995	281,255	683,061

Source BNR 2012-2014

5.3 Sub-sector SWOT

Strengths	**Weakness**
➢ Growing population in need of Shoes. ➢ Willingness of trainees in skills development sector. ➢ Potentially availability of raw material. ➢ Plentiful supply of new trainees who are keen to acquire shoemaking skills ➢ A ready market exists for shoes and leather goods ➢ All interviewees stated that given the right conditions they would easily be able to double their output in a very short timescale.	➢ Poor work environment leading to low productivity ➢ Cramped and poorly-lit workshops limit scope for growth by organic expansion ➢ Inadequate technical skills especially shoe design. ➢ Shortage of knowledge / know-how for last design and production ➢ Engineering and technical support for machine maintenance is difficult to access ➢ Low levels of mechanisation in workshops ➢ Old machinery difficult to repair and support ➢ Inadequacy of working Tools ➢ Poor / outdated shoe designs. ➢ Limited access to finance ➢ Lack of business development skills among SMEs ➢ High cost of electricity. ➢ Limited application of technology adoption. ➢ Limited availability of quality finished leather and accessories. ➢ Unstable supplies of finished leather and other accessories. ➢ Inadequate collaboration amongst SMEs with the RAPROLEP still at its infancy stages of development and inadequately not well supported
Opportunities	**Threats**
➢ Clear need for a more industrialised approach to manufacturing ➢ Readily available workforce ➢ Sound basic education and a willingness of people to learn ➢ Development of the leather garment industry as the Rwanda Skins have a high Suede Value. ➢ Lack of formal medium sized units that are producing shoes. ➢ Possibilities of leather Value-added production e.g. Furniture Production ➢ Sizable potential Market in East Africa and the COMESA region and the Rising demand of off footwear in the domestic and regional markets	➢ Artisan business being small and micro enterprises have no purchasing power, so always have to pay top prices for materials and supplies from local stockists ➢ No evidence of formal QC & QA practice, nothing is tested, so nothing can be expected to conform to any standard ➢ When seen as a low quality destination, it is easy to see how Rwanda could become a dumping ground for rejects made overseas ➢ No economies of scale are possible in production ➢ Micro enterprises cannot meet demand and large order capability is practically zero ➢ Imports of New Cheap shoes from China and Asia. ➢ Less developed sector compared to the other EAST African Countries ➢ Lack of entrepreneurial skills in the sub-sector

	➢ Competition from industrial products imported into the country e.g, Masai sandals vs the locally produced sandals. ➢ Vulnerable small industries producing similar products like those from regional industries ➢ Loan repayments often scheduled before the new capacity is up and running

5.4 Suggested Support

5.4.1 Cluster development

Nationally, a disparate collection of shoemaking artisans (estimated at around 300 by the Chairman of the Association) operates each as his own "island". As a result, they have no strength as an industry and no real potential for the scale of capacity building that is required to turn-around the economic situation. It is suggested that a centre of industrial excellence, a nucleus of learning and development of skills, process improvements and production be established, firstly in the locale of Kigali. This needs to be a diversified cluster with a training centre/industry lead academy at its core. Artisan producers who currently work out of a cramped back room should be encouraged to move their production to dedicated units in the leather village, where they could benefit from proximity to training activities, access to improved machine operations on a time / hire basis and hands-on support from the officers at the academy (acting as consultants) on days when they are not in the classroom. The rationale for this is that for each micro enterprise to invest in a full range of machinery to learn how to improve fit, finish and general quality would be prohibitive.

On the basis of current production, or should they be able to secure a 100% boost to output, each machine would be in action for only a few minutes per day. This would clearly constitute bad use of limited capital investment. Bringing artisans together in such a way is not unusual, but the concept of establishing a focus where formalised NVQ training would underpin the setting of new standards, which are going to be critical for developing line supervisors, junior managers and key decision makers for industry to employ. Mentioned also in the report section on training, a more unified approach to formalising and harmonising training standards is already under-way. It will be best to apply this in as focused a way as is practical. It is necessary to plan for the medium and long-term too. Artisan cobblers should be encouraged to share the vision of how access to better training, better machines and better support would enhance their ability. With this understood, it should not be difficult to persuade them to leave their repairs and sales facilities where they are, serving the local communities

and move manufacturing to the new leather village. The manager of one SME (SLP Ltd-Gatsibo)[7] stated another importance of clustering would be that establishing this centre of excellence would improve their ability to be more innovative in leather products designs which they can use for themselves or retail. The industrialists are likely to increase earnings as a direct result and also help to reduce youth unemployment.

With a critical mass of manufacturing established in a concentrated area, it is easy to see how the supply side of the value chain would want to relocate to where their customers are. It would be possible to have stockists and agents for imported goods such as buckles, eyelets, adhesives and other materials close to where they will be used. With increasing volumes of production, better prices for the input materials will result, accompanied by an increase in quality. The Industry Lead Academy would be the ideal place of course to set-up a central common-access tasting laboratory specifically for shoe & leather goods. Similarly, machine repair and maintenance activities would have a better chance to flourish and grow where there is a concentrated group of potential customers. It is advised for decision makers to visit the EFICCOS cooperative of shoemakers in Addis Ababa.

In a similar way to the foundation of tanning capacity, public / private partnership projects would be favoured over inviting a commercial entity from overseas in to take the majority of the benefits that would come from volume footwear production. Joint share companies with technical support from outside on a time / contract / results basis should be established that would learn as they expand and expand as they learn. The ultimate aim would be that Government interests are eventually bought-out by the other shareholders. Returning to contracts for the National Armed Forces etc, there is good scope to build capacity on a very progressive footing. The potential production line loading and work content that national procurement contracts might provide, could result in a wholly private sector enterprise of significant size.

[7] This is a Community Processing Center (CPC) with shareholdings scheme (Government, BDF, District and small shares of artisans)

Photo 1: showing crowded production units

5.4.2 Support to artisans

Current methods see artisans working in very limiting and confined spaces which give no scope for improvement or growth in industrial terms. Conditions are witnessed as better in the back streets of Khartoum, in a county that has been under the economic depression of International Economic Sanctions for 20 years or so. Big improvement is possible and should be encouraged in as short a time-span as possible. Many entrepreneurs stated that if they had more space they could increase production and profitability - why not give them that opportunity and provide them with dedicated factory units where they can expand into a cluster? This will need a focused study to develop the strategy.

Photos 6 : Some of the Products from the local firms visited

The story is by no means all negative because there are two enterprises with a more structured view of the future that could be supported as model support enterprise in this case a Star Leather Ltd and Dokmai Rwanda. The former currently produces 20 -25 pairs of shoes per day and has developed and opened a sales point in Musanze and with support of improved equipment and enhanced skills their productivity can be greatly enhanced can do better. The latter produces leather goods of very high-quality ready for the export market thus it could be supported with space needs which is its critical

challenge and more expositions of its products. Both enterprises when visited displayed a much more organised and professional face than the majority of others – they light the way that the others need to go. There needs to be support for the development of leather cluster initially in Kigali and later in other locations. In order to do this, the following actions are proposed. Such a large undertaking as establishing the National Epicentre for the trade, will require a staged approach:

- Develop a leather village and centre of excellence policy: this needs to be in line with the enhanced current Industrial and SME Policies.
- Identify a site for the leather village development (e.g. a possible site would be in the Gahanga industrial area as this will be close to the proposed leather park and currently close to Kigali Leather Ltd which could be encouraged to supply at least some of the leather).
- Review and harmonise the activities of all of the training bodies under different parent Agencies. Bring them all in line with the new industry centre of excellence in the proposed leather village.
- Perform detailed study and develop strategy for advanced cluster development.
- Enhance the capacity of the artisans in various entrepreneurial aspects. Many of the current enterprises are set up in way to provide the owners with day to day survival with only a few having a more long-term aspirations or development plans.
- Identify the ambitious ones who will easily adapt to the new shape of the industry – these will be the ones that drive into mutual agreements and collaborate to form companies that together will be bigger than the sum of their founding elements.
- Promotion and development of Rwanda leather brands: This could be from a product perspective and this needs to be linked upon integrated with other Rwanda brand support activities, such as developing a special branded hiking boot with an international brand focused on for the Gorilla trekking and sell this in terms of the robust and tough qualities that are built-in. The same goes for leather branded clothing from the high-quality Rwanda leather skins – find something unique to say about them.
- Establish a dedicated testing house for shoes and leather goods products, so that the special attributes of the product can be measured and verified most probably housed by RBS. The best prices are met with products that say something special and give the customer confidence in-use.

Section 6 Training and Vocational Education

Photos 7: Equipment at the training Institution.

Observations of training facilities and Institutes during our visits provide a disjointed picture of several different providers making space and tuition available for newcomers to the sub-sector of shoemaking. Without exception, this function is under-resourced not working in a co-ordinated way to provide what the industry needs and therefore is underutilised. Machines available in training centres are often old and frequently either broken or badly maintained, which disrupts any potential progressive flow to trainee's development. In many cases, it was not possible to see a full set of machines that would be expected to be in a modern production line based unit. There is massive potential to improve this function by re-equipping and systemising the training by adoption of a coherent set of National Vocational Qualifications (NVQs). At the same time, it will be necessary to have full cover of trainers to impart the knowledge for this to be successful. A "Train the Trainer" programme phase will need to be undertaken to ensure that sufficient capacity exists in work instruction. Currently there is no provision of training for leather processing skills.

Most healthy in our view is that almost every individual SME shoe making business found it easy to get a supply of local trainees and apprentices that they take-on and train at the most fundamental level. Some of the enterprises have won awards and significant boost to capital by demonstrating how their business model can be extended. This tells us that there is a demand and a keenness within the sub-sector to get involved at grass-roots level, join the trade and make a better living from making and repairing shoes.

6.1. Existing Establishments

The existing establishment in training are all under the Workforce Development Authority (WDA) and this involve training in the vocations training. Our survey did not show any evidence of leather skills

development at the university or Diploma level offered by IPRCs in Rwanda. The current training set up is under the process of formalisation with a crucial ongoing consultation regarding the establishment of National Vocational Qualifications being developed with the assistance of COMESA/LLPI in Addis Ababa.

6.1.1 Masaka Incubation Centre

Masaka: UNIDO and RDB (Rwanda Development Board) started the project of the new Service centre in Masaka at the end of 2008 but this was turned over to WDA management in 2015 with the leather production section being set up in 2014. The goal of the centre is to train the leather artisans in Footwear and leather goods Production. Currently the training is conducted by expatriates and to-date (as at the time of Visit) the institution has trained about 60 people. Through an MOU between WDA and COMESA /LLPI, the centre has developed a training curriculum in line with the Rwanda TVET program ranging from Level 1 – level 7, though this has not been implemented.

The centre faces the following key challenges:

- Insufficient student numbers to make the investment viable.
- High overheads, visibly more security staff and admin workers than trainees.
- Lack of formal assessments and training milestones.
- Lack of full range of equipment.
- Breakdown of machinery where there are no technicians to repair them.
- Lack of spare parts.
- Medium and long-term loss of facilities, impacts the time to completion of courses.
- Lack of full utilization of the current set up.
- Lack of trainers and technical personnel to manage the unit.

In addition to this, many of the artisan company heads stated that when they take-in a new employee that has been through the MASAKA programme, they still have to train them in the company's own methods. This indicates that the facility is not producing what the industry really needs to progress.

6.1.2 Hindiro VTC (Ngororero District)

This was set up in 2014 and offers curses in Tailoring, Food Processing and Art and craft where the leather is a significant component. The offer is of a Certificate training course in Leather craft that lasts one year. This focuses on training in the production of closed shoes, Opens Shoes, key rings, Wallets and belts. In addition to this one year course they offer a short training program of three months. They have so far trained 75 trainees and in this year they expect to be training another 25.

It was welcome that some of the former trainees have set up a cooperative within the vicinity of schools (Leather Products Cooperative). Each of the partners shares time and production space, using jointly purchased machines on a rota basis.

A review of this training facility showed the following challenges.

- Lack of full range of training equipment.
- Trainers have not attended very formal training, one of them has only attended the short course given in MASAKA and the second one was trained in house in one of the artisan units in Kigali.

6.2 Sub-sector SWOT

Strengths	**Weaknesses**
➢ Available volume of keen potential students ➢ Willingness of trainees in skills development sector. ➢ Potentially availability of Raw material ➢ Willingness of many trainees to get into the sectors. ➢ Government support services through programs like National Employment program ➢ Support of Interested partners to enhance the capacity of the sector e.g. Swiscontact ,JICA KOICA UNIDO etc.	➢ Lack of well qualified technical Personal to manage the specialised leather training institutions. ➢ Lack of full range of training equipment. ➢ Poor maintenance and lack of technical staff for machine and equipment repair. ➢ Underutilisation of the existing institutions. ➢ Lack of formalised career training program in the sector (Not fully deployed). ➢ Lack of harmonisation in course content and assessment of actual skills acquired by the trainees.
Opportunities	**Threats**
➢ The potential in the domestic market for shoes and leather goods is massive. We have not been able to find any sub-sector data that conflicts, so the direction is absolutely clear as to what could be achieved.	➢ The sub-sector is ripe for an outside company to become established and take profits out of the value chain with the result that the economic benefits to Rwanda are not maximised/optimised. ➢ It all relies on achieving maximum added value along the chain and retention of Rwanda's resources in Rwanda.

6.3 Suggested Support

Improve the equipment of Technical Training Centers: Though there are several training centres in the leather goods production, they are not fully equipped and facilitated in terms of equipment and manpower (trainers and supervisors) to develop the requisite skills in the sub-sector. Almost all the players have received informal training and have developed their skills on the job, with very few having formal training in the trade. To overcome this, the following is recommended

- Undertake a complete skill audit in the sub-sector.

- Focus TVET and engage on immediate train-the-trainer activities, using foreign experts as required.
- Identify upto10 persons to be trained in the delivery of training for the full range of various skills required for leather goods and footwear production.
- Select one of two centres as model training centres fully equip them, and develop staff in the same e.g. Masaka Incubation centre and One IPRC
- Aim to develop this into the National focal point and centre of excellence for the industry, so that it can become the National Academy required by the leather village / nuclear centre of excellence.
- Develop and use one IPRC to have a full blown leather technology unit where training can be done form the certificate to Diploma level.
- Unify the approach though systemising the training by adoption of a coherent set of National Vocational Qualifications (NVQs).
- Set-up the leather village model as the National Epicentre for Rwanda and encourage all layers of the sub-sector to participate by providing artisans with purpose –built units for relatively low rent and access to machines that they don't currently have, on a time / hire basis – after verifying that they know how to use them of course.
- In the leather village, use trained staff as trouble-shooters and problem solvers part-time, to go out into the cluster units and help the artisans to build skills and capacity in each of the units. During such time, machines in the training areas could be hired by artisans that do not own one themselves.

Section 7. Conclusions

From initial desk-based research of the various value chain elements, to the on-site visits with entrepreneurs and industry officials to the data supplied to us by Government organisations, industry bodies, international agencies and NGOs (both national and international), the message that is brought out of our study is quite simple. In every case, there is clear evidence that significant development of the value chain through industrialisation would be a major potential benefit for the Rwandan economy. Of this, there is absolutely no doubt, because although some of the indicators exposed may vary slightly in magnitude, they all point unanimously in one direction. For the country to take advantage of the best possible outcomes and retain the rewards to fuel further development will require great care:

1. In preventing the drain of natural resources that export of raw or part processed commodity hides and skins, so that full benefit can be derived within the Nation.
2. In building production capacity for Rwanda run by Rwandans and improving the livelihoods of Rwandans.
3. In building a body of skills and abilities that can serve the new industrialised methods.
4. In continuing to take the best possible care of the environment, the people and the indigenous species that need the land to provide water and food far into the future.

The leather industry value chain in Rwanda plays a significant role in foreign exchange earnings though this is based mainly on raw and part processed commodity products currently. Outside Rwanda's borders, these are further processed and developed into retail-end goods, of many times the value of the contributory materials. The emphasis must be changed progressively to ensure that earnings are made up of more and more value added products.

- Current earnings are form the export of Raw Hides and skins and minimal exports on Wet blue.
- There only exits one shoe production units with a capacity of 200 pairs per day, with all the others being artisan units procuring less than 10 pairs per day.
- Regarding leather goods products, only one unit is currently producing products that could compete in the international market with sufficient sales energy and promotion.
- The equipment used is not very modern and lacks in terms of range and engineering support.

This therefore does show that the value chain has a great potential and with more development this could be amongst the top leading foreign exchange earners in the country.

Section 8. Recommendations

In order to encourage increased capacity in the value chain, it will be necessary to address all layers of activity; raw materials, leather production, shoe & leather goods manufacture and fiscal / legislation issues – which includes import / export regulations in an over-arching capacity.

8.1 Raw Materials Sub-sector

1. The Ministry of Finance / Ministry of Agriculture / Ministry of Trade / Revenue Authority may wish to:

    - Consider an export levy on wet blue hides and skins, to persuade manufacturers to establish the production of finished leather within the country.

      Rationale: This was used very successfully by the Ethiopian Government in diverting low grade sales overseas into a will to produce finished leather at home. It should be noted that the Ethiopian leather value chain is much more highly developed than Rwanda's and lessons can be learned directly from their experience in energising onward processing.

2. The Ministry of Trade / Ministry of Finance may wish to:

    - Find a way to gain revenue from the export of salted hides and skins that will provide development capital (or help to repay capital expenditure). This could simply be a tariff although if an export tariff is unpalatable for a number of reasons could be related to operational licencing and registration of exporters – since they are allowing a Nationally important resource to escape from its potential to create wealth in Rwanda.

      Rationale: It will be important for hide and skin traders to identify that getting involved in growing Rwandan processing capacity is a good idea. The charge could start at perhaps 2%- which is somewhat less than inflation, but gradual payback for industrial development capital for the Treasury should result over time. At a low level initially, it is important to have this option in place, so that it can be adjusted at a later date to help guide and control the fundamental directions of the industry. Although there may be a general will to direct-fund change evident at the higher levels of Government, creating what would effectively be an industry self-funded "war-chest" for industrial improvement could prove a very strong policy. Providing for the necessary change in the industry to be at least part-funded from source should prove a reasonably popular policy to push through the system. Revenue should be allowed to accrue and then the funds can be targeted on the "next big development project".

3. Rwanda Standards Board/NIRDA / Ministry of Agriculture / Rwanda Environmental Authority may wish to:

- Work with authorities controlling animal husbandry and meat production to continue the improvements throughout the abattoir sector to raise standards and ensure best practice, even in the wider regions.

    a. To develop better utilisation of by products, hoof & horn, blood & bone and green offal and trimmings. In quantities, these materials can be converted into useful secondary products such as fertilisers for agriculture, compost / soil improvers, glue, and oils in commercial quantities, where at the moment disposal requires that landfill be available (a double-lose situation).
    b. To extend the basic provision of a slaughtering service to butchery under well controlled conditions to produce jointed carcasses rather than sides of beef or small carcasses in the case of sheep & goats. **Rationale:** Better meat hygiene and improved public health and collection of more of the by-products instead of treating them as waste.
    c. Equip all abattoirs with salt-free preservation methods (icing or chilling) and develop a professionalized collection system (with grading system) of raw hides and skins which would allow daily deliveries of hides and skins to go direct to the tannery and cut out 80% of the salt from the effluent mix. NB. This might influence the sitting of the tannery zone, where it is more or less equidistant from raw materials sources. There would need to be a provision of refrigerated transport in order that the material arrives in good condition.

8.2 Leather Production

It may not be advisable for Rwandan industry to embrace the entire leather-making process. If suitable wet-bluing and other tanning capacity can be arranged within the region, hides and skins could be contract tanned and returned to Rwanda solely for dyeing and finishing[8]. This could be a solution to the major part of the effluent treatment issue. On many continents, contract tanning of material is arranged, often paid for by the processor retaining a portion of the material to sell-off to his own established customers. Thus, tanned hides and skins could be brought back to Rwanda for little material cost for dyeing and finishing - which is where the value addition is much higher. This could be established with the hide & skin traders as either a short-term arrangement, until full productive capabilities are established in Rwanda, or as an overall solution, should the environmental view be one of too much risk to establish large-scale tanning from the raw in a land-locked country.

[8] Regionally Kenya and Uganda has this capacity and with the development of a Leather city in Kenya with proposed common ETP this could be ideal .This two countries are also the key destination of Rwanda Raw Materials where it is processed into wet blue and exported.

4. Rwanda Standards Board / Ministry of Agriculture / Rwanda Environmental Authority may wish to (as mentioned above):
    - Equip all abattoirs with salt-free preservation methods (icing or chilling) which would allow daily deliveries to go direct to the tannery and cut out 80% of the salt from the effluent mix. This might influence the sitting of the tannery zone, where it is more or less equidistant from raw materials sources. There would need to be a provision of refrigerated transport in order that the material arrives in good condition.
5. The Ministry of Trade / Rwanda Development Board may wish to:
    - Establish a tannery zone location and commission studies for design and supply of a modular CETP that will be able to grow with the industry. It will need to function to high standards of treatment, given the issue of salt in the effluent – if not addressed by the point above.
6. Rwanda Development Board / Ministry of Trade / Rwanda Environmental Authority may wish to consider:
    - Move existing tanning capacity on to the new leather zone where the pollution will no longer be an environmental hazard or close the current tanning facility in favour of tanning under contract in a neighbouring country.
7. Rwanda Development Board / Private Sector Federation may wish to consider:
    - Under a Public, Private Partnership, establish a consortium to build and establish a National Tanning Company. This could be a phased development, starting with dyeing and finishing and taking a more-long-term view of the value addition related to doing the tanning from raw state, given the pollutant loadings that accompany the activity. Rwandan entrepreneurs should be attracted to own a share – especially hide & skin traders, with the long-term aim that the Government interest be bought-out by the other partners ultimately. Use specialist consultants to assist in defining what is required in terms of technology, layout, workers and volumes of production – bearing in mind that 2 tanneries may be the best solution, one equipped with small plant for sheep & goat and the other with full size machinery for hides:
        a. Commission a feasibility study to determine the best way to provide tanning capacity related to number and ready availability of raw material. Critical to a preliminary design will be:
            i. Size and type of tannery
            ii. Size and type of machinery
            iii. Appropriate level of technology
            iv. Use of renewables

v. Segregation of process outflows
vi. Logical plant layout for ease of production
vii. Pre-treatment of discreet effluent streams prior to mixing and pumping to CETP
viii. Phased development into crust production and then to finished leather
ix. Bear in mind that the most effective way to provide leather for the downstream activities might be not to have factories producing material from raw to tanned (since up to 80% of the total pollutant load emanates from the beamhouse activities)

b. Use international connections to bring an overseas partner on-board in a technical stewardship contract agreement to cover the term of design, build, commissioning, production run-up and perhaps 3-5 years additional involvement to guide development of personnel and ensuring that after the contractual period, the company can function on its own resources.

8. Rwanda Development Board / Private Sector Federation may wish to consider:

- Detailed design of tannery plant – this will be done around the concept of the preliminary design, probably by a team consisting of the preliminary design consultant, representatives from the PPP and the organisation providing technical stewardship. They will preside over production of:

a. Project master specification.
b. Detailed factory plot-plan with all major plant items identified in situ.
c. Individual equipment data sheets – giving specifications of each plant item for procurement purposes.
d. Preferred supplier list for all plant items including costings.
e. Production block-flow diagrams.
f. Pipework and Instrumentation diagrams (P&IDs).
g. Machinery procurement (long-lead items first).

9. Rwanda Development Board / Private Sector Federation / NIRDA may wish to consider:

- Engage builder and architect / engineer to deliver the factory build. The best tanneries in the world are not designed by architects, but by process engineers who instruct how the architect should produce a building that will protect the process. Builders and architects do not understand what a tannery is instinctively, so have to be advised at every step. The building will encompass all of the necessary elements to provide the infrastructure and services for the production machines, so they will produce:

a. Cost of factory build and will be responsible for:

i. All permits to build & operate, along with legal responsibility for the entire site until fully commissioned and ready to start production.
ii. Site clearance & groundworks.
iii. External and internal structure (according to the needs of the process).
iv. Bills of quantities.
v. Ventilation & air-flow, gas detection and warning systems (as appropriate).
vi. Lighting, including safety lighting.
vii. Electrical sub-station, any emergency generation capacity and power distribution.
viii. Use of renewable energy.
ix. Energy control and services provision factory boilers and compressors, water supply and effluent transport (segregated, prior to mixing).
x. All pipework, pumps, cabling, junction boxes and interfaces, along with all pipe supports cable trays to serve the production plant.
xi. Machinery installation, with commissioning to be signed-off by the technical team.
xii. All safety interlocks between systems (where appropriate) and emergency systems.

b. Plant items to be installed, tested and signed-off as commissioned by 3 parties:
i. Builder.
ii. Machine supplier.
iii. Technical team.

10. RDB / NIRDA may wish to:

- Encourage artisan shoemakers to come together in their regions by firstly establishing an industrial epicentre in a Leather Products Village local to Kigali. This will need:

a. Training to be rationalised, and methods standardised under a nationwide scheme, administered from the National Academy.
b. The National Academy will be the centre of skills improvement and offer artisans the opportunity to come together in strength, improve quality and output as well as potentially get together to work on larger orders. Factory units should be made available at reasonable cost to entice the producers to come together.
c. Offer access to a full range of machinery for shoe & leather goods manufacture in the Academy on a hire per time basis. Academy Lecturers should teach part-time and also troubleshoot part time with the cluster members to help them understand how to get the

best results, hands-on. During non-teaching time, the Academy machinery would be available to hire-out.

d. The Leather Products Village will be necessary to train suitable skills for proper factory production to be established and the trainees will achieve higher and nationally unified standards of training.

e. Once the pilot is proven effective, the model can be "rolled-out" into each province in order that outlying districts can achieve the same levels of training. The subsidiary Academies will report to the National one in the locale of Kigali.

11. RDB / NIRDA may wish to:

- Within the Leather Goods Village, perhaps associated with the Industry Academy, establish and run laboratory facilities that will serve development and consistency of product quality.
- Make provision for sub-sector services to relocate to the Leather Village, so that there will be easy and ample supply of critical materials to the manufacturers and good access to technical and engineering support.

12. Workforce Dev Agency through the proposed TVET programme may wish to:

- Promote the acquisition of skills in design and last-making that will serve the shoe makers and elevate their capabilities to counter imported product styles with locally made product.

13. Private Sector Federation / Ministry of Trade may wish to:

- Establish a pan-industry steering group so that all developments can be properly coordinated and no effort is duplicated by any provider or agency. This will include industry representation from all levels as an imperative, since solutions that work on paper in the corridors of power may not be as effective as intended at the point of need or delivery. The industrialists, academia, raw materials suppliers and downstream users must be involved, as well as Government officials. The aim should be to provide industry with the right conditions and climate to grow.

14. Private Sector Federation / Business Development Funds may wish to:

- Improve access to Finance –Make available development loans tied to volume improvement, so that small businesses can begin to re-equip and expand activities. This should be in the manner of the "20:20" system described in the body of this report.

15. RDB may wish to encourage:

- Volume shoe production to become established: One model is similar to that suggested above for tanning capacity and another may be to offer an external large manufacturing company

the opportunity to become established in Rwanda. The former route offers more local opportunities and local control, and the latter would mean that the incentives provided in attracting the company and the taking of profits overseas would reduce the benefits available to the National Economy. Use Government procurement contracts for military and police to energise the production.

16. NIRDA may undertake research in the industry in collaboration with other public and private; regional/ international institution (Triple Helix Concept)

Appendices

Appendix 1 Sub-sector statistics hides

Livestock Population 2015			
District	**Bovine**	**Caprine**	**Ovine**
Huye	34,052	88,270	6,162
Gisagara	36,856	132,696	4,591
Nyaruguru	56,206	91,957	32,107
Nyamagabe	46,526	94,432	46,437
Nyanza	45,397	89,091	16,610
Ruhango	56,096	94,338	11,731
Muhanga	58,427	96,950	25,053
Kamonyi	65,912	117,599	16,235
Total SOUTH	**399,472**	**805,333**	**158,926**
Rusizi	22955	73,123	15,891
Nyamasheke	36620	76,667	19,158
Karongi	21857	75,154	36,432
Rutsiro	37126	76,818	38,013
Ngororero	50423	64,304	39,397
Rubavu	18214	71,634	25,424
Nyabihu	31100	74,121	30,792
Total WEST	218295	**511,821**	**205,107**
Musanze	36691	73,316	33,898
Gakenke	64843	75,335	45,268
Bulera	42442	86,591	38,361
Rulindo	43254	75,206	42,082
Gicumbi	66830	98,451	34,760
Total NORTH	254060	408899	194369
Gasabo	37189	57,430	3,144
Kicukiro	11969	48,127	2,578
Nyarugenge	5616	24,654	2,530
TOTAL MVK	**54,774**	**130,211**	**8,252**
Bugesera	34638	112,556	4,713
Rwamagana	38041	93,165	9,828
Kirehe	44528	74,966	11,253
Ngoma	35168	99,022	16,172
Kayonza	69041	87,351	8,008
Gatsibo	75325	92,765	6,688
Nyagatare	126,450	116,188	7,544
Total EAST	423,191	676,013	64,206
Grand Total	**1,349,792**	**2,532,277**	**630,860**

Appendix 2 : Summary of Company Visits

1. Abattoirs
    a. Equipment: The abattoirs are generally modern apart from One SATRA which needs upgrading with more modern stainless steel equipment's compared with the others.
    b. Location:
        i. SATRA and It also has a big environmental challenge as it's located near a wetland and within a housing community.
        ii. SABAN: Located in business community area and this may require relocation in future as per the Kigali city master plan.
2. Tanneries
    a. New RECUP – Non-operational due various issues
    b. Kigali leather Ltd: has key challenges of location due to its closeness to wetland and it's in Environment management's needs total rehabilitation.
    c. The company is working far outside of International Best Practice.
3. Shoe and Leather Good Manufacture.
    a. Almost all the artisans located out of Kigali town mainly survive n repairs work where they derive 50-60% of their income from shoes repair and the rest form sale of produced shoes.
    b. In Kigali, a majority of the artisans derive their income from the sale of newly produced shoes. (About 80%).
    c. All the artisans have a minimum of 2 employees and at least 1 -4 trainees, with some units having taken training as full activity where they have trainees artisan on regular basis
    d. Existing level of equipment is an overall challenge to almost all the artisans visited. It was only Dokmai where it was noted that they have a good standard of modern machines and they require more still.
    e. All the artisan would greatly do with injection of capital which was noted to be a key challenged to all them. Improved premises and access to funding would be repaid with expanded capacity
    f. Inputs (leather and accessories) was also a key challenges to all the visited artisans.
4. Training Institutions
    a. The training institution do not have all the equipment that they required to enable comprehensive training to industrialised standards.
    b. The Institutions do not have very well qualified trainers.

Appendix 3: Visits made during the investigation, key stakeholders and their contacts.

	Company name	Contact person and Location	Telephone number	Activity
7/8 /2017	ASSOMACO	Felician Bambanze - Kigali	07888674290	Leather Good production
7/8 /2017	Atelie Acoki ltd	Gatete Damas		Leather Good production
7/8 /2017	Masaka Incubation Training Centres	KAGANGO Logene	0788597657	Training
8/8/2017	CAFACHAKI	Gataramo Juvenal		Leather Good production
8/8/2017	LEATHER PROCESSING WORKSHOP/	Mugemangango Augustin	0788356673	Leather Good production
8/8/2017		Pole Pole Emmanuel	0788898843	Leather Good production
8/8/2017		Eugene Karinganire	0788674290	Leather Good production
9/8/2017	Dokmai Rwanda	Bernadette Umunyana	+250 783 451 278	Leather Good production
9/8/2017		MUGEMANI Emmanuel	0788837160	Leather Good production
9/8/2017	Rwanda leather Professional Work	HODALI RUREMESHA	0788479341	Leather Good production
10/8 /2017	Nova leather ltd	Albert Bihidi		Leather and leather good production
10/8/2017		Fredric Sindambiwe - Muhanga.	0781606704	Leather Good production
10/8/2017	Elli Assifiwe company	Uwimana Ephron		
	Kiato Afahdal Enterprises	Twizeyimana Gerald	0788872034	Leather Good production
15/8/2017	STAR LEATHER	John MUFURANAZA	0788888633	Leather Good production
18/7/2017	Cooperative Impu z'Iwacu	Tuyisingize Epaphrodite Gakenke	0787491764	Leather goods production and Rural tanning
18/7/2017	ATPROC RWANDA LTD	Hamugisha Michael (President AAPROEL) Nyabihu	0788787296	Leather goods production
18/7/2017	LEATHER PRODUCT COPERATIVE			Leather goods production
Leather Goods and accessory supplier				

	Company name	Contact person and Location	Telephone number	Activity
7/8/2017		Munanira	0782212504	Supplier of Leather and leather accessories
Abattoirs				
9/8/2017	SABAN	GM – Murenzi		Animal Slaughter
10/8/2017	SATRA	MD RUGONDO	0788512371	Animal Slaughter
11/08/2017	Kabuga slaughter house			Animal Slaughter
18/7/2017	Gakenke Modern Slaughterhouse	Accountant		Animal Slaughter
Hides and Skin Collectors.				
9/8/2017	Shenzaka Trading ltd	NTIRANDEKURA Jean De Dieu (President of the Hides and Skins Collectors Association)	0788743243	Hides and Skins collectors
Tanneries				
10-11/8/ 2017	NEW RECUP TANNERY	Nyamatulla and Anwar	0788304029	Leather Production
12/8/2017	KIGALI LEATHER Ltd	Mr Wang	078659188	Leather and Shoe Production
Other Institution				
11/8/2017	Local Administrative Entities Development Agency (LODA).	Janvier Alimanrsyize – LCF Manager	0788529103	Government agency
13/8/2017	Rwanda Standards Board (RSB)	Antoine Mukunzi		Standard development and implementation Product testing
14/8/2017	MINICOM	Dr. NSHIMIYUMUKIZA Ossiniel (Community Processing Centers Specialist)	0788616102	Policy guidance
14/8/2017	Rwanda Agricultural Board (RAB)	Dr Rukundo (Director Veterinary Inspection)		Policy development and implementation
16/08/2017	Workforce Development Authority (WDA)	Nsengiyumva Irenée (DDG)	0788 511 675	TVET coordination's in leather goods production
17/08/2017	REMA	Remy Duhuze	0788612725	Environmental Coordination
18/7/2017	HIDIRO VTC	Ntahunkirye Epimaque	0788921663	Training

Appendix 4: Sub-sector statistics shoe manufacture

Companies allowed to import leather

Company	Contact details
Uzuri K&Y	0788944960 / 0738977144 info@uzuriky.com
GBF Leather and Art Promoters Ltd	0788230308 leatherartpromoters2012@gmail.com
CAFACHAKI	0788862845 / gatorano145@yahoo.fr
Leather Processing work shop Ltd	0788427722 / amugemangango@yahoo.fr
Jolin ltd	0788307848
Stars Leather Company Ltd/GATSIBO CPC	0788888633
Rwanda leather profession Works	0788479341
KIATO AFATHALI	0788872034 / kiatoafadhal@gmail.com
Nova leather ltd	0788502918
Trade links ventures Ltd	0732304070
RWANTAN Ltd	afritanleather@yahoo.fr 0788308403/ (+257)76660060 / 0783567190