

## Cotton

Cotton became part of this project as a result of a tractor feasibility study - simply because the economies of any tractor production in Africa do not allow the luxury of expensive imported tractor tyres. All tractor tyre production is from higher labour cost zones than Africa - yet Africa has all the needed raw materials. A simple and functionally adequate tractor tyre can be made, as they were not so long ago in the west, by using a cotton fabric ply rather than the more modern synthetic materials.

Likewise with the rubber - some synthetic rubber alloys are useful for improving the tyre performance and life - but not absolutely essential for something to start with. We are laying some foundations for further development where the market and the nature of people can guide a future - there is no need to start at the "leading edge" of tyre development, and it is after all a "green sustainable" project - and modern tyre cords come from fossil oils!

There are five cotton basins on the continent, the largest being the West African basin, which stretches from Senegal/Gambia to South-Eastern Chad and even to the heart of the Central African Republic. It accounts for nearly two-thirds of Africa's total cotton production. It is estimated that two to three million West African households cultivate cotton on part of their farms; the average cotton farm is one to two hectares. In the vast majority of cases, cotton is produced with relatively few resources and family labour, which is not highly paid compared to developed countries.

The following paragraph is lifted from a World Bank Africa Region working paper and says it all.  
<http://www.worldbank.org/afr/wps/wp47.htm>

*"The economics of world cotton production and trade have been in recent years strongly distorted by the heavy subsidies paid by OECD countries (USA and EU) to their cotton farmers. These subsidies have pernicious economic effects, since they promote production in countries with high production costs at the expense of countries with lower production costs and, in particular, at the expense of African countries. The negative impact of these subsidies in the fight against poverty is quite dramatic. By increasing artificially production and exports and depressing world prices, the subsidies reduce the export earnings of African countries, thus curtailing the revenues of several millions of Africans living under one dollar a day."*

Dig further into the realities for West African cotton growers and the sense of *deja vu* grows even more. Many claim the development of the cotton industry in West Africa is actually a "success story" resulting from colonialism but two facts do become clear the more the subject is studied. One confirming the development and growth of the industry had more to do with local African initiatives than any colonial input - and the second that it is not the success story it should and could have been.

In the francophone countries of West Africa more than 90% of the cotton is exported in the form of raw fibres - in the anglophone areas the situation is a little different with about half being processed by local textile industries. From the mid 1950's considerable investment went into textile plants in the whole region with 100's of plants being built - leading to a boom period for textiles which peaked in the 1980's. However few of those plants are still running. This "boom" period was followed by difficult years marked by the crisis in public enterprises, structural adjustments, devaluation of the CFA franc as well as *significant competition from second-hand clothing imported from developed countries* and from Asian textiles. A situation not helped by skewed plant economies where factories were obliged to support expatriate European skilled labour costs and were structured to export their profits to European owners.

This situation triggered a de-industrialisation process which destroyed the high value added components of the industry and left the African cotton growers at the mercy of the OECD trade policies favouring their own cotton producers.

The typical cotton textile industry structured for developing countries may be viewed as being composed of a succession of productive stages, shown below, with each stage adding about 100% to the value. All the stages are in the "decentralised" sector with the exception of spinning. The typical volume of economically viable operation in the decentralised sector is about 30 tons/year. However, the average spinning mill needs to be around 3000 tons/year and therein lies the bottleneck that limits

Africa's value added component to the most vulnerable first step of the least value - for as long as the industrial base needed to handle large scale textile machinery is missing.

Process Step	Production Uinit	Approx. Output Value/Kg	Production per annum
Cotton Cultivation	20 farms of 2 Hectares each	USD 1.00	30 Tonnes
Yarn Spinning	Mill with 25,000 spindles	USD 2.00	3000 Tonnes
Yarn Processing	Dye House 200 Kg/day at 50% utilisation	USD 4.00	30 Tonnes
Fabric Weaving	Co-operative of handlooms	USD 8.00	30 Tonnes

While the problem as outlined above is widely recognized in the industry and government, the solutions attempted have always been towards phasing out the technologies in the decentralized sector, and replacing them with scaled up alternatives. However, the ground-realities of the African economy have not in the past, and will not in the foreseeable future, allow scaled-up units to prove cost competitive or efficient.

A solution to the same problem, but from a different perspective, is to accept that the strength of Africa's enterprise perhaps lies in operations where numerous small, knowledge-based, low-capital units can networked to produce competitive results. Then we could accept that scaling down the spinning operation would be a more sound approach to achieving a balance that would eliminate this bottleneck.

Contemporary spinning technologies are based on cotton being available in bales - primarily for the ease of transport - an assumption that is not actually relevant if we are to consider spinning in the cotton producing area. The minimum size constraint of the spinning step is actually set by the steps of converting bales into slivers - not the later step of converting slivers into yarn. This is inherently small scale - hence the need for large numbers of spinning spindles.

A logical step therefore becomes to integrate the ginning and sliver stages into one small scale operation thereby eliminating the conventional ginning and baling stage completely. The challenge then becomes to establish the local manufacture of the equipment needed to ensure the capital equipment cost is compatible with maintaining the "decentralized" cottage industry scale inherent with the other steps involved.

The IFAF Tractor project tyre requirements will offer viability to one such operation on the above scale and provide a basis for the formation of a manufacturing unit specializing in such "microspinning" plants. Success could lead to a substantial demand for such machinery throughout many parts of the cotton producing world where local consumption is limited by inability to circumvent the above described bottleneck.