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Cotton High Yields - This Time for Africa

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Ideas Proposed By Dr. M. Sabesh

Although many countries in Africa attained independence during the 1960s, the living standards, nutrition, health care and education have not progressed significantly even after six decades. Comprehensive reforms with the support of local governance in basic health care, education, nutrition, labour welfare, and a strong legal framework are required in many African countries. The recent World Bank report mentioned that six of the 10 fastest-growing economies in the world are in Africa. About 60% of the world's unused arable land is in Africa. There is a lot of scope for growth in the agricultural sector in Africa, with ample investment by donors in fertilisers, machinery, water and irrigation systems. African countries would be the world's major destination for the agricultural sector in the years to come, provided proper policies are formulated and implemented effectively.

- **Varietal development programmes should be farmer-participatory.** Farmer opinion on socio-economic and agro-ecological constraints should be considered during adaptive field trials.
- **Germplasm introduction:** Brazilian varieties (BRS 286 and BRS 293) have adapted well in Mali, Burkina Faso and Benin. These varieties yield better under irrigation. Germplasm introduction into Africa will strengthen genetic diversity for varietal improvement.
- **Conservation agricultural techniques:** Zero-tillage, especially with organic mulching, was found to enhance cotton productivity and soil fertility in many countries in Africa. The technique involves dry season land preparation, early planting, early weeding, precise field layout, and careful input application. The technique requires experimentation in Africa and further fine tuning for large-scale adoption with adequate training.
- **Topping and pruning of sympodial branches:** Manual trimming of cotton plants has been adopted successfully in China to greatly enhance yields. Such operations are possible with the availability of sufficient man power. This technique is ideally suited for African countries, where labour is inexpensive.
- **Early sowing is crucial:** Farmers must be inculcated with the technical know-how on early planting with the onset of the monsoon to ensure moisture retention during the critical crop-growth period. Since cotton

cultivation in Africa occurs predominantly under rainfed conditions, early sowing would enable the crop to get adequate soil moisture at a critical phase of the crop to enhance cotton productivity.

- **Investment in water conservation:** Ethiopia, Kenya, Tanzania and Uganda have good rainfall and abundant resources of water, whose potential has not yet been fully tapped, and requires investment.
- **Organic fertilisers:** Most of the African cotton farmers are smallholders with minimal access to financial resources. Chemical-input-intensive agriculture is unlikely to be sustainable for Africa. There is a need for research on developing crop production technologies and pest management strategies using the abundantly available natural resources that can be used as for profitable cotton farming. Crop residue recycling, organic manures and fertilisers can be cost effective and sustainable.
- **Rejuvenating ecosystems for efficient INM and IPM:** African ecosystems are comparatively less disrupted by chemical-intensive agriculture. Thus, there is a great opportunity to rejuvenate the agricultural ecosystems through natural resources, which would in turn allow integrated nutrient management (INM) and integrated pest management (IPM) to function effectively under the prevailing agro-ecological conditions for the benefit of the resource-poor small-holders in Africa. There is a need for strong research institutions across potential cotton growing countries in Africa to strengthen biological control-based pest management. Efficient non-chemical approaches for pest and disease management must to be developed, such as development of resistant varieties, cultural controls, agronomic practices and biological control for the prevailing agro-ecological conditions.
- **Wasteland reclamation:** There are large tracts of lands in Africa that have immense potential for farming. There is a need to identify the resources available in the vicinity of such wastelands for further augmentation. A comprehensive wasteland-development programme needs to be created and implemented with the help of appropriate investment from governments and private agencies. Brazil has converted large tracts of unfertile lands in the Cerrado region in central Brazil and reclaimed them. The region become agriculturally more productive.
- **Decentralised ginning units:** Establishment of small-scale ginning units, as is done in Brazil, can enable farmers to get additional remuneration by value addition to their produce. Farmers would be able to trade cotton lint directly without being exploited by middlemen to get more profits.
- **Fibre processing in eastern and southern Africa:** Textile processing generates significant employment. Data from Asia show that one tonne of lint is known to provide year-long employment to at least five persons (Kranthi, ICAC Recorder, Sept. 2018). The shift in cotton production domain from Eastern and Southern Africa to Western and Central Africa triggered the need for a few processing units in Western and Central Africa. However, 80% of raw cotton is exported from Africa. Establishment of full-scale textile manufacturing factories in Africa can greatly change the fortunes of countries and their farmers.
- **Diligent breeding:** The case of *Bt*-cotton in Burkina Faso presents a case-study on how things can falter if local sensitivities are taken for granted. Beyond a doubt, *Bt*-cotton as a pest management technology was successful. Cotton produced in Burkina Faso was known all across the world for its excellent fibre quality. Cotton harvested from the *Bt*-cotton varieties was inferior in quality compared to conventional non-*Bt* cotton. The problem was basically poor selection and incomplete cycles of back-crossing conducted with the local cultivars. The issue highlights the need for diligent breeding to ensure that the locally adapted varieties are reconstituted properly to their original state at the end of back-cross cycles.
- **Good crop management v/s Bt-cotton:** The current yields in Africa are low mainly because of poor practices. Many of the soil, nutrient, water, and pest and disease management practices, if followed precisely without any compromises in agro-input supply, have the potential to enhance the cotton yields and offer best returns to farmers in a manner that is equivalent to the adoption of *Bt*-cotton technology (Valerie 2011). Crop production technologies, if followed properly, have immense potential to enhance yields.
- **Yield gaps due to socio-economic constraints:** Many African farmers achieve lower yields because they cannot afford to apply proper inputs due to socio-economic constraints. Many African cotton varieties have high yield potential, but poor management leads to poor yields. There is a need to strengthen research that can empower the farmers in Africa to manage their crops with locally available natural resources for profitable farming, and also to sell their produce at competitive prices.