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**Socio-Economic Impact of Tissue Culture
Banana in Kenya Through the Whole Value
Chain Approach**

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Overview

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- Whole Value Chain Approach
- Study Objectives
- Study Methodology
- Study Team
- General Results
- Impact of TC banana
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- Conclusion & Recommendation



Background: Importance of the Banana in Kenya

- Predominantly grown by small scale farmers for food, nutrition security and income generation.
- The fruit is a rich source of nutrients;
 - Carbohydrates (22%)
 - Fibre (7%)
 - Minerals -calcium, potassium and iron
 - Vitamins (A, B and C).
- The continuous availability of harvestable bunches contributes to the year round income security to the growers.



Background: Decline in Banana Production

- The crop is susceptible to panama disease, sigatoka virus, weevils and nematodes. Infestation of these pests and diseases, coupled with traditional agronomic practices led to decline in the productivity and production of banana in the 1980's and early 1990's.
- The use of suckers as planting material exacerbated spread of pests and diseases, which reduced banana yields upto even 90%.
- Between 1992 and 1994, banana yields in Kenya had reportedly declined from an average of 12.8 tonnes to 9.9 tonnes per hectare.
- As a consequence, the production of banana declined from 986,000 tonnes in 1992 to 489,000 thousand tonnes in 1996.



Background: Introduction of TC Banana in Farmers Fields

- From the mid 1990 intervention by several organizations focused on promoting the use of TC banana in the farmers fields to reduced the spread of the diseases and promote the use of cultivars that had some tolerance to panama disease. Some of the organizations that have been engaged with farmers include;

KARI	JKUAT
Africa Harvest	Ministry of Agriculture
TechnoServe	BTA
ISAAA	ATL
GTL	

- Funding support: Rockefeller Foundation; IDRC; DuPont; USAID



Background: Superiority of TC Banana

- Availability of large quantities of clean and superior planting material
- Shorter harvest cycle of TC to that for traditional banana leading to additional productivity per unit of time accrued owing to early fruiting
- Bigger bunch weights of TC banana, compared to that of traditional banana, adding to the productivity of land
- Better coordination of marketing owing to more uniform banana fingers and simultaneous production of large quantities of bananas.

The Whole Value Chain (WVC) Approach



Figure 1. Africa Harvest's whole value chain (WVC) strategy

WVC: Awareness Creation



- Sensitization using agri extension, print & electronic media
- Group formation & management
- Training on technology
- Farmer to farmer exchange programs

WVC: Enhancing Seedling Access



WVC: Increased Yields at Smallholder Farms



WVC: Post Harvest Handling & Value addition

- Post harvest handling skills
- De-handing
- Cleaning
- Grading
- Packaging & branding





Study Objectives

- Assess the socio-economic effects/impact of growing TC bananas at household, community and national levels.
- To chronicle the achievements of the various TC banana projects against project objectives and prior projections.
- Recommend strategy for nationwide rollout plan
- To identify the need for policy initiatives, regulatory requirement and enforcement strategy



Methodology

The methodology adopted for the study was guided by the time available to the team. The approach included;

- **Desk review** of several documents including reports, surveys and published work
- **Focus Group discussions** with different stakeholders
- **Field visits** to banana farms, hardening nurseries, farmsteads, village and town markets, super markets and discussions with farmers, farm women, banana graders, farmers group leaders, scientists from KARI, ISAAA, JKUAT, GTL, BTA and ATL, and district level agricultural development officers of Ministry of Agriculture.



The Study Team

- **Team Leader:** Prof Shabd S. Acharya (Ph.D) (Agricultural Economics); Former Chairman, Commission for Agricultural Costs and Prices, Government of India; Former Member, SPMS, Science Council of CGIAR; Former Professor, State Agricultural University; Former Director, Institute of Development Studies, Jaipur (IDSJ) (India); and Currently Honorary Professor, IDSJ (India).
- **Team Member:** Dr Mary G. Alton Mackey, Ph.D., Health and Nutritional Consultant, Alton Mackey and Associates, Toronto, Canada.
- **Team Member:** Mwamburi Mcharo (PhD) Consultant
- **Support from Africa Harvest:**
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Snapshot of Banana Sector in Kenya

Particulars	
• No of smallholder banana farmers in Kenya.	388,920
• The average size of banana holdings is	0.21 Ha.
• Per capita consumption per day (banana grower families)	300 gm
• Per capita consumption per day (rest of the population)	60 gm
• Percentage of banana retain for family consumption	24%
• Percentage of banana sold by producers.	76%
• Banana contribution to the calories needs of rural households	8.14%
• The average yield of TC banana. Per Ha	32 Tons
• The average yield of non-TC banana plantations	14 Tons
• Percentage of total banana area under TC banana in Dec. 2006	5.22%
• The net income from TC banana in comparison to non TC banana	145%.

Structure of Banana Farming in Kenya

Particulars	Small Farms	Medium Farms	Large Farms	Total/ Overall
Range of Banana Holding (ha)	Less than 0.2	0.2 to 0.5	More than 0.5	–
Average Holding (ha)	0.12	0.45	1.98	0.21
Share in Farm Numbers (%)	79.6	18.6	1.8	100
Number of Banana Farms (No.)	309,580	72,340	7000	388,920
Banana Area (ha)	37,200	32,595	13,878	83,673
Share in Banana Area (%)	44.5	39	16.5	100

Economic Impact of TC Banana at Household Level

Particulars	First Year	Subsequent Year upto 5th Year
Establishment Cost (US\$)	1,103	–
Annual Operational Cost (US\$)	532	532
Total Cost (US\$)	1,635	532
Yield per Acre (tonnes)	11.48	15.03
Price per Tonne (US\$)	183	183
Gross Income (US\$)	2,105	2,756
Net Income to the Farmer (US\$)	470	2,224

Economic Impact of TC Banana at National Level

- TC banana was catalytic in the in recovery of banana industry from 46,426 Ha during 1996 to 79,808 Ha during 2004 (representing 77%).
- Increase in banana areas of the magnitude of 35,574 hectares within 10 years turn out to an additional net income of (\$81,000,000) accruing to 300,000 banana growers.
- Additional income directly attributable to TC banana that accrued to growers works out to around US\$ 14.2 million.
- Thus, the direct and indirect economic impact of TC banana programme can be placed at Ksh US\$95 million.
- The difference in the net income in favour of TC when compared to non TC is \$3,300 per Ha

Additional Contribution of TC;

- Providing employment and business opportunities rural communities
- lower banana prices for banana consumers
- Improved food security and nutritional levels .

Cash income security due to continuous income flow throughout the year, even under low input regimes.



Social Impact of TC Banana

- TC banana has provided household food security cushioned the farmers from food aid during drought and famine 2006.
- Home consumption of TC banana fruit by farmers and their families reduced malnutrition
- Additional income leading to dietary diversity and investment in other projects e.g. dairy animals.
- The adoption of TC banana lead to the economic empowerment of women.
- Higher income from TC is being used for payment of secondary school fees and general wellbeing of the family.
- Women empowerment enhanced due to increased income and decision on family investment



Impact at the community level

- The formation of cohesive farmer groups has empowered farmers to address other community concerns e.g. health infrastructure, water etc.
- Organized groups provided an entry point for other development activities
- Empowered farmers are development ready and are accessing credit and other development activities.
- The farmer groups have also been effective in addressing anti social behaviour within the community e.g. security.
- The ‘collective voice’ of empowered community are monitoring social projects and efficient use of community development fund.



Gender Dimensions of Impact

- Membership of men to women in TC banana project groups is approximately in the ratio of 1:1 showing balanced representation and resource distribution.
- There is more disposable income in the hands of women which is being used in women priority areas such children's nutrition
- Families have been able to construct good houses from the sale of bananas benefiting housewives.
- Families have acquired assets from sale of bananas e.g. mobile phones, bicycles and other durable items.



Effectiveness of Whole Value Chain Approach

The whole value chain approach has been quite effective in several ways, including;

- Awareness creation;
- Group formation and management,
- Facilitating farmers access to planting materials
- Facilitating farmers access to loans in kind
- Facilitating loan repayment from the proceeds of the crop,
- Securing subsidies for farmers ;
- Training on good agronomic practices;
- Capacity building in post harvest handling
- Marketing access.



Conclusion & Recommendation

- There is need to scale up and scale out of the value Chain model
- Enhancement of laboratory capacity to produce both the required quality and quantity of TC banana
- Enforcement of stringent regulatory standard among TC banana laboratories and nursery operators
- Continuous soil health management in farmers field to ensure optimal productivity
- Different on-farm orchard management regimes should be developed as part of the scaling-up programme.
- Varietal diversification
- Subsidy Scheme for initial adopters
- Banana project funding cycle should not be less than five years.



ASANTE SANA