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Tropical Agricultural Systems in Latin America

Silvia L. Saravia Matus and Sergio Gomez y Paloma
EUROPEAN COMMISSION, JOINT RESEARCH CENTRE, INSTITUTE FOR PROSPECTIVE TECHNOLOGICAL STUDIES, AGRICULTURE AND RURAL DEVELOPMENT UNIT, SUSTAG ACTION
Edificio Expo, Sevilla, Spain

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Tropical Agricultural Systems in Latin America: Challenges, Trends & Policies

By Silvia L. SARAVIA-MATUS and Sergio GOMEZ Y PALOMA



1. INTRODUCTION

In a world of environmental limits, sustainable and productive agriculture is crucial to foster socio-economic development and food security, primarily in low income economies. **The purpose is to examine the challenges and potential opportunities for Latin American countries which are characterised by tropical agriculture (over 90% of land within the tropic of Cancer & Capricorn) and (semi) subsistence farming (i.e. existence of a majority of small scale farms partially integrated to markets).** Policy support based on institutional coordination, investment in tropic-specific agricultural technology and the promotion of joint private- public initiatives are evaluated and identified as key factors to increase agricultural development. Agricultural innovation strategies (for both staple and export crops) are proposed to improve the situation of smallholders in the environmentally challenged regions.

2. CHALLENGES

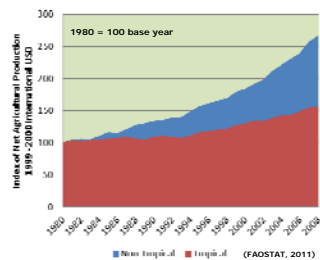
Tropical agriculture is afflicted with low yields, high evapo-transpiration, variable rainfall, highly weathered soils, veterinary diseases and plant and animal pests (Bloom and Sachs, 1998).



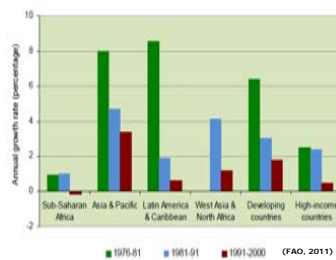
- Decline of **Green Revolution Effects & Increase of Population** in Tropical Latin America 2010 – 2050 (1,18% annual growth rate in Central America vs. 0.61% and 0.51% in North and South America respectively)
- Insufficient **Agricultural Research on Tropical Environments** (particularly Biotechnology)
- Population pressure on **SLASH & BURN** practices
- **Soil** degradation
- Inadequate **Infrastructure** for pre & post harvest (including irrigation systems)
- Unbalanced use of **fertilizers**, limited access to **credit**
- Climate Change effects, Climate Variability & Extreme Events (i.e. droughts, hurricanes)

3. TRENDS

Index of Net Agricultural Production in Latin America (per capita of agricultural population)



Annual Growth Rate in Agricultural Research (per geographical zone)



4. CASE STUDIES with small scale farmers



- **FRESH VEGETABLES** in El Salvador
- **CUT FLOWERS** in Colombia
- **COCOA & BANANA** in Costa Rica
- **CASSAVA** in Colombia

5. POLICIES

- **MARKET INFORMATION & ENTRY:** Support the transmission of price information and the consolidation of producer association and vertical integration of different players in the supply chain. Establish linkages between agricultural production and industrial processes. When necessary start with public investments and plan a transition towards cooperatives or association of small & medium farmers.
- **TECHNOLOGY ACCESS & ADOPTION:** Promote research focused on tropical agriculture context which includes new high yielding varieties on one hand and adequate infrastructure and input supply chains on the other.
- **TRAINING:** Promote farmers' schools to improve agricultural practices (i.e. conservation agriculture, organic farming) as well as knowledge of marketing strategies and product positioning nationally and internationally.
- **INSTITUTIONAL COORDINATION:** To promote small farmer association, spread the adoption of tropic-specific technology, set up production chains and secure access to key inputs (including credit).



RESEARCH AGENDA: TECHNOLOGY adjusted to tropical setting & ORGANIZATION to support smallholder production chains and market access

6. CONCLUSIONS

This paper has highlighted that there are common challenges and trends governing the tropical agricultural areas of Latin America and that there are specific sector experiences which provide insights on policies to increase agricultural employment, output and value added. Demographic trends indicate that addressing the needs of subsistence farmers in these areas will be pivotal to regional stability via the improvement of food security levels and the containment of rural migration. **Given the current (inadequate and relatively low) access level to inputs and technology of tropical farming in Latin America there is significant room for increasing productivity and yields per hectare.**

To introduce sustainable, environmentally friendly and productive agricultural practices, new adapted technology and research specific to tropical settings must be advanced. The latter is constrained by the declining trend of resources allocated to agricultural research and extension services in the entire Latin American region. **Expenditure in agricultural research will need to increase and go beyond technological support in order to allow smallholders to better organise the use of their assets and engage in both domestic and international markets.**

The establishment of inclusive research and institutional networks (which address the socio-economic needs of smallholders and explore how sustainable practices can be widely adopted) play an important role. Similarly, the ability to form **public-private partnerships** is crucial so that efforts to develop and acquire sustainable agricultural technology find a reward in market integration.