



# A collaborative model for value added and safe food production in Zambia

Colin Seeley<sup>1</sup>, Jimmy Chikahya<sup>2</sup>, Dale Lewis<sup>2</sup>, Alex Travis<sup>1</sup>, and Carmen I. Moraru<sup>1</sup>

<sup>1</sup>Cornell University, Ithaca, New York 14853, USA.

<sup>2</sup>Community Markets for Conservation (COMACO), Lundazi, Zambia



## ABSTRACT

Zambia, a country of about 12 million people located in Sub-Saharan Africa, is currently affected by the “triple threat” of poor governance, high prevalence of HIV/AIDS, and chronic and acute food insecurity. Over 60% of the people in Zambia live in rural areas, with limited access to clean water, electricity, and quality education. Development of agriculture and food production could be key for the development of the country and for pulling the impoverished masses into a more healthy and sustainable class. COMACO, a local cooperative organization that operates in the Luangwa Valley, has made significant efforts in recent years to improve the livelihoods for rural farmers in Zambia. Adding value to the locally grown food crops through processing was identified as a critical component for the long-term success and sustainability of COMACO. This paper will illustrate how a collaborative effort between Cornell University and COMACO, with financial support from USAID and additional support from the US Company General Mills, has helped enhance the technical capabilities and human resources at COMACO. The key issues that were the object of this collaboration include: 1) capacity building for hygienic and safe food processing; and 2) expanding the range of value added foods processed within COMACO through collaborative product development efforts, as a means for economical growth. The paper will illustrate some of the challenges, as well as the most significant successes of this collaborative effort. This work is viewed as an example of how well focused efforts can help alleviate poverty and hunger in Africa, by building the human resources and better using the natural resources of the country. Ultimately, this can lead to sustainable development of the region and diminished dependence on foreign aid.

### Quick Zambia Facts:

- Total population: 12.2 Million
- Over 70% of Zambians live in poverty.
- Per capita annual income: \$627
- 64% of population living on \$1/day
- Healthy life expectancy at birth: 37.7 years (3<sup>rd</sup> lowest in the world)
- Ranked 165 out of 176 countries on Human Development Index
- Contrasting development

Sources: WHO Statistics 2008, United Nations, and World Bank Data

### COMACO Community Markets for Conservation

- Community-shareholder owned company launched in 2002 by the Wildlife Conservation Society (WCS)
- Co-op style model to help rural farmers enter the marketplace
- **Mission:** Provide marketing services, trade benefits, and extension support for farm-based and natural resource-based commodities as a basis for small-scale farmer adoption of improved land use practices that promote natural resource conservation.
- **Goals:** Poverty reduction, job creation, sustainability

### OBJECTIVES of the Cornell-SANREM Project

1. Determine to what extent the COMACO model can be economically self-sustaining
2. Identify and integrate new technologies into COMACO to improve profitability, food security, and rural incomes
3. Determine the extent to which COMACO provides self-sustaining social institutions and meaningful roles for the COMACO participants
4. Determine the extent to which the COMACO model improves biodiversity and watershed conservation

### Food Science and Technology Strategy and Activities

- Training programs in basic food hygiene and safety
- Integration of new food processing technologies
- Quality improvement and new product development
- Assistance and training in quality and safety testing

#### The beginnings: peanut butter processing in 2005

#### Basic food hygiene training - 2007

### The Luangwa Valley: Wildlife & Poverty

- Vital for wildlife-based tourism
- 20-60% of households are food insecure
- Consequences:
  - 42% of food insecure families poach, which leads to an annual loss of 3000 to 4000 animals in the Valley alone
  - Planting of cash crops such as cotton and tobacco results in deforestation, pesticide use, perpetuation of poverty cycle, HIV, gender inequality.

### COMACO: Basic Structure

### COMACO: Accomplishments

- Improved wildlife (gun/snare reduction)
- Sustainability
- Increased food security
- Poverty reduction

### Soy milk and tofu processing

### Extrusion processing for HEPS and puffed cereal products

- Extrusion could be key to product line extension
- General Mills has made significant contributions in form of extruder donations and technology transfer

**New technology**

### Significant changes in the past five years!

#### Peanut butter processing

This training enhanced COMACO's capacity for safe food processing, by:

- Providing theoretical and hands-on training on basic food hygiene and good manufacturing practices.
- Providing COMACO with electronic and printed materials for future in-house training on GMPs and hygienic food processing.

#### Quality control and new product development lab

#### Acknowledgements

The authors would like to thank USAID-SANREM for funding, COMACO personnel for their daily hard work, Betsy Bihn and Bob Gravani from the National GAPs Program and Catalin Moraru (IFN, Ithaca NY) for their contributions to the project. Special thanks go to General Mills and to Sheri Schelhaas, Dan Green and John Mendesh for their significant contributions and invaluable assistance with the food processing activities.

### CONCLUSIONS AND IMPACTS

Facility improvements and intensive staff training in hygiene, safety, and quality control allowed COMACO to obtain HACCP certification, and consistently pass product quality & safety testing. These steps were essential in COMACO's certification as a vendor for high-energy protein supplement (HEPS) for WFP and Catholic Relief Services, which resulted in large-volume contracts for this product. In addition, research has decreased breakage of rice, reduced phase separation and improved packaging of peanut butter to improve quality and shelf life. Other contributions include assistance in developing new products, including soy milk, tofu, extruded snacks, protein bars. These changes have enhanced COMACO's ability to negotiate contracts with urban supermarkets and significantly increased sales of food products.