Potential for small scale marketing of pesticidal plant products in Africa

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Background

- Global challenge to produce more food to feed a growing population
- Pest management is crucial for food security
- Biopesticides are an ecologically friendly technology which could increase food production and food safety
- Trade is one way of increasing access to these friendly technologies and raise profile of pesticidal plants

Demand for pesticides

- Value of world pesticide market was about USD 32.8 billion in 2010

- Africa only 3% of the pesticides market share
  - Largely targeted at high-value cash crops predestined for export

- Pesticide use

Location	kg/ha
World average	3
China	13
USA	7
India	0.6 (insecticides 65% >50% for cotton production)
Africa	??

Demand for biopesticides

- Biopesticides sub-sector remain small and fragmented
- Sub-sector estimated at
  - 0.2% in 2000,
  - 2.5% in 2005
  - 4.2 % in 2010

- Biopesticides valued at US $1.3 billion in 2010

- Expected to reach US $3.2 billion by 2018

- North America accounted for about 40% of the global biopesticides demand in 2012

Demand for biopesticides

- Africa markets remain small and undeveloped with limited production for local use
- Initiatives remain pilots and demonstration with exception of pyrethrum in East Africa

Production of biopesticides

- Large companies are still very sceptical
  - return on investment
  - unreliable raw material supply
  - often less than absolute efficacy

Production

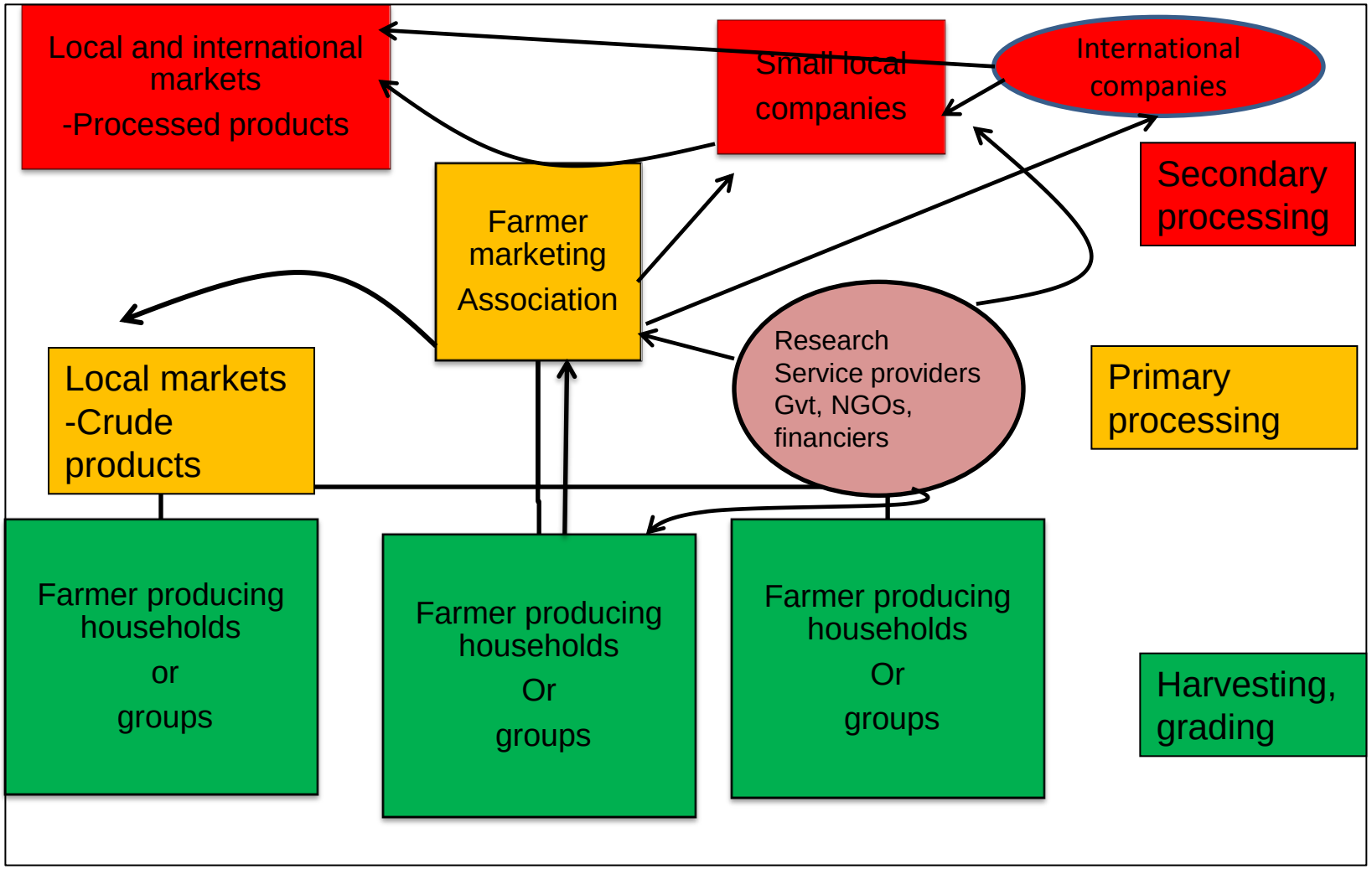
- Ecological distribution restricted
  - Disadvantage: Limited raw material
  - Advantage: Unique, novel products

Production

- Production, processing, preparation and standardisation pose major problems

- Traditional methods of preparation are often variable and lead to inconsistent efficacy

- Existence of inherent differences in plant chemistries



Emerging plant pesticides industry

Legal framework

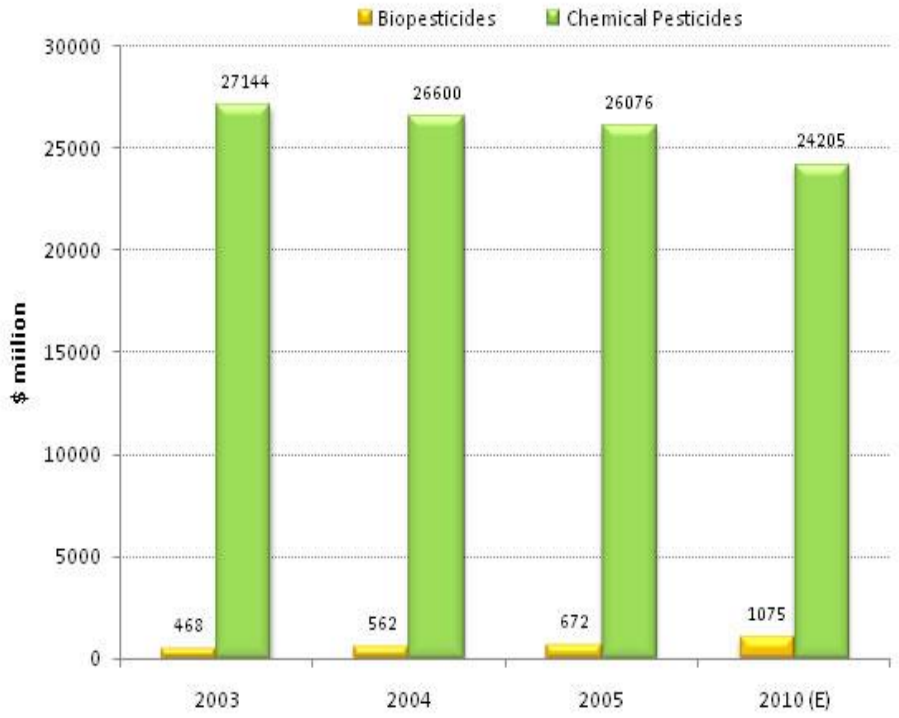
- Pesticide legislation in most countries states that:
  - no pesticides may be imported, exported, manufactured, distributed, advertised, sold or used unless they are registered according to the national pesticide regulations

- All pesticides to be registered should have documented data and information on:
  - Efficacy
  - Toxicity
  - Persistence
  - Shelf life: preferably two (2) years.
  - Safety Data:

- Successes registered in countries with specific and dedicated procedures and guidelines for registration and trade in biopesticides

Lessons from India

- India is currently one of the top three manufacturers of pesticides in Asia and ranks fourth globally after the US, Japan and China
- Indian industry in 2012 was estimated to be USD 3.8 billion with exports accounting for 50% of the market
- Biopesticides represented only 4.2%
- India, 25 biopesticides registered more than 227 synthetics were registered as of 2008
- Neem products 85% of the biopesticides in the market at USD 5.73 million in 2012



Bikramjit and Indranil, 2008

Azadirachta indica

Neem products

One of the most successful pesticidal plants currently used in the world

- Traded in Kenya and Tanzania

Form

- Extract of **Azadirachtin**
- Bark Powder
- Seed cake
- Emulsion of bark powder

Lessons from India

- Strong presence of multinational companies

- 2013 estimated that there were more than 150,000 players in the industry,
  - distributors (approximately 145,000)
  - formulators (approximately 800)
  - technical grade manufacturers (approximately 125)

- Each large manufacturer maintain an elaborate distribution network of 400 to 1000 distributors who supply 25,000 to 30,000 wholesalers and retailers

- Only about 10% of the enterprises operate on a commercial basis providing quality products for export

Africa small scale business potential

- Investing in rigorous research that will assure policy makers and the public about human and environmental safety and efficacy

- Already there are a number of pesticidal plant species that have been partly or adequately researched
  - Novel products such as *Tephrosia*, using models similar to those of pyrethrum and neem

Africa small scale business potential

- Investing in local production and distribution
- Investing in development of low cost technologies
- Investment in value chain development to spread the costs of research and increase the value of botanicals (production distribution network)

Africa small scale business potential

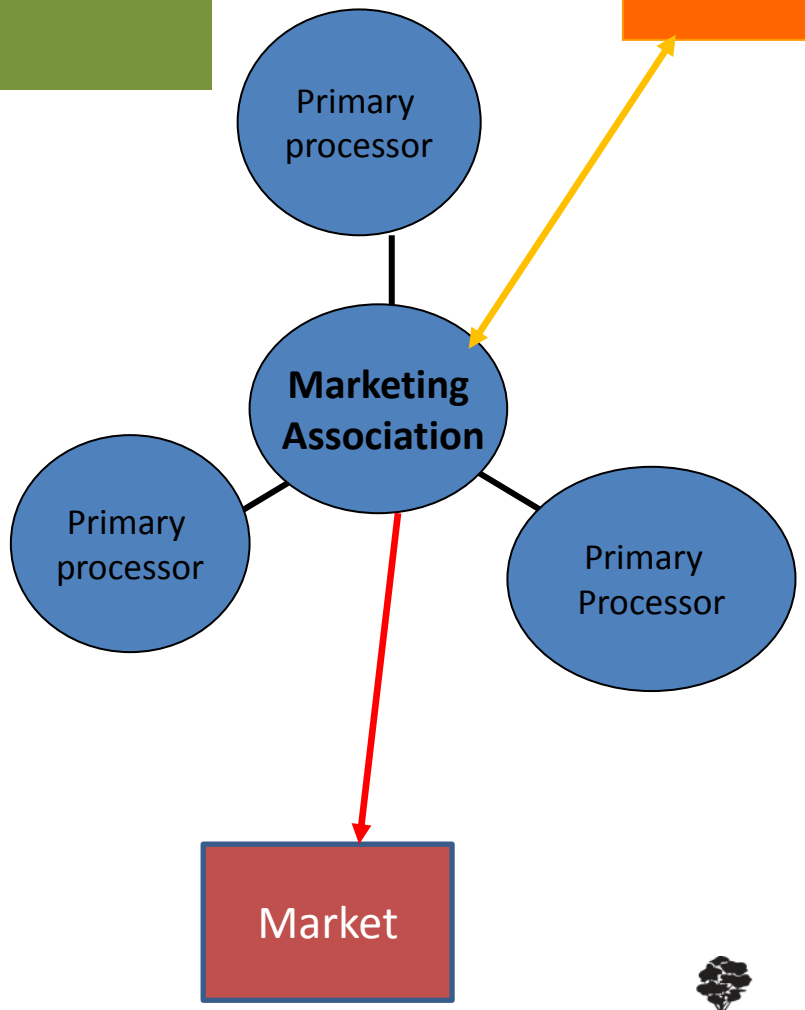
- **Business/Farmer organisation model selection crucial**
- A function of
  - Geographical distribution concentration of raw materials
  - Nature of raw materials
  - Nature of final product
  - Levels of value addition
  - Complexity of processing technology
  - Infrastructure requirements
  - Sophistication of markets

Africa small scale business potential

Private sector partner

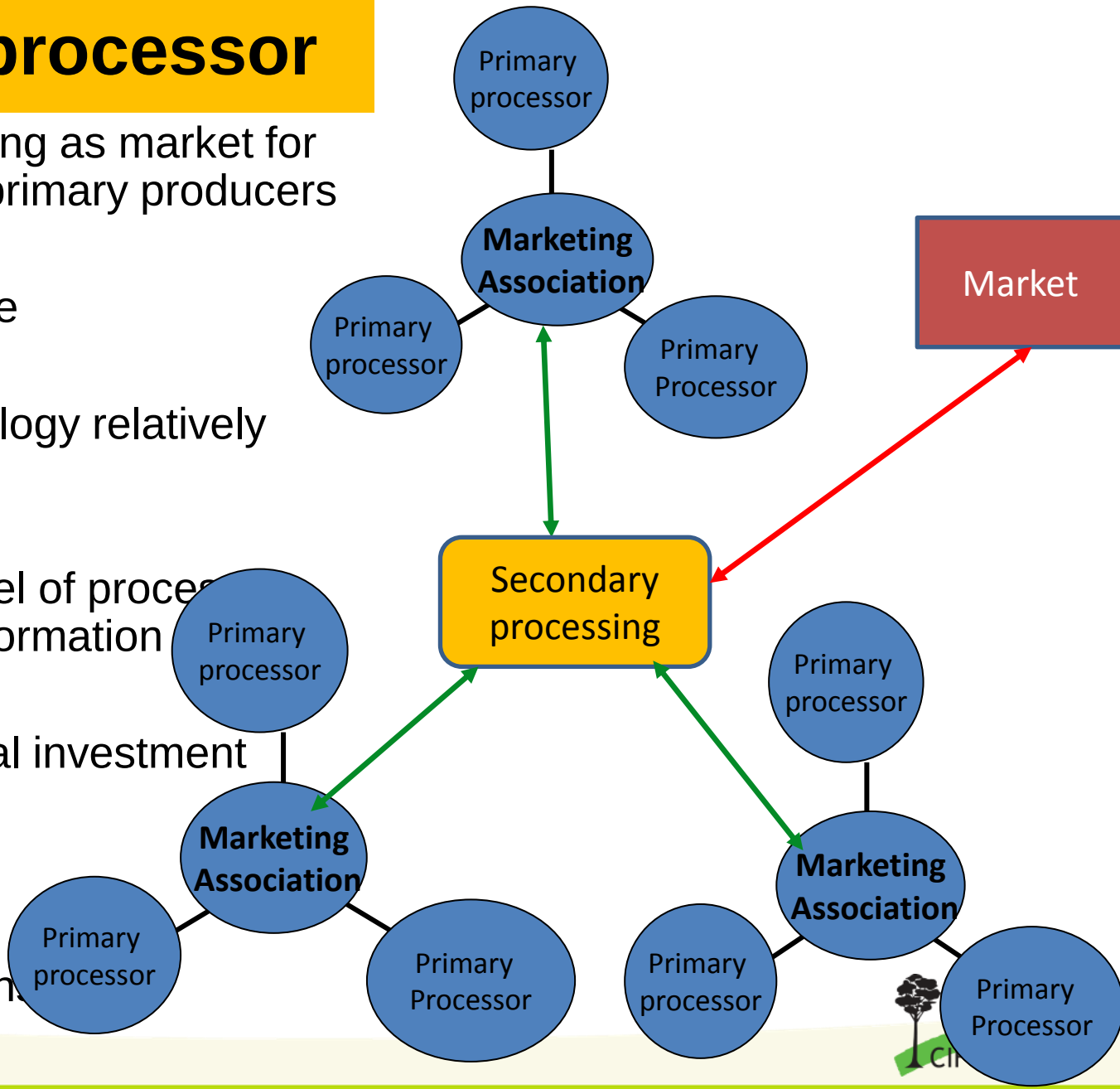
Primary processors

- **Gathering and selling**
  - Low capital
  - Low skills levels
  - Products very simple
  - Low returns
  - Sell direct to consumers or to processor
- **May form associations to**
  - bulk produce
  - improve negotiation
  - Adopt agree quality standards



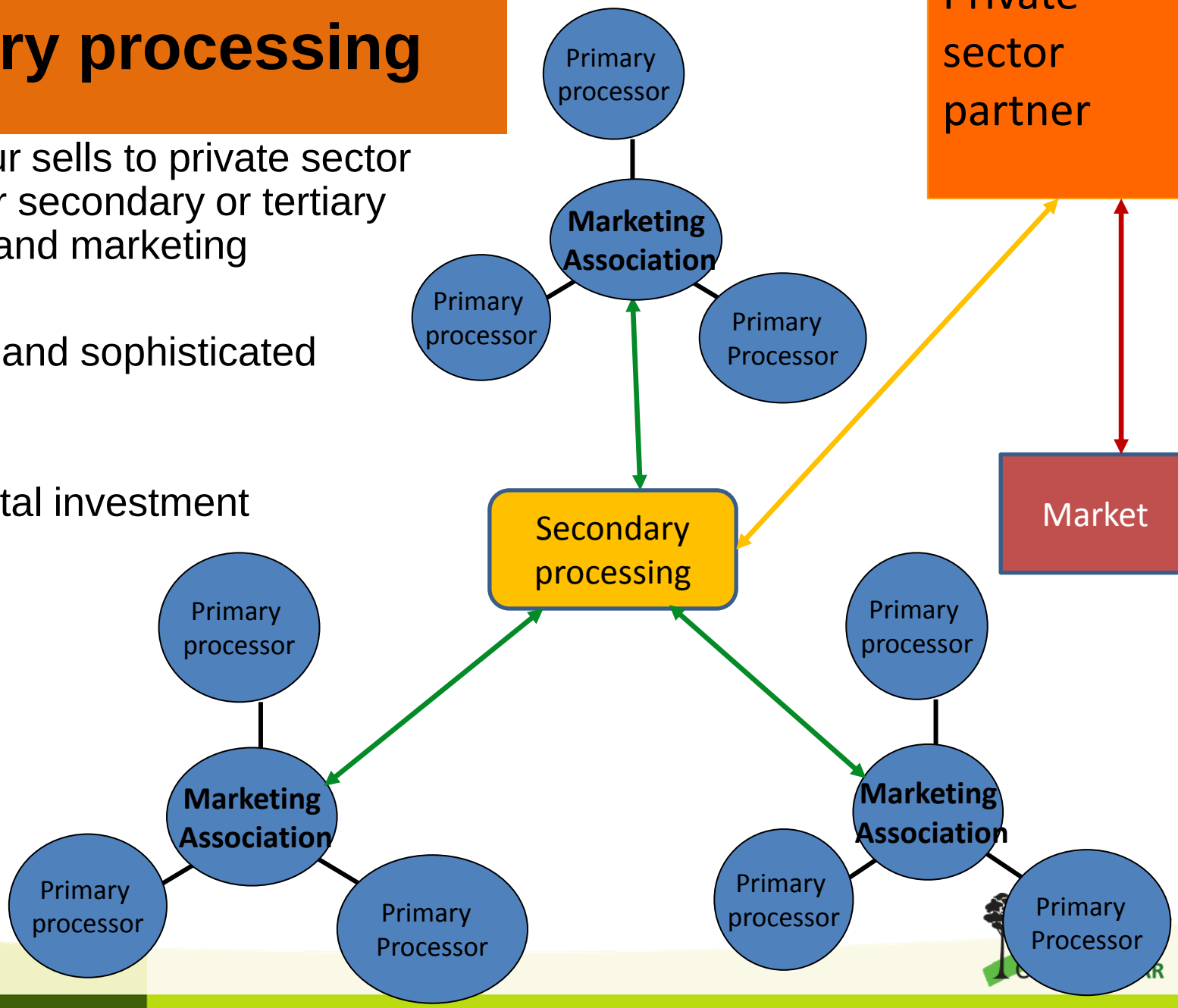
Secondary processor

- Entrepreneur serving as market for producer groups/ primary producers
- Economies of scale
- Processing technology relatively simple
- Relatively high level of proces and product transformation
- Intermediate capital investment
- Semi-skilled staff
- Good to high return



Tertiary processing

- Entrepreneur sells to private sector company for secondary or tertiary processing and marketing
  - Complex and sophisticated markets
  - High capital investment
  - Exports



Pyrethrum value chain

Primary processing
Labour intensive
Manual

Secondary processing
Machinery

Tertiary processing
Biochemistry
and standards

Flower harvesting

Isolation of pyrethrin

Tanacetum cinerariaefolium

Plantations

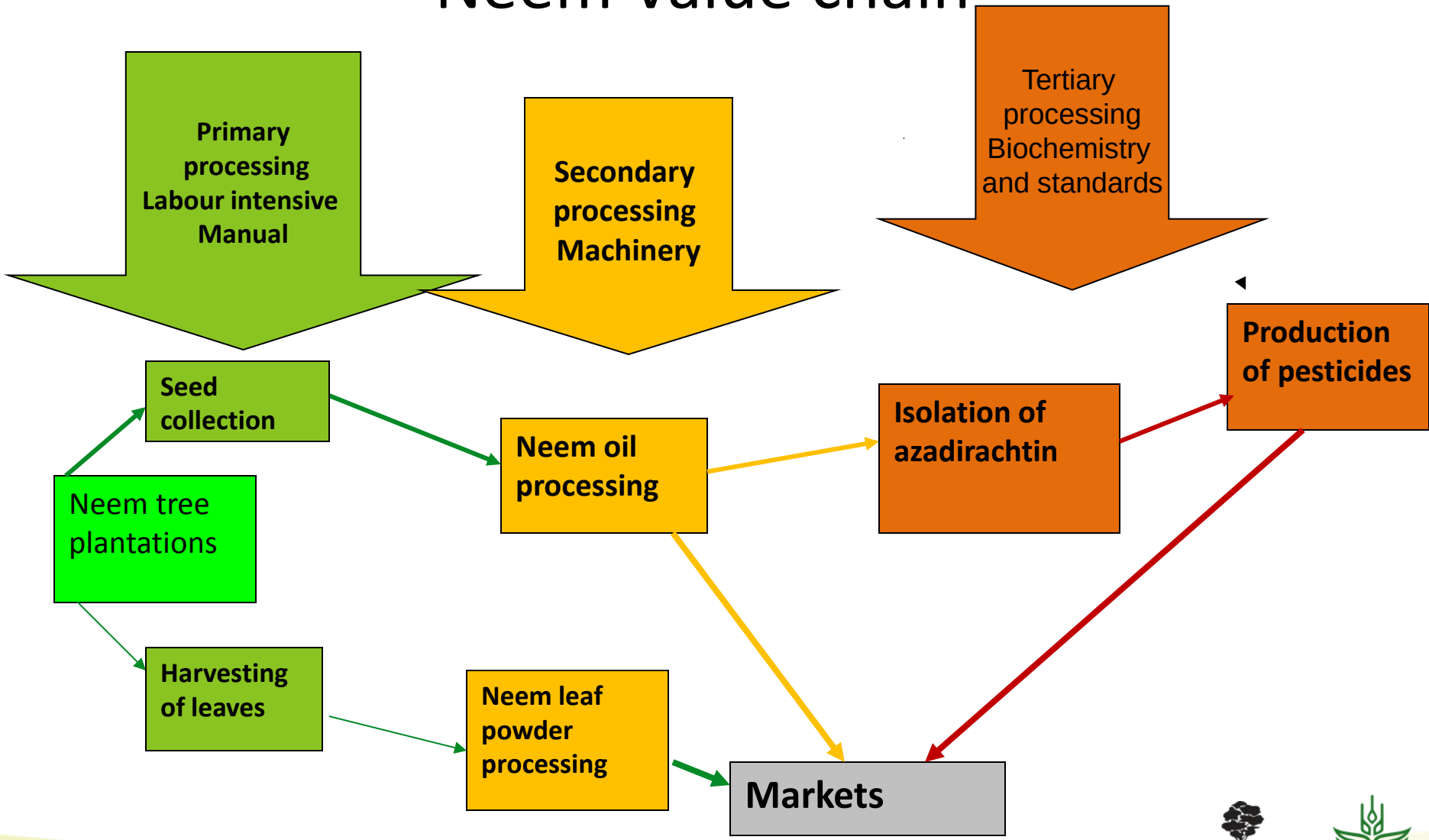
Flower powder (pyrethrum) processing

Production of pesticides

Markets

CIFOR CGIAR

Neem Value chain



Challenge of bringing pesticidal plant products from the forest/farm to the shelves at a reasonably low cost that is affordable to smallholder farmers who produce the bulk of the food in Africa

Further reading

Sola, P., Mvumi, B. M., Stevenson, P.C., Belmain, S.R., Ogendo, J. O., Mponda, O., Kamanula, J.F., and Nyirenda, S. P. (2014). Botanical pesticide production, trade and regulatory mechanisms in sub-Saharan Africa: making a case for plant-based pesticidal products. Food Sec. (2014) 6:369–384

http://blog.cifor.org/24631/in-fight-against-african-pests-researchers-point-to-natural-born-killers

Thank you

Egerton University

Thinking beyond the canopy

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