Promotion of underutilised plants and biodiversity: Lessons for fruits and markets

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GLOBAL CROP DIVERSITY TRUST
A Foundation for Food Security

International Seminar on Economics and Marketing of Tropical and Subtropical Fruits.
16 – 18 July 2007, Kuala Lumpur, Malaysia.

The International Centre for Underutilised Crops

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- What is biodiversity?
- Effects of species promotion on diversity
- Strategies to combat loss of diversity

What is biodiversity?

- All variation found in living organisms, both between and within ecosystems
- Vital for nutrition, income, labour efficiency, self-reliance, food security, the environment
- Sustains cultural richness and community identity

Importance of genetic variation within species

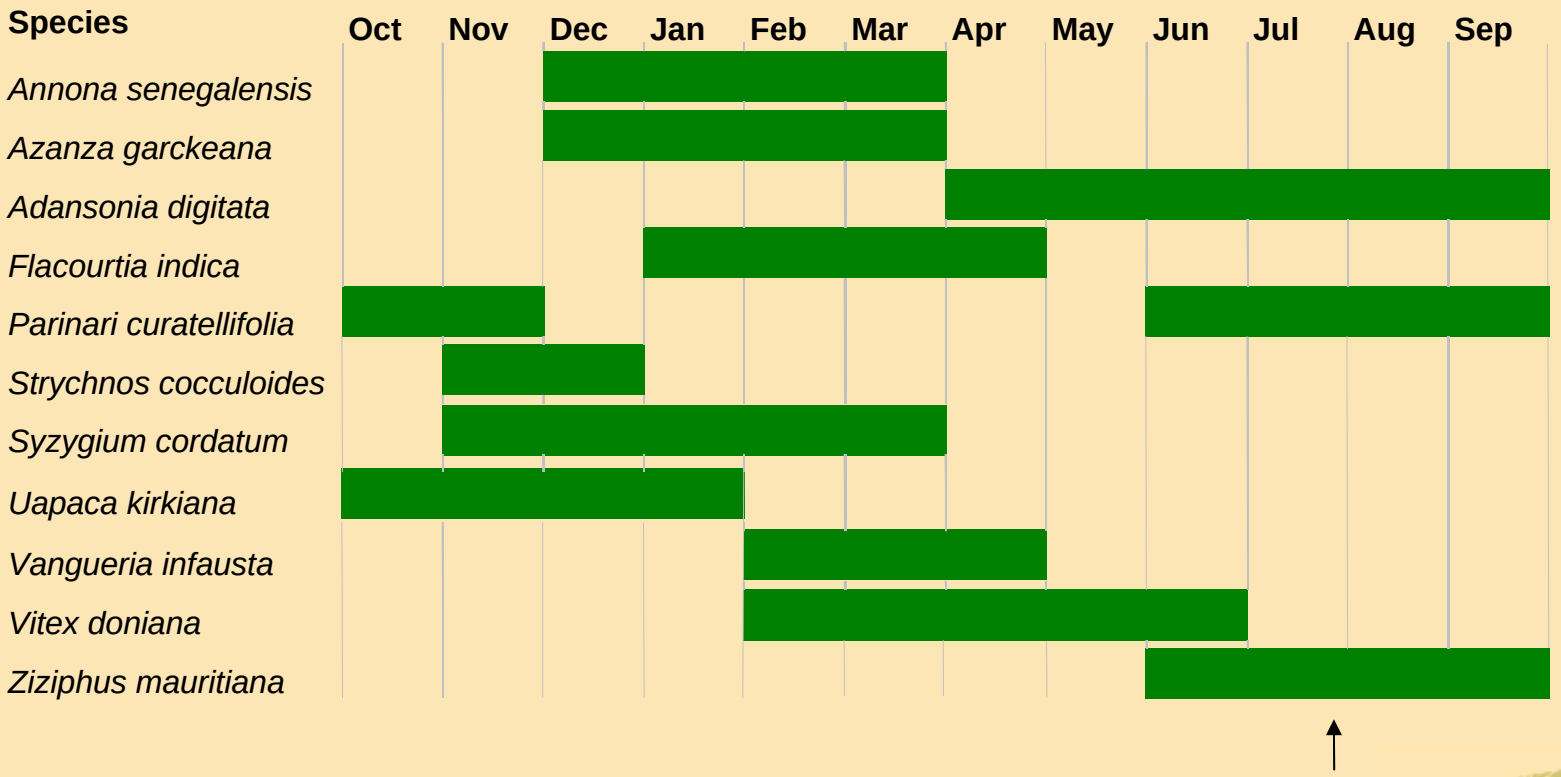
- Prevents inbreeding depression
- Opportunities for increased productivity
- Adaptation to change

Value of diversity in a farm context

- Higher productivity and more stability
- Increased efficiency
- Increased resilience to external pressures
- Maintenance of pollinators, whose decline may have significant financial implications

Diversity for nutrition & health

Based on a World Agroforestry Centre case study



Species promotion and diversity

- Historically, human-induced change in landscapes (e.g. habitat destruction and fragmentation) may be as, or more, significant for loss in biodiversity than species promotion

The Green Revolution

- Yield/food availability ↑ (high yielding cvs)
- Biodiversity ↓ (displacement of traditional varieties/species, simplification of human diets)
- Global food security now based mainly on 3 crops (maize, wheat, rice) → increased vulnerability to change, especially for the rural poor (inputs)

Effects of selection

Intensification → monoculture → displacement

- Maintenance of resilience in highly selected crops needs infusion of new variation that is outside mainstream production (crop wild relatives; not immediately ‘useful’: public good)
- *Ex situ* genebanks

Displacement scenarios (1)

Substitution

- of one variety by another of the same species, similar function

  → karat banana; modern rice varieties

- of one variety by another of the same species, different function

  → maize for food/ethanol

Displacement scenarios (2)

Displacement

- of one species by another that already exists in the farm landscape

  → intensification (rambutan, mangosteen, mango instead of traditional food crops)

- of one species by another that is new to the farm landscape

  → coffee in Vietnam, instead of traditional food crops

Factors affecting risk of erosion

- Biological characteristics of the species
  - Longevity, breeding system, propagation techniques, methods of pollination, methods of seed exchange, plant size
- Functional use
- Type of market for product
- Type of farming system
- Particular promotional methods
- Level of previous domestication

Impact of promotion on genetic variation within species

Little information available

- Potentially high losses
  - generally small populations, thus vulnerable to reductions in genetic variation
- However…
  - farmers can have strong cultural preferences for certain crop varieties, maintained in home-gardens
  - lack of formal germplasm distribution systems mean individual locations more likely to maintain their own variation?

Impact of promotion on the diversity of associated crop species

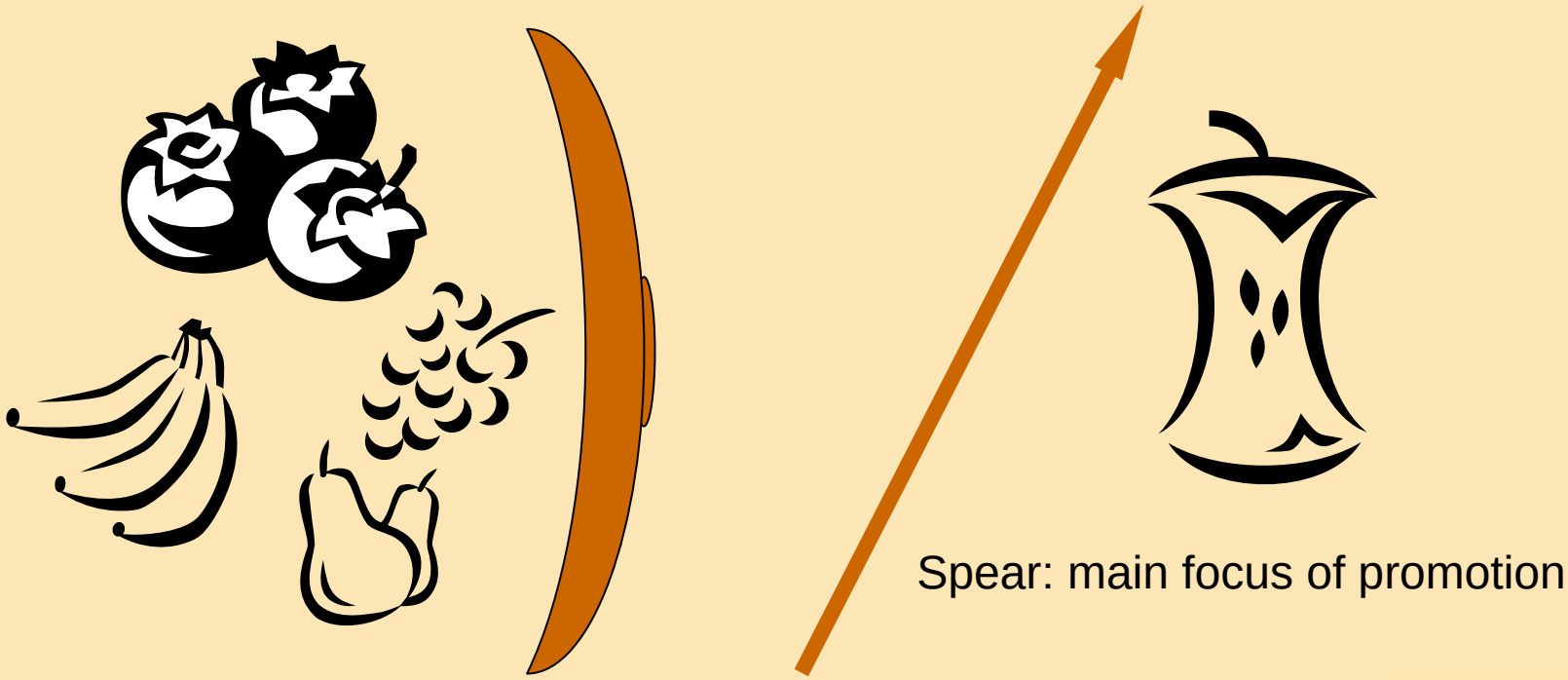
- Can have important consequences, unless expansion involves bringing new land under cultivation
- However, farmers maintain diversity to minimise risk
  - so some level of diversity within farms likely to be maintained

Impact of promotion on market diversity

- Positive
  - new products available
  - more quantity/higher quality (important for food security)
- Negative
  - loss of traditional crops/products
  - less diversity (potential effect on health)

Strategies to combat loss of diversity

The “spear and shield” approach



Shield: backup species

Spear: main focus of promotion

Assuring germplasm availability

- Community networks
  - →raising awareness, facilitating network development, involvement of 'nodal' farmers; commercial aspects
- Germplasm/diversity fairs
  - →work best where propagule shows desirable characteristics (for ease of selection)
- Village-level domestication strategies
  - →'generic' training in germplasm collection, propagation, production, harvesting, processing etc.

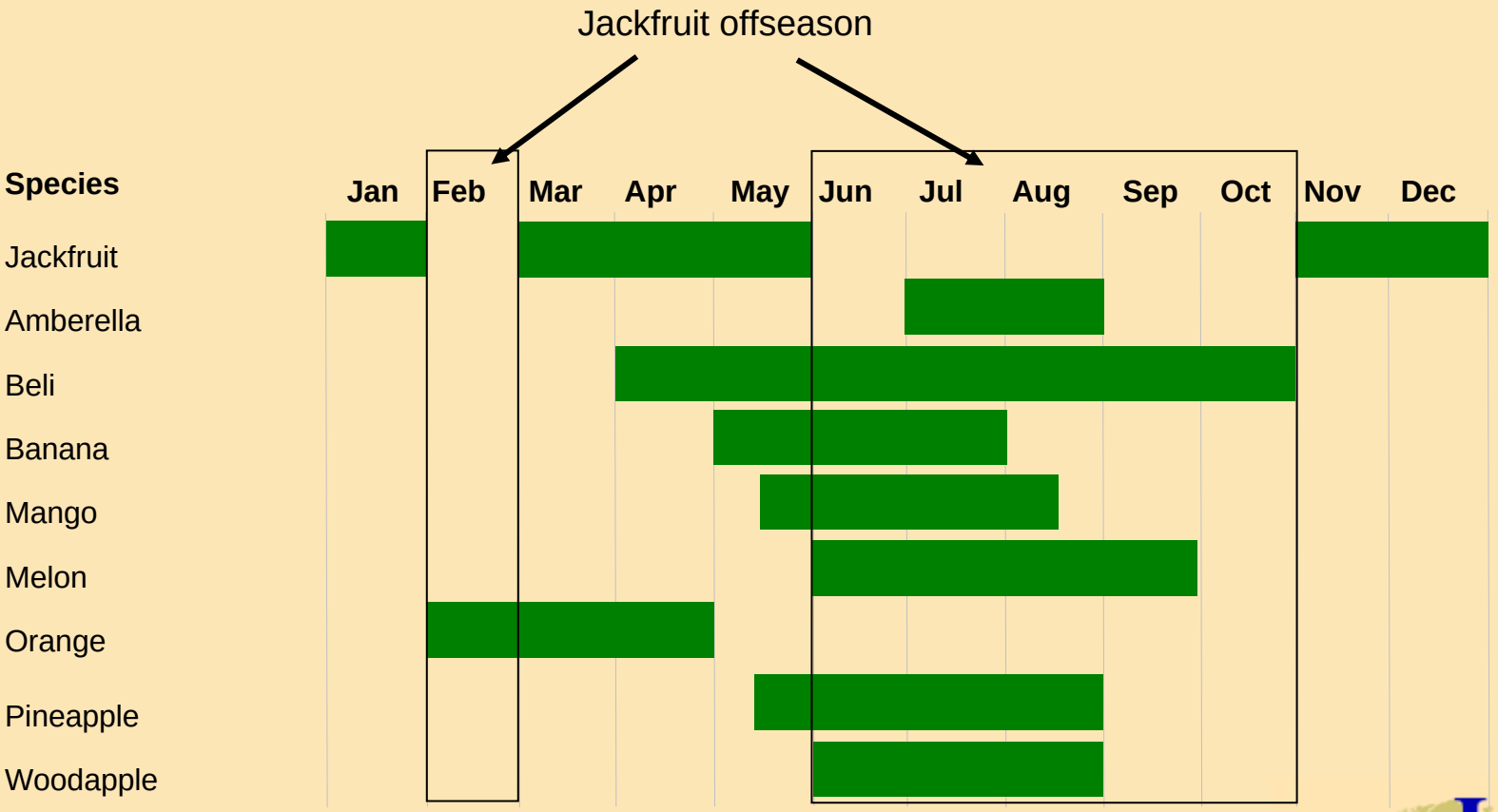
Processing and certification: argan oil in Morocco

Nill and Böhnert, 2006

- Pressed (manual/industrial) from the nut of the argan tree (*Argania spinosa*) for food/cosmetics.
- Processing training for local women, support in group organisation, establishment of new argan stands.
- Higher prices realised through certification and partnership with international buyers.
- Conservation in new plantings based on improved markets
- Recognition of the Arganeraie as a UNESCO biosphere reserve.

Fruit processing in Sri Lanka

Adapted from Sri Lanka Dept. of Agriculture, 1997



Markets fostering biodiversity

- Functioning value chains
- Producer/processor organisations
- Niche markets: DOC, Slow Food, Fair Trade, organic
- Directly link producer/processor – market
- Group/joint certification schemes
- Needed: reduced constraints to market entry
  - lower costs for ‘process’ and ‘product’ certification
  - less restrictive tariff and non-tariff barriers (e.g., EU-NFR)

Denomination of Origin

- Mainly used for commodities: coffee, cocoa etc.
- Can be an incentive for maintaining diversity
- Key is…
  - explicit links between a geographic territory, a specific variety (or varieties) and its product, and a particular community with its traditional practices

Types of markets

- Local, national and international markets each have their own advantages and disadvantages…

Local markets

Advantages

- Traditional use and acceptance of products; identity of societies maintained; conservation reinforced
- Minimal regulatory requirements in bringing products to market
- Short value chain from producers to consumers
- Direct farmer consumption possible in the absence of a market

Disadvantages

- Premium for products may be lower than in other markets, especially with ‘gluts’ and low value during peak production
- Increasing competition from supermarkets (also opportunity for sale)

National markets

Advantages

- Some traditional use and acceptance of products, possible access to higher value 'internal' markets than those available locally
- Regulatory/certification barriers likely to be lower than for international markets
- Provides good opportunities for 'value addition' through processing

Disadvantages

- Absence of proper certification may make producers vulnerable to unscrupulous practice ('misnaming' of lower quality product by large suppliers)
- Longer value chains than for local markets may decrease the benefits for farmers
- Generally, markets at this level are more 'industrial', requiring more uniform product

International markets

Advantages

- Niches products (e.g., DOC, Fair Trade) may be of high value and bring considerable economic benefits to communities
- Specialised value chains are generally built around good practice that ensures ‘fair play’ between producers and consumers

Disadvantages

- Non-tariff barriers to trade may be high; certification costs
- May be very sensitive to health scares
- Entry into more ‘industrial’ (not niche) markets requires highly uniform product

“Intelligent” markets

- Markets locally, nationally and globally will only be effective in supporting diversity if:
  - emphasis is placed on educating consumers about diversity
  - sufficient consumers are willing to pay premium prices for products that support diversity
  - attention is given to higher-value niche market development