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Life Cycle Analysis: a tool for decision making and strategic planning?

researching the value of LCA in Kenyan horticulture

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Carbon and Water Management in Horticultural Exports from East Africa

Simba Lodge, Lake Naivasha, Kenya

8th -9th December 2011



Life Cycle Analysis: a tool for decision making and strategic planning?

- Introduction to the 'Less Carbon' project
- Brief overview of LCA
- LCA in practice
- Enabling factors for successful planning



Less Carbon Project



Proactive response to retailer/consumer concerns

- Concern about a new 'barrier to trade'
- Feedback from industry – 2008 consultation
- Anticipated requests for information by retailers
- Existing accreditation schemes require more information

Knowledge transfer

- Build capacity for LCA within Kenya – Africa Knowledge Transfer Project
- Train graduate in LCA - academic study and practical application
- Train staff on data collection

Data collection and analysis

- Develop data collection methodology
- Identify and address issues with data collection and analysis

Desired outcomes

Calculate a range of product carbon footprints

Identify 'HOTSPOTS'

Model potential [carbon/water/cost] reduction scenarios

Develop carbon [and water] reduction strategies for key crops

Identify operational and training issues

Respond to customer demands

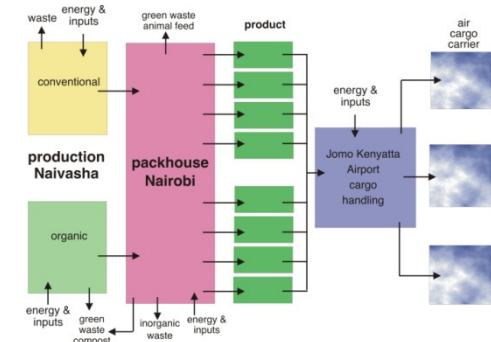
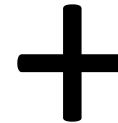
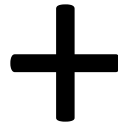
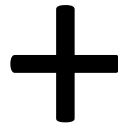
Reduce cost, carbon, and water use

Improve efficiency along the supply chain

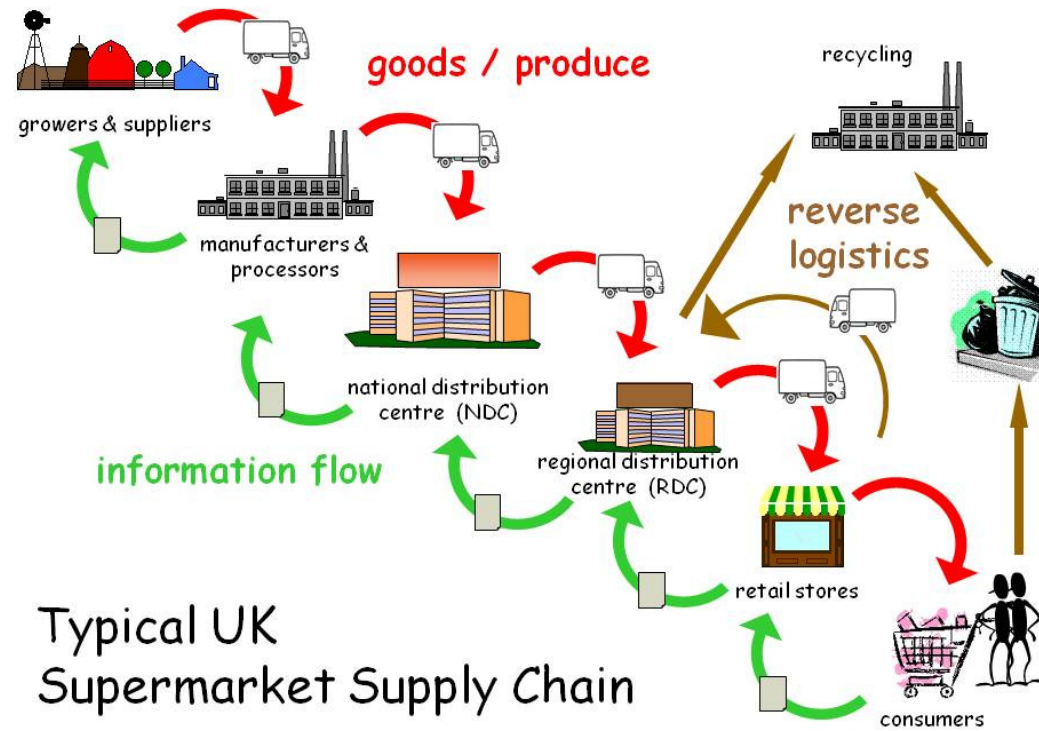
ADDED VALUE ?

REDUCE COSTS + STREAMLINE PRODUCTION + NEW BUSINESS OPPORTUNITIES

Beyond Carbon...



The product lifecycle



Henry Matthews © 2008 Writtle College

EMISSIONS FROM: INPUTS WASTE ENERGY WATER RESOURCE USE

Key parameters for LCA

LCA attempts to predict the overall environmental impact associated with a product, function or service

Define the boundaries

What to include and discard from the study

The system boundary – cradle to gate – cradle to grave – **cradle to UK RDC**

The functional unit

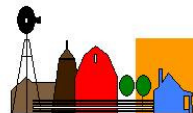
How do we compare products? **Kg CO₂e per Kg product**

Data collection

Questionnaires & supplier data requests - **design to fit production system**

Filling the knowledge gap

Using generic data – **is it valid for Kenya?**



from farm to fork (gate to plate)



Henry Matthews © 2008 Writtle College

LCA tools



Internationally recognised standards
International, national & peer reviewed EF calculations
Industry standard software



ISSUES:

Lack of EF relevant to Kenya

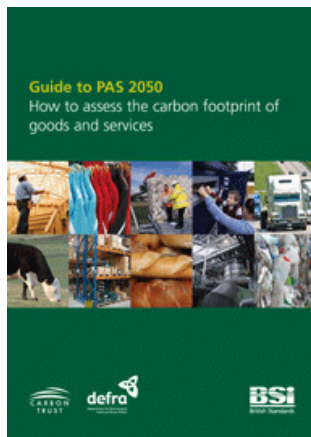
Calculate EF

Identify 'best fit' EF

Peer consultation

Complexity of software

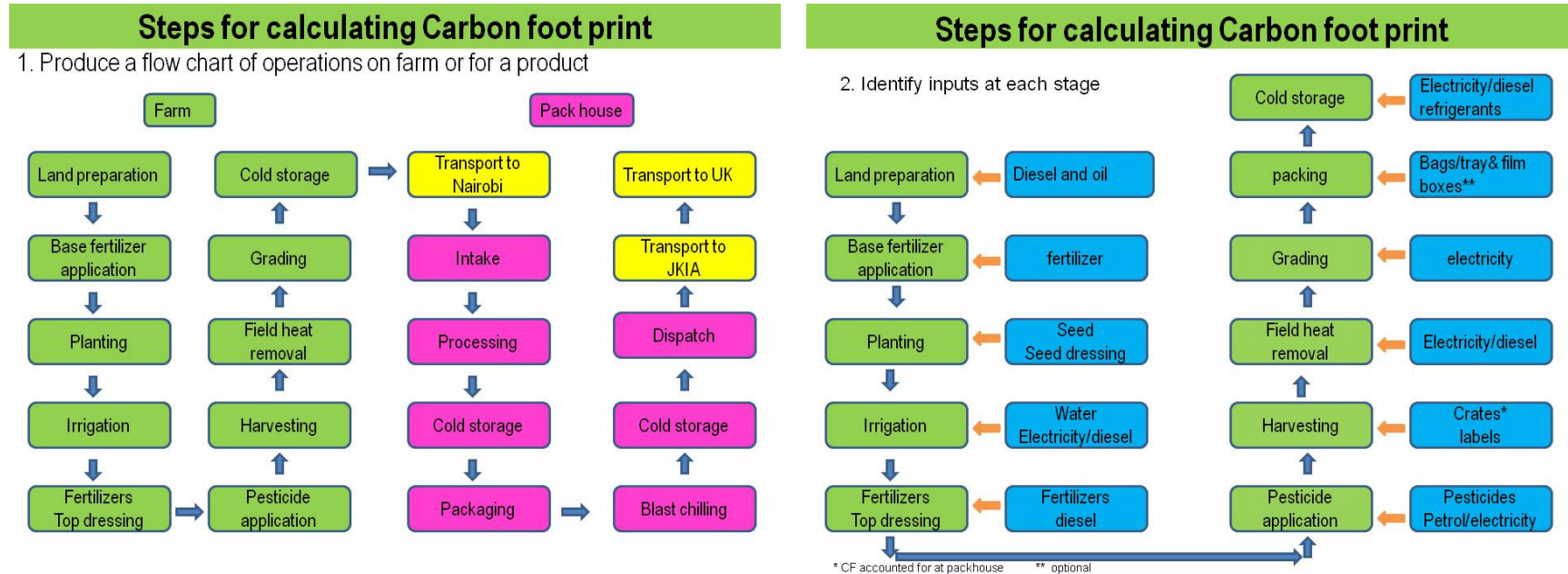
Create bespoke templates in SimaPro



SimaPro

The flow chart

ENERGY +INPUTS+ WATER +TRANSPORT+WASTE



Simplified example:
Full process flow for export horticulture product = over 100 operations

Each input = discreate calculation
Example:
Fertiliser NPK 22:22:22
3 x EF - raw material production (N,P,K) +
transport from country of origin +
Transport of fertiliser to farm

From results to strategy

Key factors - hotspots:

Farming protocols:

- IPM
- LEAF
- Organic
- Conventional

Farm type:

- Smallholder
- Grower/exporter

Yield

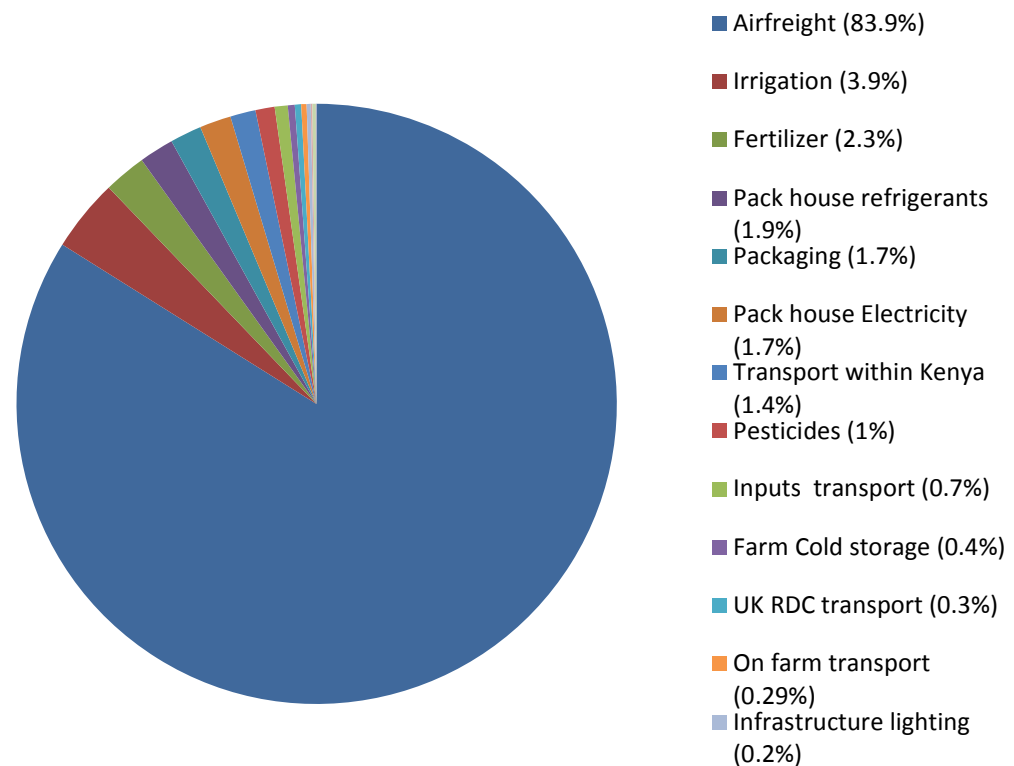
Irrigation method

Soil type

Packaging regime

Weather

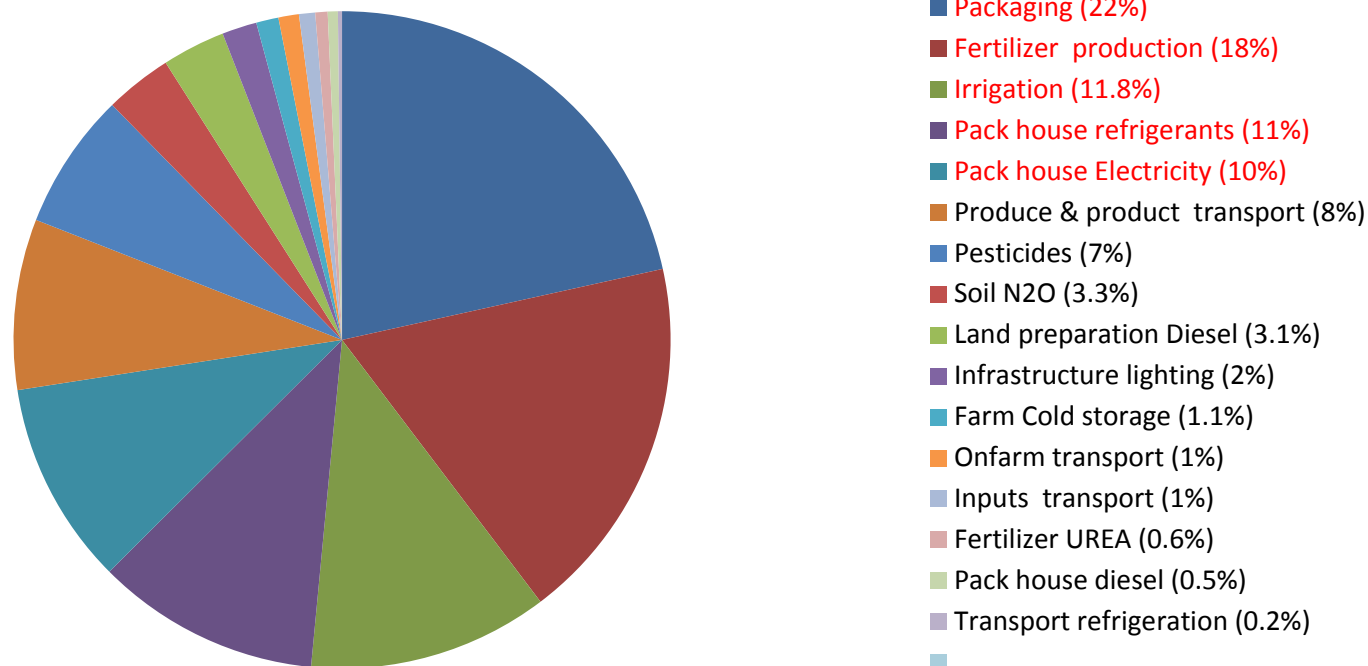
Vegetable 1- 5.89kg/kg product to UK RDC



From results to strategy

Product A: Production and packing for export - 0.998Kg CO₂e/Kg product

Breakdown of CO₂e emissions



Key findings

LCA - Enabling factors for effective strategic planning:

- Holistic approach
- Direct observation- Operations audit
- Comprehensive data collection
- Realistic and creative approach to modelling scenarios
- Staff awareness, enrolment and training in the process
- Deeper insight/examination of supply chain operations
- Understanding of wider horticultural good practice



Benefits for company:

- Immediate carbon, water & cost savings
- Strategic plan for WF and CF reduction
- Identify R &D opportunities
 - longer term strategies
 - Complementary industries within Kenya
- Positive marketing materials and information for customers





Less Carbon



A Kenyan LCA service for Kenyan horticulture, industry and business

THANK YOU

QUESTIONS ?