“EcoLife” as a Navigator for Consumers

Identification of requirements to tools, data source, and case studies

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Objective

- **To develop a household consumption model for consumers’ (voluntary) environmental management**
- Tracking consumption and emission history
- Identify the potential improvements in individual consumption activities
- Present different scenarios

Navigate the shift to a more sustainable lifestyle (consumption) style

Structure: Hybrid use of models

1) I/O model helps to identify the hot-spots in overall lifestyle
2) Bottom-up process models provide differences that arise by individual choices made by consumers

Complexity of Household Consumption Activities

- LCA Database & Case studies are accumulating, however...
- The diversity of household types are greater
- Results for same set of choices varies in different regions
- Consumption is a system of multiple products and service usage
- Details matter

It is difficult to apply those resources for consumer guidance as it is...

Example of bottom-up models

Drinking tea: Prepare at home vs. Buy a tea bottle at convenience store

Tea bottle
- PET bottle (2 liters)
- Convenience store

Tea bag
- Supermarket
- Boil 2 liters

Viewpoint: CO₂ emission as the focal environmental impact

Reduction of CO₂ Emission Associated with Consumption Activities

- Compulsory regulations
  - EX) Home appliance recycling law
- Incentives
  - EX) Subsidies for buying LEV
- Stimulating voluntary actions
  - EX) Environmental Balance Sheets
  - EX) Advertisement for a better action

Viewpoint: CO₂ emission as the focal environmental impact
Constructing bottom-up models

- Express consumer choices with a decision tree diagram

Demand to Demand to
drink drink
teat at home
tea at home
Buy PET bottle fromBuy PET bottle from
convenience store
Buy tea pack fromBuy tea pack from
tea shop and prepare
at home
at home
ReceiveReceive
PS bag
Don't receivDon't receiv
PS bag
ReceiveReceive
PS bag
Don't receivDon't receiv
PS bag

Bottom-up model for "drinking tea"

- Describe the model that involves all the choices and outcomes

Decisions

Choices

and Events

Expectations

Outcomes

"EcoLife" Software

Identifying hotspots using I/O model

K. Asakura et al., "I/O table for environmental analyses" 2001, Keio Univ. Press

Identifying potential improvements using bottom-up models

K. Asakura et al., "I/O table for environmental analyses" 2001, Keio Univ. Press

"EcoLife" Software

Identifying hotspots using I/O model

"EcoLife" Software

Identifying potential improvements using bottom-up models

"EcoLife" Software

Identifying potential improvements using bottom-up models

What did you buy?
- Bought PET bottle in Convenience store
- Bought tea bag in supermarket

PE bag?

Yes, I took it.
“EcoLife” Software
Identifying potential improvements using bottom-up models

“EcoLife Software”
Communicating the differences

Findings (1)
- The prototyping project elucidates the power of household consumption model & lifecycle thinking...
  - Follows the consumer’s decision process
  - Clear presentation of differences associated with decisions
  - Stimulates systems thinking
  ...as well as the difficulties to build the model
  - Data sources are scattered
  - Available data is always aggregated with different boundaries
    - Collection of techniques to disaggregate should be established
    - LCA case studies, reports, and DB can increase its values by preparing for re-definition of its boundaries

Findings (2)
- The model needs more extensions
  - Dealing with different time horizons
    - Monthly life model + daily, weekly, season, year models
  - Support achieving specific goals of action
  - Automatic identification of potentials
  - Tracking the consumption history
  - Communication among users
- Other means of implementation
  - Mobile phone, PDA
  - Paper + post service

Findings (3)
- Methodology: Refinement & development is needed
  - Actually hybrid bottom-up model and IO model
  - Consider other impacts
  - Presentation of outcomes of choices with multiple objectives
  - Identification and communication of uncertainties
  - Modular structure is favorable
    - Bottom up models install as it gets available
    - Support development of bottom-up models
      - Decision tree
      - Collection of assumption techniques (disaggregating, filling missing data,...)