

Integration of social and natural sciences to develop improved tools for assessing and managing food chain risks affecting the rural economy

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Project partners

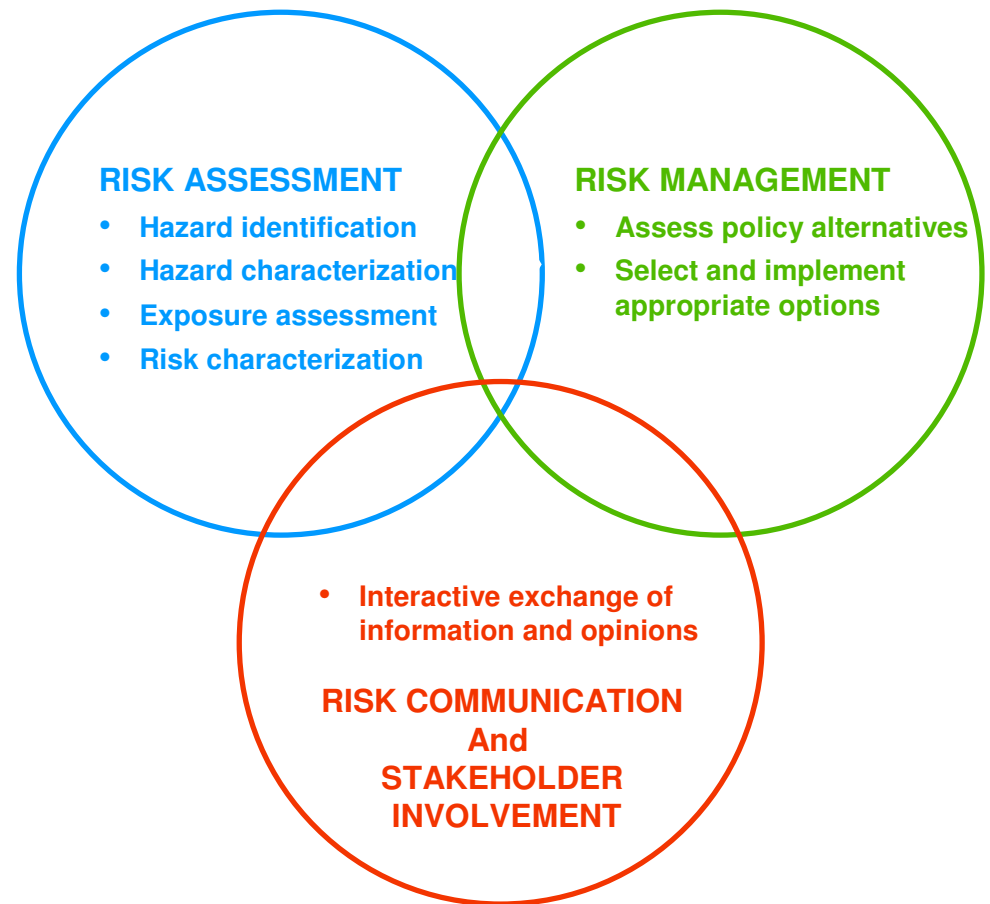
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Project objectives

- Develop interactive web-enabled tools for quantitative assessment of risks and uncertainty
- Use participatory methods to ensure web-enabled tools, etc. appropriate for stakeholders
- Develop methods to predict consumer behaviour driven by perceptions of risk and uncertainty
- Develop improved methods for communicating with stakeholders
- Test, evaluate and demonstrate improved approaches in case studies of food contamination and microbiological hazards

Food borne hazards - Risks

- Multiple views
 - Science and statistics
 - Social, political, economic
- Multiple stakeholders
 - Consumers, caterers, producers, farmers, regulators



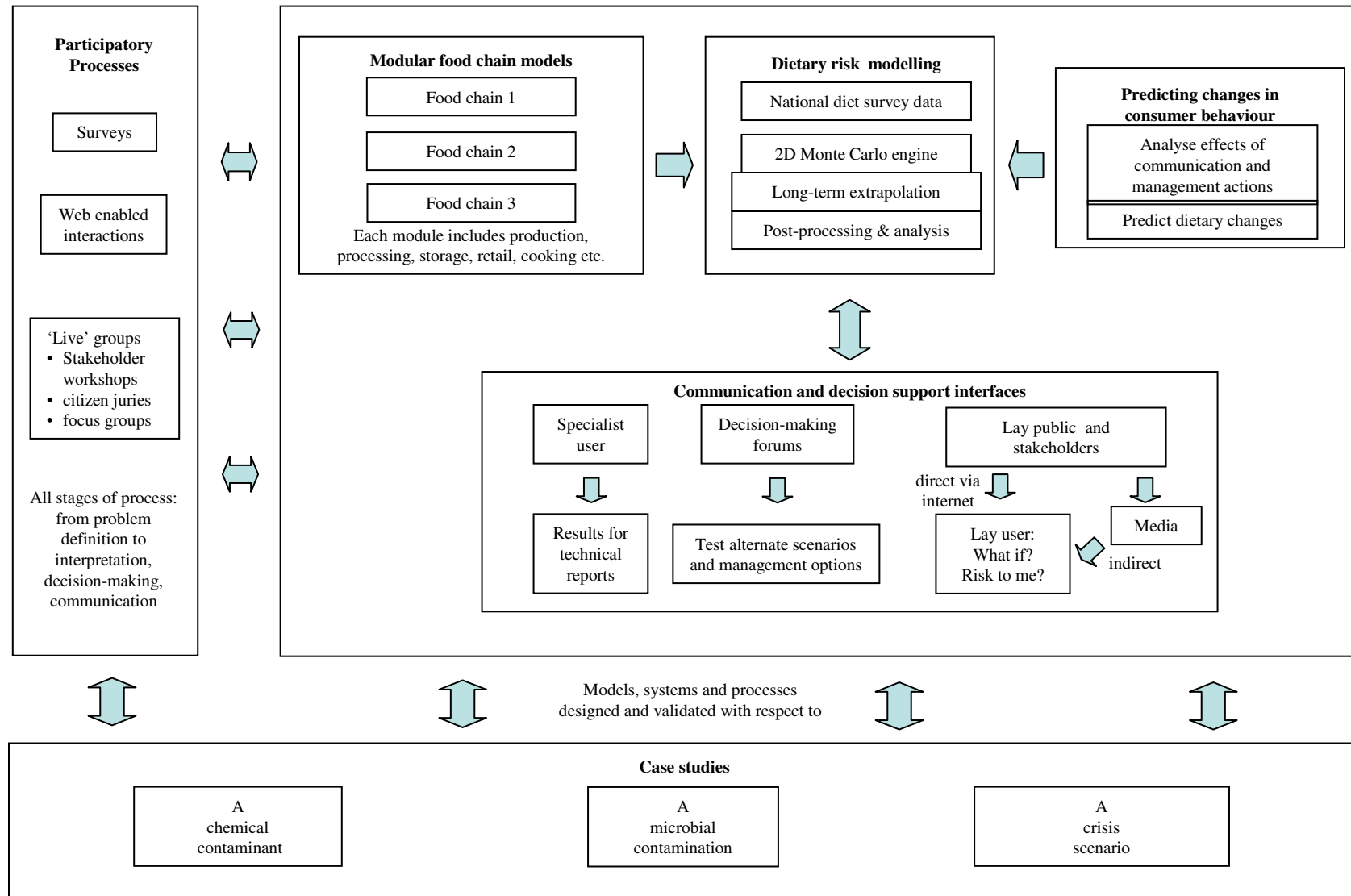
Food borne hazards - domains & uncertainty

- Known domain
- Knowable domain
- Complex domain
- Chaos domain
- The public want information on uncertainty
 - Early indications on uncertainty engender honesty
 - Subsequent indications on uncertainty lead to problems with credibility
- Information domain
 - Complexity, uncertainty, dependency
- There are multiple forms of uncertainty
 - Information uncertainty
 - Population variability
- The public are more accepting of uncertainty when it is due to the scientific process than when it is due to lack of interest or inaction

Project modules

- Participatory processes
- Dietary risk modelling
- Modular food chain models
- Predicting changes in consumer behaviour
- Communication and decision support interfaces
- Case studies

Modules within the project



Participatory processes

- Information flows that promote and inform the domain description
- Participatory methods
 - Stakeholder workshops
 - Citizens' juries
 - Focus groups
 - Scenarios to stimulate discussion
- Runs throughout project to:
 - Inform initial developments and ensure processes and web-enabled tools appropriate for stakeholders
 - Test in case studies
- Input into all other modules

Dietary risk modelling

- Integrate information on hazards with detailed information on consumption (NDNS)
- Develop web-based tools based on CSL probabilistic tool
- Probabilistic methods of risk assessment:
 - Take account of variability and uncertainty
 - Usually aimed at specialists
- Hierarchical 2D Monte Carlo to quantify uncertainties
- Expand to include:
 - Other contaminants and pathogens
 - Long term exposures
 - Suitable for non-technical users
 - 'What if' tools
- Input into communication and decision support interfaces

Modular food chain models

- Systematically quantify the dependencies and the uncertainties that are associated with individual elements of food safety assessments (FSO)
- Modularisation of food chain
 - Production, processing, storage, consumption
- Dependencies across the chain
 - loads as a function of control measures, performance criteria
- Build set of uncertainty distributions
- Input into dietary risk modelling

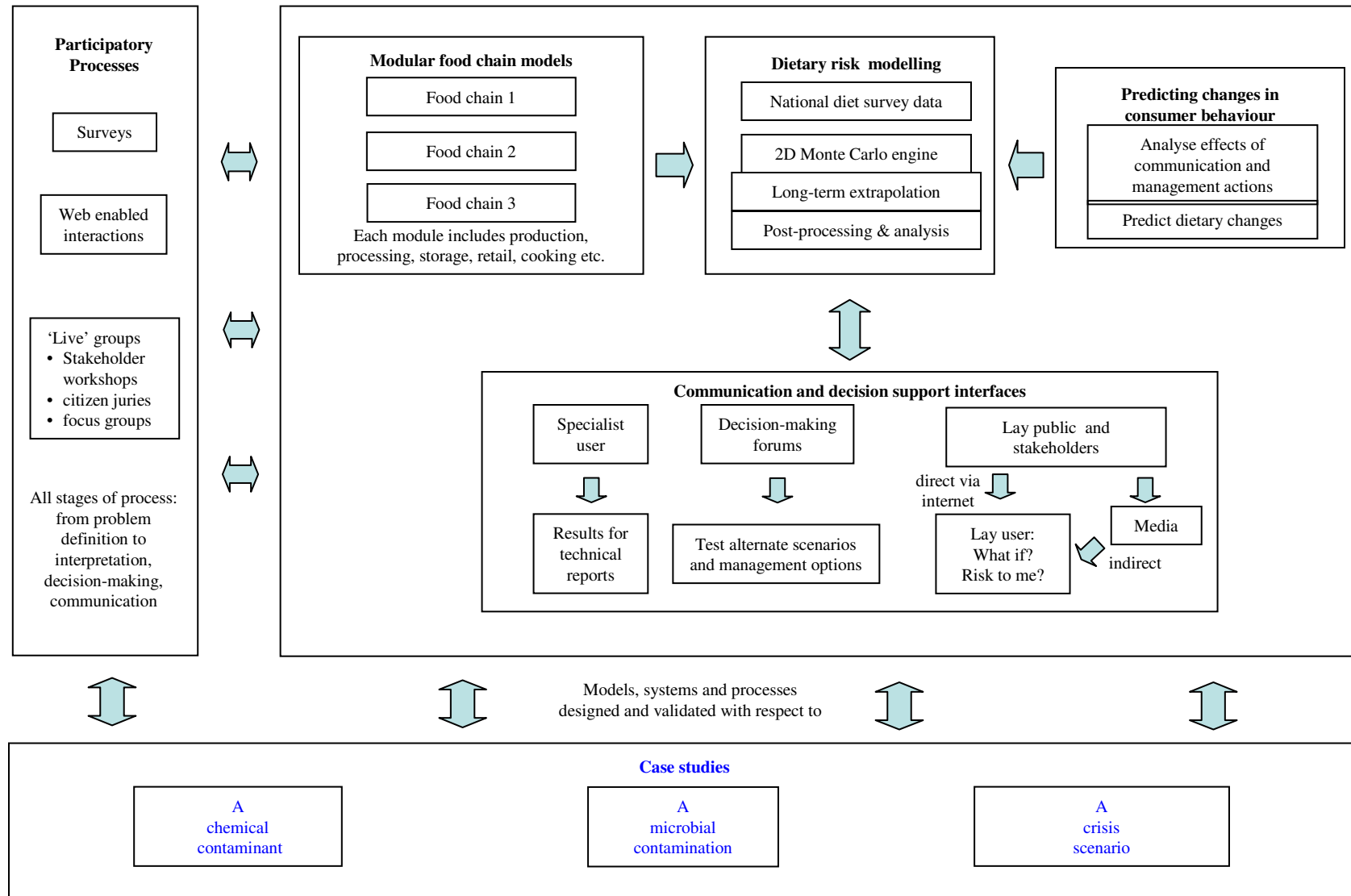
Predicting changes in consumer behaviour

- Assess the impact of risk communication and management actions on consumer behaviour and particularly on food choice
- Issues addressed:
 - Risk information v direct recommendation
 - Personal relevance of information
 - Presentation of uncertainty
 - Numerical/verbal presentation of uncertainty
- Experimental (between subjects) studies
- Input into dietary risk modelling

Communication and decision support interfaces

- Identify processes and tools that have the greatest potential for communicating information about food chain risks and their associated uncertainties
- Evaluate different approaches to risk communication (risk comparators, frequency representations)
- Specialist users
 - Technical reports and data representations
- Decision-making forum
 - Alternative scenarios and management options
- Lay public and stakeholders
 - Internet (dynamic information)
 - ‘what if’ structured queries
 - risk to me
 - Media (aligned sources)

Modules within the project



Case studies

- Chemical - pesticide
 - Strongly quantified (data rich)
 - Spatial source (farm use)
 - Probabilistic modelling
- Microbiological - cross contamination with campylobacter
 - Chicken production often identified as a source
 - Domestic hygiene, catering facilities as risk factors
- Scenario with unanticipated risk
 - Hypothetical scenarios
 - Communications strategy for rapid response
 - Communications strategy with forwards look

Conclusion

- Interdisciplinary research & case studies
 - Natural sciences
 - Social science
- Quantitative assessment and modelling of risks and uncertainty across the food chain
- Stakeholder involvement and participatory processes
- Effective communication with the public and stakeholders

