

Sustainable Value Chain Analysis:

An agri-food chain diagnostic

Research Team

This methodology is the product of a succession of collaborative projects undertaken by

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The Research Team wish to acknowledge the valuable practical, financial and intellectual contributions they have received during the multiple projects which have resulted in this version of the SVCA Methodology Guide, in particular from:

- Tasmanian Institute of Agricultural Research
- Horticulture Australia
- South Australian Government (Primary Industries and Resources; Department of Trade and Economic Development; Adelaide Thinkers in Residence Programme)
- Dr Claudine Soosay, University of South Australia



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Section 1 – Sustainable Value Chain Analysis

Section 1.1 - Outcomes

1. This Sustainable Value Chain Analysis:
 - Defines value creation in terms of the product attributes which affect consumer behaviour (willingness to pay and frequency of purchase);
 - Identifies which activities add this value, from inputs for agricultural production to consumption/disposal of the final product;
 - Evaluates the preparedness of chain to create, realise and distribute value effectively;
 - Compares the environmental impact of different activities along the chain, and
 - Assesses the scope for the chain to act collaboratively to create competitive advantage through both product and process innovation and improved environmental management.
2. The remainder of Section 1 explains the background to Sustainable Value Chain Analysis (SVCA). Section 2 sets out the seven stages of the methodology in detail. Sections 3-5 summarises how the three main themes of SVCA (consumer value; innovation and environmental management) contribute to truly sustainable competitive advantage, and how to assess the scope for a greater contribution through SVCA. Sections 6-8 expands on how to map and evaluate the value chain's material and information flows and relationships. The Annexes provide practical assistance and examples for undertaking an SVCA.

Section 1.2 - Components

3. SVCA looks at both effectiveness - doing the right things - and efficiency - doing things right. For a value chain to be competitive, it must do both. Accordingly, SVCA assesses whether the value chain is:
 - a) **Effective** at maximising the opportunities for adding value in the eyes of the consumer; and
 - b) **Efficient** in adding value, producing, processing and distributing at the least cost and ecological impact.This requires that the value chain:
 - understands what consumers value in the product, and focus on adding this value throughout the chain;
 - develops strategic collaboration and operational co-operation throughout the value chain;
 - strives for continuous innovation to improve both effectiveness and efficiency; and
 - achieves competitive advantage in ways that are environmentally as well as commercially sustainable.
4. **Consumer value:** Supply chains focus upstream on integrating supplier and producer processes; improving efficiency, reducing waste and meeting *customer* value; value chains focus downstream, on understanding what it is that *consumers* value, and then delivering it as effectively and efficiently as possible. This requires a shift in the view of the chain – from supply *push* to demand *pull*. The essential distinction here is that whilst customer value is critical in order to gain market access, it is the final consumer who ultimately determines where and how much value lies in a product or service.
5. In some chains, the requirements of the customer (principally the retailer) and consumer differ, and may even conflict. SVCA should identify these inconsistencies, and provide a framework for resolving them. Indeed, understanding consumer value provides a foundation for negotiation. While customers' needs cannot be ignored because they act as gatekeepers to the marketplace, the distinction must be drawn: customers' needs should be minimised and focus on efficiency; investment in consumers' needs reaps more rewards and so a chain should explore market segmentation and product differentiation. After all, it is consumers who ultimately dictate the value created by the chain through their frequency of purchase and willingness to pay a premium for the chain's particular product.

6. **Collaboration:** In an effective value chain, firms do not act in isolation. Collaboration becomes possible when there is a shared vision between the partners; the presence of trust and commitment; compatible structures and processes; open communication, co-operation and opportunities for mutual benefits. When a chain acts in partnership, it develops products and systems which are much harder for competitors to imitate, and therefore which deliver more resilient competitive advantage.
7. **Innovation:** To remain competitive firms must pursue continuous improvement, in existing processes (marketing, operations management, purchasing and logistics) and the development of products and services that add consumer value. One particularly beneficial outcome of collaboration is 'collaborative innovation', or co-innovation. But while co-innovation is a powerful option for a value chain, it requires both the foundation of partnership within and between firms and a focus on innovation; this approach often needs to overcome structural, cultural and organisational barriers.
8. **Sustainability:** There are mounting imperatives for more sustainable production systems. These emerge from consumers, retailers, other stakeholders and national and international regulation including taxes, emissions trading, standards, voluntary incentives and related regulations. These have far reaching commercial and market access implications for all food and drink value chains. Sustainability also offers many chains with a potential source of competitive advantage. The objective of SVCA is to align the allocation of a chain's resources with consumer preferences and environmental management throughout the chain.
9. SVCA works through the correspondence of Value Chain Management and Life Cycle Management. Both take a whole chain approach, from 'cradle-to-grave', identifying ways in which the chain can work together respectively to increase consumer value and to reduce environmental impacts. They highlight how the actions in one part of the chain affects the whole chain. VCA highlights how resources are misallocated, for example by missing opportunities to create value. LCA identifies how improved environmental management can create competitive advantage. Ultimately, both tools should assist a chain to make investments where their commercial and ecological outcomes are greatest, especially when this requires firms to work across boundaries.
10. SVCA draws on the key insights from both VCA and LCA. The methodology focuses on five key themes:
 - What product attributes do **consumers value** in the product?
 - Where in the chain's **material flow** is this value created? Value adding activities should be targeted for investment; whereas necessary but non-value-adding activities should focus on efficiency and only attract investment for cost reduction. Any unnecessary activities should be eliminated.
 - What are the main **environmental impacts** of the chain, and through which activities do these impacts arise? What commercial advantage can be gained from reducing these impacts?
 - How is **information** generated, shared and used, from final consumption/disposal up to primary production and input genetics and back again? Are decisions about what, when and how to produce pulled by the consumer, or distorted by fractured flows?
 - Do the **relationships** in the chain enhance strategic alignment? How much trust and commitment exists? Do the relationships foster an equitable distribution of value, reflecting where it was created and the risks taken by different chain partners?

11. The process involves mapping the material and information flows and relationships within and between the businesses, from agricultural inputs to consumption and disposal of the product. The data is gathered by
- a participant survey of the chain at all levels, managerial and operational, and of all chain participants;
 - interviews, focusing on the priorities identified through the survey, and
 - consumer research, involving focus groups and surveys.
- This combination provides a strategic assessment of where opportunities exist to achieve truly sustainable competitive advantage, and the extent to which the chain is ready to collaborate in exploiting those opportunities.

Section 1.3 - Diagnostic

12. This SVCA is a diagnosis, not a cure. It is essential that this is understood from the outset. SVCA systematically identifies opportunities for improvement, but these will only deliver competitive advantage when chain participants are committed to pursuing them subsequently as part of a strategic partnership.

Product families versus specific products

13. For a single chain producing a family of similar products, much of the material and information flows and the relationships may be common to every product, which only minor distinctions, for example upstream in the source of different quality raw materials or downstream in the final route to distinctive markets. Accordingly, the mapping process can accommodate the flow of many products, so long as it validates that commonality. However, it is important that the consumer research distinguishes between each product. The attributes which are valued and the relative significance of those attributes are very likely to vary within the product family. The activities which add those values for each product will mirror these variations, and this difference is significant.
14. In summary, the SVCA process of mapping material and information flows and relationships can cover a range of products. Material flow mapping may even be possible on an industry basis. However, the integration of consumer research must be product and chain specific.

Section 2 - SVCA Methodology

15. Section 2 sets out:

- The expertise required within the project team;
- How the project should be managed, and
- The seven stages of the methodology.

Section 2.1 - Project Team

16. An SVCA project team needs a project manager, and then have team members who can analyse the material and information flows; relationships; consumer research and environmental management. The team needs to include expertise in quantitative (survey) and qualitative (interview) analysis. The team also needs to include, or have ready access to someone with experience in the industry being studied. This makes understanding the context, and establishing credibility with stakeholders easier and quicker.

17. Other VCA approaches encourage the involvement of people from chain participants. This works well when focusing on material and information flows typical of lean analysis of a value chain. However, the integration of the strength of relationships in this methodology means that more sensitive data is collected and assessed. Accordingly, the background of the team members needs to allow interviewees to be frank, which typically means they need to be independent.

18. The project team, through membership or liaison, ideally need to link with university researchers. This maintains the feedback between SVCA theory and practice, to the benefit of both.

19. The team could also incorporate expertise in organisational behaviour. While this may be useful during the analysis, it offers greatest potential in ensuring the project acts as a catalyst for change/collaboration, and so maximise the chance of subsequent implementation. Indeed, as an alternative to the expertise resting in the project team, the SG might co-opt a change agent to provide on-going assistance during the delivery of the improvement projects.

Section 2.2 - Project Management

20. Each SVCA examines a value stream, typically defined as a specific product family serving a specific market or markets. When the number and diversity of potential products is high, the selection of a specific value stream is guided by the relative importance and/or the recognition of problems associated with product lines.

21. In gaining the commitment of SVCA participants, it must be made clear that:

- The value of the insights from SVCA depends on the engagement of participants, and their willingness to be frank and honest.
- SVCA is a diagnostic, not a cure; its benefits will be realised only with the ongoing commitment of participants to embrace its results and devise and implement improvement projects collectively.

22. Each project is a seven stage process set out below. A generic project plan is provided in Annex C.

	<u>Chain</u>	<u>Project Team</u>
Engaging the Chain	Establish Stakeholder Group	
Mapping the Current State 1	Participant Survey	Mapping Material Flow. Gathering environmental impact data Consumer focus groups
	Conducting Round One interviews	
Reviewing initial evidence		Review evidence to prioritise people and issues for exploration in interviews
Mapping the Current State 2	Conduct Round Two interviews Consumer survey	
Analysing		Analysing and Round Three interviews
Reporting	Ground-truthing presentation/report	
Implementing	Stakeholder Group take ownership of devising and implementing improvement projects	

Section 2.2.1 – Stage 1: Engaging the chain

23. Once in principle commitment has been gained, the engagement starts with the formation of a Stakeholder Group (SG) to oversee the project and take ownership of the conclusions. The Group is drawn from all the major participants in the value chain. Nominees must be sufficiently senior

- To secure ongoing commitment within their organisation, eg for completion of surveys and interviews, and for implementation of improvement projects, and
- To acquire any necessary resources for the SVCA itself (budget, information/data and staff), and resolve significant problems during the project

The SG must involve growers. How this is achieved will vary between chains. It is impractical to introduce a formal representative structure just for this purpose, so unless such a mechanism already exists, it may be appropriate to co-opt respected leaders who embrace the need to change. Accordingly, they can encourage growers to participate in the survey and interviews, and subsequently in improvement projects, but without the presumption or pressure of being deemed to represent all growers.

24. The project should commence with a presentation to the Stakeholder Group. This should ensure clarity and consistency over expectations by setting out:

- the principles of Sustainable Value Chain Management;
- the process and timetable for SVCA, and what it will deliver, and
- the need for ongoing commitment after the report.

The SG should be provided with the Frequently Asked Questions (Annex B) and an invitation to complete online survey, both of which should be dissemination widely by SG within their organisation/stakeholder group, with strong encouragement to complete the participant survey (see next section).

25. All data is covered by the confidentiality agreements, so before the data gathering begins, confidentiality agreements should be put in place with SG members. These safeguard the commercial and personal sensitivity of the information provided, thus encouraging all parties to be candid during discussions and in sharing information. Annex H provides an outline confidentiality agreement.
26. Following the meeting with the SG, the *Round One* interviews involve key partners in the chain, preferably at a senior level. This allows the project team to assemble a strategic overview of the chain, including its structure and key relationships and activities. During the interviews, the project team should request the most relevant internal material, for example strategy statements, examples of contracts (especially with growers), in-house consumer research and environment management reports. SVCA does not require any financial information.

Section 2.2.2 – Stage 2: Mapping the Current State 1

27. This involves the initial data gathering which will determine which issues should be interrogated in more detail.

Section 2.2.2.1 - Participant Survey

28. The survey should be completed by as much of the chain as possible. SG must ensure the survey engages:

- a representative sample of farmers;
- management and operational staff, and
- suppliers and customers who are part of chain, but only tangentially involved in project.

Adjusted for the configuration of the specific chain, this is likely to consist of:

Agricultural input suppliers:

- Genetics providers (seeds, seedling, livestock)
- Agricultural advisers
- Contractors (planting, harvesting, storage, transport)
- Suppliers (chemicals, feed etc)

Farmers:

- A sample to reflect differing abilities, resources and motivations

Processing input suppliers:

- Any additional key ingredients
- Packaging suppliers

Processor:

- Procurement
- Processing
- Marketing
- Supply chain manager
- Quality control
- Innovation (NPD, process, agricultural and systems)
- Sales and forecasting
- HR

Logistics suppliers:

- Transport } account managers and
- Storage } operational staff

Retailers/Wholesalers:

- Buyer
- Ordering/inventory
- Quality Assurance
- Sales/consumer data analysts
- Outlet managers (eg, stores or restaurants)

29. The survey investigates chain participants' view of the efficacy of the material and information flows and the relationships. It tests the key indicators of the chain's current state, and will be used subsequently in combination with other data. A model participant survey is provided in Annex D.

Section 2.2.2.2 – Mapping the Material Flow

30. The project team should map the material flow. The process is not the detailed basis for a lean VCA, but simply needs to identify the discrete inputs and activities which constitute the production, processing, distribution, retailing and consumption of the product. Each discrete activity is identified. It is not necessary to measure time, volumes or costs along the material flow. However, it should be possible to identify significant waste from changes in the rate of flow or poor information flows which led to double handling and unnecessary inventory.
31. Two approaches can be taken depending on resources available and practicality of the geography of the chain.
- i) The project team can physically walk the chain involving farms, processing factories, and outlets. Depending on the importance of different stages within the particular chain, it may also include the production of agricultural inputs and the storage at different parts of the chain.
 - ii) A generic agri-food chain map can be adapted and validated during the course of the project to ensure it captures each activity involved in the chain.
32. Section 6 sets out the details of how to map and assess the material flow.

Section 2.2.2.3 – Consumer focus groups

33. It is essential to establish an objective and comprehensive definition of what consumers value in the final product. Unless this information already exists, it will require primary consumer research to be undertaken. This will involve both qualitative (focus groups) and quantitative (survey) data. The focus groups identify the value consumers apply to different product attributes and the potential interest in new product variants. The relative importance of the multiple product attributes identified in the focus groups and the scale of the opportunities are quantified through the survey.
34. The focus group data should be available in time for the review of initial evidence, because this will help focus the subsequent interviews. The subsequent survey data should be collected and analysed to inform the overall SVCA analysis.
35. Each project should also examine the consumer data/research which already exists within the value chain. Where available, this should include actual purchasing behaviour, for example through retailers' loyalty cards. Through the interviews, value chain partners should explain how consumer data is used and with what consequences - successful and otherwise.
36. More detail on commissioning and assessing consumer research is given in Section 3.

Section 2.2.2.4 – Gathering environmental impact data

37. The collection and assessment of environmental impact data is likely to span Stages 2-6. However, at this early stage it is necessary only to gain an overview of what the most significant impacts are, and where they arise. This may use data from within the chain, discussions as part of Round One interviews or from standardised industry databases.
38. For the later stages of the project, the team, in discussion with SG, must determine what is the most appropriate and affordable approach to map the product's environmental impact. This includes:
- the boundaries (activities/inputs/suppliers) of what should be included;
 - which environmental impacts to focus on, and

- the level of detail, including the mix of qualitative and quantitative information.
- Section 5 provides more detail on incorporating environmental impact data.

Section 2.2.3 – Stage 3: Reviewing initial evidence

39. Once the first stage of mapping the current state is complete, the project team should review what critical issues and points in the chain have emerged. This will include where
- the consumer focus groups have highlighted there is scope for creating value;
 - there is greatest environmental impact, and
 - the survey and Round One interviews reveal misalignment or underperformance in the chain or conflicting accounts of the chain's effectiveness and efficiency.
- These areas should be pursued in more detail through the Round Two interviews.

Section 2.2.4 – Stage 4: Mapping the Current State 2

Section 2.2.4.1 – Round Two Interviews

40. The aim of the *Round Two* interviews is to focus on critical points in the chain which emerged during the review of initial evidence and were confirmed during the Round One interviews. The number of interviews in Round Two will be dictated by the range of issues identified in the review of initial evidence and by the resources available for the project to interview and analyse. Inevitably, more interviews yield more insight, but are expensive. Limiting the number interviews mean that issues may be identified but not fully understood, requiring further initial investigation as part of the improvement projects.
41. Round Two interviews should explore the characteristics of value chains, these are set out in Sections 3-8. Each interview should concentrate on those characteristics of that part of the chain which were identified in Stage 3 as being critical or underperforming. A checklist for interviews is provided in Annex E, and this too should be tailored for the key issues for each interview.
42. The project team must recognise their responsibility to those they interview, including being conscious of the vulnerability of suppliers and staff as a result of their honesty. Sampling frameworks for interviewees and anonymising reports should minimise the traceability of comments. Where required, universities' ethical clearance must be gained prior to data collection. In conducting each discussion, interviewers must explain the nature of the research, the procedures in place to protect confidentiality and, where appropriate, ask interviewees to sign consent forms prior to an interview taking place. Interviews should be recorded and transcribed, and the material not divulged beyond the project team.

Section 2.2.5 – Stage 5: Analysis

43. SVCA analysis has three objectives:
- To classify each activity in the *material flow* as to
 - Whether it adds value to the consumer, is necessary but non-value adding or unnecessary (ie, the whole activity is wasteful)
 - Its relative environmental impact, either for each impact (carbon emissions; water use; pollution; damage to eco-systems etc) or a consolidated measure.
 - To evaluate whether each significant *information flow* between different functional groups
 - is strong, partial or weak; and
 - is uni-directional or two-way, and for the latter whether the information flows equally in each direction.
 - To assess whether inter- and intra-organisational *relationships* within the chain are strong, basic or weak.
44. The data are explored using a content analysis approach. A coding framework should be devised to draw out the main themes from the interviews and other material, and subsequently allow the comparison of data between different interviews. This framework should be based on the assessment criteria set out in Sections 6-8. These condense a vast

field of established research into the characteristics/indicators of successful value chains. It is recommended to use qualitative analysis software, such as Nvivo.

45. *Round Three* interviews take place during the analysis stage. They may involve revisiting previous interviewees to validate interpretations, triangulating evidence with new interviewees, or gathering missing or inadequate data.

Section 2.2.6 – Stage 6: Reporting and ground-truthing

46. The results should be presented to the chain participants and, with their permission, external stakeholders. This might involve a single presentation to SG, and/or a succession of presentations to each chain participant, especially where some of data and findings are sensitive. It is important that stakeholders criticise and challenge any findings they disagree with since this provides further validation of the results. If the criticisms are substantive, the project team must be prepared to review some of its findings.
47. Some examples of how to present the results graphically are given in Annex F. For all the complexities of the theory underlying SVCA, for the outcomes to be useful for senior management, they must be presented succinctly in a form which highlights the application of conclusions, rather than dwelling on how the project was conducted. Annex F also identifies how some results can be applied to management decisions.

Section 2.2.7 – Stage 7: Implementation

48. Following the presentation of results and the identification of weaknesses and opportunities within the chain, the Stakeholder Group becomes responsible for devising a set improvements projects to improve the commercial and environmental sustainability of the chain. This stage is crucial, and realising the benefits of SVCA takes an ongoing commitment to act collaboratively. If the material flow identifies opportunities for lean cost savings, these could be prioritised to achieve a quick win and build momentum for more challenging collaborative projects. The SG may want to call upon specialist expertise to advise and manage any change programme or individual projects.

Section 3 – Consumer Insight

49. A critical aspect of SVCA is whether consumer value underpins decision-making. Failure to identify what value means to the final consumer results in the misallocation of resources to activities that do not add value, and should only be targeted to improve efficiency. SVCA should identify how much and where value is currently added, and the opportunities for adding more value. To do this, it must be founded on consumer insight. Ideally, it should be informed by specific consumer research which covers both attitudes and behaviour. Focusing only on attitudes risks the analysis only reflecting how consumers believe they act, whilst they actually behave very differently.

Commissioning research

50. There are three objectives for the consumer research commissioned as part of SVCA:

- 1) Identifying the factors that influence shoppers' purchasing decisions. How do consumers decide when to buy the product and, having made the decision to purchase, how do they decide which product/brand to buy? The research should distinguish, as relevant, between:
 - branded and private label;
 - meal occasion (e.g. mid-week snack, weekend evening meal and special occasions), and
 - shopping mission (e.g. main shop, top-up shop).
- 2) Determining the importance, relative and absolute, of different product attributes. What value do consumers attach to them and why? Depending on the product, this might include:
 - Price, promotions and premium branding;
 - Taste, texture, nutritional value and freshness;
 - Packaging (appearance; product information/endorsements; benefits in convenience of use, eg pack size);
 - New products (range extensions or new ranges);
 - Convenience of preparation/cooking or interesting preparation suggestions;
 - Sustainability of production, processing, packaging, distribution and disposal, and
 - Provenance.
- 3) Exploring what changes to the marketing mix for existing products and/or what additions/extensions to the existing range would be most likely to stimulate consumption of and/or increase expenditure on the family of products. Equally, what aspects on existing products deter consumers from purchasing the product, for example, how much ends up wasted, or the inadequacies of packaging (amount, design, information)?

Assessment of existing research

51. The examination of research already used by the chain should incorporate specific examples which highlight whether consumer research:

- Is used to make strategic as well as product-specific decisions;
- Covers consumers' various attitudes and behaviour; and
- Continuously monitors consumer segments, or only tests new product ideas once they have been developed.

52. The analysis should assess how the research is used to inform:

- Category strategies, product specifications and product performance measures agreed by retailer and supplier.
- Innovation programmes, including:
 - new product development, both in monitoring attitude/behaviour changes to identify new opportunities and in testing specific new product ideas, and
 - extending further upstream, eg reflecting consumer insight in agricultural R&D, and in process and systems innovation.

- Raw material and packaging specifications.
- Incentive schemes, both between value chain partners (contractual) and within partners (personnel performance management systems).

Section 4 - Innovation

Evaluating Innovation

53. A value chain's long term competitive advantage is driven by its capacity to innovate. Strong relationships and information flows give the opportunity for collaboration innovation - co-innovation. This requires enhanced knowledge sharing, relation-specific assets, shared processes and systems and more effective forms of governance that are difficult for competitors to copy, thus conferring a more resilient form of competitive advantage.
54. Co-innovation may take two primary forms, considered in terms of outputs and inputs. Outputs refer to what chain partners actually do, including the development of new, value-added products/services for particular value chains and targeted consumer segments. Inputs refer to process improvements for existing products/services beyond organisational boundaries - how organisations go about achieving innovation. It is important to identify the scope for radical, as opposed to incremental innovation. Incremental innovation involves minor variations requiring little departure from existing practices. Radical innovation involves non-routine and re-orienting changes that produce fundamental departures from existing practices.
55. Four primary areas for innovation within agri-food value chains should be evaluated:
- Agricultural R&D innovation;
 - Production innovation (new product development);
 - Process innovation; and
 - Systems/logistics innovation.

Assessment criteria

56. The assessment of the existence and scope for innovation in the value chain is a theme which runs through the analysis of material and information flows and relationships. The analysis should look for a number of distinctive indicators:
- Common strategies and performance measures which include the four different types of innovation;
 - Incentive structures and resource allocation systems which prioritise and reward innovation, including relative emphasis on the particular value chain by those participants who are involved in multiple value chains;
 - Mutual capacity for innovative thinking and adoption of its outcomes;
 - Communication of consumer insight throughout the chain and upon which all innovation programmes are then built; and
 - A culture of risk-taking and collective experience of, and attitude to failed innovation.
57. Consequently, the interview process should explore
- Consumer attitudes/behaviour:
 - Have the key drivers and trends in purchasing behaviour been identified? Are these being used to generate NPD ideas, or just to test ideas?
 - Are there particular barriers to purchasing the product which close off some NPD options, eg consumer reluctance to try particular types of new products?
 - Are consumers more willing to try branded innovative products?
 - Supplier-retailer relationship:
 - How influential is innovation in category strategy? If NPD is seen as key, is this accepted as compatible with any strategy for range efficiency?
 - Is the retailer realistic about the time/investment taken for innovative products to establish a market (eg re-coup development and advertising costs)
 - Are agricultural R&D programmes (genetics and production) reflecting consumer values, or primarily about yield and processing efficiency?

- Is innovation a mutual activity amongst chain partners with knowledge, costs, risks and benefits shared? Or do some partners in the chain see innovation as being done by others, even when it directly affects their own operations/returns (in particular farmers, but also some functions within other organisations)?
- Are the buyers of raw materials, other inputs and services, and finished goods rotated frequently? If so, do suppliers see the strategies for buying decisions, in particular towards innovative products and processes, as remaining consistent?

Section 5 – Environmental Sustainability

Evaluating environmental sustainability

58. Introducing product life cycle management shifts the focus from production sites and manufacturing processes to the economic, social and environmental impact of a product over its entire life cycle, from raw materials to consumption and disposal. It involves systematic evaluation and management of resource use and environmental releases to air, water and soil from products, processes and services. This approach can deliver a range of commercial benefits, chiefly:
- 1) Reduced operational expenditure;
 - 2) Product/service differentiation;
 - 3) Protecting asset value and deferring capital investment;
 - 4) Regulatory compliance and accessing/protecting markets;
 - 5) Reducing exposure to risk and future cost increases (notably energy), and
 - 6) Strengthening business-to-business relationships within the chain, and influencing internal and external stakeholders, including employees, local communities and government/regulators.

Mapping Environmental Impacts

59. There are a number of tools available for calculating the environmental impact of a product's life cycle. These vary considerably in the cost and time required, for example depending on how many inputs/suppliers fall within their boundaries; the collection of actual, chain-specific data rather than using surrogate, eg industry-average, data, and which environmental impacts are assessed. Some chains may have existing analysis to incorporate in their SVCA, but where they do not, they should be mindful that this is an internal diagnostic management tool, not an audit of regulatory compliance, nor a basis for external/consumer comparison with competitors. Accordingly, the approach should be fit-for-purpose, and Streamlined LCA or Abridged LCA methodologies are likely to be sufficient.
60. Where there is limited existing data and resources for collecting new data, the project team should consider:
- *What activities should be included?* These should reflect the boundary and detail used for mapping the material flow for the creation of consumer value. While some activities might need to be considered in detail, other activities or inputs/suppliers can be excluded, either because they fall outside the material flow being assessed or because their impacts fall below a nominal threshold level.
 - *What ecological consequences to measure?* Preliminary discussions should identify the most significant/costly impacts, which can then be investigated in more detail. Typically, agri-food chains impact the environment through:
 - Emissions affecting climate change
 - Energy use
 - Water use
 - Biodiversity and land use
 - Use/release of toxic chemicals
 - Water and air pollution
 - Waste management
 - Ozone layer depletion
 - Depletion of oceans and fisheries
 - Deforestation
 - *Would qualitative information suffice?* Through surveys, stakeholder focus groups and/or interviews, it may be possible to gather sufficient evidence to rate the relative effect of each selected activity on each selected environmental impact.

61. Having adopted a proportionate methodology, any conclusions must highlight that a more detailed analysis of priority areas should be completed before significant investment is
- Approved for use in National Lamb Value Chain Project by IDC 4/6/09

undertaken. This might well require external input or validation, because LCA methodologies vary considerably, and involve a range subjective decisions which, again, should be determined by how the results will be used.

Assessment Criteria

62. There are two principle ways of assessing the chain’s environmental impact:
- The relative impact of each activity in the material flow, and
 - The comparative impact of each activity and product with others in the same industry.

The scope for making these assessments will be determined by what data have been collected. Unless the data are quantified and uses complementary boundaries, detail and balance of average and specific data, comparisons with similar products is probably meaningless. In any case, a relative assessment within the chain is more appropriate for SVCA in terms of informing strategic decisions. Accordingly, the analysis should simply identify where the most detrimental impacts arise.

63. The participant survey and interviews should explore two issues. Firstly, whether the chain is aligned in its commitment to environmental management and the outcome it expects to gain. This can be seen by the extent to which different participants have the same extensive view on the potential outcomes. Regulatory compliance is seen as the sole objective by some; while others are looking for the much wider commercial benefits listed above. Secondly, do partners consistently quantify outcomes, or is there a prevalence for only monitoring processes. This goes beyond ‘what isn’t measured isn’t managed’, into whether chains evaluate the gains from environmental management in order to ensure that their strategy is commercially justified.

64. Based on the relative impact of each activity, the assessment should then compare the scope for activities to create consumer value. The model below is designed to highlight what priorities and expectations the chain’s management should have for investment in particular activities. For all activities, the scope for adding consumer value (defined by the consumer research) is mapped against that activity’s relative environmental impact. The management conclusions which can be drawn are exemplified in Annex F, Figure 2.

Scope for adding consumer value	High	Innovate to create value; avoid increasing environmental impact	Focus for innovation to add value; and simultaneously reduce environmental impact
	Low	Limited scope for adding value or reducing environmental impact	Chain only invests to reduce cost; May require government intervention to ensure environmental improvement
		Low	High
		Relative environmental impact	

65. This presentation of the analysis abstracts the relationship between consumer value and environmental management. As set out above, investment in environmental management can contribute to competitive advantage in many other ways. Nonetheless, the opportunity for simultaneously creating value and tackling environmental management will be greater if some consumers place an emphasis on the environmental sustainability of the product. In those circumstances, all activities, but especially those in the top right segment, offer scope for differentiating the product on environmental attributes

Section 6 - The Material Flow

Evaluating the material flow

66. The objective of a material flow is to deliver efficiently the required type, volume and quality of product to maximise consumer value. Accordingly, each activity in the chain is assessed against the consumer research and classified as either:
- **Value adding** - those activities that, in the eyes of the final consumer, make a product or service more valuable.
 - **Necessary, but non-value-adding** - those activities that, in the eyes of the final consumer, do not make a product or service more valuable but are necessary unless the existing supply process is radically changed. Efficiency and the reduction of waste are essential to these activities, and in the longer term should be a target for radical change or even elimination.
 - **Wasteful** - those activities that, in the eyes of the final consumer, do not make a product or service more valuable and are unnecessary. These activities should be targeted for elimination. A wasteful activity is distinct from a value-adding or necessary activity which nonetheless creates some waste.

Mapping the material flow

67. The material flow should be mapped from one end of value chain to the other, from suppliers of agricultural inputs to consumers. This should result in a map of the product flow, identifying each activity involved in its production, and where and how much inventory is held. When there are multiple suppliers of the same input (goods or services), a sample can need to be visited to glean the degree of variation in how they operate. The aim is not the detailed quantification of process efficiency, which is the domain of process re-engineering and operations management and for which other tools are more appropriate.
68. The precise activities involved in a chain will depend on the nature of both the raw materials and the final product and on the geographical configuration of the chain. The activities may include:
- Agricultural inputs:**
 - Genetics (seeds, seedlings, livestock)
 - Chemicals, feed etc
 - On-farm activities:**
 - Arable/horticulture: Land preparation, planting, growing, irrigating, harvesting
 - Livestock: breeding, animal health, feeding, land management
 - Transporting raw material**
 - Transporting the raw material from farm to factory, via abattoir, cold storage, elevators etc
 - Processing inputs:**
 - Additional key ingredients
 - Packaging
 - Processing:**
 - In-take and preparation of raw materials
 - Processing
 - Packaging
 - WIP and finished goods storage
 - Quality control
 - Dispatch
 - Transporting of final goods:**
 - Intermediary transport and storage of product
 - Retailing:**
 - In-take/transport to outlets (stores/foodservice)
 - Storage
 - Merchandising
 - Waste and returns
 - Consuming**

- Purchasing and storage by consumer
- Consumption
- Disposal
- Waste

Assessment criteria

69. A number of characteristics of the material flow can be assessed. Again, this is not a lean analysis, so the level of insight will depend on how much time can be spent mapping the material flow. Tight funding means the assessment may not go beyond classifying the activities as set out above and a broad evaluation of the material flow based on:
- *Maximising the scope for adding value*;
 - *Timeliness* in allowing continuous, efficient flow through processing; maximising the smooth continuity between demand and supply (not always easy with the seasonality of many agricultural products), and so avoiding unnecessary inventory and product movements, and ultimately avoiding stockouts in stores; and
 - *Minimising waste* caused by unnecessary processing or by production of unusable raw material or by-products.
70. However, through walking the material flow and/or interviewing those involved, it should be possible to explore some issues in more detail. This is especially useful when the causes and consequences of imperfect material flow are related to the information flow, relationships, environmental impact and capacity for innovation. Accordingly, the assessment should examine the scope for
- Reducing lead times between decisions and completion of activities, eg
 - volume of raw material required and delivery of raw material from farms;
 - new product development ideas and their commercialisation, in particular the capacity of agricultural production to respond nimbly to changes in downstream requirements; and
 - retailers' orders and their fulfilment, without generating inventory.
 - Reducing environmental impacts through efficiency, reducing/reusing waste etc, including in production as well as subsequent processing.
 - Improving use of real data and more accurate forecasts to extend upstream the point at which the flow is governed by actual demand rather than inaccurate forecasts (of supply or demand) and simply raw material push. This may require an understanding of how demand and supply varies (weekly, seasonally and annually) and the extent of demand variations being amplified further upstream. This may have detrimental effects of relationships, especially with farmers, as the demand for their produce is over-ordered and then subsequently cut back and/or the price lowered.
 - Focusing investment programmes on efficiency and consumer value creation, and crucially distinguishing between the two.

Section 7 - The Information Flow

Evaluating the Information Flow

71. Information should be collected, shared and used throughout a value chain to improve the chain's effectiveness (value adding and innovation activities) and efficiency (all activities). Accordingly, the information flow in the value chain should be assessed against the following objectives:

To improve effectiveness by:

- Identifying what consumers value in the final product; and
- Communicating and then incorporating these values in research and development programmes and in production, processing and marketing activities.

To improve efficiency by:

- Ensuring the production and processing of sufficient raw material and final product of the required quality;
- Maximising productivity of farms and any subsequent processing;
- Minimising waste on-farm, in factories and shops, and during transport and storage;
- Minimising work-in-progress and finished good inventory;
- Ensuring traceability and quality assurance to meet regulatory and consumer requirements; and
- Informing strategic management of the chain, including shared visions and decision-making; process alignment; incentives and mutual benefits; and transparency of market, cost, forecast and performance data.

Assessment Criteria

72. A number of characteristics of the information flow need to be assessed, including:

- a) Minimising delay and distortion: market information (eg, demand) suffers from delay and distortion as it moves up the supply chain. This can create waste (excessive raw material) and inefficiency (inventory), and the consequent costs are detrimental to relationships. Accordingly, the flow should reduce uncertainty as information moves up the chain and retain information's value by reducing the time delay in transferring it.
- b) Focusing on the value rather than volume of information, ie is information merely communicated indiscriminately, or is it managed?
- c) Evaluating flow against:
 - Validity: accuracy and reliability;
 - Robustness: similar interpretation by all users, repeatable, comparable across time and place;
 - Usefulness: relevant, understandable, actionable, benchmarkable;
 - Completeness: measurement of all relevant aspects;
 - Timeliness: how often information is provided (real time or historic) and whether this is sufficient;
 - Targeted: does information reach everyone who needs to know and no one else;
 - Consistency with value chain's strategy;
 - Economy: cost-benefit evaluation of collecting and analysing the data;
 - Format: is the most appropriate communication media used (from face-to-face to electronic)

73. There are seven issues against which the information flow can be rated:

- 1) **Value Chain Strategy:** Is there a strategy for the product(s) and chain? Was it informed/supported by consumer research? By whom was it agreed, and how widely

has it been communicated and understood between and within organisations in the chain? Is there a process of review to reflect changing circumstances?

2) **Performance measurement systems** both within and between organisations:

- Do systems measure activities which are convenient to measure, or which only that part of the chain considers significant; or do they monitor the activities which consumers value and the outcomes of which are most relevant to the whole chain's strategy?
- Are systems monitoring the whole value chain's performance, or just the performance of individual organisations/functions/individuals?
- Is there a process to review performance of individuals and chain partners? This should include the setting of objectives, evaluating performance, and agreeing and monitoring actions to improve performance.
- Do the systems reinforce or constrain incentivisation?

3) **Dealing with uncertainty:** eg in demand; in quality and quantity of supply; market competition and changing consumer preferences. Are risks and uncertainties identified? How are they managed through flexibility and contingency plans?

4) **Forecasting:**

- By whom; with what information (actual v estimated sales/inventory figures) and what level of inaccuracy?
- Have the effects of inaccuracy been measured at a chain level to reveal their true costs, both financially and on relationships?

5) **Deficient information flows:** Are deficient flows caused by operational issues or based on problems in relationships, eg information not flowing because of a lack of trust, or flowing but not being used because of a lack of alignment?

6) **Waste:** on farm, during processing and in transit, how is data

- Collected (how, by whom, how frequently);
- Monitored (how, by whom, how frequently); and
- Acted upon (examples)?

7) **Consumer complaints:** How many consumer complaints are there and about what? Who collects data and how is it communicated and used? While complaints may not be numerically significant, how they are handled may reflect the degree of consumer-focus within the chain.

Section 8 - Relationships

Evaluating relationships

74. Value chain's relationships are the foundation of their success, often driving improvement or causing stagnation in material and information flows. Relationships' strengths are based upon:

- Shared visions, culture and leadership;
- Compatible structures and processes;
- Mutual alignment of ability, resources and motivation, and
- Commitment to continuous improvement, in particular through innovation in products, processes and systems.

Accordingly, through interviews and other material, for all value chain partners (including for key functions within organisations), each relationship's strength and potential is evaluated against indicators of three characteristics:

- Strategic alignment;
- Trust, cooperation and commitment;
- Power, dependence, opportunism and conflict and its resolution.

Assessment criteria

75. The types of issues used to assess the degree of **strategic alignment** are:

- 1) Is there an agreed strategy? Are expectations aligned, eg growth in returns and market share; scope for efficiency improvements; opportunities offered by better environmental management?
- 2) Do partners accept the primacy of consumer value in principle, and have they the knowledge and skills to apply it in practice?
- 3) How is the relationship incentivised, eg commitment, quality, volume, reliability, efficiency &/or adding value? Do incentives upstream encourage the push of material flow, and so risk creating of inventory/waste downstream? Do incentives downstream have detrimental impact upstream, for example fluctuations in demand?
- 4) In long standing relationship, are any current problems symptomatic of changes in the commercial context which mitigate the mutual value of the original strategy? If so, is this recognised by either or both parties, and how is this being tackled?
- 5) Are opportunities, risks and alternatives within relationship accurately recognised and acknowledged?

76. **Trust, cooperation and commitment** are shown in a chain's

- Contractual arrangements (shared risks and rewards for mutual benefit; formality and length of contracts; negotiation, monitoring and enforcement costs)
- Joint ventures/investment;
- Open communication, honesty and consistency (between words and actions; and in sustaining level of effort);
- Understand each other's businesses, and so the impact of own actions upon the other chain members; and
- Performance assessment, feedback and resultant action; pro-active suggestions for improvement.

77. Accordingly, the types of issues against which trust, cooperation and commitment are assessed are:

- 1) Is sensitive/proprietary commercial/technical information shared?
- 2) Are there any relationship-specific assets (if yes, mutually or singularly funded?) and/or exclusivity agreements?
- 3) Where arrangements/requirements are vague or frequently change, is there evidence of either party taking advantage?
- 4) Does interaction only take place when required by operational needs, or is it also pro-active and related to strategy?
- 5) Is there evidence of:

- Prioritisation of the customer/supplier in the value chain compared to other customers/suppliers;
 - Collaboration in innovation, consumer insight etc involving mutual commitment of time, money, data/knowledge/expertise, sharing of risks/rewards; and
 - Honouring of commitments; reliable delivery of performance; timely response to requests; recognition of other's competency?
- 6) How often do personnel involved in each relationship change? Has this resulted in tangible disruption (eg inconsistency in strategy) or harmed the relationship? Or does lack of change mean inter-personal tensions persist?

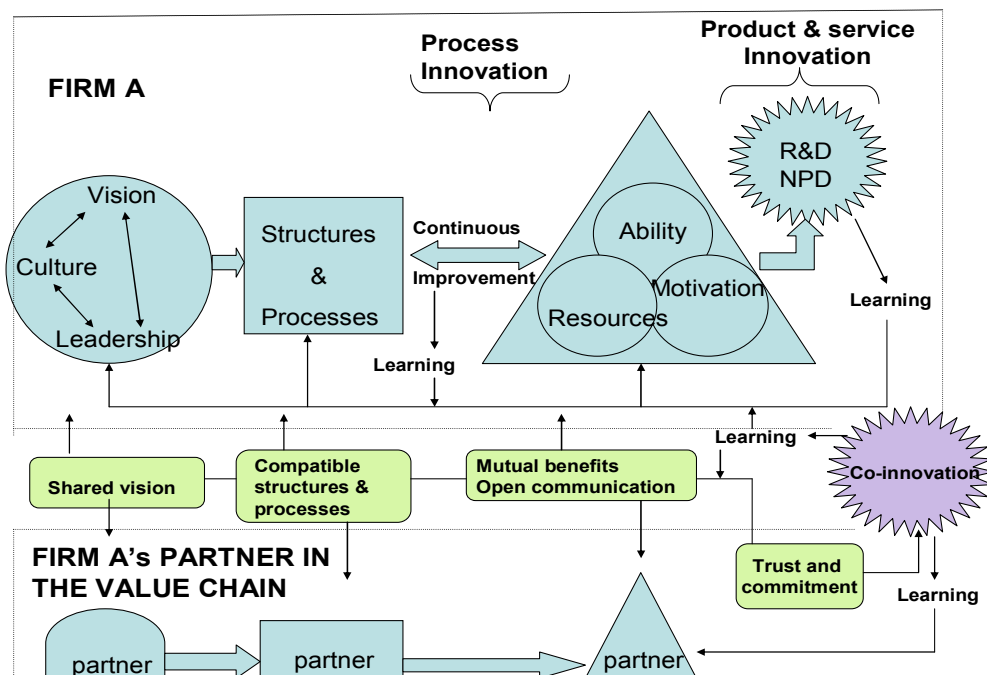
78. Chain's relationships reflect the balance of **Power and dependence**; the extent of **opportunism**; and **conflict and its resolution**. These are assessed by examining:

- 1) Inter-dependence – the relative importance of the value chain to each party in the relationship in terms of volume, value or strategic significance to business growth;
- 2) Asymmetrical power - relative size of value chain partners; availability of alternative customers/suppliers, and history of opportunism;
- 3) Dysfunctional behaviour - where one partner has and abuses greater power;
- 4) Perception of information as power rather than sharing it, and
- 5) How disputes are resolved, and whether this creates or diminishes trust.

Annex A – Theoretical Framework

79. The framework which underpins the methodology is the Value Chain Innovation Roadmap.

The guiding framework: Value Chain Innovation Roadmap



80. The Roadmap shows that a firm's culture, vision and leadership shape its structures and processes, and these in turn provide the means by which a firm puts to work its resources, abilities and motivations. The interplay between the enabling environment (the structures and processes) and the drivers of action (resources, ability and motivation) gives rise to opportunities for process, product and service innovation through continuous improvement, R&D and new product development. This is how individual firms, independently of their value chain partners, are able to innovate.

81. In an effective value chain, however, firms do not operate in isolation. Partnerships between firms give rise to the opportunity for the second form of innovation: co-innovation. Co-innovation becomes possible when there is a shared vision between the partners; compatible structures and processes; open communication, co-operation and opportunities for mutual benefits, and the presence of trust and commitment. Critically, partners must adopt a learning attitude in whatever they do together to create an environment for co-innovation. The Roadmap shows how these factors are the precursors for co-innovation between firms in value chains. This framework is used to build a picture of the characteristics and performance of the particular value chain being studied, and thus guides the diagnostic process from its initial design through to data collection, analysis and interpretation. This process uses extensive qualitative data, combined with quantitative data such as consumer research, to give a comprehensive picture of the whole value chain. This provides the framework for analysing the material and information flows within the value chain, including the extent to which these flows are responsive to consumer behaviour, and an assessment of the relationships between and within chain partners.

82. A more in-depth explanation of the theoretical context for this Roadmap is set out in Bonney, L, Clark, R, Collins, R & Fearn, A 2007, From serendipity to sustainable competitive advantage: insights from Houston's Farm and their journey of co-innovation, *Supply Chain Management: an International Journal*, Vol. 12 No. 6, pp. 395-399.

Annex B – Sustainable Value Chain Analysis – Frequently Asked Questions

What will the project deliver?

Sustainable Value Chain Analysis (SVCA) will:

- Define value in terms of the product attributes for which consumers are willing to pay;
- Identify which activities add this value, from genetic inputs for agricultural production to consumption/disposal of the final product;
- Evaluate the preparedness of chain to create, realise and distribute value effectively; and
- Assess the scope for the chain to act collaboratively to create competitive advantage through product and process innovation, and improved environmental management.

How does Value Chain Analysis work?

By taking a chain perspective and using extensive research into what characteristics of value chains determine their potential for collaboration, innovation and sustainability, SVCA diagnoses where and how a chain can improve its competitiveness. In particular, it will

- Use consumer insight to explore what different consumers value most about the product, and how this affects their purchasing behaviour;
- Identify which activities add consumer value, and which are necessary but non-value adding;
- Evaluate the current flow and use of information along the chain;
- Assess how relationships are enhancing or limiting collaboration and competitiveness; and
- Determine where the greatest ecological impacts arise, and what commercial advantages might be generated from improved environmental management.

What does SVCA involve?

- Consumer research to clarify which product attributes different consumers value;
- Mapping the material flow by identifying
 - The main, discrete activities involved in production, processing, distribution and retailing;
 - Which of these activities add the consumer value, and
 - Where significant environmental impacts arise.
- Investigating how information is generated, shared and used along the whole chain, eg strategies; consumer insight; orders and forecasts; performance management systems; environmental data.
- Discussing the relationships in the chain and looking for the key indicators of the chain's potential to collaborate.
- Presenting a confidential report.

What does the VCA Project team need?

- CEO/senior management confidence and commitment. This is essential to projects' success since staff need to be encouraged to make time available for their participation.
- The completion of an online survey by participants throughout the chain
- Frank discussions with key personnel. SVCA is most effective when participants from all parts of the chain are involved and can be open in their contributions. The analysis only creates new insights by looking along the whole chain and assessing the material and information flows and the relationships from all perspectives.
- All findings are 'ground-truthed' with participants. In presenting the report to key members of the chain, they have the chance:
 - to challenge any proposed findings, and if appropriate, suggest drafting changes
 - to identify if any sensitive analysis cannot be shared with others in the chain.

How are improvements delivered?

Participants' expectations must be realistic. SVCA is a diagnostic, not a cure. Realising its benefits takes an ongoing commitment to act collaboratively. A Stakeholder Group will be formed at the outset of the project. Members will act as contact points within their firms, and tackle any problems which arise during the project. Crucially, the Group subsequently becomes responsible for discussing the findings in order to devise and implement a set of improvement projects.

How is participants' anonymity protected?

Confidentiality is one of the fundamental principles of making the methodology work. All interviews are conducted on the basis of anonymity. The SVCA team abides by the research ethics policy of their universities, which independently ensures that participants will not be disadvantaged through their contribution. This is achieved by:

- the project team's report summarises its evaluation, but the evidence which underpins it remains confidential, and so as far as practicable those interviewees providing data are not identifiable from the report;
- interviewees being selected by the project team and not being identified to others in the chain wherever possible, although in the case of line managers or sole suppliers/customers, this is not always possible. In some circumstances, interviews involve a range of individuals from the same part of the chain/organisation, both to preserve anonymity (and so encourage openness) and to gather a breadth of views.
- the original data only being available to the project team, and later destroyed.

How is organisations' confidentiality protected?

- The VCA team signs confidentiality agreements with the companies involved in the project, as required.
- The overall project outcomes will not be released publicly unless in a form agreed by all participants.

Annex C – Generic Project Timetable

This timetable is necessarily flexible. A number of factors will determine the pace, and even order in which stages are completed, including

- the readiness of participants to engage in the project, in terms of understanding, commitment and practicality;
- the locations of the research team and chain, and hence the ease with which the team can undertake visits to the chain. For example, the participant survey should be undertaken in advance of the strategic (Round One) interviews if both Round One and Two interviews have to be completed during a single visit by the team, and
- whether the lead researcher(s) is engaged full time.

Stage 1: Engaging the chain (Section 2.2.1)

Weeks 1-2

- Write to participants setting out the terms of the project and to ask for
 - appointment of a senior colleague to sit on the Stakeholder Group. The ‘representative’ of producers should then be provided with material to send to other producers explaining the project’s objectives and urging their participation
 - the confidentiality agreement to be signed
- Map the chain participants
- Initiate university ethics approval (if necessary)
- Amend participant survey (Annex D) to reflect specific of chain and its products and upload
- Design consumer research

Week 4 (or as soon as convenient)

- Hold first Stakeholder Group meeting
- Conduct strategic interviews
- Map the material flow (using the Stakeholder Group, supplemented by the strategic interviews and, if possible, physically walking the material flow and observing)

Stage 2: Mapping the Current State 1 (Section 2.2.2)

Weeks 5-6

- Participants complete survey (weeks 5&6)
- Commission consumer research (focus groups then survey)
- Gather existing environmental information and determine most appropriate way to map the product’s environmental impact
- Prepare communications plan and submit to Stakeholder Group. This should cover dissemination of findings within the whole chain (giving particular attention to producers), and, if relevant, any public reports.

Week 7

- Analyse participant survey

Stage 3: Reviewing initial evidence (Section 2.2.3)

Weeks 8-9 (or as soon as participant survey results and consumer research have been analysed)

- Review initial evidence (survey; consumer research; Round One interviews; environmental data) to determine priorities for Round Two Interviews (what issues to cover and hence who to interview).

Stage 4: Mapping the Current State 2 (Section 2.2.4)

Week 10

- Arrange Round Two Interviews

Weeks 11-15 (or as soon practical and for as long as necessary)

- Conduct Round Two interviews and have them transcribed.

Stage 5: Analysis (Section 2.2.5)

Approved for use in National Lamb Value Chain Project by IDC 4/6/09

Weeks 16-22 (may be long if lead researcher not full time on the project)

- Analyse interview data and compare with other data sources
- Complete further interviews to clarify or validate data
- Prepare reports and presentation(s) in line with communications plan
- Arrange Stakeholder Group meeting for ground-truthing/reporting

Stage 6: Reporting and ground-truthing (Section 2.2.6)

Week 23

- Ground-truthing/reporting in line with communications plan

Stage 7: Implementation (Section 2.2.7)

- Stakeholder Group to endorse findings (revised as necessary) and commit to devising and implementing improvement projects, including the governance arrangements – as set out in Annex G.

Annex D - Model survey of participants

Section A: Your Position in the Chain

A1. Which of the following describes your position in the value chain? *(Please tick one only)*

Agricultural input supplier: please specify.....	
Producer	
Processor: please specify department.....	
Retailer: please specify department.....	
Other: please specify.....	

Section B: Relationships

B1. Please indicate the extent to which you agree/disagree with the following questions relating to your relationships with your suppliers and customers in this chain

My firm would struggle to replace business generated by this chain	Strongly disagree to Strongly agree (1-5) and don't know
My firm shares both risks and rewards with other businesses in this chain	
My business collaborates to develop long term competitive advantage	
My business collaborates to reduce uncertainty (eg, planning and forecasting)	
My business has joint investments with some suppliers/customers	
My business gives suppliers in this chain useful and timely feedback on their performance	
My business' customers in this chain give us useful and timely feedback on our performance	
Contractual arrangements or service agreements are informal and flexible, not rigid and prescriptive	
Disagreements/disputes are resolved fairly without impact on relationships	

B2. Please indicate the extent to which you agree/disagree with the following statements about collaboration within your business

My business is committed to developing long term relationships with its key customers in this chain	Strongly disagree to Strongly agree (1-5) and don't know/not applicable
My business is committed to developing long term relationships with its key suppliers in this chain	
My business encourages staff to collaborate with suppliers and customers	
I feel supported by my manager/s in this company to use my initiative to solve problems	
There is trust and mutual respect between management and employees	
Communications are open and honest within this company	
I am encouraged to challenge decisions and actions if I think there is a better way of doing things	
Staff are rewarded by the company when performance targets are reached	
I recognise and endorse the company's goals	
The company's goals and the way it does business are compatible with my own personal values	

B3. Relationships with my customers would benefit most from

.....

B4. Relationships with my suppliers would benefit most from

.....

Section C: Business and Consumer alignment

C1. How would you rate your level of understanding of business strategies in this chain?

<i>I have a clear understanding of:</i>	Very Poor to excellent (1-5) and don't know
Key input suppliers' strategies for their business supplying producers	
Producers' strategies for improving the competitiveness of their businesses	
The processor's strategy for developing their business	
The retailer's strategy for marketing the chain's products	
The value that consumers place on different attributes of the chain's products	

C2. Please indicate the extent to which you agree/disagree with the following statements about incentives/rewards for innovation

This company encourages and rewards staff who are innovative.	Strongly disagree to Strongly agree (1-5) and don't know/not applicable
This company encourages collaboration with chain partners that results in innovation	
This company rewards collaboration with chain partners that results in innovation	

C3. How important do you think the following product attributes are to consumers in this chain when they are considering the products of this chain?

Taste	Not at all important to extremely important and don't know
Texture	
Nutritional value	
Region of Origin	
Country of Origin	
The environmental sustainability of production	
Price	
Packaging design	
Presentation/service in-store	
Convenient packaging	
Pack/portion sizes	
Brand name	
Raised/grown on small farms	
Traceability back to specific farm	
Freedom from <ul style="list-style-type: none"> • antibiotics, growth promoters and/or animal by-products in feed <u>or</u> chemicals in production • And/or additives in processing 	
Animal welfare	
Convenience of preparation	
Convenience of storage	
Further processing/added value (e.g. pre-seasoning or marinated)	
Other (please specify.....)	

Section D: Information Flow

D1. Please indicate the extent to which you agree with the following statements about your access to information about the chain

<i>I have access to good quality information on:</i>	Strongly disagree to Strongly agree (1-5) and don't know
How my operation can increase the value of the chain's products	
Benchmarking my operation's performance against best practice	
What my customer/s expect of me	
How I can improve my operation's environmental sustainability	
Short term (next few months) sales forecasts for this chain	
Long term (more than 1 year) sales forecasts for this chain	

D2. Please indicate the extent to which you agree/disagree with the following questions relating to your business' use of consumer information.

We have access to up-to-date consumer research on what product attributes shoppers value about this chain's products	Strongly disagree to Strongly agree (1-5) and don't know
We use consumer research in our tactical (short to medium term) decisions (eg, what and how much to produce/order)	
We use consumer research in our strategic (long-term) investment decisions (eg, capital investment; new product development etc)	
Consumer research is used to determine performance measures, eg incentives in contracts or individuals' performance assessments.	

D3. Please indicate the extent to which you agree/disagree with the following questions relating to your business' use of environmental information.

We collect and monitor information on environmental impacts, eg energy and water use, arising from our role in this chain	Strongly disagree to Strongly agree (1-5) and don't know
We share information on environmental impacts with others in the chain	

D4. My operation would benefit from more/better information on

.....

Annex E – Interview checklist

The key issues for Round One (strategic) and Round Two (detailed) interviews will vary depending on the chain's structure, history and products, and the results of the initial analysis, including the chain participants survey. However, this checklist provides a comprehensive list, from which key data to collect should be pre-determined.

Interview introduction

At the start of the interview:

- Explain the project's objectives:
 - to improve existing supply chain processes, from viticultural input supply to final consumption, and
 - to introduce new product attributes which consumers value and are willing to pay for.
- Explain the interview's objectives
 - to map the flow of materials and information, within organisations and between suppliers and customers, and
 - to assess relationships within organisations and between suppliers and customers.
- Explain the personal anonymity and value chain confidentiality procedures, and ask interviewees to sign consent form.
- Gain an overview of the interviewee's role.

Material Flow

Maximising adding value

- *Identify every distinct activity within the interviewee's operation in order that it can be classified as potentially value adding (and whether this value is actually added); necessary but non-value-adding or unnecessary (wasteful)*
- *Flexibility to customise for different customers/consumers, and responsiveness to changing needs of target market*
- *Process for commercialising new products*
- *Focus on investment programmes on value creation (R&D, processing, packaging)*
- *Responsiveness to customer/consumer feedback*

Maximising efficiency

- *Timeliness: continuous, efficient flow through processing; avoiding unnecessary inventory and product movements, and ultimately avoiding stockouts in stores;*
- *Variability: order variability (weekly, seasonally and annually) reflected or amplified in production of raw material, packaging and other inputs*
- *Inventory creation: at what point of the material flow is finished product no longer made according to actual demand and instead is made against forecasts alone, and WIP made according to raw material push*
- *Order fulfilment (raw material, other inputs and finished goods) delivered at required time, volume and quality*
- *Benchmarking: extent and application*

Minimising waste

- *Over-production: raw material and final product*
- *Transport: double handling, excessive movements at:*
 - *micro-level (farm/factory layout)*
 - *macro-level (configuration of supply chain)*
- *Inappropriate, over-complex processing;*
- *Waste created during processing and storing and at retail*
- *Unnecessary inventory*
- *Missed opportunities for using by-products*
- *Waiting: for raw material, WIP, finished goods, transport or people;*
- *Unnecessary staff effort*
- *Defects*

Information Flow

Consumer value

- *Identification, communication and application of consumer values and behaviour in R&D, production, processing and marketing*

Production/processing efficiency

- Ensuring the production and processing of sufficient raw material, other inputs (eg packaging) and final product of the required quality;
- Maximising productivity of farms and any subsequent processing;
- Minimising farm waste, in the factories and shops, and during transport and storage
- Minimising work-in-progress and finished good inventory;
- Ensuring traceability and quality assurance to meet regulatory and consumer requirements; and
- Informing strategic management of the chain, including shared visions and decision-making; process alignment; incentives and mutual benefits; and transparency of market, cost, forecast and performance data.
- Minimising delay and distortion in order/demand information, eg, reducing variation between actual demand and forecasts

Effectiveness of information flows

- *Validity: accuracy and reliability;*
- *Robustness: similar interpretation by all users, repeatable, comparable across time and place;*
- *Usefulness: relevant (indiscriminate communication), understandable, actionable, benchmarkable;*
- *Completeness: measurement of all relevant aspects;*
- *Timeliness: how often information is provided (real time or historic) and whether this is sufficient;*
- *Targeted: does information reach everyone who needs to know and no one else;*
- *Consistency with value chain's strategy;*
- *Economy: cost–benefit evaluation of collecting and analysing data;*
- *Format: is the most appropriate communication media used (from face-to-face to electronic)*

Relationships

Strategic alignment/Value chain integration:

- Resources available (production/processing capacity) and investment strategy
- Ability, expertise and motivation
- Strategic planning: analysis and programme building based on the known
- Strategic thinking : synthesis of information, intuition, creativity and experimentation
- Investing in foresight: causes of change; mapping)and where possible influencing) alternative futures

Trust, commitment and collaboration:

- Long-term orientation: shared visions; compatible and adaptable structures and processes
- Contractual arrangements: formality and length of contracts; negotiation, monitoring and enforcement costs
- Joint ventures/investment
- Open communication, honesty and consistenc between words and actions
- Understanding of each others' businesses, and so the impact of own actions upon the other chain members;
- Performance assessment, feedback and resultant action; pro-active suggestions for improvement
- Commitment to relationship greater than short term fluctuations in performance
- Consistency in attitude to individuals and a supplier/customer organisation

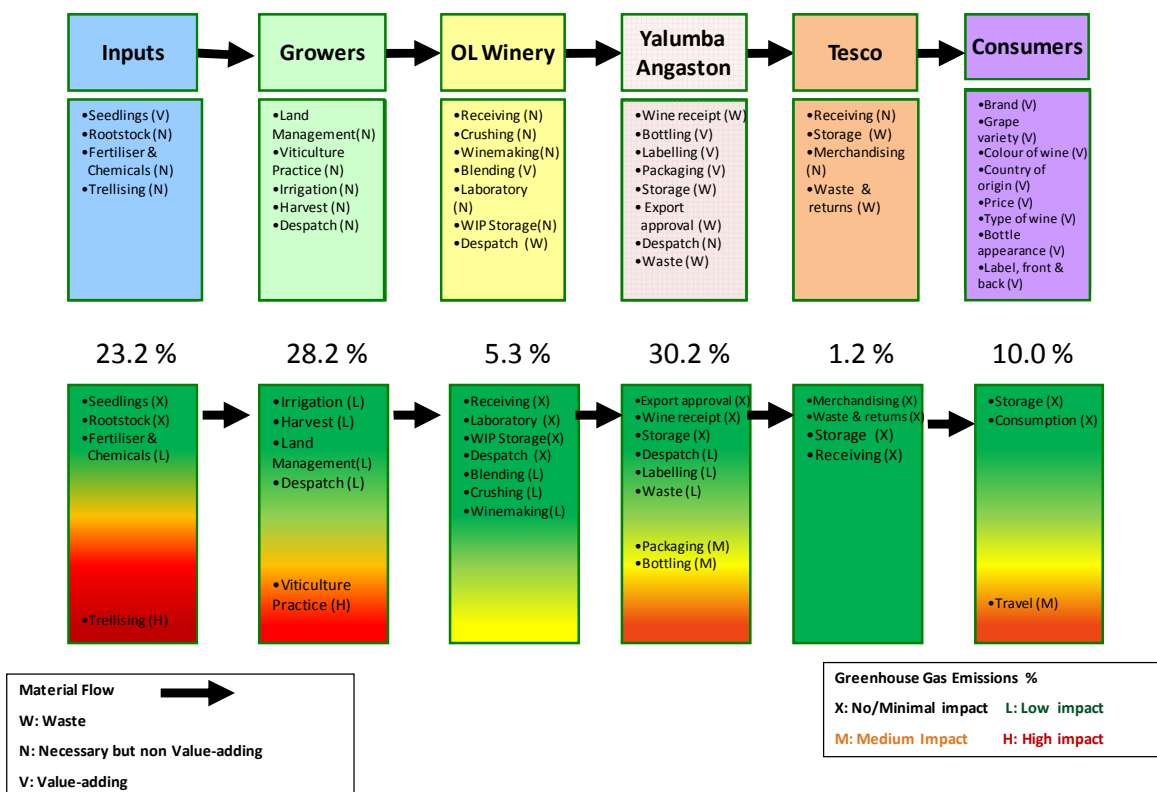
Power and dependence; opportunism; conflict and its resolution:

- Characterisation as high challenge driven by customers (with or without support); mutual development, eg joint planning; technology sharing
- Inter-dependence: the relative importance of the value chain to each party in the relationship in terms of volume, value or strategic significance to business growth
- Asymmetrical power: availability of alternative customers/suppliers, and ease and history of replacement; relative size of value chain partners
- Shared risks/costs and rewards for mutual benefit;
- Fairness of policies and procedures, and how procedures are enacted by individuals
- Dysfunctional behaviour: imbalance of power and its abuse
- Extent of opportunistic behaviour
- Is information seen as power rather than shared?
- Conflict creation and dispute resolution: causes of conflicts pre-empted; consequences of conflicts (impact on trust and commitment) minimised

Annex F – Examples of Graphical Presentation of Results

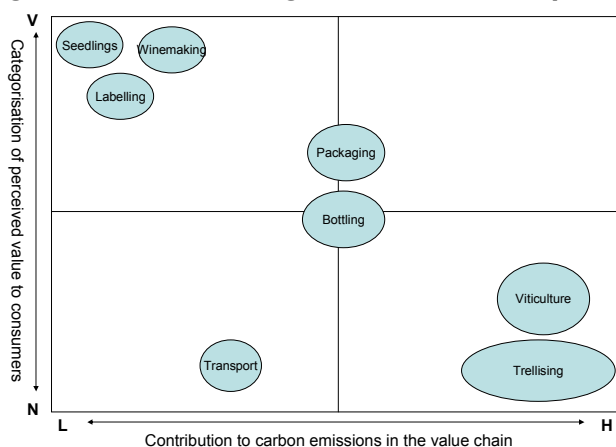
The Vine to Dine study¹ examined the Oxford Landing wine value chain from South Australian grape growers, via Yalumba Winery to Tesco consumers in the UK. The top half of **Figure 1** shows how the material flow was presented showing which activities added consumer value, or were necessary but non-value-adding. The bottom half shows the relative carbon emissions created by each activity. This second diagram can either be produced for each of the selected ecological consequences included in the SVCA, or they can be consolidated into one diagram, although this would be subjective summary, and that the significance impacts and opportunities would vary between the constituent aspects of environmental management.

Figure 1 – Oxford Landing Wine Material Flow



This information was combined into **Figure 2**, which classifies each activity in terms of its potential to create consumer value against its current environmental impact.

Figure 2 – Adding value and reducing environmental impact in the Oxford Landing value chain



¹ Sustainable Value Chain Analysis: A Case Study of South Australian Wine – Professor Andrew Fearn et al 2009 available at <http://www.pir.sa.gov.au/wine>

This presentation summarises the priorities for, and risks of investment. In this case, since most consumers of Oxford Landing wine did not place much significance on its environmentally sustainable attributes, there was little prospect of improved environmental management in itself creating value. Accordingly, the chain should only innovate and invest around environmental impact where other outcomes provide sufficient return, for example reduced operating expenditure. This is most stark in tackling the highest emitting activities in the vineyard, which are all necessary but non-value-adding activities. Furthermore, given that consumer value is created by packaging and bottling, any attempts to reduce the emissions from these activities must be careful not to reduce consumer value.

Figure 3 provides a generic example of how information flows can be presented alongside the material flow – the more solid the lines, the stronger the flow.

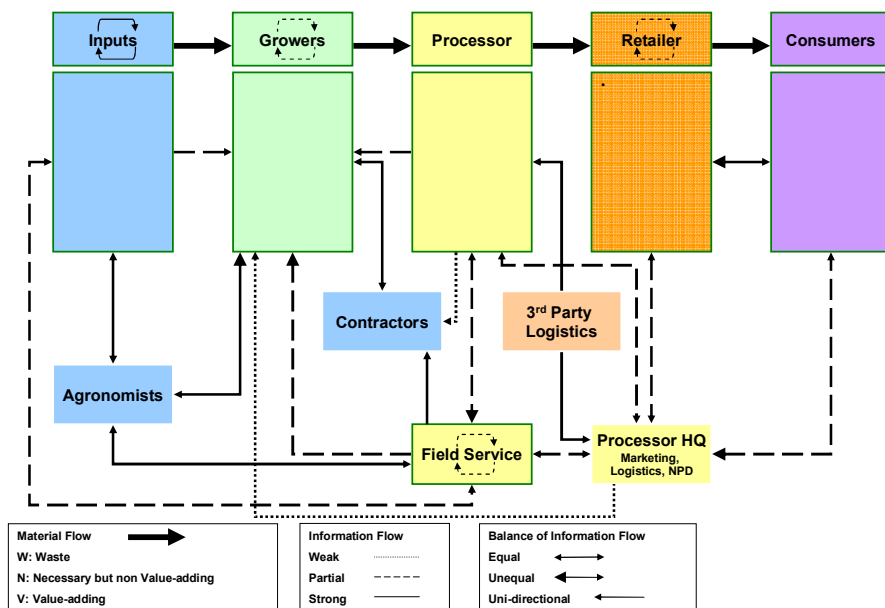
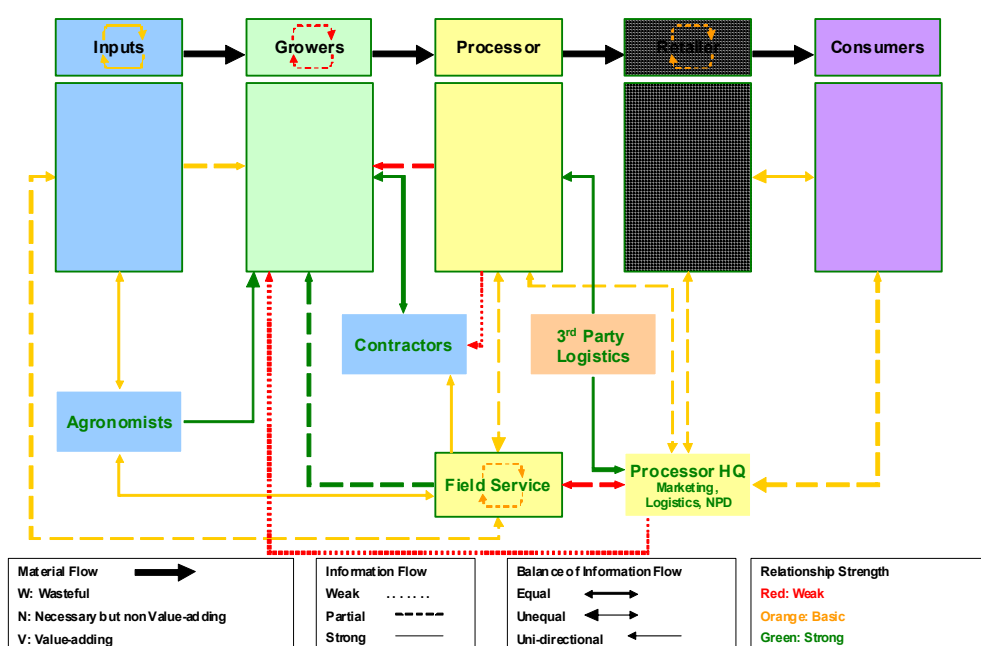


Figure 4 shows how the strength of the relationships can be overlaid onto the information flow by colour coding the lines – wherever there is an information flow, there is a relationship; and where there is a relationship, there should be an information flow.



Annex G – Standard Improvement Project 1 – Developing value chain management

Objective

The value chain partners have all committed time and openness to ensuring the analysis resulted in the identification of opportunities for further efficiencies and value creation.

However, there is a risk that the subsequent benefits are not realised because:

- the research findings are left on the shelf or only addressed internally, rather than forming a basis for ongoing strategic dialogue amongst the whole chain;
- the opportunity for strengthening strategic alignment along the chain is lost; relationships continue to be bilateral and consumer insight is not developed and shared along the whole chain; and
- the risks and benefits from future investments are not shared equitably.

All of these threaten the opportunity for the chain to fulfil its commercial and environmental potential. Therefore, it is essential that the foundation of value chain management is itself managed to deliver significant improvements, both to individual organisations and to the competitive advantage of the whole chain, and that the lessons are learned for other parts of the participants' businesses. Accordingly, the value chain partners need to take ownership of the next stages.

Project Requirements

There are three successive phases of implementation:

1. Devising a coherent strategy for identifying, devising and implementing improvements covering the whole value chain, which may include the projects suggested in this report;
2. Implementing these projects to deliver the strategy; and
3. Monitoring and evaluating the projects' impact and the distribution of benefits.

Governing the implementation process will require representatives from the key partners with the authority to:

- Secure ongoing commitment;
- Agree the strategy and timetable for an improvement programme, and lead the evaluation of impacts;
- Acquire the necessary resources (budget, information/data and staff);
- Resolve significant problems (delays; funding and other resources; disagreements), and
- Monitor delivery (milestones) and outcomes (KPIs).

However, the process must be realistic and efficient. The Stakeholder Group should firstly identify where the main opportunities exist, and therefore which partners should be most intimately involved in implementation. Commitment from senior executive level of each of the main partners is essential, and would demonstrate that the chain is genuinely of importance to the major participants. It will also need the willingness of a few growers with credibility to continue/take on a representative role. However, depending on the significance of the chain, the retailer may not have the time to engage in depth with this process, but the chain's commitment to continuous improvement should enable it to build on its relationship with the retailer. On occasion, the process could extend to others involved in the supply chain (eg, agronomists, contractors, logistics providers); other stakeholders (eg, government and industry representatives) and external experts.

Those involved must establish the most efficient means of operation. This could involve a working group, supported by a (part time, jointly funded) manager, potentially supplemented with an advisor on change management. They would:

- Propose an implementation plan (timetable, resources, milestones, dependencies and risks) and subsequently lead its delivery, including reporting on progress;
- Maintain momentum through individual projects, and broker solutions to barriers as necessary; and

- Ensure the outcomes of projects were evaluated to quantify and widely communicate the benefits accrued from enhanced value chain management, including:
 - improvements to the material and information flows and relationships; and
 - increased value creation and co-innovation.

Annex I - Key issues for consumer research

The consumer research needs to quantify the degree of influence a range of product attributes wields over different consumers' behaviour. Common attributes which should be tested are given below, although this list should be supplemented by a review of consumer research undertaken by the chain, as well as any published reports and papers. Clearly, it will vary between particular types of products (meat, produce, processed etc). Care must be taken to validate the attributes most applicable to the specific chain, since they may vary significantly between market segments, and accordingly may be quite distinctive for shoppers in the particular retail outlet included within the analysis.

Taste
Texture
Nutritional/health attributes
Provenance (local, regional and/or national)
The environmental sustainability of production
Price
Packaging design
Presentation/service in-store
Convenient packaging
Pack/portion sizes
Brand name
Raised/grown on small farms
Traceability back to specific farm
Freedom from <ul style="list-style-type: none">• antibiotics, growth promoters and/or animal by-products in feed <u>or</u> chemicals in production• And/or additives in processing
Animal welfare
Convenience of preparation
Convenience of storage
Further processing/added value (e.g. marinated)