Guide to the Framework for Strategic Sustainable Development

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Strategic Leadership towards Sustainability
Blekinge Institute of Technology

Acknowledgements

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1.0 Introduction

1.1 Background and Context

The *purpose* of the master's programme "Strategic Leadership towards Sustainability" at the Blekinge Institute of Technology, Sweden is to develop a network of leaders capable of leading society towards sustainability. To do this, we embrace a 'whole-system perspective' and an approach that deals with complexity without reductionism.

A *Generic Five Level Framework* (5LF) has been introduced as a supporting conceptual model. The generic 5LF can be used for planning in any complex system.

When applying the generic 5LF to the system "*Society in the Biopshere*", we refer to it as the *Framework for Strategic Sustainable Development* (FSSD)[1]. Competence in using it for sustainable development comes with experience. This is simulated, to the greatest degree possible, by the projects and coursework during the Master's programme. The thesis, for example, provides an opportunity for students to gain direct experience applying the FSSD. In addition, competence in using the FSSD is further developed via concrete work with clients/partners afterwards. The intent of this guide is to provide clarification of the basics and some subtleties of the generic 5LF, the FSSD and their applications.

This guide is the result of a dialogue on applications of the generic 5LF and the FSSD during the 2005/6, 2006/7 and 2007/08 academic years. It is *not* intended as an introduction but rather assumes previous knowledge. See, in particular, Robèrt et al. 2007, Strategic Leadership towards Sustainability.

The guide is organized as follows:

Section 2.0 – Introduces the *Generic Five Level Framework (5LF)* and describes how it can be used for planning in any complex system.

Section 3.0 – Introduces the *Framework for Strategic Sustainable Development (FSSD)*.

Section 3.1 – Discusses the application of the FSSD for planning

Section 3.2 – Discusses the application of the FSSD for assessing and designing tools, concepts and initiatives with respect to its utility to support a shift towards sustainability

Section 4.0 – Provides reflections and guiding comments.

See Table 1 below for a summary of the main issues for each of the five levels of the framework, for each of these applications.

[1] In business and community applications, the FSSD (its generic name) is often referred to as *The Natural Step Framework* or *TNS Framework*, after the organisation that has promoted and supported its development.

Table 1. Summary of Applications of the Generic Five Level Framework and the Framework for Strategic Sustainable Development

	Planning in Complex Systems		
Name	**'Generic Five Level Framework'**	**'Framework for Strategic Sustainable Development' (a.k.a TNS Framework)**	
Level	**Section 2.0 Generic Planning**	**Section 3.0 Planning for Sustainability – Global Society in the Biosphere**	**Section 3.1 Planning for Sustainability – specific entity (e.g. organisation)**
1. System	Any 'system' or set of variables that are relevant to the goal you want to achieve	Society within the biosphere, including the social and ecological laws/rules/norms which govern this system.	Entity (e.g. organisation, project, etc.) within society in the biosphere
2. Success	Any goal you want to achieve	Society within the Biosphere compliant with the conditions for socio-ecological sustainability (i.e. the Four System Conditions).	(i) Organisational Vision or activity-specific goals (ii) Sustainability Principles: the elimination of *contribution* to violations of the SP's (iii) A whole-systems view of global sustainability.
3. Strategic Guidelines	The strategic principles for selecting actions you use to achieve your goal. - Backcasting from success - Step-by-step while ensuring influx of resources - …	Backcasting from success for socio-ecological sustainability and the associated 3 prioritization questions as a minimum	- Backcasting from (i) within constraints of (ii), recognising (iii) (listed above). - 3 prioritization questions for sustainability - Other guidelines to select actions which help achieve organisational or activity-specific goals.
4. Actions	The actions you need to take to achieve your goal	The actions that help move the global socio-ecological system towards success	The actions that help move the entity (e.g. organisation) towards compliance with success AND global sustainability
5. Tools	The tools that support you in achieving your goal	The tools that support efforts to achieve global sustainability.	The tools that help move the organisation towards compliance with stated goals AND global sustainability

2.0 The Generic Five Level Framework (5LF)

This section introduces the *Generic Five Level Framework* (5LF). The generic 5LF can be used for planning in *any* complex system where there is an intended success outcome. The generic 5LF is defined, in general, by the headings in the boxes in Figure 2.1 (below).

Please note that the* Framework for Strategic Sustainable Development (FSSD) *is introduced in the next section (Section 3.0).

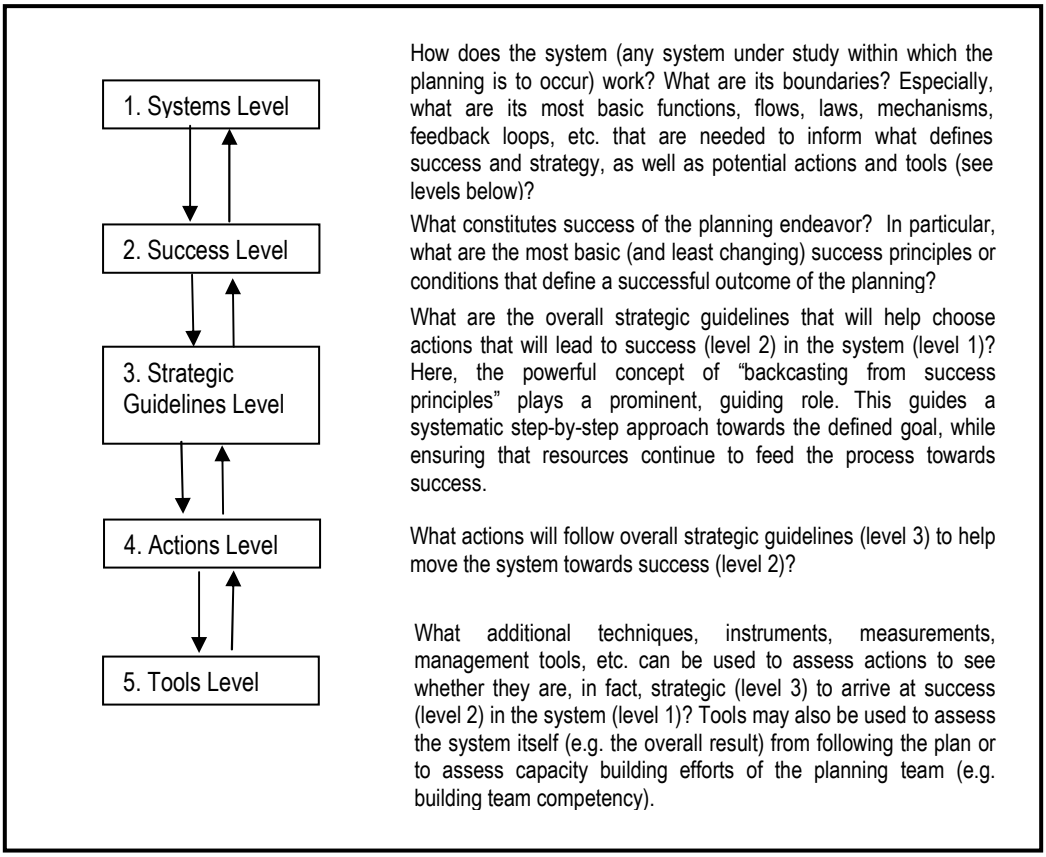

Figure 2.1 The Generic Five Level Framework for Planning and Decision-making in Complex Systems. *Questions to the right-hand side guide the application of the generic 5FL by prompting thinking about each of the five levels (for any planning endeavour in <u>any</u> complex system).*

It is important to keep in mind a few key points with respect to the generic 5LF (Figure 2.1).

- With respect to the Success Level in the generic 5LF, *any kind* of success within the system can be considered. In addition, when defining basic success principles and conditions within this level, they need to be: necessary, sufficient, general, concrete, and distinct (i.e. non-overlapping).

- With respect to the Strategic Guideline level of the generic 5LF, it is important to make the distinction between Strategic Guidelines (level 3) which are generic to any planning process, and "strategy", which is specific to the organisation, project, or community (i.e. "our strategy is…"). "Strategy" in this sense is a grouping of Actions (level 4), which often result in a written

plan. It is important to be clear when we use the word "strategy" as it has different meanings in different contexts. Backcasting, as a Strategic Guideline (level 3), is the 'heart' of the framework. To consciously strive towards principled success, three questions (as a minimum) at this level guide the prioritization of actions. Will this action:

1. …bring the project/organisation and society closer to success?
2. …avoid blind alleys, i.e. serve as a platform for future steps towards success?
3. …generate enough resources (financial, social, ecological, cultural, and political) for the continuation of the process?

Application Examples:

Examples of applying the generic 5LF to different complex systems are given in Chapter 2 of the Strategic Leadership towards Sustainability textbook (Robèrt et al. 2006) for winning a football (soccer) game (refer to page 29-30). Another common example is winning at the game of chess. In those cases, use of the 5LF is inherent in the way we perform. However, in more complex situations, in particular when many people are involved to solve a new problem where no routine exists, it may be essential to analyze the endeavor in relation to the generic 5LF.

Example of how the generic 5LF may be subconsciously used to guide the planning of the preparation of a meal.

Applying the generic 5LF to cooking a meal might reveal the following:

System	Kitchen and its contents, the cook, etc.
Success	Delicious, nutritious hot meal, served when guests are hungry, but not too hungry.
Strategy	Backcasting from 'success,' influencing speed, care, quality, and the logistics of the cooking process that follows from the recipe, etc.
Actions	Grocery shopping, gathering ingredients, preparing ingredients, mixing ingredients, cooking ingredients, gathering serving dishes, congregating guests at the table, serving meal.
Tools	Recipe, utensils, pots and pans, stove, oven, plates, etc.

In addition to guiding planning efforts, the generic 5LF can also be used as an analytical tool to perform a neutral analysis of a topic. *Appendix B: The Generic Five Level Framework as an Analytical Tool* provides a brief overview of the potential of the generic 5LF for use as an analytical tool to assess and describe any topic.

Key Considerations:

Key considerations regarding the *Generic Five Level Framework* include:

- It takes a *whole-system perspective* – avoiding a common tendency in planning to focus on only a sub-set of issues, areas or topics ignoring broader, connected issues leading to a need to expand system boundaries.
- It *facilitates intellectual analysis of the interrelated elements* of strategic planning and how they inform one another, by clarifying:
    - the *distinction* between the different levels, e.g. helps people to not confuse characteristics of the system itself with success principles within that system, or success principles with strategies; and
    - the *interrelationships* between the different levels. The most essential aspect is to clearly understand the relationship between the System, Success and Strategic Guideline levels, as this provides the foundation for identifying appropriate Actions and deciding on Tools appropriate to the endeavour. However, communication also between other levels is often helpful, e.g. learning more about a System (level 1) to come up with creative suggestions for Actions (level 4), which can then be scrutinized by use of Success (level 2) and Strategic Guidelines (level 3).
- It promotes a *strategic approach*
    - It *contextualizes* the role of "backcasting from success principles" as a powerful way to maintain strategic direction towards success in planning and change processes that are complex and confusing.
    - It is *intuitive* (and often used *implicitly*) for individuals making decisions in complex systems, as illustrated by the example above and the metaphorical examples from the textbook regarding chess, football/soccer, moving to a new home etc. When used by groups *explicitly*, it can help us make sense of complexity, build successful teams, and co-create common purpose. In so doing, it can help foster *cooperation*, where experts from different fields can cooperate more effectively through use of a shared decision-making framework.

3.0 The Framework for a Strategic Sustainable Development (FSSD)

The *Framework for Strategic Sustainable Development* is the *Generic Five Level Framework* applied to the system "Society in the Biosphere" (Figure 3.1).

The purpose of doing this is to bring clarity, rigour and insight to planning and decision-making towards a sustainable society in the biosphere. Two key elements include:

1. the establishment of *basic principles (or 'system conditions') for sustainable society in the biosphere*, which provides a principle-level definition of 'success', and
2. the development of *strategic guidelines* to guide efforts towards success by informing the selection of various actions and tools.

This section outlines the FSSD (Section 3.0) and its application to guide i) planning efforts (Section 3.1) and ii) the assessment and design of tools, concepts and initiatives (Section 3.2).

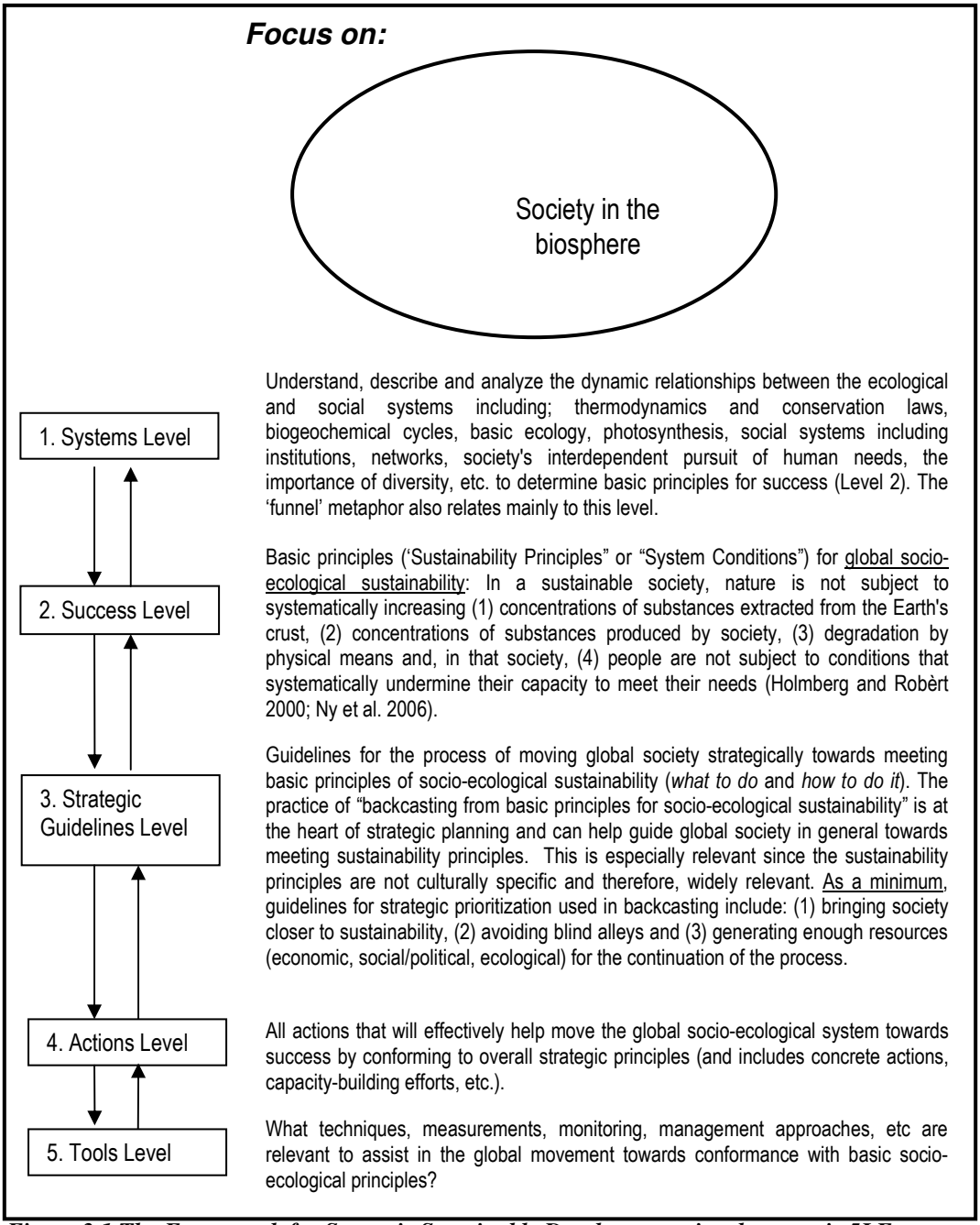

Figure 3.1 The Framework for Strategic Sustainable Development , i.e. the generic 5LF applied to the system "Society in the Biosphere."

Key Considerations:

In addition to the key considerations described in Section 2.0, it is important to note that analysis at Levels 1 and 2 brings a clear, principled whole-system perspective on sustainability, uncovering the *basic mechanisms of unsustainability*, as opposed to the common approach of analyzing *ad hoc symptoms of unsustainability* in isolation (e.g. fisheries depletion, climate change, widespread poverty, malnutrition, etc.). This reveals the problem of unsustainability as not simply a series of unlinked negative impacts, but underlying systemic errors of societal design that will make things worse and worse until, in the end, it will be impossible for society to sustain itself (Robèrt et al. 2006, 7).

Since the FSSD only addresses actions at the global scale it is somewhat 'theoretical' and in practice, we are in real situations acting within a particular context or scale such as an organisation, community, country or sector like agriculture, etc., *that is also* within society in the biosphere (i.e. a 'sub-system' of the global system). Section 3.2 below explores the application of the FSSD for planning in this context.

3.1 Applying the FSSD to guide planning

Please note that for ease of reading Section 3.1 will refer to "organisations", however the FSSD can also be applied in this manner on any entity that engages in planning with intent, such as sectors (e.g. agricultural sector), regions, communities, etc.

We are inevitably acting within a certain context (e.g. within our own organisation, community, etc.) when we begin a planning endeavour. Therefore, a more practical framework for the purpose of moving strategically towards sustainability is from the perspective of both our own unique context *and* the global socio-ecological system. This is a more practical use for acting in a specific context and provides a foundation for the Master's programme.

The purpose of using the FSSD in this manner is to bring clarity, rigour and insight to planning and decision-making for any specific organisation moving strategically towards the goal of 'sustainability within a sustainable society in the biosphere.' Key elements of this include, for example, the establishment of basic principles for the organisation within sustainable society in the biosphere ('success') and the development of strategic guidelines (societal and organisational scales) to guide efforts towards success by informing our selection of various actions and tools.

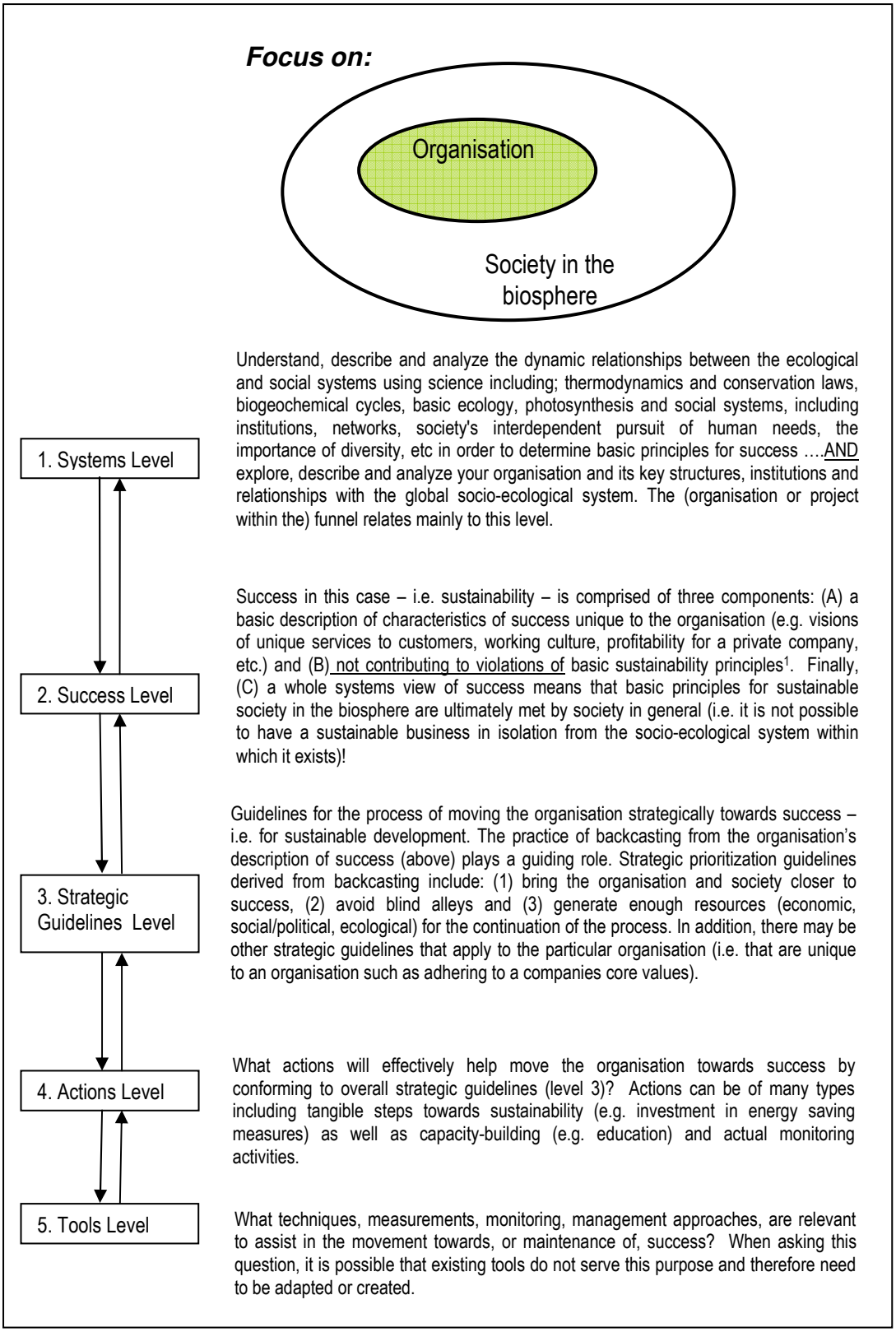

Figure 3.2 Application of the Five-Level Planning Framework to the system: "An Organisation within Society in the Biosphere."

[1] When applied to an organisation, these principles of "not contributing to…" are often referred to as "the organisation's sustainability principles."

There is a formalized way of applying the FSSD called the 'A-B-C-D Analysis'. It is a strategic tool (Level 5) that was developed for applying backcasting (Level 3) from basic principles of success (Level 2) (Robèrt 2000, 247). It provides a methodology to guide workshops in which people can co-create a sustainability plan for their particular planning endeavour. Note that while the A-B-C-D analysis is often used as a method to guide workshop processes, it is not confined to such applications. For instance it can be used to help guide the development of strategic plans for sustainability over a much longer time frame.

Consisting of four simple steps, the A-B-C-D Analysis guides users to channel their specific knowledge and visions through the 'lens' of the FSSD:

> A – building a shared mental model that conveys context and meaning to participants in the planning process, so that everyone is aware of and understands the 'rules of the game', i.e. characteristics of the system, principles of success (sustainability), and strategic guidelines. The metaphor of the funnel is often used to describe the state of our global socio-ecological system;
>
> B – examining the current reality through the lens of the Sustainability Principles (i.e. identifying violations of each and current assets to address the challenges) by conducting a baseline assessment of the organisation's present activities;
>
> C – creative visioning of short and long term solutions to problems and strengths listed in B, envisioning a desired future outcome within the basic constraints of the Sustainability Principles and brainstorming a 'C-list' of possible compelling measures[2]; and,
>
> D – strategic selection and prioritisation of compelling measures identified during the visioning process (Ny et al., 2006):
>
> > (1) measures should bring the organisation (or community, sector, etc.) and society closer to sustainability, (though it may be impossible to implement actions that lead to full compliance with the Sustainability Principles in the short term without considering long-term implications);
> >
> > (2) measures must also avoid blind alleys (e.g. 'sunk' costs) in the future by providing technically feasible stepping-stones towards future actions; and
> >
> > (3) measures should generate enough economic, socio-political and ecological resources (i.e. 'capital') for the continuation of the process.

[2] When performing the B- and the C-analysis in a strategic planning process it may be necessary to go 'back and forth' in order to create a clear understanding of the gap between current reality and the desired sustainable future. For example, the actual process may consist of quickly performing a current reality assessment (B) to begin conversations about a desired future (C) which in turn will lead to extra questions about the current reality (B) which may lead to extra ideas about possible measures (C) and so on. The level of depth for the B- and C-analysis will be determined by what the participants consider to be necessary in order to successfully complete the planning process, and also depends on the existence and organisational 'buy-in' to the vision of success. The main point is that facilitators of such 'back and forth' dialogues help set-up the "creative tension" between the current reality and the desired future by putting the right aspects under the correct B and C (and D once the prioritization process begins) titles respectively.

Because investments are often resource-intensive, it is important to have a perspective that is large enough, in terms of time and space, to provide an accurate perception of returns. Investing in measures that will cause fewer impacts today, but which do not have the potential to adapt to contributing to complete compliance with the Sustainability Principles in the future, may not be a sound use of resources (Robèrt et al. 2007). Strategic decision-makers will consider the risks associated with rising costs, increasing public awareness and more restrictive legislation, as well as declining resource availability (described by the funnel metaphor), and work to eliminate their violations of the Sustainability Principles, regardless of short-term incentives to do otherwise. (Robèrt et al., 2002; Ny et al., 2006).

Key Considerations:

In addition to the key considerations listed in Sections 2.0 and 3.0, it is worth emphasizing that since any specific organisation is situated within the biosphere, it is subject to both the system conditions of the global context, and its own particular system's characteristics, for example:

- Level 1 – System, the characteristics of BOTH the organisational system and, for example, the organisation's stakeholders (i.e. broader systems) AND the global socio-ecological system (and the interrelationships between all scales);
- Level 2 – Success, the basic principles for BOTH socio-ecological success, i.e. global sustainability, AND aspects of success that are unique to the organisation (e.g. mandatory principles for success that are inherent in an individual organisation's vision); and
- Level 3 – Strategic guidelines that guide towards success for BOTH the organisation AND eliminating its contributions to societal non-sustainability.

Example: "A business within… society in the biosphere"

This general example is outlined in depth in Chapter 9 of the MSLS course textbook (Robèrt et al 2006). A business after first studying its relationship to society and the biosphere, can arrive at its own definition of 'success' with its own vision (i.e. purpose, values, strategic goals) that exists within the boundaries of the Sustainability Principles (Level 2). See Figure 3.3.

Figure 3.3: The vision within the boundaries of the sustainability principles

The business' actions (and 'strategy' documents or overaching plans which encompass a collection of actions) should be guided by the strategic guideline (Level 3) of backcasting, i.e. (1) bringing the organisation and society closer to sustainability and its vision, (2) avoiding blind alleys and (3) generating enough resources (economic, social/political, ecological) for the continuation of the process), as well as its own unique strategic guidelines for operation (e.g. a cooperative approach with its customers, a 'flat' organisational structure, etc.). Its choice of tools to monitor, manage or analyze its various actions are

also guided by success level 2 and strategic guidelines level 3 (e.g. a company may decide to carry out strategic life cycle assessment (LCA) for a particular product or institute a management system to schedule and track its various actions).

3.2 Applying the FSSD to assess and design tools, concepts and initiatives with respect to its utility to support a shift towards sustainability

We can also use the FSSD as a way of framing our thinking when it comes to various collections of tools, concepts and initiatives that are intended to relate, in some way, to sustainable development. Such collections of tools, concepts and initiatives may coincidentally include clear system boundaries or clear planning goals and strategies but this is not always the case. Some are simply collections of potentially useful tools (e.g. specific techniques for realizing short-term business benefits). Others may be concepts that help explain a sub-system and its success (e.g. empirical studies of local ecosystem characteristics and successful common property management routines). Still others may be initiatives that may or may not help organisations, sectors and communities achieve success (e.g. an Ecological Footprint Study Project).

To assess the utility of a tool, concept or initiative *within a particular planning* process, one of the most common ways of doing this is to assess what tools are necessary *after* an A-B-C-D analysis is done. Once the B and C lists have been generated, along with some suggested early prioritizations under D, ask: "what tools do we need to bring to the planning endeavor to comply with the Principles of Sustainability? How can the tool help to fill the gaps that need to be filled between B and C?"

If the assessment and design of a tool, concept or initiative is *not related to any particular planning endeavor*, but rather concerns a generic analysis of the tool to understand utility *any* planning endeavor (e.g. an analysis of ISO14001 or the Ecological Footprint), an A-B-C-D analysis as a thought experiment is helpful. However, in this case, B is "an understanding of tool, concept or initiative as it is currently" and C can be thought of as "the tool, concept or initiative either designed or complimented from a full strategic sustainability perspective". Within the gap between B and C, one can then derive what changes are required, and / or what is IS specifically good at and how it can be complimented with other tools, concepts and initiatives to fill any gaps. This is further elaborated below:

You can approach the B analysis by examining the tool, concept or initiative by *first*, using the generic 5LF to conduct a neutral analysis for the purpose of gaining a structured understanding of the tool, concept, or initiative's *intended* purpose (see Appendix B). For example, consider questions such as: does the tool, concept or initiative clearly state for what purposes it can be used, and does it deliver on the full scope of such claims? Is it designed for planning, monitoring, auditing, or some other purpose?

Then, you can begin the C analysis by comparing your findings from the perspective of the FSSD in order to assess its utility in the transition towards a sustainable society in the biosphere. For example, consider the following questions: does it cover the full scope of sustainability or does it need to be complimented with other tools? Does it account for all aspects that are relevant for sustainability?

By doing this analysis it is then possible to identify "gaps" or "blind spots" that the tool, concept or initiative does not cover with respect to a movement towards full sustainability. These "gaps" may require a further analysis from the perspective of Level 1 (System – are the system boundaries too narrow to really cover all essential aspects, e.g. neoclassical economy perceived as a tool, and externalizing impacts in ecological and social systems?) and Level 3 (Strategic Guidelines – in what ways can a Backcasting from Principles of Sustainability perspective be incorporated into the tool, concept or initiative?). Here also is it important to keep in mind that specific tools often have specific intent(s), and very few of them explicitly AIM to bring society within full compliance of the Sustainability Principles. Therefore, it is often useful to understand what the tool IS good at assisting with, and then consider using complimentary tools when undertaking larger, more broad planning endeavours.

Example: Comparing the Intended Purpose of the Ecological Footprint against the FSSD to Identify Gaps and Blind Spots

The Ecological Footprint is a concept that is often used as an indicator to help people understand and reduce their contribution to environmental aspects, i.e. "reduce their footprint". The indicators measured by the Ecological Footprint relate primarily to aspects within the first principle (e.g. increasing land to sequester carbon thereby lowering concentrations) and third principle (e.g. reducing the need for natural resources such as wood to protect forested areas). However, the Ecological Footprint does not explicitly discuss aspects related to, for example, the second principle (e.g. concentrations of persistent compounds), parts of the first principle (e.g. the concentration of trace metals), and the fourth principle (e.g. conditions that undermine people's ability to meet their basic human needs). This forms possible "gaps" or "blind spots" when applying the tool that sustainability practitioners should be aware of, because, for example, one may be reducing their footprint, but still systematically increasing concentrations of persistent compounds.

With this understanding one could suggest that complimentary indicators be developed to measure progress with respect to trace metals, conditions that undermine people's human needs, and so on to make sure that the "blind spots" are covered. Furthermore, and as essential: The Ecological Footprint methodology is all about aggregation of impacts into one number (the footprint). For planning purposes we need to have a transparent display of all impacts that are relevant to sustainability and a transparent display of optional solutions (such as in the A,B,C,D). Successful outcomes of such planning may then be revealed as a favourable outcome with regard to the footprint. While the Ecological Footprint is an excellent tool for communication of certain aspects of sustainable development, it has serious limitations for strategic planning purposes and should not be attempted as the major tool for such purposes.

For more information see: Holmberg, J., Lundqvist, U., Robèrt, K-H. and Wackernagel, M. (1999). The Ecological Footprint from a Systems Perspective of Sustainability. *International Journal of Sustainable Development and World Ecology* 6:17-33.IPCC. 2001.

Example: Comparing the Intended Purpose of the ISO14001 Standard to the FSSD to create a "Strategic Sustainability Management System"

In other cases the tool or concept does not provide a clear definition of success as it relates to sustainability. For example, consider the ISO14001 standard, which has been used by many organisations to create an environmental management system, because it can be an excellent tool to implement a process of continuous improvement. However, the ISO14001 standard does not have a definition of ultimate success to provide strategic guidance on selecting environmental aspects, i.e. continuous improvement towards what end?

In this situation, consider how the Principles of Sustainability can be incorporated. Whereas the ISO14001 standard is a management system without strategic guidance, the Principles of Sustainability provide a definition of sustainability and strategic guidance, however, they are not a management system. When

considered together, these concepts are complementary and powerful, because they can then be combined to create a management system that helps an organisation continuously improve towards a principled definition of sustainability.

For more information see: MacDonald, J.P. 2005. Strategic sustainable development using the ISO 14001 Standard. In *Journal of Cleaner Production*. 13 (6): 631-643

4.0 Reflections on Applications of the Generic 5LF and the FSSD

This section provides further insights on the generic 5LF, the FSSD and how it can be used in analyzing current planning approaches (and concepts that may affect planning efforts) and in particular, how it can be used to plan strategically towards sustainability.

4.1 Time frame and depth of analysis, with particular focus on assignments and thesis work.

The examples above give illustrations that should help sustainability practitioners and their collaborators: (1) craft questions (i.e. define success) and, consequently, (2) define the appropriate system boundaries. They are also highly relevant for defining the scope of Master's programme assignments and thesis projects in order to deliver them within the time frame available. The wider the scope, the more time will be required to do a given depth of analysis.

For example, if you only have time to carry out a very high-level analysis of a thesis topic, focusing only on the most obvious and accessible aspects of the chosen topic within the time frame available, you will probably need to change your topic by narrowing the scope (i.e. craft a more specific research question(s)).

To quickly determine if your scope is appropriate, think about what you need to do in order to explore these nested systems in a way that is meaningful in order to arrive at a successful response to your initial question(s). Once you have a good understanding of your topic in terms of the communication between its particular five levels, and you believe that you can explore that communication within the time frame given to you, you have defined an appropriate scope and you can proceed.

4.2 Cases where the Five-level Planning Framework may not be appropriate

The 5LF is a tool for planning in complex systems and sometimes science is not at all about planning in complex systems. In descriptive science, you may even NEED to have a completely neutral attitude as regards the outcome of your study, applying a completely empirical methodology. For example, penicillin was discovered by coincidence in combination with curiosity, intelligence and sound, scientific analysis, not through a planning endeavour. In such cases, a structured planning framework with a pre-determined understanding of success may not be helpful for the research as such.

However, in the case of a student group in the MSLS programme intending to undergo this kind of research, this introduction must set a clear planning context, including applying the FSSD (implicitly or explicitly) to explain how the empirical study may be useful in the larger, strategic context. This is to align with the overall mission of the MSLS programme: to learn strategic planning and leadership towards sustainability.

4.3 Other Considerations

As one becomes more and more experienced with application of the FSSD and the generic 5LF in various contexts, various subtleties reveal themselves to be important. Here are some points based on various experiences:

- The trigger to use the generic 5LF is always the *intention* to act in a certain circumstance, and to plan that action. After expressing that *intent*, the 5LF can

be used to clarify what is meant by success, and what the system is…and all the other details that follow.

- In the context of a particular topic, the FSSD described in Section 3.0, is meant to be applied simultaneously in at least two scales (i.e. society in the biosphere, and the specific topic). These are two different scales of systems, and there are many in between. The *translation* of the principles of Success (Level 2) to the scale of your application therefore becomes important. It is also interesting to note that taking the systems view of a topic shows how it is related to the larger system, or other parts within it, and hence sustainability must eventually occur at every level of the global system.

- In relation to SSD, it should be emphasized that a complete description of "sustainable society" is many things to many people. We should not get sloppy, or even lazy, by confusing FSSD with 'sustainable society' itself. It is merely a framework to guide and help us plan strategically towards it. A key component of this, of course, are success principles (level 2) which have been determined to be: (i) necessary; (ii) sufficient; etc. These, however, are simply the basic 'trunk and branches' of a sustainable society. The details (i.e. 'twigs and leaves') are also essential to build a compelling vision of sustainable society.

- It is also possible, and undesirable, to become 'captured' by various good ideas you encounter in a way that allows them to take on an exaggerated importance as regards planning strategically towards sustainability. For example, having meaningful dialogue may be vitally important as an activity or even in guiding overall strategy, but it might not lead strategically towards sustainability without some broader awareness of science-based, biophysical constraints, etc. Similarly, moving towards industrial-scale biofuels may be an important action but it should not be confused as *the* solution for sustainable energy.

- Some concepts you encounter may not be relevant or applicable to all other cultures, meaning that the 'system' definition (and success and strategy, etc.) need to be further refined to respect those culturally unique aspects. For example, indigenous cultures often have their own unique, spiritual relationship with nature and decision-making processes involving councils of elders. These cultural norms should also be respected.

- The concept of 'second order principles' is important and can be revealed by studies of the kind described above. In searching for second order principles, it is particularly important to introduce explicit clarification of a particular topic (e.g. the 'system' and the 'success' that respective parties are talking about) before delving into a discussion of solutions. Once this clarification is provided, various second order principles (e.g. from economics, natural systems, etc.) can become meaningful in a strategic sustainable development context (if accompanied by clear and explicit statements about the context (system) and purpose (success) for which they are being used). For example, examining the topic of 'building the business case for sustainability' only makes sense when you know (or make more detailed assumptions) about the actual business you are looking at (e.g. in the case of a company like IKEA, this business case would also need to be built around the idea of IKEA's vision: "making everyday life better for all people"). A table to clarify the

principles at various levels of the global system is provided at the end of this document.

- Structured, strategic planning towards sustainability is a powerful methodology for moving towards a sustainable society, in large part, because it is inherently *creativity enabling* – i.e. it inspires 'free creativity within basic constraints.' In this respect, a clear understanding of the *basic* constraints (e.g. 'not allowing systematic accumulation of concentration of substances from the lithosphere, etc.') as opposed to *unsubstantiated extensions* of the basic constraints (e.g. 'no mining') should be encouraged in order to open up the full potential for sustainability solutions.

- Finally, as in the introduction, it is important to not get 'captured' by the 5LF or the FSSD. Rather, capture it and put it to use. Remember that the ultimate *aim* is to create a sustainable society, not necessarily to structure everything according to the 5LF. A sustainable society demands that all sorts of technological and social innovations occur…not all of them planned using a 5LF, some just emerging!

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Appendix A. Clarification of Principles at each Level of the FSSD

Level	Description	Clarification of Principles and Guidelines
1 System	Society within the biosphere, including the social and ecological laws/rules/norms which govern this system.	*Ecological principles* • Conservation laws • Laws of thermodynamics • Principles of biogeochemical cycles • Interdependence • Diversity • Dynamic equilibrium *Social principles* • Human needs (subsistence, affection, participation, identity, freedom, creativity, idleness, protection, understanding) • Self-organisation • Diversity • Interdependence
2 Success	Society within the Biosphere compliant with the conditions for socio-ecological sustainability (i.e. the Four System Conditions).	*The Brundtland definition* • "Such development can be defined simply as an approach to progress which meets the needs of the present without compromising the ability of future generations to meet their own needs."[3] *The Sustainability Principles*[4] In a sustainable society, nature is not subject to systematically increasing… • …concentrations of substances extracted from the Earth's crust; • …concentrations of substances produced by society; • …degradation by physical means; • …and in that society people are not subject to conditions that systematically undermine their capacity to meet their needs.
3 Strategic Guidelines	Guidelines to apply "backcasting from success for socio-ecological sustainability"	*Guidelines for strategic planning:* • Measures should bring a planning endeavour closer to compliance with the sustainability principles. • Measures should serve as flexible platforms for further advancing the planning endeavor to comply with the principles. • Measures should bring capital (financial, social, political) to the process so that it doesn't halt due to lack of resources. • Precaution[5] *Guidelines to guide behaviour*

[3] Toyko Declaration (27 Feb 1987).

[4] The Four Sustainability Principles (developed Robert, R., Holmberg, J., Broman G., and a network of scientists and promoted and supported by The Natural Step), through a process of scientific consensus, provide four second order principles under the Brundtland definition, shaped as basic principles for societal design, from which subsequent orders of principles follow, e.g. dematerializations and substitutions, elimination of abuses of political, economic and environmental power and barriers to people's meeting their needs.

[5] The precautionary approach was officially adopted in international development community as part of the United Nations Environment Program's Rio Declaration on Environment and Development. Principle 15 states that "[i]n order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

		• The Golden Rule[6] • Participation • Transparency • Honesty • Responsibility and Accountability
4 Actions	The actions that help move the global socio-ecological system towards success	Examples could include: • Switch to renewable energy • Recycle material • Change taxation structure • Run a capacity-building workshop • Institute democratic representation
5 Tools	The tools that support efforts to achieve global sustainability.	*Strategic Tools* to evaluate how progress towards success and compliance with the strategic plan. Examples could include: • ABCD Analysis • Environmental Management Systems (ISO 14001, EMAS) • Life Cycle Analysis • Ecological Footprint • Factor X • Cleaner Production • Zero Emissions • Natural Capitalism *Systems Tools* to monitor actual impacts in the system we want to protect. Examples could include: • Species counts • Toxicity level measurements • Total Material Flow *Capacity Tools* to build capacity to understand the system itself. Examples could include: • TNS Framework • Training programs • Causal Loop Diagrams • Systems Thinking

[6][5] The Golden Rule, do *not do unto to others that which you would not like done unto you*, is a cross-cultural, all-embracing principle that concisely conveys the spirit behind the social principles

Appendix B: The Generic Five Level Framework used as a Analytical Tool

The generic 5LF does not necessarily need to be used for planning or for sustainable development. It can also be used for a neutral study of an existing human system if there is *intent* in the system. For example, the generic 5LF can be used to analyse our economic system, which has the *intent* of providing, among other things, a basis for efficient use of resources. Of course, our economic system has a major influence on planning and decision-making processes – including establishing national policies and major business investments. Similarly, the generic 5LF can be used to analyze an eco-labeling system, which has the *intent* of promoting green consumption.

Analysis using the generic 5LF can help to identify, understand and evaluate what is really happening with these systems – what their intent is, what they cover, what they don't cover, their specific definition of success, whether or not their actions are executed in a strategic manner, etc. This can be helpful for understanding the system's strengths and weaknesses, particularly in contributing to comprehensive efforts towards sustainability.

Purpose:

- to better understand what is happening in human systems, especially those with intent[7] to influence decision-making and planning; and,
- to better understand the inherent purpose of human systems (e.g. green consumption intended by an eco-labeling system, efficient use of resources intended by the macro-economic system or global dematerialization for sustainability intended by Factor X initiatives).

This section provides some examples of how the generic 5LF can be used as an analytical tool, but first a generic guide is presented in Figure 4.1.

[7] In this context "intent" may be defined explicitly, for example, clearly stated goals for eco-labelling and green consumption, or implicitly, such as an implication of "increased material throughput" to support continued economic growth (assuming a lack of extensive dematerialization efforts).

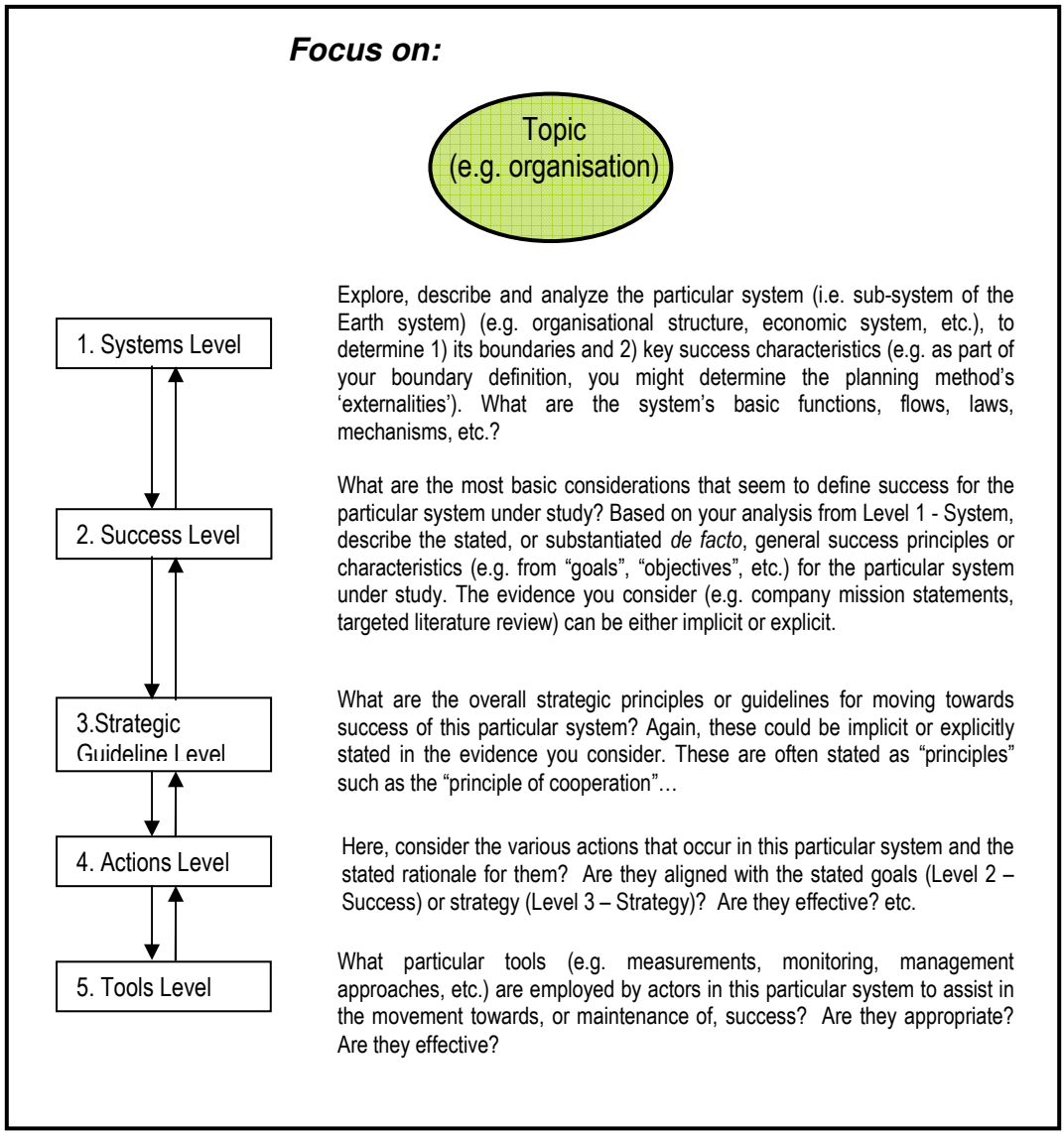

Figure 0.1 The Five Level Framework used as an analytical tool.

This application can be used to better understand what is happening with human systems (especially those with intent to influence decision-making and planning) and their inherent purpose.

Example: Expanding system boundaries when applying the generic 5LF

We often THINK that we know what scientific question we want to ask, but may bypass the fact that we sometimes have only a vague understanding. The Generic 5LF can help us develop a more effective and appropriate question, e.g. from "I want to explore eco-labelling" to "I want to see if there are gaps in the way the general supermarket visitor is positively influenced by eco-labelling, and seek solutions to close any gaps I identify". Once Success (Level 2) is defined in this stricter and clearer manner ('success' that responds to the question), you then determine where to define the appropriate system boundary to be able to effectively respond to the question.

An illustrative example of a potential conversation around eco-labelling in the above context is: someone could propose "It seems we need to take a look at the standards by which a certain product can get an eco-label", somebody else could say: "It is not only about the quality and rationale of the label in relation to sustainability, it is also about the awareness and dissemination of it, so we need to expand the system to include communication with the public."

Then somebody else could say: "Well, in order to respond to that question we need to include the economy in this system as well, because even if the quality and trustworthiness and awareness of the label are good, the prices on eco-labelled goods are generally too high to attract customers."

Yet another person could say: "We need to include the political system as well, because the total costs for eco-labelled goods are lower to society due to more care of the planet, which is not reflected in the current pricing system" or public policy.

At this point, an effort to clarify Success (Level 2) has lead to a discussion of expanded system boundaries of these nested systems. The key message of this example is that it is important to be flexible and think carefully about the system boundaries in concert with the interplay between the analysis of Levels 1 and 2 System and Success.

Example: Abbreviated analysis of our economic system

1. Systems Level. Our economic system has a significant influence on planning today's society (in terms of major investments, national policies, etc.). By first studying the 'economic system', we see that it sets parameters for exchange of goods and services – our monetary system of exchange (e.g. prices, costs, rents, etc.). This system often does not include various biological or social services of value – especially common property resources – such as the value and/or price of clean water, clean air, a stable atmosphere, a community without excessive violence, etc. Rather, it often sees these as "externalities" – that is, aspects external to the economic system. In the field of Environmental Economics, the economic system attempts to put a monetary value on common property goods and services through measures such as 'contingent evaluation,' however, this technique is problematic for many reasons (see Chapter 8 for a deeper discussion; Robèrt et al. 2006)). The economic system operates at various spatial scales including local, regional, national and global. In general, this system is often criticized for being partly 'blind' to key system characteristics of our broader socio-ecological system.

2. Success Level. Upon review of the economic system, economists often define success as maximizing "social welfare" (i.e. *the well-being of society or community at large*; MIT Dictionary of Modern Economics). This is typically quantified in monetary terms with key indicators and indices (e.g. Gross Domestic Product).

3. Strategic Guideline Level. In order to achieve this vision of success, economic strategies (Level 3) such as those for "economic development", governed by economic principles, rules, guidelines are designed with the intent of encouraging progress towards this definition of success For example, economic schools of thought regarding interest rate policy, taxation strategies, guidelines for public policy, investment strategy etc. for the purpose of maximization of social welfare).

4. Actions Level. Out of the overall economic development strategies come various actions (e.g. raising interest rates, lower taxes, specific policy decisions, investments, etc). that are intended to move society towards this definition of success (as defined above).

5. Tools Level. Various tools (e.g. measurements, monitoring, management approaches, etc.) are be used to assist in the measurement and implementation of movement towards, or maintenance of, success. For example, at the national economy scale, indicators such as the Gross National Product (GNP) and Gross Domestic Product (GDP) dominate (also, employment data, retail sales, etc).

By using the Generic 5LF as an analytical tool, we can then assess the strengths and limitations of our economic system and the decision-making criteria that dominate society's decision-making process. This is done by comparing this neutral assessment of our economy with the FSSD (Section 3) applied to develop an ideal overall strategic plan to move global society towards sustainability with our economic system. Various gaps are revealed.

At the System level (Level 1) of our economic system, we see extensive gaps related to the broader social and ecological systems. For example, the reality of the Earth's biogeochemical cycles and the resulting resource flows are not considered in our current economic system, which see unlimited physical growth potential (meaning it assumes unlimited resources).

This incomplete understanding of the system leads to various gaps when Success (Level 2) is discussed in the conventional economic system. For example, the importance of preventing the degradation of the ecological foundations for life or the social fabric that we depend on, such as fossil fuel reserves, atmospheric quality, etc. is not considered in the predominately monetary principles of success such as GDP growth. This has lead to impacts such as climate change, fish stock depletion, deforestation, loss of topsoil, etc., which are symptoms of the systematic degradation of the Earth system (biosphere with its human societies) in which the economic system operates. These impacts send repercussions back into the economic system, which – with its current system boundaries – is incapable of understanding that they are symptoms of a greater systemic flaw, and therefore is incapable of addressing. Consequently, *ad hoc* strategies/plans are developed to deal with the individual symptoms, leading to reductionist approaches at the action and tools levels.