

An analysis prepared as part of



Sustainable Food Systems: Working Towards a Fundamental Solution

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Introduction

The Vivid Picture project describes a vision of a sustainable food system in the state of California in the year 2030 and proposes a change agenda for reaching that future. In order to foster a shared and explicit vision of strategies, we perform an exercise in detailed systems thinking, basing our efforts upon the approaches described in Peter Senge's *The Fifth Discipline: The Art and Practice of the Learning Organization* and associated workbooks.

We find that a close examination of historical storylines and causal loops allows us to better understand the emergence of both the mainstream conventional and niche sustainable food industries in the 20th century. We also find that applying the systems archetypes—as lenses, as pattern templates, and as dynamic theories—elucidates historical trends, structural perspectives, and prescriptions for action that may be useful in progress towards an integrated, sustainable food system. In the hope that this exercise can enable further discussion, we present three applications of systems archetypes and narratives: Limits to the Growth of the Conventional Food and Agriculture Industry, Limits to the Growth of the Modern Sustainable Food and Agriculture Industry, and Working towards a Fundamental Solution.

Background

Peter Senge lists his five disciplines as systems thinking, personal mastery, mental models, building shared vision, and team learning. Through systems thinking, Senge writes, one is better able to perceive interrelationships and patterns of change, thereby arriving at a better understanding of dynamic complexity, which manifests itself in situations where cause and effect are subtle and removed in both time and space. Seeing structures, we are better able to discern high from low leverage change, and seeing wholes, we learn how to foster health.

In diagramming a system, Senge emphasizes circles of causality. Feedback processes either reinforce, amplifying an initial action, or balance, stabilizing an action. Patterns of structure emerge, and Senge formalizes these patterns as systems archetypes. In our work below, we build upon two of these archetypes: Limits to Success and Shifting the Burden. Here are the templates for these two archetypes, drawn from Kim and Anderson's *System Archetype Basics*.

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As a counterpoint, is it worth recognizing the diverse number of approaches to systems based inquiry and development. We note two comments on Senge's work here, by Bob Williams and Robert Louis Flood.

In his paper *Evaluation and Systems Thinking*, Bob Williams compares and contrasts Senge's Fifth Discipline with System Dynamics, Soft Systems Methodology, Cultural-Historical Activity Theory, Complexity Theory, Critical Systems Thinking, and Systemic Thinking. He finds the strengths and weaknesses of Fifth Discipline to be as follows:

Strengths

- Its popularity reaches beyond systems practitioners.
- It links people with the more mechanical aspects of systems inquiry.
- It stresses reflective processes, dialogue and experiential learning.

Weaknesses

- It is powerfully driven on notions of consensus, which some feel reduces the potential for critical reflection.
- In any formal sense, it does not address power, knowledge distribution and ethical issues.
- Of itself, it is not really a systems approach, it refers back to system dynamics for that. This can be constraining.
- Its whole is not particularly rigorous, even if the parts are.
- There are no formal means of boundary setting.

In *Rethinking the Fifth Discipline*, Robert Louis Flood compares and contrasts Senge's work with that of five others: Ludwig von Bertalanffy, Stafford Beer, Russell Ackoff, Peter Checkland, and C. West Churchman. Flood includes this comment:

Russell Ackoff says..., "It is in the nature of systems thinking to yield many different views of the same thing and the same view of many different things."
[Yet] Senge... manages only to generate the same view of many different things.

These criticisms notwithstanding, we find that this exercise in systems thinking produces interesting results and hope that it will generate dialog that proves useful to the continuing efforts of the Roots of Change Council. We present below three applications of systems narratives and archetypes.

Limits to the Growth of the Conventional Food & Agriculture Industry in the U.S.

[This narrative describes a "Limits to Success" archetype. In this situation, actions that lead to success encourage more of the same efforts. Over time, however, the success itself causes the system to encounter limits, which lead to a decrease in the rate of growth.]

The conventional food and agriculture industry that we are familiar with today is an outgrowth of the era of industrialization in American history. The processes of industrialization follow similar trajectories across numerous sectors and include the following trends in food and agriculture: a specialization of production, an increase in

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purchased inputs such as seeds and pesticides, and a concentration of land, wealth, and markets on the largest farms and by the largest corporations.

Systemic policy, finance, media, and research support have reinforced the growth of conventional food and agriculture. Also fundamental to the growth has been the satisfaction of industrial economy values that reflect the zeitgeist of the era, such as price, profitability, convenience, and efficiency.

In recent decades, curbs to the continuing growth of conventional food and agriculture have arisen. The negative social and ecological impacts of industrialization have triggered constraints in the form of a commitment to or awareness of values that are sometimes associated with a more traditional era. These values—including interconnectedness, diversity and regeneration—might alternatively be considered part of a nascent zeitgeist that synthesizes 20th century advances in the sciences into a thoroughly modern view of the human relationship to the natural world. We will refer to them as sustainability values.

Some negative social and ecological impacts of industrialization have met with rising public outcry and initiatives for consumer education. And some negative social and ecological impacts of industrialization have met with incidences of regulation and litigation in an attempt to limit “bad actor” behavior. These trends have helped to slow the growth and/or mediate the ill effects of conventional food and agriculture.

Recognition of the impacts of industrialization and awareness of sustainability values have also led to the construction of an alternative system: the modern sustainable food and agriculture industry and supporting players. By successfully competing for market share, this trend has also slowed the growth of the conventional industry.

Some sustainability values have been adopted, or re-emphasized, as values in the commercial industry. The competition between the mainstream and alternative systems to define the value of “personal health” is a prime example.

More recently, another significant constraint has also slowed the growth of the conventional industry: a decrease in profitability as a result of increasing global competition. This trend has led some conventional food and agriculture actors, who might not otherwise participate in the modern sustainable food and agriculture industry, to express an interest in this rising alternative.

Finally, ecological limits—such as water and soil availability—limit the availability of ecological services and fundamentally constrain the growth of the conventional system.

Limits to the Growth of the Modern Sustainable Food & Agriculture Industry in the U.S.

[This narrative describes a “Limits to Success” archetype. In this situation, actions that lead to success encourage more of the same efforts. Over time, however, the success itself causes the system to encounter limits, which lead to a decrease in the rate of growth.]

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The modern sustainable food and agriculture industry began as both a practical and values-based alternative to the industrialization of food and agriculture. Reinforcing the growth of the sustainable food and agriculture industry has been its modest success in reducing the negative social and ecological effects of conventional food and agriculture. Some systemic policy, media, and research support have further encouraged the modern sustainable industry's growth. Another fundamental impetus has been the commitment among the American population to sustainability values, such as interconnectedness, diversity and regeneration.

The nascent growth of the modern sustainable food and agriculture industry has met with two broad constraints. The first is the commitment to industrial economy values and/or resistance to sustainability mental models. This constraint limits the ability of the alternative industry to compete with the conventional system. Some industrial economy values, such as profitability, have necessarily been adopted by participants in the sustainable food industry, thus facilitating greater growth.

The second constraint is the perceived value in mainstreaming and/or the suspicion of industrial economy values among participants in the sustainable food system. This constraint limits the level of commitment to growth among participants in the sustainable food system.

Working Towards a Fundamental Solution

[This narrative describes a "Shifting the Burden" archetype. In this situation, a problem symptom can be addressed by applying a symptomatic solution or a more fundamental solution. Over time, however, symptomatic solutions produce side effects that further divert attention away from more fundamental solutions.]

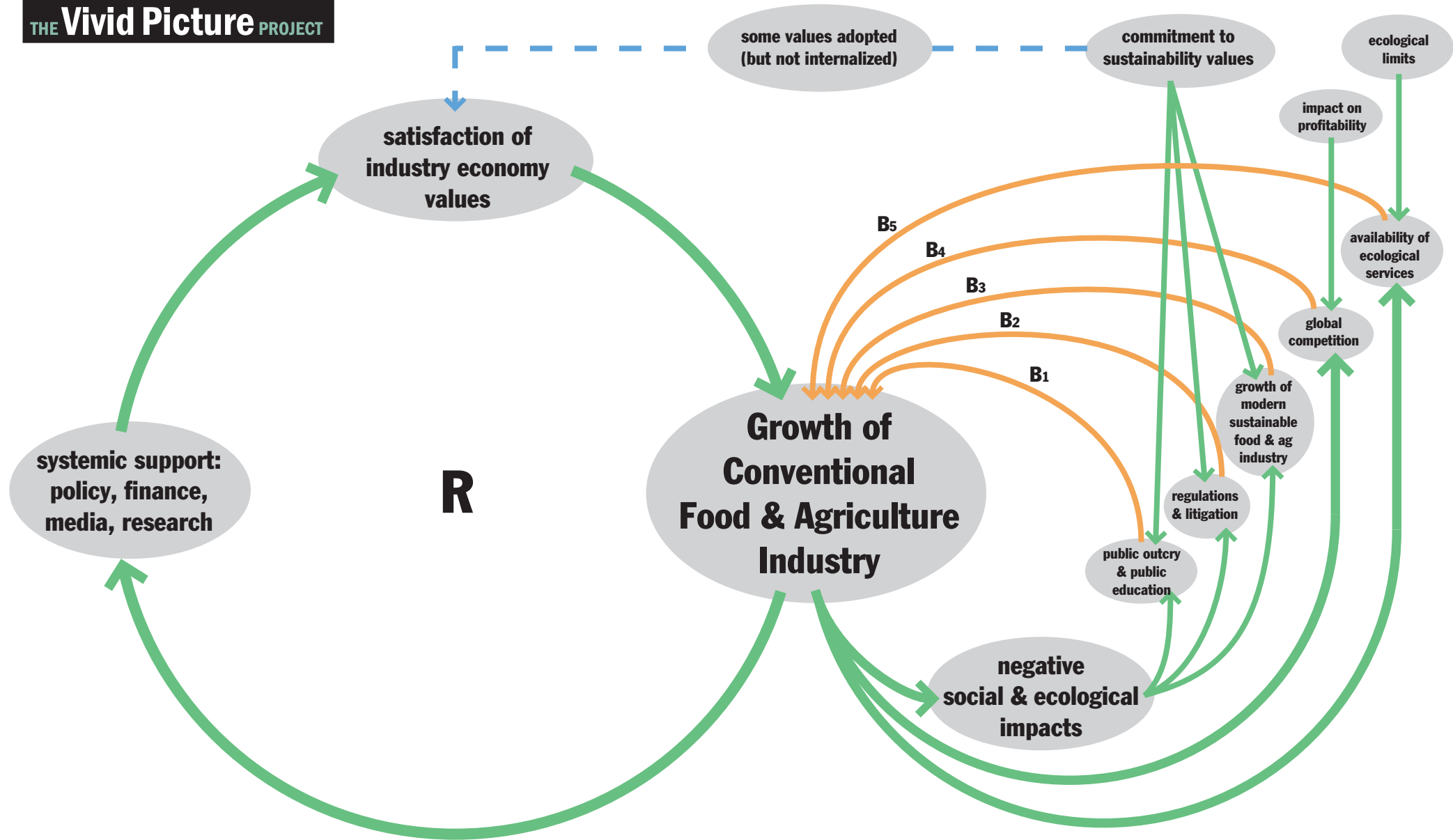
As discussed above, the negative social and ecological impacts of conventional agriculture raised an awareness of and commitment to sustainability values, thereby sparking waves of public outcry and consumer education as well as regulations and litigation.

Although these approaches have successfully limited some of the negative social and ecological impacts of conventional agriculture, they contribute to a social environment that can include an unwanted side effect: divisiveness.

A more fundamental solution would be to work to reinforce sustainability values through the opportunity-based criteria described in the Vivid Picture project. This strategy uses value-based communications to build a broadly shared vision, which facilitates the implementation of incentives-based policy and supports sustainable market development.

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Limits to the Growth of the Conventional Food & Agriculture Industry in the U.S.
 Archetype: Limits to Success

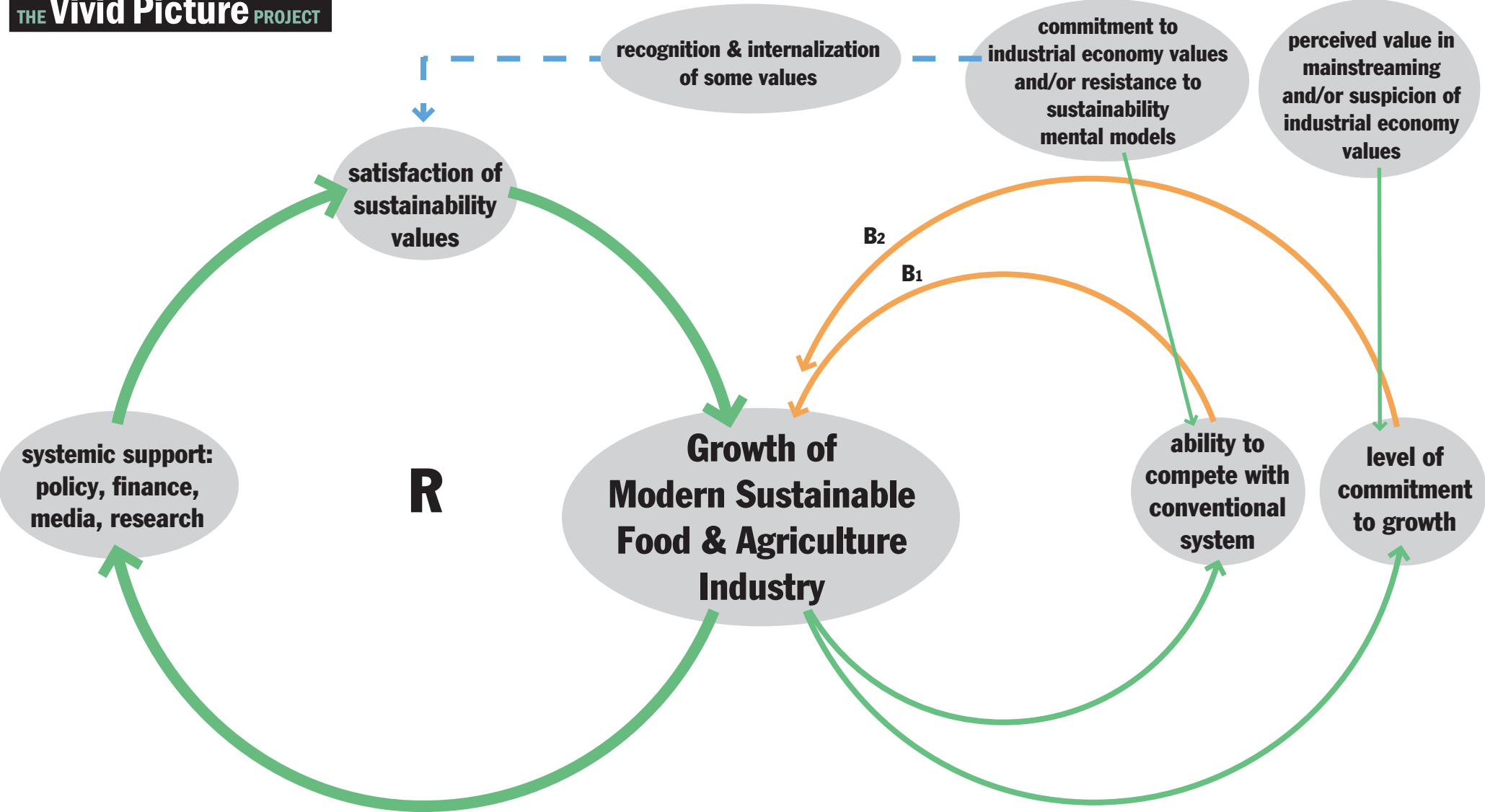
LEGEND

R = reinforcing process

B = balancing process

→ = change in same direction

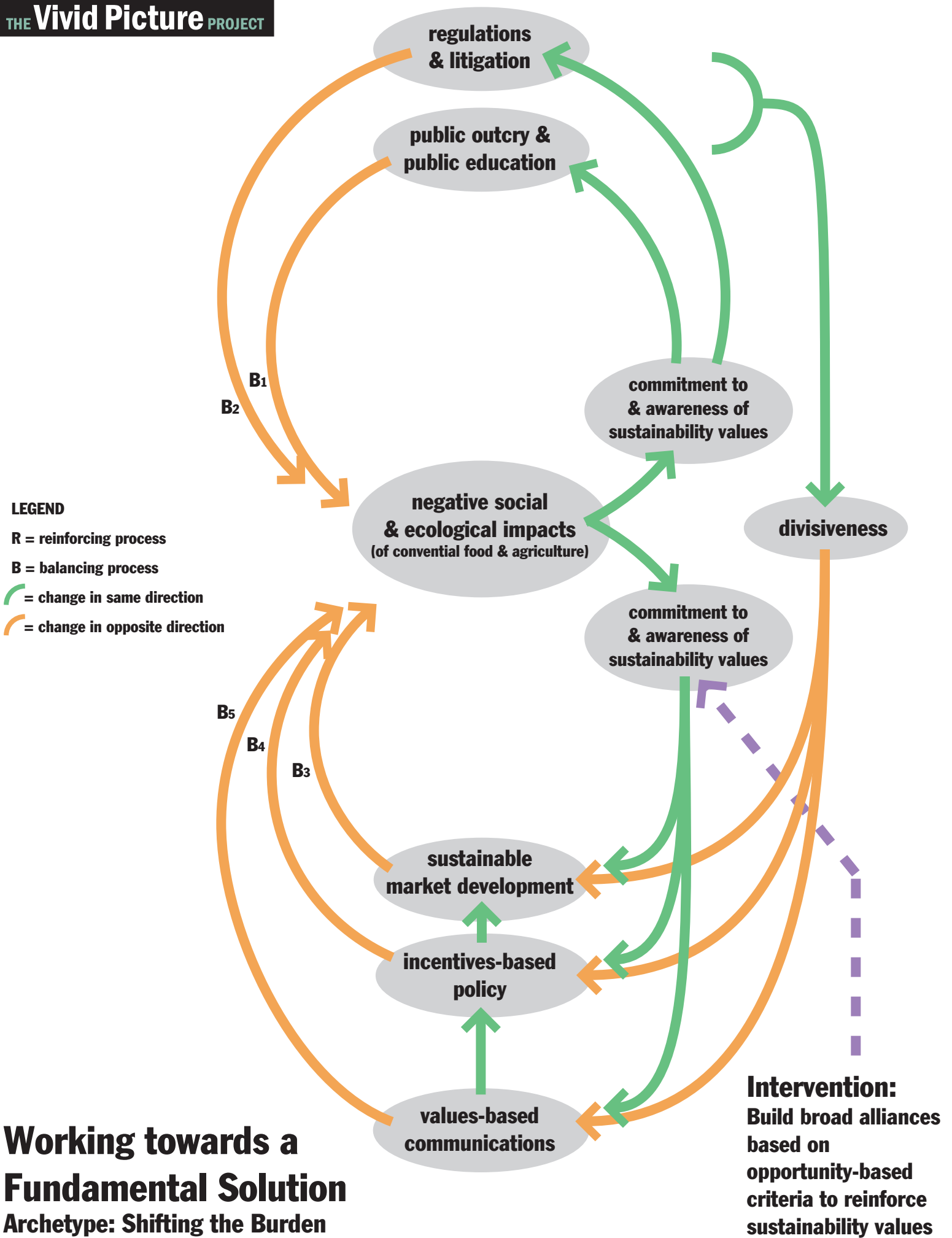
↔ = change in opposite direction



Limits to the Growth of the Modern Sustainable Food & Agriculture Industry in the U.S.

Archetype: Limits to Success

- LEGEND**
- R = reinforcing process
 - B = balancing process
 - (green arrow) = change in same direction
 - (orange arrow) = change in opposite direction



regulations & litigation

public outcry & public education

commitment to & awareness of sustainability values

negative social & ecological impacts (of conventional food & agriculture)

divisiveness

commitment to & awareness of sustainability values

B1
B2

B5
B4
B3

sustainable market development

incentives-based policy

values-based communications

Intervention:
 Build broad alliances based on opportunity-based criteria to reinforce sustainability values