Ecologically-Based Communities

Putting It All Together at the Local Level

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Authors' Note and Acknowledgments

This monograph, which advocates holistic thinking and interdisciplinary collaboration is, itself, a product of support and contributions from several organizations and individuals. Of key significance has been the role of the Kerr Center for Sustainable Agriculture as its publisher. Their long history of effective collaboration with USDA-ARS and numerous other organizations shepherded by Dr. James E. Horne, the Kerr Center's president and CEO, is reflected again by this project. Jim's early appreciation of the paper's visions and their convergence with the direction of his Center and its board of directors kept the authors' enthusiasm alive during the writing process and catalyzed the completion. The keen eye, editorial skills, patience, and consistent good humor of Maura McDermott, Kerr Center communications director, made refinement of the final version a pleasure. Tracy Clark, a graphics and design specialist, transformed a typical draft document into the effective format represented in the final product.

Special thanks must also be given to key supporters within the authors' respective organizations. Neil Shorthouse, president and founder of Communities in Schools of Georgia, Inc., provided early encouragement for the project before the ideas were refined and could be clearly articulated. Subsequently, over the last two years, he has given his own time and thoughts to the development of these approaches and worked to expand their relevance in the non-profit and education sectors. Through the artistic and computer skills of Linda Kelley, the Communities in Schools of Georgia evaluation specialist, a conceptual analogy of a house became a picture graphic and the centerpiece of the monograph. Roger Breeze, former area director of the South Atlantic area, Robert Lynch, location coordinator / research leader of the Tifton location, and national program leaders of USDA-ARS have consistently provided valuable encouragement for the development of this document and related innovative collaborative projects toward lasting solutions for agricultural and rural community issues.

With immense respect and appreciation, we express our gratitude to Professor Eugene Odum for inspiring discussions and resources used in validating the ecological basis for our arguments. Further, a number of colleagues and students served as valuable "sounding boards" during many brainstorming discussions,

including Dawn Olson, Glen Rains, Felix Wackers, Torstein Meiners, Keiji Takasu, Craig Kvien, Alton Walker, Jill Auburn, Consuelo DeMoraes, Anne Marie Cortesero, Oscar Stapel, Rich Johnson, Peter Bankston, and others.

Also, we owe special gratitude to the leaders of the city of Tifton, Georgia, for their visionary support and interactive discussion in using Tifton and the surrounding community as a working model for exploring the subject matter. City Manager Charlie Howell, Mayor Paul O. Johnson, and fellow Council Members David Hetzel, Richard Chalfant, and Roosevelt Russell are united in the view that a healthy long-term future for local communities must come through developing ecologically-sound growth strategies along the lines advocated by this monograph.

The need for rapid and bold redirections to ecologically-based practices in all our individual and professional pursuits is urgent. A revitalized sense of hope in meeting these challenges has been sparked within us by the strong support and encouragement received during this project. We are reminded of a passage from Marilyn Ferguson's *The Aquarian Conspiracy*, "Armed with more sophisticated understanding of how change occurs, we know that the very forces that have brought us to planetary brinkmanship carry in them the seeds of renewal." We dedicate this monograph as a tool to that end and hope that the readers will share with us a personal and professional renewal translated into citizenship action in our respective local communities.

FOREWORD

Deep into his book, *Ishmael*, author Daniel Quinn, speaking through the teacher, Ishmael, uses a metaphor to describe our civilization as it has arisen out of the first industrial revolution and the agricultural revolution before that. If you find yourself agreeing that maybe this civilization of ours is just not quite working out right, that something is seriously wrong, you will relate to Daniel Quinn's metaphor.

He likens our civilization to one of those early attempts to build the first airplane, the one with the flapping wings and the guy pedaling away to make the wings go. You've seen them in old film clips. In Quinn's metaphor, the man and the plane go off of a very, very high cliff and the guy is pedaling away and the wings are flapping, the wind is in his face, and this poor fool thinks he's flying. But in fact, he is in free fall, and just doesn't realize it because the ground is so far away. Why is his plane not flying? Because it isn't built according to the laws of aerodynamics, and it is subject, like everything else, to the law of gravity.

Quinn says that our civilization is in free fall, too, for the same reason:

It wasn't built according to the laws of aerodynamics for civilizations that would fly. We think we can just pedal harder and everything will be OK; pedal still harder and even fly to the stars to find salvation for the human race out there. But we will surely crash instead, unless we redesign our craft, our civilization, according to the laws of aerodynamics for civilizations that would fly.

In the metaphor, the very, very high cliff represents the seemingly unlimited resources we started with as a species and still had available to us when we threw off the habits of hunting and gathering, settled down to become farmers and, later, industrialists, and began to shape this civilization we have today. No wonder it took a while for the ground to come into sight.

But we are fortunate that there are people with better vision who have seen the ground rushing up toward us, perhaps sooner than most of us have; and others who have undertaken to discover those laws of aerodynamics for civilizations that would fly. In the latter category is the Swedish endeavor, led by Dr. Karl-Henrik Robért, to achieve scientific consensus on the principles of sustainability. Reduced to four fundamental principles, they have become recognized as the first order principles of sustainability. You might call them the consensus-derived, science-based laws of aero-

dynamics for civilizations that would fly sustainable civilizations. The four principles are expressed as the system conditions for sustainability. The "system" is the ecosystem, that thin shell of life where we and all the other creatures live, also called the ecosphere and the biosphere, that is 8,000 miles in diameter but only about 10 miles thick. From sea level, it extends about five miles down into the depths of the ocean and about five miles up into the troposphere. Relative to a basketball-size Earth, it is tissue-paper thin, and oh so fragile! For practical purposes, it sustains all life, and today, worldwide, it is in decline. It is this decline that the principles of sustainability address.

The principles are based on scientific laws of nature that have been well understood for over a hundred years, the laws of thermodynamics. They are like the law of gravity. Someone has said, "They're not just a good idea, they are the law, the law of the universe." Here are the first two laws of thermodynamics:

1. The first law of thermodynamics says that matter and energy cannot be created or destroyed. This is the principle of conservation of matter. When we burn something, it doesn't cease to exist. It changes form. When an automobile turns into a pile of rust, it doesn't cease to exist. It changes form. Every atom in the universe has always been in the universe. Every atom has existed since the beginning of time, and will exist until the end of time. It's true for matter; it's true for energy. Matter is energy. Neither can be created or destroyed.
2. The second law of thermodynamics says that matter and energy tend to disperse. A drop of ink in a bathtub disperses. It may seem to disappear, but that's through dilution; it's still there, dispersed. Every manufactured article from the moment it takes its final form begins to disintegrate and disperse. A simple water glass, through the concentration of energy and design and human labor, is transformed from a pile of sand into a container, but from the moment of its completion it begins to disintegrate. If I drop it, I will accelerate that disintegration. Another way to say it: the arrow of time flies in the direction of entropy, from order toward disorder. In a closed system, everything runs down. Everything that is concentrated eventually disperses.

Matter and energy cannot be created or destroyed. Matter and energy tend to disperse. This means that any and all matter that is introduced into society will never cease to exist and will, sooner or later, find its way into our natural systems. It will find its way. It will disperse. Toxic materials are no exception. They, too, will disperse and find their way ultimately into our bodies. These are scientific principles. We can ignore them, but they will not go away. There are other laws of thermodynamics, but these two are enough for now.

With the laws of thermodynamics for background, here are the scientifically derived (based on the laws of thermodynamics) principles of sustainability, the system conditions of sustainability published by Dr. Robért and his consensus-reaching Swedish peer group, and ratified by American peer review as well (*A Compass for Sustainable Development*, by Karl-Henrik Robért, Herman Daly, Paul Hawken, John Holmberg).

1. *Substances from Earth's crust must not systematically increase in the ecosphere.* This means that fossil fuels, metals, and other minerals must not be extracted at a faster pace than they can be re-deposited and reintegrated into Earth's crust, turned back into nature's building blocks. If substances from Earth's crust systematically and inexorably accumulate, the concentration of those substances in the ecosphere will increase and eventually reach limits. We don't know what the limits are, but beyond the limits, irreversible changes will occur. So much radioactivity that we all die; so much lead in the water that we all become sterile; so much carbon dioxide in the atmosphere that the polar ice caps melt.

2. *Substances produced by society (man-made materials) must not systematically increase in the ecosphere.* This means that man-made materials must not be produced at a faster pace than they can be broken down and integrated back into the cycles of nature, or deposited into the earth's crust and turned back into nature's building blocks. If persistent man-made substances systematically and inexorably accumulate, the concentration of these substances in the ecosphere will increase and eventually reach limits. Again, we don't know the limits, but beyond those limits irreversible changes will occur. At some point, dioxins kill. Enough dioxins will kill us all. At some point, DDT, DDE, DES, mercury-containing compounds, and PCBs begin to disrupt endocrine systems. Endocrine systems keep our species going, and keep other species going as well.

3. *The productivity and diversity of nature must not be systematically diminished.* This means we cannot over-harvest or reduce our ecosystems in such a way that their productive capacity and diversity systematically diminish. We must certainly protect the small fraction of species that are capable of photosynthesis. We must not cut down the forests. They produce the oxygen that keeps us alive. Our health and prosperity depend on the capacity of nature to re-concentrate, restructure, and reorder building blocks into new resources. Rainforests and fisheries, farmlands and aquifers must not be pushed beyond their ability to recover. Species must be preserved; diversity in nature, protected. Why? Because we simply don't know all the interconnections in the web of life, but we know we

are part of that web. It is foolish to say that we don't need this, or we don't need that. This and that lead to us.

4. ***Therefore,*** [emphasis added], ***in recognition of the first three conditions, there must be fair and efficient use of resources to meet human needs.*** This means that basic human needs must be met in the most resource-efficient ways possible, and meeting basic needs for all must take precedence over providing luxuries for a few. Otherwise, we will reap a harvest of social as well as environmental instability. If people living in wooded or forested areas cut down all the trees for firewood because they don't have another source of fuel, all humanity suffers from the loss of biodiversity, and from the erosion, climate change, flooding, and desertification that follow. Fair is one thing; efficient is another, but they are intimately connected. How can we lift the lowest economically without dragging down the highest? The answer lies in resource efficiency.

These four principles define a starting place for thinking about a sustainable society, including its sustainable industrial system without which the society cannot be sustainable. The four principles, expressed as the system conditions of sustainability, also define the desired outcome of society's quest for sustainability.

But principles in and of themselves do not produce outcomes. Intervening, there must be practices that flow from principles and produce outcomes. How, then, shall we reorganize businesses, industries, and communities and introduce those practices that will produce a society that conforms to the system conditions for sustainability? How shall we rethink and redesign such elements of society as agriculture, healthcare, human services, education, land use, business and commerce to satisfy the system conditions? How do we get civilization to "fly?" How, indeed, when we as a civilization are crashing. Of paramount importance, how shall we heal the biosphere?

As we reach for these system conditions, our organizations must systematically decrease their economic dependence on underground metals and fuels and other minerals. Our organizations must systematically decrease their economic dependence on the production of persistent, unnatural, man-made substances. Our organizations must systematically decrease their economic dependence on activities which encroach on the productive parts of nature. And our organizations must systematically decrease their economic dependence on the use of unnecessary amounts of resources in relation to added human value, i.e., they must systematically move toward fair and efficient use of resources to meet all basic human needs, and put people to work to raise their standards of living, too.

This is hard stuff. These are unrelenting principles, and they will not go away.

Today, we are violating every one of them in ways that must not go on and on and on. Species are disappearing at a rate unknown on Earth in the last 65 million years, and we are fouling our own nest, too. The laws of thermodynamics are undeniable, but no law says we must follow the principles of sustainability. That's a matter of choice. However, the principles are telling us, also in undeniable fashion, that we must, for the sake of humankind's future, fundamentally change our industrial system and all its components. There is a limit to what Earth can endure.

So, that is the challenge and, with principles in hand and the goal clear, society's quest for sustainability becomes a design problem: how to incorporate these principles into everything we do? Where are we in the process of designing, then building, the sustainable society? Just about where the Wright brothers were in 1901, just beginning, in field after field, with a rudimentary knowledge of the "laws of aerodynamics" for civilizations that would fly. It is a beginning.

The authors, Joe Lewis and Marion Jay, have focused their considerable insights, experience, and talents on the redesign of communities. Their work has produced a set of practices that the thoughtful, well-intentioned agriculturist, health or human services professional, educator, or community planner will want to embrace. Their work invites a new kind of thinking and acting. It is not for the faint-hearted, but it is enormously important to future generations.

Ray C. Anderson
Chairman and CEO
Interface, Inc.

Preface

About 18 months ago I was at Jekyll Island, Georgia, attending the annual Southern Sustainable Agriculture Working Group conference. Among the many interesting offerings were two workshops on sustainable rural communities that I was especially drawn to. The workshops were to be led by a government entomologist and an educator. I thought this unusual pairing might produce a new, interesting perspective. So I attended their workshops and was not disappointed.

Joe Lewis, the USDAentomologist, and Marion Jay, the educator, have developed, with both passion and sound science, a road map to sustainable development. They have recognized that social organizations, indeed, all life, must be built on strong and unmovable pillars of support. They have given new meaning to the phrase "pillars of the community," as you shall see as you read this remarkable paper.

Joe Lewis has drawn on his knowledge of how healthy ecosystems work and applied those principles to healthy human systems, i.e., communities. His community work in his hometown of Tifton, Georgia, has also contributed to his thinking. Marion Jay, who has worked for many years with communities and schools to solve many of today's most pressing social problems, has contributed her insights into what people and communities need in order to function at their greatest potential. This melding of the ecological and the social has led to this unique paper.

As a result of that initial meeting at Jekyll Island, the Kerr Center has continued to headline their work as we believe that their novel concepts are the foundation for the future. We are happy that we have been able to overcome the barriers that often stand in the way of private foundations such as the Kerr Center forging a partnership with individuals from government agencies. We are proud to join with them in this piece of work that we hope will spur discussions and positive action in communities across rural America.

– Jim Horne, Ph.D.,
President, Kerr Center

Executive Summary

The USAis the highest producer and consumer of goods, and the largest producer of wastes on earth (President's Council on Sustainable Development, 1996). Solid and lasting ways to manage our economic, social and natural resources more wisely must be found and rapidly implemented. Our central position is that achievement of true sustainability will require a collective ecologically-based redirection of technology, professional pursuits, and personal / family / neighborhood interactions focused toward fostering local communities. To borrow a quote from Bucky Fuller (1981), "Think globally, act locally." Herein, we offer a foundational map to guide a holistic pursuit of sustainable communities. We examine how technology and reductionist trends are impacting our society and propose conceptual models and guidelines for healthy communities drawn from natural ecosystems.

PREMISE

Certain unifying principles, including transfer of energy and cycling of materials, are known to govern the functional mechanisms of systems at all levels from individual organisms and ecosystems to the biosphere. The human race and its associated activities, including local communities, are a part of this design and are ultimately subject to these natural guidelines. Thus, the elucidation and understanding of these principles is the basis for sustainable living practices.

From our knowledge of natural systems we suggest six such inherent pillar strengths that should be fostered in communities to assure their health (Figure A).

FIGURE A

PREMISE

From the study of ecology we can identify six inherent strengths that promote health and balance of communities and other natural systems. Unbridled practice of modern trends and technology can erode the health of community and other systems. We must redirect community planning and development so that our technology is better aligned with fundamental systems principles.

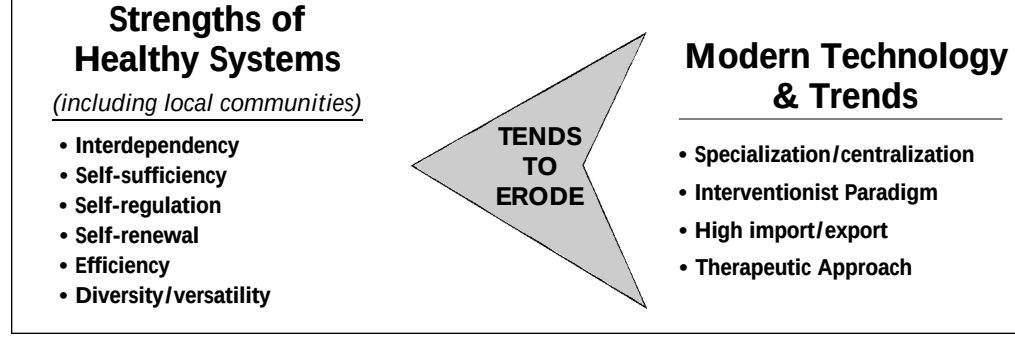
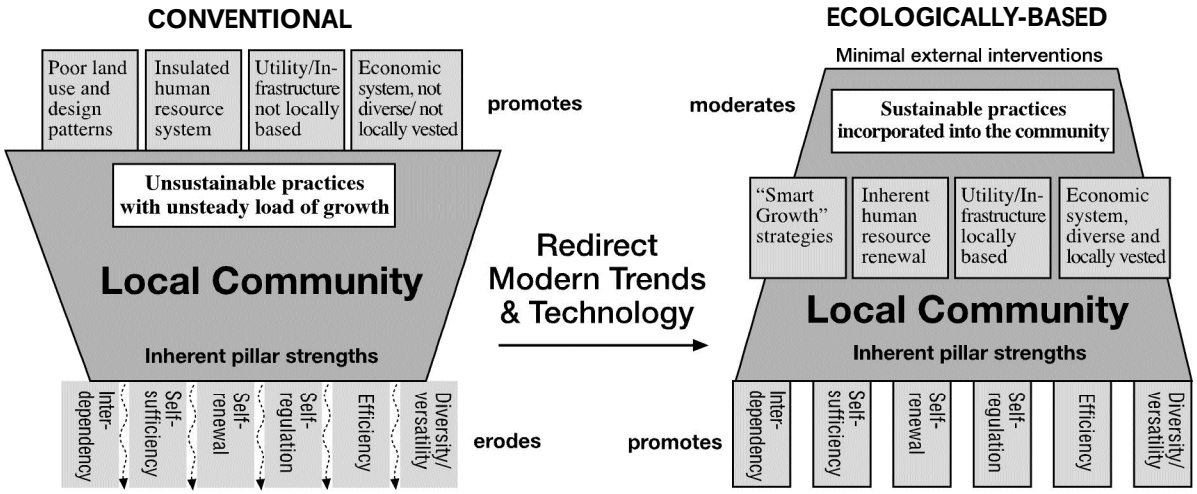


FIGURE B **COMMUNITY MANAGEMENT AND DEVELOPMENT STRATEGIES**



We must redirect our technology and operating paradigm so as to base our economic development and management on principles that promote inherent strengths and moderate the load of growth on communities. Such a redirection will emphasize practices shown in the right-hand boxes that are based on the "built-in" renewable strengths of community.

These strengths are: *interdependency, self-sufficiency, self-regulation, self-renewal, efficiency, and diversity/versatility.* On the other hand, we have identified four modern trends that place us in undue confrontation with the six important strengths of natural systems and threaten the balance and well-being of our communities: *specialization/centraliza - tion, interventionist paradigm, high import/export, and therapeutic approach.* These developments and trends, in turn, have led to numerous unwise and unsustainable practices that must be redirected in order for our local communities to deal with the realities of our modern world in a sustainable fashion. We class these unsustainable practices, as seen in figure B, into four major categories: *poor land use and design patterns, insulated human resource service system, core utility and infrastructure services not locally-based,* and an *economic system not adequately diverse and locally-vested.*

REDIRECTION

By shifting our operating paradigm and use of modern technology, we can redirect our community management and development strategies to an ecologically-based approach. The redirection should be guided by principles that promote rather than erode the inherent pillar strengths of community systems, and moderate rather than promote the load of growth. Basically, by design, these growth and maintenance processes should be based on promoting and using the "built in," renewable strengths of the community as depicted by the ecologically-based model on the right side of figure B. In boxes on the right are four ecologically-based counterparts to the four unsustainable practices mentioned above and shown as outside loads in the conventional model on

the left of figure B. They are: *"Smart growth" strategies, inherent human resource renewal, utilities/infrastructure locally-based,* and an *economic system diverse and locally-vested.*

ECOLOGICALLY-BASED GUIDELINES

The management of communities in accordance to ecological principles is in essence applied ecology. We recognize that such a process is complex and cumbersome. In fact, in accordance with the same ecological principles, the process has to be customized to each local community. Thus, no "cookie cutter" prescription can be given. However, some general ecological guidelines are appropriate and can be effectively used as a baseline tool for individual community decision-making. Suggestions along this line are presented in Figure C.

FIGURE C

PRINCIPLES FOR ECOLOGICALLY-BASED COMMUNITIES

- **Land use and design patterns based on smart growth principles that:**
  - Conserve natural resources
  - Preserve historic and cultural assets
  - Promote neighborhoods which are effectively integrated with educational, recreational, and business needs and combined with greenways
  - Provide a distribution and variety of housing choices that effectively incorporate all citizens into neighborhoods
  - Provide walking, cycling and transit as desirable alternative to automobiles
  - Provide urban to rural interfaces that support farm to in-town relationships
- **An inherent human resource renewal system that:**
  - Promotes formal/informal life-long learning for all citizens through intergenerational, peer-to-peer and team processes
  - Fosters strong mutual respect and interaction between schools, parents, other citizens and business
  - Provides processes by which health care, habilitation, and other human services are provided primarily by natural supports with professionals serving as a complement
  - Promotes an environment which nurtures and incorporates the diverse gifts and participation of all citizens
- **Strong local sufficiency In core infrastructural needs insured by:**
  - Local government-owned or authority-owned and operated services which are responsive to the voice of citizens
  - Private locally-owned and -operated services and/or
  - Locally designed and operated public/private partnerships
- **Industry/business strategy that:**
  - Is diverse and strongly invested in the community
  - Maximizes coexistence of local businesses with nationally- or regionally-owned chains
  - Seeks and negotiates agreements by which all industry/business participants are strongly Invested as corporate citizens
  - Seeks broad balance of business sectors that respect and support community integrity.

GUIDING RULE

Do the proposed actions promote the community pillar strengths of interdependency, self-sufficiency, self-regulation, self-renewal, efficiency, and diversity/versatility; while buffering the eroding trends of specialization/centralization, interventionist paradigm high import/export, and therapeutic approach?

Introduction

Since the Great Depression, American society has experienced golden years of prosperity and quality of life improvements. More Americans than ever before are homeowners. Also, advancements in technology, whether it be in transportation, comfort or educational access have enhanced the ease of living for most families. However, it is becoming increasingly clear that these enhancements have a hidden price tag.

The USA is the highest producer and consumer of goods, and the largest producer of wastes on earth (President's Council on Sustainable Development, 1996). Our own welfare and that of future generations is increasingly at risk by the failure to manage our economic, social and natural resources holistically.

Consensus is mounting that we must make profound changes in the near future to avoid severe system-wide breakdown at the biosphere level (Tibbs, 1996). The consequences of unsound practices are evident across the nation. For example, the state of Georgia is experiencing serious air quality and storm drainage problems in the Metro-Atlanta area, with no clear long-term solution in sight. At the same time, this state, which once boasted of an abundant water supply, now faces imminent water shortages among the competing needs of North Georgia, downstream rural South Georgia, and Alabama and Florida (Jordan, 1998; Kundell, 1997, 1998).

These natural resource issues are compounded by major human resource issues such as a reported national drop-out rate of 11.8% (various states report much higher rates: the Georgia Department of Education *Report Card* 1998-99 shows a rate of 31.2%; Oregon in '98-'99 reports rates by county from 2.52% to 38.87%; in the *Texas Public School Dropout Report* the rate is 14.7%). Other issues of concern: teen pregnancies (national rate of 34 births per 1000 females ages 15-17, *'99 Kids Count Data*), drug abuse, school violence, and extensive crime problems that are overloading our courts, jails, and associated budgets. At the same time, pressing economic issues have surfaced around matters such as the survival of family farms and a qualified workforce to fuel our industries. Our robust economy and social fabric cannot continue to withstand these mounting loads. Solid and lasting solutions must be found and rapidly implemented.

Attention is being given to these emerging concerns both at state and national levels, including the President's appointment of a Council on Sustainable

Development referenced earlier (see *Sustainable America: A New Consensus for Prosperity, Opportunity, and a Healthy Environment for the Future*, 1996). Much of this concern is centered on environmental issues and sustainability of natural resources. Many businesses are finding that an emphasis on better waste and pollution management and other ecological concerns is, in fact, good business. An excellent example of how a business can change to more ecologically-friendly methods and benefit accordingly is discussed by Ray Anderson, CEO of Interface (1998). He documents how his company, through more ecologically sound practices, is "doing well by doing good." Further, within various professions a shift to holistic approaches and attention to sustainability is receiving emphasis at varying levels and with varying degrees of success.

Yet, attention to sustainability issues at local community levels has been limited and fragmented. Efforts are underway in many communities to deal with pollution, sprawl and other natural resource issues. Concurrently, multitudes of programs are being proposed and initiated in response to massive social and economic challenges facing local communities. However, these various diverse initiatives are seldom integrated or holistic in nature, and no solid framework for such a community systems approach appears to be readily available.

The purpose of this report is to provide a foundational map to guide our pursuit of sustainable communities. To that end we examine how technology and reductionist trends are impacting our society and propose conceptual models and guidelines for healthy communities drawn from natural ecosystems. Our central position is that achievement of true sustainability will require a collective ecologically-based redirection of technology, professional pursuits, and personal / family / neighborhood interactions, all focused toward fostering strong local communities.

Premise

A well-known ecological principle is that the universe is made up of systems within systems. Certain unifying principles of the universe are known to govern the functional mechanisms of these systems at all levels from individual organisms and ecosystems to the biosphere. The human race and associated activities, including local communities, are a part of this design and are ultimately subject to these natural guidelines. Thus, the elucidation and understanding these principles is the basis for sustainable living practices.

Two forces unify all components of the biosphere:

1) The cycling, transformation and transport of essential materials among the various components of the biosphere (i.e. oxygen, carbon, hydrogen, calcium, phosphorous, nitrogen, etc.); and
2) The process of capture and distribution of energy necessary to power the activity of living organisms, ultimately from the sun through the photosynthesis of green plants and indirectly transported to all other living organisms through interactions of herbivores, carnivores, etc. In other words, we are dependent directly or indirectly on these exchange processes with green plants for the basic energy required for our survival, including walking and breathing.

Life would soon cease without the proper functioning of these basic processes. Humankind is inextricably linked and bound by these forces, as are all other organisms. These basic requirements for energy and essential materials, along with the additional interdependent needs for reproduction and protection, (and in the case of humans, spiritual, nurturing and cultural needs), bind various groups of organisms into communities.

The basic ecological definition of a community is a group of interacting and interdependent population of organisms, which share a common environment and form a fairly complete structure for the capture and release of energy and cycling of materials. For the purposes of our discussions we define a local community as the people living in an area along with the environment and associated natural resources. See basic ecology textbooks e.g. Odum (1971), Krebs (1972) for further discussion of this subject. These local communities evolved through people coming together for mutual benefit and to meet interdependent needs for energy, materials and relationship.

Certain inherent features are central to the healthy functioning of communities and other natural systems and enable them to maintain balance and minimize the impact of adverse encounters. From the knowledge of natural systems we suggest six such inherent pillar strengths that should be fostered in communities to assure their health (Figure 1). These strengths are:

Interdependency– The various components of a system, such as various members of a community, come to exist together due to interdependent needs of energy, cycling of materials and other interactive needs. The presence of an entity not connected through some avenue of interdependence can be highly disruptive.

Self-sufficiency– By definition a community is a fairly complete group of inter-dependent organisms along with their environment. Minimal reliance on external providers, especially for core needs, assures greater stability.

Self-regulation– Natural ecosystems maintain a balance within certain bounds. This factor is known as "balance of nature" or "homeostasis." This balance is maintained through an array of biofeedback loops. Asimple example of this would be where populations of predator and prey such as the fox and hare are maintained within certain levels by what is termed "density-dependent" relationships. As the number of hares increases, the rate of predation (foxes) increases or vice-versa.

Self-renewal–The ability of organisms of a community to provide for their adequate perpetuation via effective reproduction, defense, and other strategies, as well as the necessary materials for their well-being, determines the ultimate survival of their species.

Efficiency– In natural systems there is no waste, and high efficiency is assured through natural selection. Furthermore, maximum use of resources is assured through food web/chains and recycling of materials, i.e., one animal's waste is another animal's food, etc.

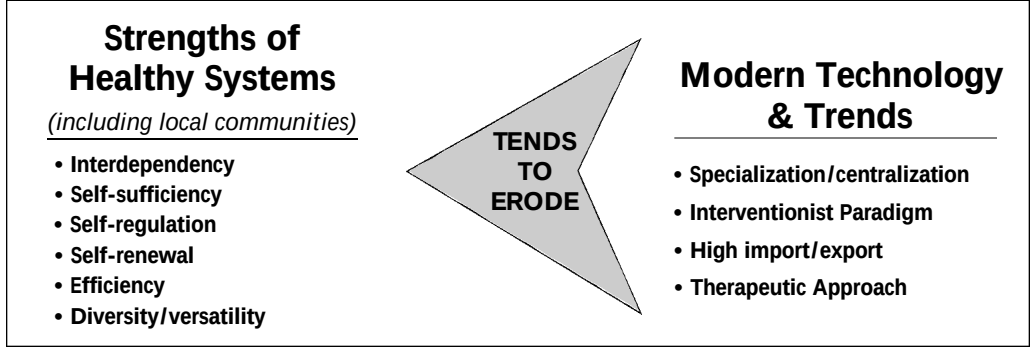
Diversity/versatility– Diversity is a vital feature for stability of a system. It provides the ability to cope with cycles of fluctuating conditions. At the individual organism level the corresponding feature for diversity is versatility.

Modern science and associated technologies has brought about a way of thinking and an array of interventions that offer serious challenges to these inherent attributes of healthy communities (see Flint and van den Bosch, 1981 for a basic discussion of this subject as it relates to pest outbreaks and management). Science by traditional design is based on reductionism, which requires subdividing things into parts for specialized study, versus holistic views. Reductionist perspectives together with tech-nological advances have brought many short-term benefits such as flexibility in

FIGURE 1

PREMISE

From the study of ecology we can identify six inherent strengths that promote health and balance of communities and other natural systems. Unbridled practice of modern trends and technology can erode the health of community and other systems. We must redirect community planning and development so that our technology is better aligned with fundamental systems principles.



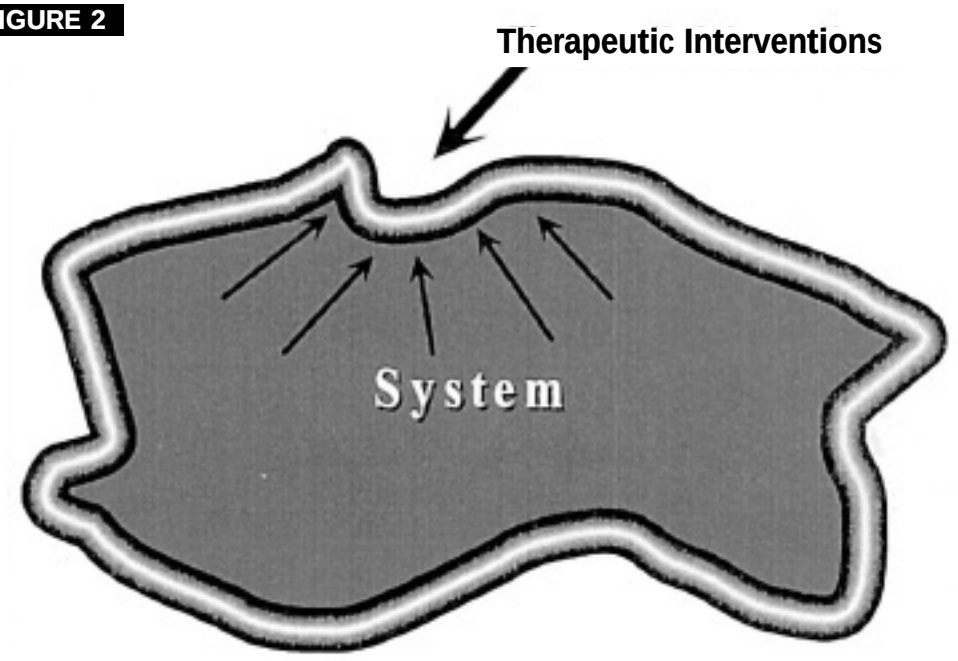
modifying our surroundings and in the production of goods for subsistence (food, clothing, and shelter) and various pursuits of happiness (transportation, communication, medical, and the fine arts) while appearing to fuel an insatiable need to consume. However, the over-reliance on these technologies has given us a false sense of freedom from the connectedness and accountability to the governing principles for local communities, the global network and the natural world. For the purpose of this discussion we have identified four trends stemming from such approaches that have placed us in undue confrontation with the six core features mentioned earlier and threaten the balance and well-being of our communities. We will be referring to these four trends as "potentially eroding trends" (Figure 1). The four trends are:

Specialization/centralization– The reductionist perspective has resulted in the development of professions and infrastructures being formed around isolated components of communities at the expense of recognizing and appreciating the importance of the total system. Furthermore, this perspective has fostered the formation of organizations which are unaligned with and unresponsive to natural systems.

Interventionist paradigm– Our weakened appreciation of the integrity and inherent value of natural systems has led to both a false liberty to intervene into these systems and to a misconstrued sense of short- and long-term costs versus benefits of such interventions.

High import/export– This same lack of respect for the integrity of natural systems and assumed liberty for interventions has further led to unbridled transfer of resources among systems, which are often disconnected and distantly separated. Such transfer of resources among systems is highly disruptive and eventually leads to an array of undesired consequences.

FIGURE 2



Therapeutic inputs may be spectacularly effective initially, but due to the intrinsic tendency of natural systems to maintain balance and their ability to neutralize external interventions, increasingly higher doses are required to achieve the same results.

Therapeutic Approach– The predominant modern day approach for managing undesired variables or symptoms within systems, most of which are created by our unwise interventions and/or management, is the use of therapeutics, which is never sustainable, and ultimately evolves into a treadmill (Figure 2).

Throughout the paper we will explore in detail how these modern trends impact the course of our various professions and society. However, so as to more clearly establish the premise of our discussion let us briefly examine, at this point, how these trends can affect the health of local communities. A clear example of modern trends is the centralization and specialization process by which vital goods and services are provided to local communities. Due to this centralization, the providers of these goods and services are no longer interdependent components of the local community system and can jeopardize the balance and sustainability of the community. This disruption can develop in a number of ways. For example, a large chain store which sells low-cost clothing could eliminate the market for small local clothing stores thus leaving the community with a sole provider. As is apparent, this situation reduces the features of diversity, self-regulation and self-renewal, leaving the community greatly weakened. In a similar way this situation can occur within the human services profession. For instance, when the support to people with disabilities comes from

centralized professional organizations that are not part of the community, the natural community supports such as churches, families and neighbors begin to turn this responsibility over to the "professionals" and discontinue their natural supports.

This major pattern toward specialization/centralization further leads to infrastructures and decision-making centers removed from and inaccessible to local communities. The system for production and delivery of goods and services under this paradigm consists of centralized headquarters, production, distribution and retail centers often distantly separated and disconnected from these local settings. Such infrastructures rely on high import/export processes and are disruptive to community interdependence and self-sufficiency. It is obvious from these examples that the major trends toward specialization/centralization and interventionist paradigms are of potential concern to the sustainability of local communities. A multitude of environmental, economic and social consequences have arisen that can be ultimately traced to these trends. Through our failure to appreciate the interconnectedness and holistic nature of these problems, we have invested heavily in the development of therapeutic approaches for their resolution, which in and of themselves create further consequences.

Entire industries have emerged around such therapeutic interventions. Such approaches are highly disconnected from the principles of healthy systems. On the surface it would seem that an optimal corrective action for an undesired entity is to apply a direct external counter force against it. However, there is a long history of experiences in medicine and social science where such interventionist actions never produce sustainable desired effects (Figure 2). Rather, the attempted solution becomes the problem. (See Waltzlawich, et al., 1974, for a discussion of this subject with coverage of underlying mathematical principles.) One vivid example of this is the problem of addiction as a consequence of the use of drugs for treatment of pain or mental distress. Another is black market crime as a repercussion of the use of prohibition as an intended solution for alcoholism.

Thus, as a matter of fundamental principle, application of external corrective actions into a system can be effective only for short-term relief. Long-term sustainable solutions must be achieved through restructuring the system so that inherent forces function via feedback mechanisms. In the case of substance abuse the question would be to discover the causative factors for the increased use of drugs and alcohol. A possible alternative to tougher laws, penalties, and attempts to limit the availability of such substances would be to eliminate the need and market for such substances. These examples are at the individual level. At the community level the design or the approach for dealing with such causative factors must include an appreciation of the

interactions of the full array of cultural, physical, economic and social components. Thereby, the foundation for such a sustainable approach must be built on understanding the attributes of a healthy, "in-balance" community and ways to nurture such a design.

As we can see, these modern trends tend to violate the core features important to sustainable communities. Our premise is that the development of healthy communities will require a redirection of our paradigm and practices so as to maximize the six core principles drawn from natural systems while moderating the adverse impact of modern trends. However, from our study of natural systems, we also know that a crucial feature of a healthy system is the ability to adapt to changes. Thus, it is important to realize that these modern trends are realities. It is our objective to explore ways to understand these principles and apply them in ways that strengthen our community's ability to deal with these trends in a practical yet sustainable manner. Readers are referred to Senge et al. (1994), *The Fifth Discipline: The Art and Practice of the Learning Organization*, for related information as it applies to business organizations. In this book and with subsequent undertakings, Senge and colleagues advocate the use by organizations of similar principles to guide their practices and adjustment to change.

We do emphasize that our premise further requires that the redirection and application of these ecologically-based principles must be applied at the local community level. To bypass these local units of our biosphere and universe would in and of itself violate ecological principles. As we mentioned earlier the integration of our various professions and other interrelated activities should be primarily based at these local levels. All other classifications such as regions, states, nations, and sometimes counties are arbitrary groupings. These groupings can serve useful purposes but cannot substitute for the authentic role of local communities. To borrow a quote from Bucky Fuller (1981), "Think globally, act locally."

Case History Examples

Let's examine the trends of several representative components of our society and then analyze these patterns in context with the need for more sustainable living practices.

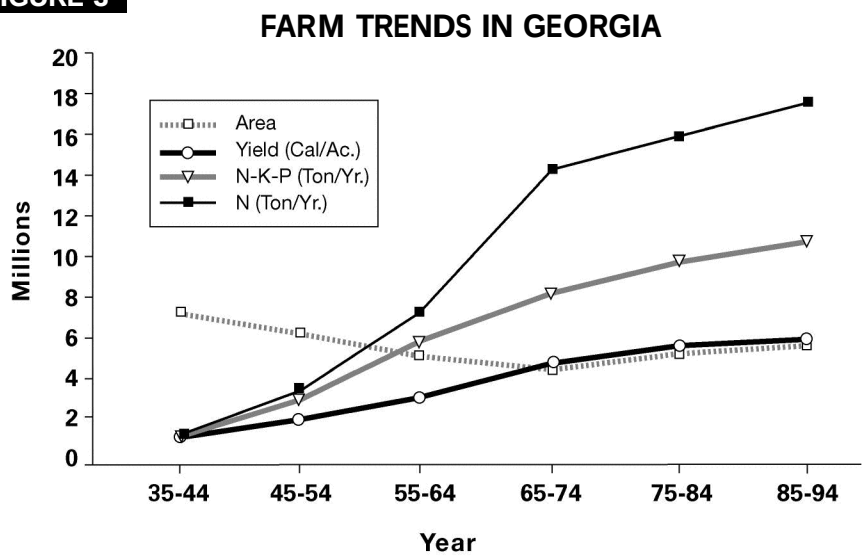
AGRICULTURE

Humankind has a long and rich history of cultivating plants and animals as resources for food, fiber, shelter, and other needs. Historically we have cultivated these organisms on farms, which we term more ecologically as agroecosystems. Farmers were in many ways the world's first ecologists. Though their objectives have always been to manipulate these systems to maximize the production of desired harvests, farmers have long recognized the importance of respecting and preserving the long-term health of their farms. They have long known that these agroecosystems are governed by the core principles of interdependence, self-regulation, self-renewal, efficiency, and biodiversity. Thus, they were careful to foster these components of the system by such practices as crop rotation, intercropping, recycling of residue, and use of cover crops. They further recognized that healthy systems provided a "balance of nature" where needs for costly inputs of pesticides, fertilizers, and tillage were minimal.

Major technological developments and organizational trends in the agricultural infrastructure have dramatically changed many of these ecologically-based farm practices. Our general trend toward scientific reductionism and specialization has reduced our level of focus on the interdependence of the various components of agroecosystems such as soil health, plant health, insect pests, and plant disease outbreaks, and natural enemies of pests. Furthermore, through these specialty subdisciplines have emerged remarkable tools such as chemical pesticides, synthetic fertilizers, and large-scale tillage and cultivation machinery. These therapeutic tools provided spectacular short-term solutions for problems such as soil nutrition, and insect, weed, and plant disease pest occurrences.

With the availability of these tools, emphasis on inherent, self-renewing regulators such as biodiversity, natural enemies of pests, and recycling of nutrients generally fell by the wayside. In the near-term, the dosages and cost of these therapeutic solutions was nominal. Thus, the practice of monoculture and high-input agriculture surged along with spectacular increases in yields per acre (see Figure 3 drawn from Odum et al., 1987).

FIGURE 3



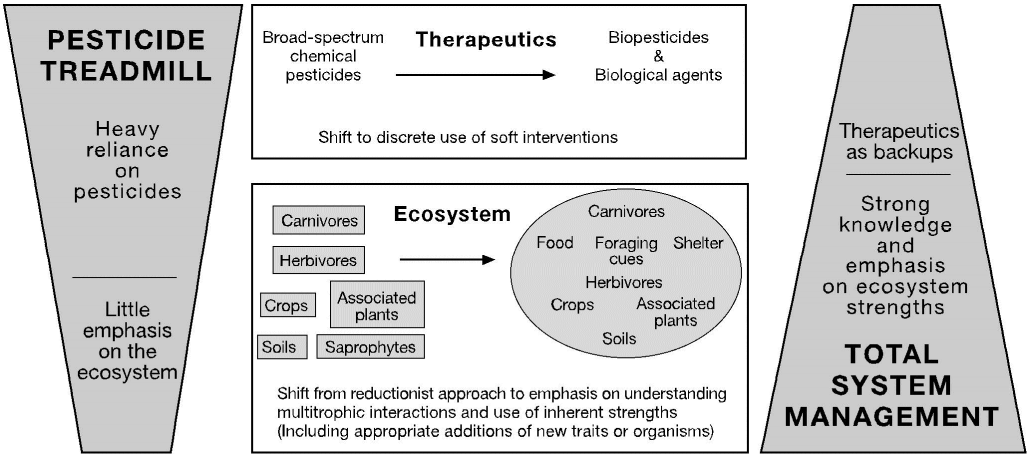
Through the use of modern tools during the last 50 years, the yields per acre have quadrupled, but not without a heavy price. To maintain results, nitrogen use has increased 11-fold and general fertilizers 7-fold. Increases in pesticide requirements have been much greater. As shown, benefits are diminishing.

However, due to the characteristic of all systems to neutralize external interventions as mentioned above and illustrated in Figure 2 (in this specific case the neutralization occurs through pest resistance, reduced numbers and effectiveness of natural enemies, etc.), more and more of these materials are required to achieve acceptable results. Also, the reduced biodiversity through the practice of monoculture, reduced soil health through erosion and lack of residue recycling, and increased pollution of our soil and water with the high chemical input has severely weakened the inherent strength of our natural resource base. Consequently, there are the worsening problems of low profit margins and unreliable production. The general sustainability of American agriculture is in question.

This major trend in agriculture has been so prevailing that the entire industry infrastructure is centered on a therapeutic-based "product solutions" paradigm, rather than a preventative-based "process solutions" paradigm. Therefore, the primary means of resolving the mounting problems is still to seek new and better therapeutic tools, versus exploring the more holistic question of why these variables are occurring, and seeking to redesign the specific agroecosystem so that the solutions are "built-in" and renewable (Figure 4, drawn from Lewis, et. al., 1997).

An associated concurrent trend in the infrastructural organization of agriculture is important to our subject matter. As with other industries there is a strong pattern toward centralization of the ownership and operation of all phases of the agricultural

FIGURE 4 **SUSTAINABLE PEST MANAGEMENT SYSTEM**



industry, including production, processing, and marketing. For any particular farm commodity, these various centers for production, processing and marketing may be substantially separated geographically. Modern transportation and communication systems along with the monocultural / therapeutic-based approach accommodates this centralization trend. Substantial concern has emerged regarding how this trend, including the mergers of supermarkets, is affecting the availability, distribution and pricing of quality food. (See the Winter / Spring issue of *Community Food Security News*, 1999). However, our family-based small farm operations cannot effectively compete and survive where such large-scale technology investments and frequent updates are required. The future of a centralized corporate farm operation is not tied to the well-being of the natural resources of any one agroecosystem, as is the case with a family farm. Furthermore, corporate farm operations are not as interdependent with the other components of a given local community. Thus, the shift toward corporate-based farming along with the overall trend toward centralization and therapeutic-based solutions seriously jeopardizes the overall health and sustainability of our rural communities, directly and indirectly.

HEALTH CARE

As emphasized in McKnight 's discussion of *The Careless Society* (1995), the medical profession has historically been based on respecting the integrity of individuals and their families and other relationships. The physician's oath provided by Hippocrates, the founder of western medicine concludes with the primary mandate, "this above all, do no harm." This oath was obviously based on the recognition that every intervention has negative as well as beneficial outcomes. Much

of the positive reputation of the health care profession is derived from years of careful practice based on this respect for the sacredness of natural systems and the need for caution when intervening into these systems. Despite this long-standing tradition, the health care field has experienced the diminishing benefits of modern technology as have all the other professions.

The specialization / centralization trend has resulted in large centralized health care organizations and centralized hospitals and other medical facilities. The bureaucratic structures of such entities have dramatically weakened the doctor-to-patient relationships characteristic of and crucial to the holistic premise of the Hippocratic oath. Health care administrators often justify these specialization / centralization patterns and health care companies by arguments that these actions are required in the interest of cost containment and availability of high technology treatments. However, mounting data and the experiences of both patients and practitioners clearly reveal that these trends are adverse to effective health care (Schwarz 2000, Williamson 1997). Demonstrated weaknesses in this direction include: long waits and limited choices in physicians for patients, limited physician discretion in choice of treatment options, family disruptions, etc. Furthermore, rather than cost containment being achieved, direct and indirect health care costs have skyrocketed. An entire managed care industry has developed around these issues.

In addition to the centralization pattern, the advent of prescription drugs and procedures stemming from technological advances have led to expectations of "quick fixes" for all maladies. All therapeutic interventions, such as antibiotics and painkillers, are seemingly miraculous on the short-term, but lead to secondary problems and eventually become ineffective. As indicated in a previous discussion, the "solution becomes the problem" and the treadmill effect continues to be created. Mega-pharmaceutical and other "quick fix" industries have developed to fulfill the ever-expanding desire for these instant solutions for all ailments. The holistic view is lost in this pursuit for easy remedies, and an appreciation of the value of the inherent strengths derived from nutrition, rest, exercise and other preventative-based health care management is overshadowed (Reed 1998).

There are strong initiatives within the health care professions to reconnect practices to the inherent strengths of the body and the importance of the individual's overall context (Rogers 1994, Cowling 2000). These initiatives are based on recognition of the interdependence of all components of the body, including interpersonal and environmental interactions. Further, an appreciation of the body's ability to self-regulate, self-renew and adapt to changing conditions is possible within this

paradigm. This shift recognizes the importance of viewing the inherent strengths as the first team and therapeutic interventions as the second team, which must work with and complement the first team. A return to a well-grounded doctor-to-patient relationship based on partnership and trust is a vital component of this approach. From this perspective caregivers recognize the importance of integrating health care with other components of the patient's overall family and community life (Gueldner, 1994). There are major movements, literature, services, and products offered in the areas of alternative and holistic health care. However, these movements are subject to exploitation, and strong caution must be used to assure an authentic basis for the service or product. Mainstream health care institutions have taken considerable steps to blend these redirections into their practices. However, this approach will require further restructuring of the health care infrastructure and operating philosophy, and major shifts to more effectively align it as a component of local community systems.

HUMAN SERVICES

Culture is, by and large, exclusive to human society. As a part of cultural activities humans have historically faced the question of how to handle those individuals who for various reasons are perceived as unable to effectively participate in typical community activities and responsibilities. People who usually fall into this category include the elderly, the disabled, the chronically ill, the mentally ill, the impoverished and those addicted to drugs and alcohol. Some portions of our history of dealing with these differences are not laudable. An example is illustrated by Wolfensberger's monograph *The Origin and Nature of our Institutional Models* (1975) regarding the Puritans' response to difference. He states that the Puritans looked with suspicion on any deviation from behavioral norms, and irregular conduct was often explained in terms of the supernatural, such as witchcraft. He further states that there is reason to believe that retarded individuals were hanged and burned on this suspicion. To our credit, there are also many historical examples of the more caring, humane and ecologically-based approaches. Many of us who grew up in more rural and less technologically-advanced settings remember people with mental retardation, people with mental illness, people with chronic illness, and the elderly being fully incorporated through natural supports in more productive and meaningful ways.

In an attempt to provide a more systematic means of care, the professional field of human services developed. With this specialization there has been a continuous trend toward centralization in the form of institutions and a strong emphasis on therapeutic interventions. This interventionist/institutional approach holds true for all

populations who have been defined as deviant. However, let us use examples from the field of disabilities to illustrate this trend.

In the field of disabilities, and in particular, in the area of mental retardation, there is a long history of trying to do the right thing. Wolfensberger (1975) reveals the history of societal perceptions and their implications for people with disabilities. Too often these perceptions were ones which focused on the deviances of people with disabilities rather than on their humanity. In an effort to provide care for this population, a movement began in the mid 1800's to build institutions for people perceived to have disabilities. These institutions or "schools" as they were often called, were intended to provide safety, care, and training. Typically these institutions were built in rural settings apart from population centers. This movement grew with ever increasing numbers of people with disabilities being sent to these institutions "for their own good." Families were often advised by physicians that it would be in the best interest of the child and his/her family for the family to send its infant or young child to an institution as soon as possible. The largest of these institutions was in Georgia. By 1970, Central State Hospital located in Milledgeville, Georgia, had a population of 20,000 residents. At about this same time, the abuses within these institutional settings began to be exposed. The most famous of these was the lawsuit brought in New York against Willowbrook Institution. The realities revealed by this suit began the national questioning of institutional models and the recognition that institutions had failed to provide protection, care, or training for the people for which they were designed.

This trend, as illustrated by the field of disabilities, is representative of the institutional/centralization approach of the human service field in general. All of the eroding trends are present in this pattern. Institutionalization, by design, assumes specialization/centralization, and the placement of people in these institutions apart from their families and community is high import/export in nature. Furthermore, this approach is highly interventionist in that it disrupts natural family and community relationships while assuming that professionals "know best." Also, it is based on the therapeutic approach, in that the intervention and removal of the people with disabilities will solve the problems for the family and the community and/or the institutionalization will resolve the ailments of the individuals. The consequences of these interventions are the same as for any other therapeutic intervention. In giving the responsibilities to the professional the families and communities step back and become generally less capable of providing for the needs of people seen as deviant or devalued. Thus the solution becomes the problem and even more therapeutic interventions are required leading to the typical treadmill. Entire industries have been

built in pursuit of fulfilling these ever-increasing needs. Examples of such industries are large companies that offer to state departments residential or case management services for an entire state. We are now prone to "institutionalize" family members not typically seen as deviant. For example, due to our highly mobile way of life, including working long distances from home, we place preschool children in daycare centers and elderly parents in personal care homes or related institutions as opposed to in-home settings. Clearly, these practices contribute to the weakening of the fabric of our homes and neighborhoods as discussed in other sections of this paper.

It has become apparent that this interventionist / institutional approach is not sustainable, either socially or economically. As with any therapeutic approach, the inherent strengths are becoming increasingly weakened, while the need for further treatments / intervention and their costs are escalating. The results are that families and communities are caught in a dilemma. On the one hand their capacity for natural supports has become severely limited, while on the other hand costs for professional service are prohibitive. For example, the cost of institutional care for people with mental retardation has escalated from $542 per year in 1926 (Wolfensberger, 1975), to $95,000 per year in 1999. Community and state leaders along with policymakers have recognized the futility of this approach and have begun seeking alternatives.

In the mid 1970's a movement began to return people with disabilities to their home communities. The challenge was to re-think societal perceptions of both the people with disabilities and their capacity to contribute to society. Early descriptions of this effort were called normalization. Professionals and families continue to struggle to design supports that are sustainable and that focus on people with disabilities as equal and contributing citizens. The most natural of these processes is one known as personal futures planning (see O'Brien and O'Brien, 1998, for a detailed discussion of this process). Interestingly, the futures-planning process, in its design, adheres to all of our ecological pillars. All futures-planning begins by gathering the person with a disability and all the people who care about him / her in a comfortable setting for vision-sharing and discussion. It is critical that family and friends, not just professionals, be present. The process is documented utilizing chart paper and graphic representations of the discussion so that everyone can participate and see their ideas recorded. The assets and interests of the person with disabilities are the focus. In this way, respecting the competency of the person manifests the pillar of self-sufficiency. Further, the design of personal futures-planning acknowledges the pillar of interdependence by including all the people who have a relationship to the person with disabilities. This process is self-renewing because it focuses on natural supports

rather than solely on staff or professional services. The design assures that the interest and desires of the person with disabilities actually drives the process. The process actually assures that the person with disabilities is in control. This control combined with the participation of people who are not paid to be there results in self-regulation. The pillar of efficiency is readily supported in that many of the activities or processes are ones that can best be negotiated by friends and family members rather than paid staff (i.e engaging the person with disabilities in the life of a church). These efforts require no increased cost and utilize existing networks within the community. Finally, because the process emphasizes inclusion of the person with disabilities in typical community activities rather than segregated and professionally designed services, the pillar of diversity / versatility is adhered to. The importance of this different way of thinking is that by adhering to the ecological principles it is assured that people with disabilities are fully integrated into the community rather than distanced from it.

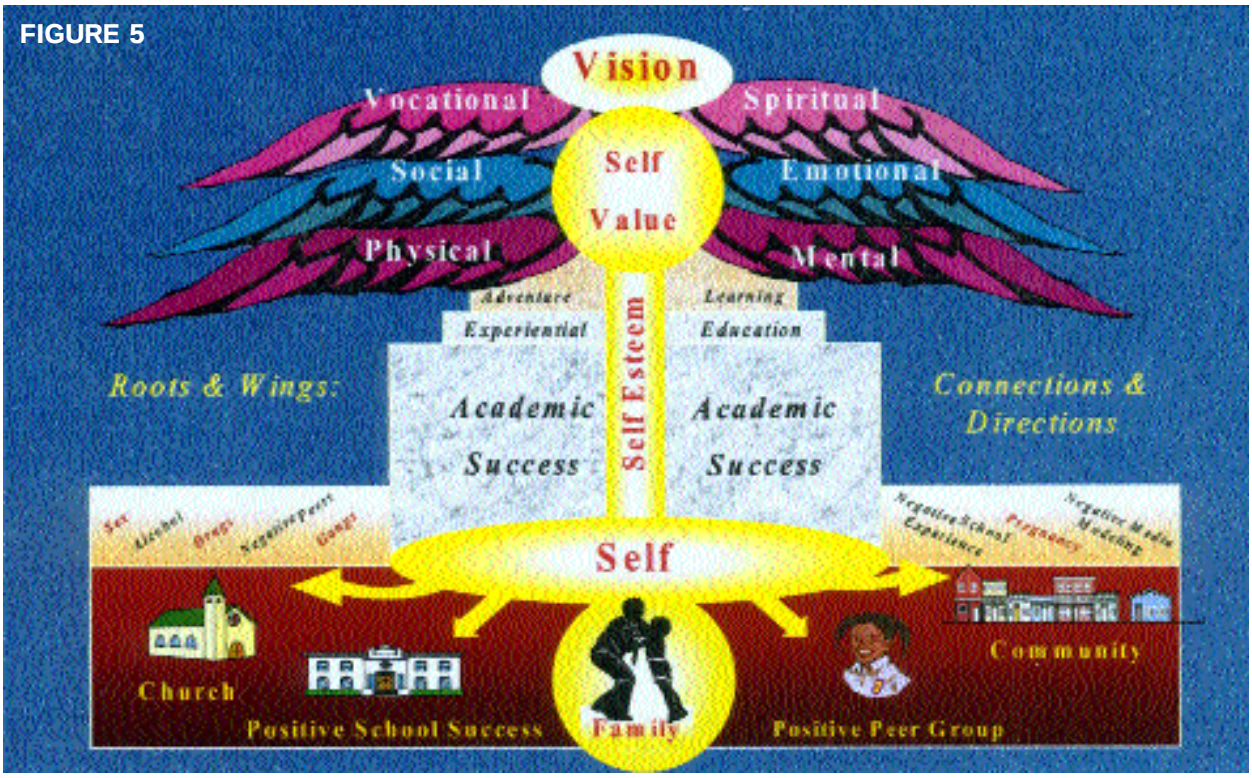
Similar recognition of the need for and pursuit of alternatives is occurring throughout the human services arena.

EDUCATION

American society has been based on the belief that every citizen deserves an education. Our nation's strength, revolutionary roots, and democratic institutions have maintained this belief in free public education. In the early years of the republic, the "school house" was seen as the center of the community. It was the public building in which many public meetings and gatherings occurred, often both literally and figuratively representing the heart of the community. Public educators have been given the trust of inspiring and directing our most precious resource: our youth, the leaders of tomorrow.

The modern trends of specialization / centralization and high technology during the twentieth century have led to our country's shift from a rural culture to an urban culture. This migration from the agrarian lifestyle to an urban life style has created major changes in many aspects of our communities. Before the great migration to cities, schools were often small, with multiple age groups learning in the same space. Due to this intimate educational setting, teachers naturally taught children to engage in team learning and to appreciate each other's differences and gifts. These small agricultural communities were literally organized around the seasonal cycles of the crops and activities of the farmers. Teachers themselves had to adapt the educational year to these cycles, thus everyone was acutely aware of natural cycles and respectful of their requirements. The small schools also assured that teachers knew students and their

FIGURE 5



The "Roots and Wings" figure was developed by Rich Johnson, Communities in Schools (CIS), of the Thomas Area and prepared by Linda Kelley, CIS Georgia.

families well. The community and the school were inextricably linked.

Just as modern trends and technologies have impacted the design of our professions and other organizations, so has it affected the design of schools. Schools have become more centralized, specialized and interventionist-oriented. Manifestations of these trends are exemplified by school consolidation, specialization by grade level (primary = K-2, Elementary = 3-5, Middle School = 6-8, High School = 9-12), and/or focusing on content areas, i.e., magnet schools, or schools defined by behavioral needs, i.e., psycho-educational centers and alternative schools for the chronically disruptive. These changes combined with the greater mobility of our society has resulted in most children attending schools outside their neighborhoods. Neighborhood schools in most communities have become a memory. This specialization has also resulted in schools no longer being seen as the center of the community.

The resulting disconnection (high import/export) from the community has distanced parents, educators and students from one another's lives outside the definition of the regular school day. Parents often have children scattered among several schools thus making it difficult for parents to actively participate in the daily routine of their children's school lives outside of special events such as plays, athletic

events, or called parent/teacher conferences. Schools, which were once seen as the heart of the community, are now primarily viewed as specialized environments from which academic curricula are delivered. This distancing from the school has resulted in community members becoming disconnected from the issues and losing appreciation for the issues which educators face each day. The changes in our society have had great impact on family constellations and on the complexities with which youth enter the school environment. Single-parent and two-parent working families are the norm in our society. Busy parents, faced with hectic work schedules, the complexities of daily living requirements in combination with the distance factor, are unable to be as available at the school as in the past. This disconnection of parents from the daily functioning and routine, in concert with the lack of close relationships to teachers, can lead to a vicious cycle of misunderstanding between parents and educators along with a proliferation of consequences, i.e., vouchers, home-schooling, and private schools. Educators, feeling under attack, in self-defense tend to focus more on their specialized knowledge and academic credentials. Self-defense has lead to greater insulation from public opinion and so builds a self-fulfilling prophecy of educators and families living in an "us against them attitude." This scenario illustrates the ultimate result of the loss of appreciation of interdependence and relationship.

These combinations of erosion in the fabric of interactions among educators, families and community members have been accompanied by an escalation of youth performance and behavior problems such as increases in school dropouts, teen pregnancy, drug use, crime, truancy, etc. Due to our predominating interventionist/therapeutic approach paradigm, we have sought to resolve these emerging youth issues with a multitude of therapeutic interventions such as computer remediation programs, character education, drug education, etc. These tools in and of themselves can be useful but must be utilized in combination with a redesign of our schools so as to "re-connect" schools to the family, neighborhood, and community settings.

We recognize that not all aspects of the modern trends in education are negative. The increased access to computers and state-of-the-art school buildings has been a boon to teachers and the education of youth. However, in our opinion, these benefits have come to be outweighed by the loss of a holistic view. This loss of a holistic view is manifested both at the student and community level. At the student level specialization results in a focus on the weaknesses of students while diminishing the appreciation of the student as a whole person. The impact at the community level is that education is perceived as a school issue alone rather than as a community responsibility. This isolated role for education masks that it is one component of the overall

necessity of human resource renewal, including spiritual, enrichment, cultural and stewardship responsibilities. Indeed, a community development approach must be made to education such as the one promoted by Communities in Schools, Inc. (an international nonprofit organization designed to help kids help themselves, www.cisnet.org). The reality is that the resources of the community must be unified around families, students and schools if they are to be successful. This is what schools need if they are to be successful, but they cannot do it alone. Indeed, no one organization acting alone can succeed.

The Communities in Schools (CIS) model when viewed from the perspective of the student is represented in Figure 5. The CIS organization offers an alternative approach / process that seeks to combine the benefits of specialization and modern technology while still maintaining a holistic view. The education of any child emanates from the home. Families are the primary stakeholders in the success of children. As the illustration depicts, all children grow from families. Children as they mature must have a positive sense of self, which leads to self-esteem, and valuing of oneself which ultimately results in youth that have a positive vision of their future.

Prior to modern trends families were typically supported in their efforts to raise healthy children with a positive vision by the grounding influence of community institutions such as the church, neighborhood schools, positive friendships and the larger neighborhood and community. In this way, youth not only benefited from the anchor of their family but also the roots developed through the relationships that evolved in these other domains. This scenario suggests that families and youth had additional supports, thereby utilizing their interdependence as a strength. This strength, in fact, provides protective factors for youth from the negative influences of drugs / alcohol, gangs, pregnancy, negative peers, negative school experiences, etc.

Growing up is a process that is filled with missteps; mistakes are not the problem. The problem is the lack of a network of positive experiences and influences, which allow mistakes to turn from learning opportunities into life-defining behaviors. When this support network is in place, academic success is possible. This success continues to build self-esteem. The addition of experiential education and adventure learning allows youth to step outside their comfort zones and in a safe space test themselves or press the boundaries in a positive way. As youth grow they must be nurtured in their physical, social, vocational, spiritual, emotional and mental development. This process equips youth with both roots and wings. Youth learn that they have the capacity to control their destiny.

COMMON DENOMINATORS

Among all of the case examples we find four basic common denominators. First, we see that the six core principles of interdependence, self-sufficiency, self-regulation, self-renewal, efficiency, and diversity / versatility are fundamentally important features in all of these systems. Thus, it is important to foster each of these features in order to assure the health and proper functioning of such systems.

Secondly, we find that each of the professions has permitted the trends of scientific reductionism and modern technology to erode adherence to the six core principles of healthy systems:

a. They have become more specialized and centralized (focused more on studying systems in their parts versus the whole, with centralized organizational infrastructures that are less interdependent and accountable to other components of the community), thus resulting in a high import / export approach and a less balanced, less inherently healthy system.

b. An appreciation for the integrity of natural systems has been dulled, leading to an interventionist paradigm.

c. Therapeutic approaches have been adopted as the primary means for resolving undesired variables and results rather than as backups to the inherent regulators, leading to the therapeutic treadmill.

Thirdly, weaknesses in the modern trends have been recognized and some efforts toward redirections have been undertaken with mixed levels of success.

Fourthly, due to a loss of our natural literacy and our failing to recognize the importance of integrating across professions and responsibility areas, there has been an absence of redirections and application of ecologically-based practices at the community level.

Local Communities

Now let us turn to a specific examination of local communities in light of the foregoing discussion of living systems and the historical trends of our respective professions. Local communities evolved as a natural component of our social fabric and in accordance with the needs and desires of the people living therein. These communities are the building blocks of our society and it is at this level that all of our professional, social, and cultural interactions are ultimately expressed. Above the family level, local communities are the only truly natural assemblage in our social structure. State, national, and sometimes county groupings, though usually based on certain historical, cultural and other parameters, are relatively arbitrary as compared to local communities. The principles drawn from the study of natural systems strongly apply to local communities and can be effectively used in evaluating, planning and assuring the sustainability of community health.

For the purpose of this discussion a conceptual model will be utilized to illustrate the role of the six features of natural systems as they relate to the healthy functioning of communities. To graphically illustrate the concept, a model of a house has been utilized (Figure 6). A house is a structure which we readily recognize as a symbol of community. Furthermore, sustainable living principles are derived from the science of ecology. The root word “eco” means house. Thus, the house analogy is, indeed, an appropriate illustration. We will examine the importance of protecting key fragile community assets as well as illustrate the potential impact of modern trends and technology. Finally, we will explore ways to deal with these trends in order to assure sustainable local communities. As we progress through the discussion we will demonstrate the way in which these ideas theoretically create the complete house.

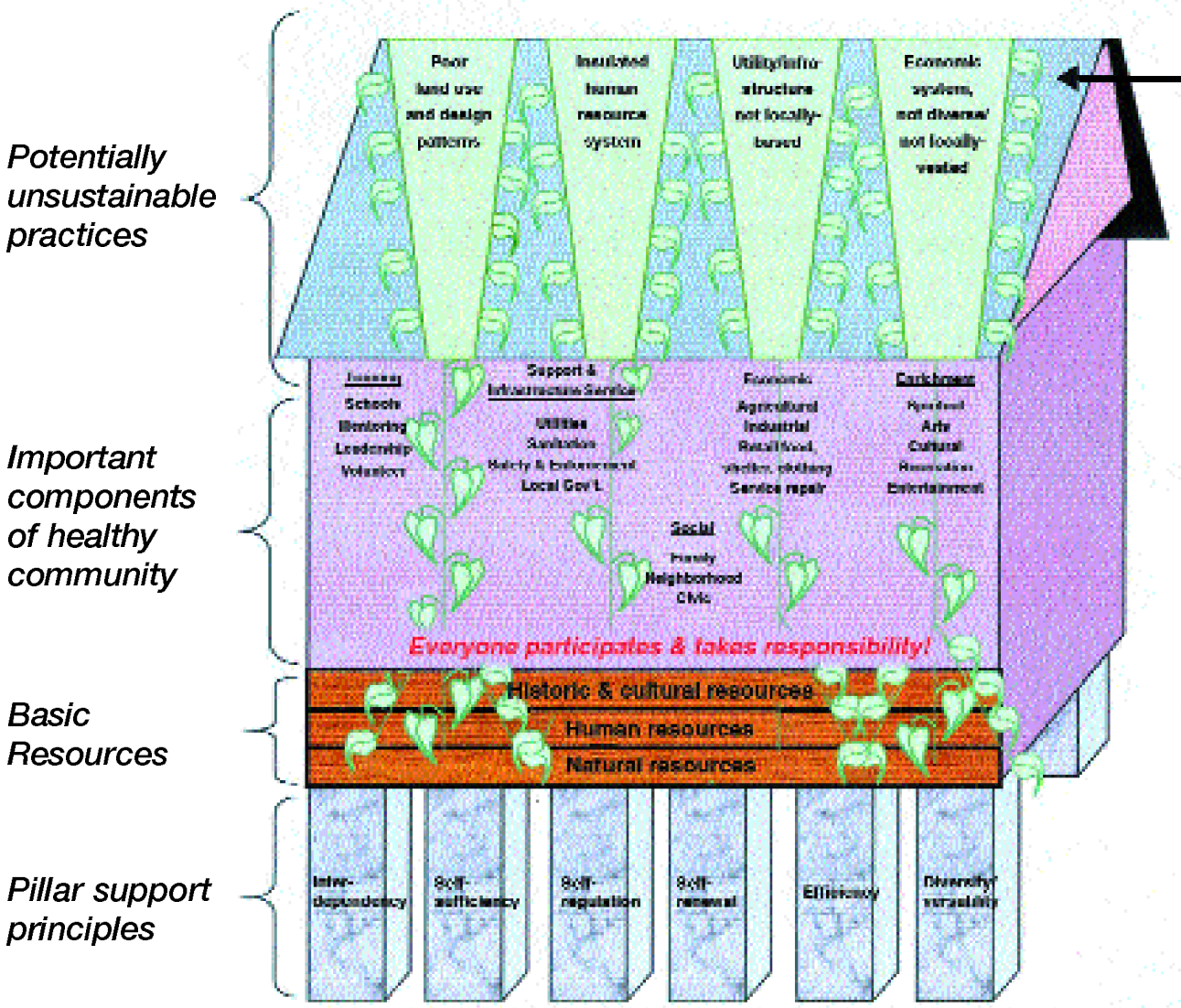
PILLAR PRINCIPLES

The six core features previously discussed are the ultimate foundation for any healthy system. Therefore, they are the pillars upon which the community structure rest.

Interdependency is the first pillar. The interdependence of the various components of a community promotes mutual support and balance throughout the system. Since each component is reliant on the well-being of the community, all entities are supported and nurtured in the interest of the "common good." For example, a local subdivision developer is motivated to include long-term plans for

FIGURE 6

CONCEPTUAL COMMUNITY MODEL



storm drainage and traffic flow during initial development because he is a stakeholder in the future economic well-being of the community. If major tax appropriations are required at a later date to correct poor planning problems, this developer not only has to deal with harm to his reputation but also will have to participate in the cost of correcting the mistake.

The second pillar is self-sufficiency. As with any functional system it is important for a community to be more or less self-sufficient. This feature allows the community to be in control of its own destiny. This principle does not mean that a community should function as an island unto itself. Each community is a part of a larger system and interdependent with other communities at that level. For example, individual people are generally self-sufficient. This does not mean that they do not need other people and sustenance. However, if an individual is unable to breathe on their own or feed themselves they are at some level of risk. In a similar fashion becoming reliant on outside providers for certain core needs and services, i.e., sewers, water, and utilities, places a community at risk.

The third pillar is self-regulation. All systems encounter undesired disruptions. These disruptions can come from within or without. However, as described earlier with the balance-of-nature principle, these systems have inherent mechanisms for keeping these disruptions within certain bounds. For years institutional models were used to support people with disabilities. With this model people with mental retardation were not incorporated into local schools, work places, and recreation. Rather, they were sent to state-funded programs many miles from their homes and families. Recent programs have confirmed that the incorporation of this component of our population into typical school, work and recreational programs is more socially and economically beneficial to all citizens. Through this approach, not only do we reduce the tax-supported cost of interventionist programs, but we also benefit from the contributions of people with disabilities.

The fourth pillar is self-renewal. A cardinal feature assuring the sustainability of all natural systems is their ability to endure and cope with change through the ongoing renewal of their resources and functional mechanisms. The well-known cycling of elements and organisms of ecosystems are a part of this renewal process. Natural communities have long practiced strategies for assuring the renewal of their resources and culture. For example, as discussed under agriculture, farmers and rural communities historically have been careful to plan ahead and assure the renewal of their natural resource base upon which their livelihood was highly dependent. The inherent self-regulating processes such as local and natural supports for people with

disabilities, as mentioned in the paragraph above, assures the renewal of diverse human resources as well as serving as a regulating mechanism. Alternatively, the interventionist and therapeutic-based practice of state-supported professional-driven programs for people with disabilities disrupts the renewal strength of a community. This approach tends to deprive the community of a portion of their human resources, family and neighborhood dignity and relationships while escalating the cost.

The fifth pillar is efficiency. High efficiency and full use of resources are fundamental aspects of natural ecosystems. Through processes such as food chains, decomposition and recycling, waste is eliminated. In earlier generations conservative and efficient use of such resources as water and fuel were key practices because of their limited supply and/or accessibility. However, with the modern technologies of transportation and mechanization these resources have become more immediately accessible and abundant through importation, exploration, etc. Correspondingly, our use of these resources have become excessive and our handling of associated waste has become careless. Moreover, when we examine these uses and associated disruptions at the ecosystem and biosphere levels, our inefficiency becomes apparent. Through high import/export processes we are only postponing the necessity for true-cost accounting. We must draw on the natural laws to better learn the importance of and approaches for, efficient use, transfer, and recycling of all resources.

The sixth pillar is diversity/versatility. Natural systems encounter substantial oscillation in conditions and external forces. These oscillations preserve diversity in different components of the system with each varying sub-component having its functional role for certain conditions. Clearly then diversity is an important feature for the sustainability of systems. Diversity is important to the sustainability of communities in a variety of ways. Healthy communities exemplify this principle by planning diversity in their business and industrial base so that they can withstand shifting business and market conditions. Replication of this principle in our work force also creates greater resilience in times of change for both workers and businesses. Further, a healthy community seeks to engage all of its citizens in meaningful roles, especially citizens who are at risk of being devalued such as the elderly, unwed mothers and people with disabilities. Such practices are not only morally appropriate but are also economically sound since such people, if not meaningful engaged, will become recipients of taxpayer-funded programs.

BASIC RESOURCES

All natural systems draw upon certain raw materials to fuel their system. Natural ecosystems draw upon basic elements such as nitrogen, carbon, and oxygen as the building blocks of the living organisms of the system. These systems are dependent on the recycling and adequate availability of these resources. In the case of communities these base resources are represented as the floor planks in our conceptual model. The three undergirding resources are natural resources, human resources and historical/cultural resources. As in natural systems the sustainability of communities depends on the protection, renewal, quality, and adequate availability of these resources. Each of these three resources is critical to the well-being and sustainability of communities.

Natural Resources

Obviously, adequate availability of soil, water, air, and other natural resources are crucial to a healthy community. The United States of America is a relatively young nation, blessed with a great abundance of natural resources. It is strategically placed between two great bodies of water with two mountain ranges and excellent climate while enjoying a great diversity of natural resources. Too often we've historically taken these resources for granted because of their great abundance. However, due to the rapid advances of industrial development, reliance on energy-inefficient transportation, and unconscious wastefulness and disposal of modern convenience products, such as detergents, chemicals, paper products, and metal and plastic containers, all aspects of our natural soil, water, air and associated wildlife are in jeopardy at some level. However, it is easy to be complacent about this threat to our well-being, because it is not perceived as being an immediate local community problem. The resolve is typically seen as the responsibility of someone else. In the interest of long-term sustainability each community must view their natural resource quality as critical to their health and mobilize a population-wide commitment to its preservation.

Human Resources

Community sustainability is absolutely dependent on the renewal and continued nurturing of its human resources. A core perspective for assuring effective human resource quality and utilization is that everyone regardless of age or status in the community is valued and should both participate and contribute. A comprehensive approach to life-long learning is essential for each generation. This is accomplished by both formal training programs such as those typically taught in our schools and institutions of higher education, and informal training that naturally occurs as a result of

relationships between different sectors, i.e. older people to youth, business people to the community, and youth through community service projects. In a similar way all aspects of nurturing, quality of life, and productive engagement must be assured life-long and in comprehensive ways. Too often these elements occur through a disjointed view which does not look at the total person in context of their various relationships. A negative result is often that health care and other supports are delivered as therapeutic interventions only after illness or other problems occur rather than focusing on wellness.

Historic and Cultural Resources

All communities have their own unique history and culture. A diverse repertoire of traditions, products, and lifestyles give identity, meaning, and continuity to the members of each community. These distinctive characteristics are evidenced through such matters as language, arts, foods, architecture, music, dance, stories, etc. The community's collective experiences with climate, adversities, major transitions, and other occurrences are represented through these expressions. These historical and cultural resources are the bridges by which cohesive relationships are maintained among members of the community, which in turn foster a common vision.

COMMUNITIES IN ACTION

As is the case of ecosystems, communities are comprised of its habitat arena (including its natural resource base) together with a fabric of interactions. The network, flow, expression, and outcomes of these interactions define the community and its health. There are multitudes of perspectives from which we can view and discuss communities. For the purpose of this model, we represent the community as the room of the house together with an array of interactions occurring among its components. Any process for classifying the components of a community is arbitrary to some extent, since the elements and interactions are fluid and variable, but such a process can be effective for appropriate discussion. We categorize the components into five major groupings: social, training, support & and infrastructure, economic, enrichment.

Social

The basic social units of the community are families, which in turn, tend to cluster into neighborhoods, particularly in urban settings. Strong relationships derived from the family / neighborhood units are fundamentally essential to the health

of any community. Physical layouts and practices that foster the natural flow of people-to-people interactions within families and neighborhoods strengthens the overall community in many ways. Reduced crime, juvenile delinquency, and increased general civic interest along with many other values can be readily connected to interactive families and neighborhoods.

Historically a number of designs and activities co-evolved in communities, which fostered the interactions and bonds within families and neighborhood. Typically all three meals had set times and were a family event at which members gathered around a single table. Evening time was typified by family conversation around a central gathering place in the home– porch, fireplace, living room– and often included drop-in friends and neighbors. As a general rule, all family members were expected to participate in the ongoing chores of the home including cooking, sewing, home repair, and in the case of farms, taking care of the animals and crops. Often aging relatives such as grandparents or maiden aunts lived with the family and participated in these activities, thereby providing cross-generational continuity. These natural interactions promoted cohesion and structure in family life while helping to assure that youth found their sense of place and role within this structure.

There are also designs and practices at the neighborhood level that promote interactions and bonding. The expectation in all sustainable communities is that everyone knows everyone else. There are neighborhood gathering places such as local stores, restaurants, pubs, or parks where people regularly spend their leisure time. A feature of these places is that they are centrally-located and easily accessible by walkways rather than by cars. Members of healthy neighborhoods participate in a range of activities together, including work, play, and learning. Schools, churches, and recreation centers are easily accessible, utilized, and viewed as belonging to the neighborhood. This comprehensive range of interactions promotes the likelihood of neighbors participating together in life's celebrations and crises, thus leading to enduring bonds in the interest of the individual and common good.

Training

Strong communities recognize the importance of life-long learning for all citizens with a special focus on the youth. Training can be both formal and informal. Formal learning is typified by courses taught through post-secondary schools and in local school systems. Informal learning while very different in its design and delivery is equally important. This is the training which occurs through shared activities between generations such as sport leagues or church group activities. Through these venues

youth are taught subtle lessons that prepare them for life, while engaged in the activities. Typical lessons learned are teamwork, the joy of giving to another, and empathy for another person's situations. Implicit in these activities are opportunities for youth to progressively learn and practice leadership, decision-making and equality. Within healthy communities, these informal training opportunities are naturally interwoven with formal training due to the fact that the teachers and school administrators are very connected to all aspects of students' lives outside of school. This possibility is more likely to occur when schools are small in size and the school programs are closely interlinked with community activities. A natural result of this blend of formal and informal training is that members are taught to value their role as a part of the total community well-being and to understand their responsibility for the good stewardship that will insure the long-term health of the community.

Enrichment

Acomplete life experience for anyone includes the fulfillment of various spiritual, cultural, and leisure needs. In a healthy community the arts, cultural traditions and spiritual services are a highly valued component, which gives depth to the local identity and history. Thus the members of the community value and preserve historical and cultural assets such as landmarks, buildings, arts, music, foods, etc., and faithfully celebrate their uniqueness. Interwoven into their daily lives are processes by which they meet their spiritual and leisure needs. The enrichment programs of such a community provide for personal needs while assuring a common bond between neighbors.

Support Services and Infrastructure

Historically, members of the community have sought ways to provide for mutual needs in the areas of infrastructure and support services. Typical examples are utilities, water, sewage, electricity, transportation, public safety, health care, communication, and waste management. These services are the core services that promote quality of life and upon which the economic base is built. In most circumstances the primary responsibility for the provision of these services is seen as a role for local government. For this reason it is crucial that the local community safeguard the control and common access to these services at a fair and reasonable price. Equally important is that these services, in conjunction with and as complements to preventive and natural support systems, i.e., health services, focus on wellness rather than primarily on illness and therapeutic inputs. These services can be provided directly by the local government or through competing private providers.

Economics

In the interest of economic stability and quality of life, every community needs: (1) ready access to the full range of goods and services such as food, shelter, and clothing; (2) a local economy vibrant enough to provide all local citizens with sufficient income to purchase needed goods and services, and (3) a local economy based on adequate diversity and local ownership to insure survival and stability through ongoing cyclic business swings. An integral part of a stable economy is the assurance of an adequately trained and diverse work-force that meets the needs of business. A requisite of sustainability is that local business and industry function in a way that is ecologically sound and assures the protection and renewal of the natural, human, and historic/cultural resource base. A measure of the health of the economy is the degree to which it is interlinked to other components of the community and of the common good.

General

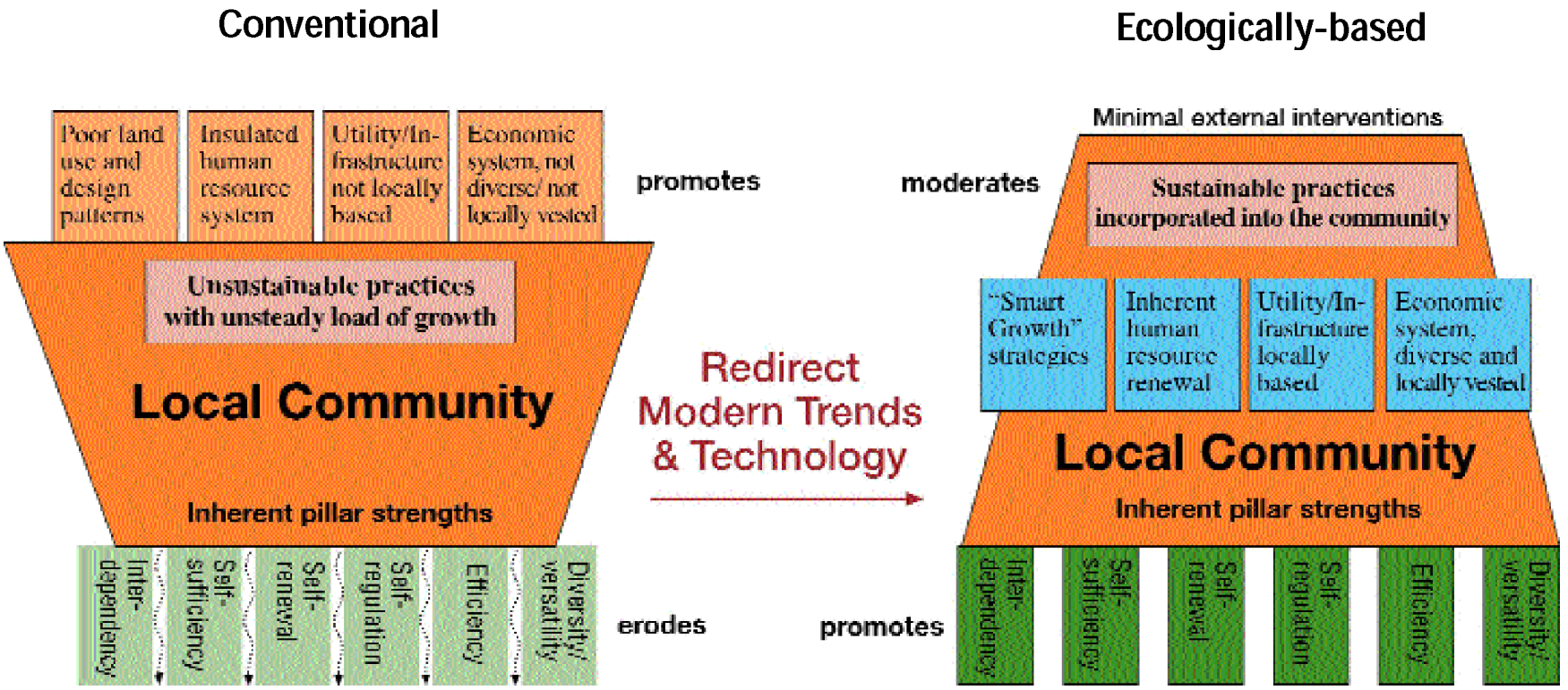
In examining a healthy community it is apparent that it fosters and is highly-reliant on the six support pillars drawn from our analysis of natural ecosystems. The various components of the community are highly interdependent; the core services are locally-owned and managed thereby providing self-sufficiency; generally the community is self-regulating with minimum reliance on therapeutics and/or outside interventions; built-in provisions assure the renewal and efficient use of key resources including natural, human, and historic/cultural resources; and diversity/versatility is appreciated and the functional roles of all members are valued.

CHALLENGES TO COMMUNITY HEALTH

As stated in the premise, healthy communities must find ways to effectively deal with a variety of challenges that threaten their sustainability, especially the potential negative impact of modern technology and management. Four such modern technology and trend categories were identified, (specialization/centralization, inter-ventionist paradigm, high input/export, and therapeutic approach) and further elaborated on with the case histories of several individual professions. These four potentially eroding trends are reflected in figure 6. With the industrial age, came the emergence of high technology, specialized tools and knowledge, and an expanding array of goods and services, including homes with a host of appliances, luxury automobiles, and spectacular entertainment devices. The marvels of communication and transportation technology allow us to span the earth in a matter of hours.

COMMUNITY MANAGEMENT AND DEVELOPMENT STRATEGIES

FIGURE 7



We must redirect our technology and operating paradigm so as to base our economic development and management on principles that promote inherent strengths and moderate the load of growth on communities. Such a redirection will emphasize practices shown in the right-hand boxes that are based on the "built-in" renewable strengths of community.

Powerful machinery enables us to literally reshape large portions of the landscape of entire communities and to transport natural resources, services, and manufactured goods around the world in a matter of days. The growth in the global market for these goods, services, and lifestyles has enhanced the rate of specialization and centralization of organizations and management structures. A result of this phenomena is increased insulation of organizations from accountability at the point of delivery, which is the local community. High volume-based organizations tend to "crowd out" the local businesses and providers. Because of minimal interdependence of the large organization on an individual local community and in the absence of reduced competition, the community's influence regarding the organization's service and wise-use of resources becomes limited. The objective of this final segment will be to discuss how the potentially eroding trends have led to unwise and unsustainable practices that must be redirected in order for our local communities to deal with the realities of our modern world in a sustainable fashion.

In our conceptual model the unsustainable practices stemming from the potential eroding trends are represented as "add-ons," to the house. In that connection, they could be envisioned as plants such as ivy, moss, or other plants that were originally added for complements or enhancements, but are now somewhat out of control. In that vein, many of the practices when originally undertaken / added were seen as enhancements to the community. However, all these factors share the common fact that they are not truly interdependent with the other components of the community. They are either major extensions from other locations into the community or have grown from within the community to become centralized entities and / or practices that are now insulated from a direct process of accountability. We class these unsustainable practices, as seen in figure 6, into four major categories: poor land use and design patterns, insulated human resource service system, core utility and infrastructure services not locally-based, and an economic system not adequately diverse and locally-vested.

By shifting our operating paradigm and use of modern technology, we can redirect our community management and development strategies as depicted in figure 7 to an ecologically-based approach. The redirection should be guided by principles that promote rather than erode the inherent pillar strengths of community systems, and moderate rather than promote the load of growth. Basically, by design, these growth and maintenance processes should be based on promoting and using the "built in," renewable strengths of the community as depicted by the ecologically-based model of figure 7. In blue on the right are four ecologically-based counterparts to the four unsustainable practices mentioned above and shown as orange in the conventional

model on the left. They are: "smart growth" strategies, inherent human resource renewal, utilities / infrastructure locally-based, and an economic system diverse and locally-vested.

Now let us briefly discuss each of these four unsustainable practice categories and the proposed ecologically-based counterpart.

Poor Land-Use and Design Patterns

The tremendous technological capabilities for altering landscapes along with abilities to redistribute natural resources such as soil, water, wood, petroleum and other materials (high import / export trend) has dulled our respect for both the integrity of community and the order of natural systems. From this interventionist paradigm, we are rapidly changing the faces and bounds of our communities, often at the expense of their historical and cultural assets and sense of place. Further, through this process, often termed "sprawl," we are engulfing the surrounding countryside with suburbs, shopping centers, industrial parks, and other uses in ways that are not ecologically-sound and sustainable. Many of the areas contain swamps, streams, and forests that provide valuable ecological functions such as water holding, absorption and / or filtration, and wildlife refuge. Whereas their inappropriate modifications often create serious repercussion with matters such as storm drainage and water quality. Also, these trends are consuming valuable farmland and disrupting family farms that are vital to our communities and overall society. According to reports from the American Farmland Trust (Sorensen et al., 1997), it is estimated that between 1982 and 1992, 4.3 million acres of prime and unique American farmland were overrun, nearly 50 acres every hour of every day. Moreover, it has become apparent that modern development designs and zoning guidelines are resulting in traffic congestion, air pollution, absorption of open space, and rising municipal infrastructure costs. At the same time these suburban development patterns are encouraging people and wealth to leave central areas, thereby resulting in a tendency toward loss of valuable historic resources and blighted inner areas.

These "sprawling" development patterns, segregated by residential, professional, recreational, retail, industrial, etc. groupings, versus the more compact, mixed uses of older communities, contribute on a local level to the modern high import / export trend discussed earlier. The natural flow of interactions and bonding of people within neighborhoods often fails to occur because of the typical absence of walkways, recreational, and other socializing areas intermingled with residential areas. These designs are very transport-intensive and energy-inefficient, requiring a daily heavy movement of people and resources "in and out" among these local specialized centers. This same

high import/export trend occurs on a larger scale at levels among communities as part of our centralization process. As discussed earlier, centers for various goods and services, and even the production, distribution, and management processes for a particular good are often distantly separated from one another. As well as being ultimately energy-inefficient, this trend toward reliance on goods and services from central production and distribution centers from outside the community tends to erode the historical "butcher, baker, candlestick maker" interdependence of local communities.

This trend has been particularly adverse to locally-based agricultural industries. As just mentioned, portions of the land valuable for agricultural production is lost to urban expansions and other uses. Furthermore, as discussed in the agricultural case history, the influence of modern trends on farming patterns has resulted in monocultural and therapeutic-based practices that reduce landscape diversity, disrupt natural balances, and reduce inherent renewal/regulation strengths, which increases incidences of agricultural pest outbreaks and erodes natural resources. The centralization of processing and marketing of farm produce limits the accessibility and voice in prices for the farm produce. The entire trend reduces the diversity of the agricultural production and agri-business industry and in turn the agricultural economy.

Shift to Smart Growth Strategies

It is vital that we renew our appreciation of how land-use and design patterns shape the physical and social character of communities. In the absence of wise guidelines and plans of this nature, communities will not be able to harness technology and growth trends in ways that assure environmental, social, and economic sustainability. It is becoming clear that conventional zoning and planning guidelines are outdated for these modern trends and in fact exacerbate the problems. Anumber of substantial movements are underway to redirect community planning. These efforts are known by a number of names, but perhaps most typically as "Smart Growth." As defined by the American Planning Association (www.planning.org), Smart Growth means planning, regulatory, and developmental practices and techniques founded upon and promoting the following principles:

- using land resources more efficiently through compact building forms, infill development, and moderation in street and parking standards in order to lessen land consumption and preserve natural resources;
- supporting the location of stores, offices, residences, schools, recreational spaces, and other public facilities within walking distance of each other in compact neighborhoods that are designed to provide alternate opportunities for easier movement and interaction;

- providing a variety of housing choices, so that the young and old, single persons and families, and those of varying economic ability may find places to live;
- supporting walking, cycling, and transit as attractive alternatives to driving, and lowering traffic speeds in neighborhoods;
- connecting infrastructure and development decisions to minimize future costs by creating neighborhoods where more people use existing services and facilities, and by integrating development and land use with transit routes and stations; and
- improving the development review process and development standards so that developers are encouraged to apply the principles stated above.

We feel that it is vital for local communities to adopt these and/or similar principles advocated by a number of organizations. For example, see *The Charter for the New Urbanism* for similar suggested guides for good planning (Congress for the New Urbanism, www.dpz-architects.com/charter.htm). However, most such movements deal primarily with the physical aspects of community planning. Thus, we further urge that these efforts further be incorporated with the broader ecologically-based social and economic considerations discussed in this paper.

The land dedicated to agricultural and related uses must also be used more wisely. Mounting evidence and guidelines are emerging for more holistic and systems-based practices for soil and water quality, pest management, and sustainable production purposes. See *Agroecology: The Science of Sustainable Agriculture*, (Altieri, 1995), Appropriate Technology Transfer for Rural Areas (www.Attra.org), and the Sustainable Agriculture Network (www.sare.org) for key principles and references in this regard.

Insulated Human Resource Service System

Historically, human service needs in the areas of education, health care, disabilities, and other specialized professions were provided for within the context of families, neighbor-to-neighbor and the larger community context. As a part of the specialization era these services moved more into the professional arena, thus requiring specialized training and certification for activities that previously had been rendered through a network of caring relationships and natural supports. As the professional personnel and institutions became more involved, the families and other members of the community began to believe they were inadequate to meet the needs thus relinquishing these responsibilities to "the professionals." The outcome has been an increased reliance upon professionals and an increase in the size and cost of a professional

presence and control, leading to a “crowding out” of the role of natural supports. As a part of dealing with the increasing needs and cost of services and with a "well intentioned" desire to increase efficiency these professional services have been centralized by organization and / or licensing / certification at regional, state, and national levels.

A part of the mindset is best typified by the idea that "the professional knows best" and should set the guidelines for how, when, and in what context the service should be provided. Naturally, in this atmosphere there is limited empowerment of the customer / recipient and the professional becomes insulated from direct accountability for quality of service to the customer. Direct customer accountability is limited. Funding and other means of perpetuating the institutions become based on measurements and other determinations that are increasingly disconnected from customer satisfaction outcomes and influence. These patterns of service have become typical in the areas of healthcare, education, and human services. Therefore, the vital assurance of human resource renewal is often at serious risk. This fact is apparent in the data reflecting dropout rates, teen pregnancies, juvenile delinquency, adult incarceration, and the spiraling cost and reduced accessibility of health care, etc. Communities and policy makers are becoming alarmed, but in our opinion have not adequately connected these to a total community system model. Too often this circumstance is seen as a need for more of the same.

For example, a focus on student test scores has resulted in the unfortunate and extreme solution of some school administrators who encourage low-performing students to leave school at age sixteen in order to increase the overall school test scores as an assurance of meeting the parameters for continued funding. In other words the focus is on how to continue the status quo, not address the weakness in the system. The assumption is not that all students can learn and graduate, rather that they must adjust to the system. This within-the-system accountability versus a customer-to-program accountability tends to result in more and larger programs to handle the problem. In other words, the solution becomes the problem. We see similar examples in other areas, i.e., more juveniles are being charged as adults in order to reduce juvenile crime, leading to bigger jails, rather than the funding of mentoring and after school / weekend programs; abstinence programs for teen mothers rather than early intervention after-school and enrichment programs; and more funding for programs for people with disabilities to be in "day care" rather than to support them working in meaningful jobs. As Mark Twain said, if the only tool you have is a hammer, all your problems look like nails.

Shift to Inherent Human Resource Renewal

It is our opinion that these escalating problems stem from a fundamentally unsound approach, as per our premise regarding the mechanism governing any system. As we pointed out in our premise, no external therapeutic intervention can provide sustainable resolutions for undesired entities within a system. Rather therapeutics can only serve as short-term complements to the inherent natural regulators and renewers from within the system. In these specific cases at hand, we are violating this fundamental principle. We must focus more on cultivating the inherent strengths within the community for training, nurturing, and long-term support, as well as for prevention of various problems such as school dropouts and teen pregnancy. Professionals such as teachers, probation officers, doctors, and counselors can only facilitate these natural support systems which must come primarily from within families and neighborhoods. For example, the Communities in Schools organization (referred to earlier) at the local, state, and national level focuses not on blaming educators but on connecting families in positive ways with the schools, while also connecting other community resources to the school in meaningful ways such as business people serving as mentors and tutors both at the school site and at their businesses. It is important that local community leaders coalesce together to develop total community solutions based on systems principles. In keeping with these principles, families, neighborhoods, communities of faith, and businesses must reassume their grassroots responsibilities for human resource renewal. In turn, institutions and professionals must give back the primary responsibilities to the community and serve as facilitators in cooperation with the larger community.

Core Utility and Infrastructure Services Not Locally-Based

As indicated above certain core services and infrastructure needs are vital to the basic well-being of a community. Further, we indicated that a healthy community assures full access to these services and infrastructure at a fair and reasonable cost. This assurance can come either by publicly-owned local government provision of these services or through locally-owned private providers that are interdependent. In the latter case it is desirable that alternative competing providers be available. However, there is a trend, often justified by high capital cost requirements, that certain of these utilities be provided by regional corporations. In many instances only one provider is available per community. This has been typically true for power and communications needs. The states have provided public service regulating bodies to assure fair pricing. However, even under these circumstances the local community

has lost its direct voice over pricing and control of service. These consequences have been buffered in Georgia by many local governments providing for their own electrical power and natural gas needs. Statewide associations have been organized to assure good planning and competitiveness in the provision of these services. Effective cooperation has been established with major private companies for the purchase of these power and gas goods which are being delivered through these locally-controlled systems.

A similar trend has occurred in the area of waste management. Emerging regulations from the federal government regarding certifications for landfills and associated practices have added high capital cost factors, making it difficult for some local governments to meet waste disposal needs on their own. Large private corporations have entered this market and in some areas monopolies by a single provider are an emerging possibility.

Shift to Utilities and Infrastructure, Locally-Based

It is our opinion that in the interest of the self-sufficiency pillar, local governments should seek ways, either through their own individual arrangements or through cooperative arrangements with surrounding communities, to meet various core service needs so that local control is assured. A number of communities in Georgia have taken these steps as indicated above for gas and electrical power and more recently, waste management, often through an investment in local government-owned landfills and waste collection and transport systems. More recently, similar decisions have been made by some local communities to take the initiative in assuring quality, equity, and fair pricing for telecommunication systems. For example the cities of Tifton, Thomasville, Moultrie, and Camilla, Georgia, have initiated the construction of a city-owned fiber optic network. Their belief is that the fiber optic system is vital to the provision of state-of-the-art informational traffic basic to the economic and quality of life needs of the community, just as streets and highways provide for automotive traffic. In a similar fashion the concept is that the city will own the informational highway and invite various private providers to operate on this system. The rationale for undertaking this initiative was that private providers would not invest in state-of-the-art systems in smaller rural communities and that competition would be limited in the case of any privately-owned telecommunication system.

In the interest of sustainability of economic and quality of life needs, local governments, citizens, and business stakeholders must seek ways to assure local ownership and/or an empowered voice regarding infrastructure and support service needs.

Economic System Not Adequately Diverse and Locally-Vested

A major part of modern day trends is centralization of ownership and operation of the manufacturing, processing, distribution, and retail sales of goods. Keen competition and stockholder demands have required that these businesses be high-volume-based operations with limited profit margins. Locally-owned business often cannot compete with the pricing and long business hours of these large scale operations. Therefore, the location of these businesses within a community typically results in an elimination of local providers.

A parallel trend, particularly in rural communities, has been the intense recruitment of many of these industries to locate in their community. Due to recruitment and competition from other communities seeking these industries, attractive packages including utilities and tax incentives are offered. These new industries often provide short-term economic stimuli to the local community in the way of increased payrolls and employment, which in turn increases purchasing power at local stores. However, the long-term consequences of these strategies are not adequately projected. For example, the increased load on the local infrastructure, such as water and sewer, roads, schools, police, and natural resources are not computed. As the cost of maintaining these infrastructures takes place at the expense of the taxpayer, the benefits are neutralized and actually can be negative. Particularly when other factors are considered, such as the impact of land price and competing water supply needs on the profitability of the local farming community.

In addition to the short-term effects of competition on local businesses, a much more serious yet connected long-term effect must be considered. These effects are connected to the pillar support principles of interdependence and diversity. Through the elimination of local businesses, together with the fact that the corporate industries and chain stores are large-scale operations headquartered in remote areas, the lack of interdependence on other components of the community is obvious. Furthermore, through the elimination of local competitors and as a part of large-scale business strategies among these corporations, a community may become dependent on only a few or even a single provider for a particular good or service. Additionally, in the absence of good long-term planning, a large portion of the employment base could become reliant on a single industry. This community is then vulnerable when an industry chooses to close or relocate.

Shift to an Economic System Diverse and Locally-Vested

There are several steps a community can take to reduce these risk. The first step is to plan for diversity in all its economic strategies. Any one segment of the economy could be adversely affected by normal business cycles. The second strategy is to take all possible steps to foster local businesses and seek ways to maximize the coexistence of local businesses with incoming chain stores. Thirdly, when recruiting new business, long-term systems thinking should be incorporated into the negotiations with incoming businesses to include long-term and extrinsic costs such as load on infra-structure and natural resources, and negative impacts on other segments of the economy. Fourthly, there is a need to take all possible steps to seek industries that advocate the importance of being a good corporate citizen and cooperate with them in establishing activities within the local community.

ECOLOGICALLY-BASED GUIDELINES

The management of communities in accordance with ecological principles is in essence applied ecology. We recognize that such a process is complex and cumbersome. In fact, in accordance with the same ecological principles, the process has to be customized to each local community. Thus, no "cookie cutter" prescription can be given. However, we do feel that some general guidelines are appropriate and can be effectively used as a baseline tool for individual community decision making. Such a set of ecologically-based guidelines that integrate the principles we have discussed are presented in figure 8. The guiding rule for evaluating all plans should be: Does the proposed action promote the community pillar strengths of interdependency, self-sufficiency, self-regulation, self-renewal, efficiency and diversity / versatility, while buffering the eroding trends of specialization / centralization, the interventionist paradigm, high import / export, and the therapeutic approach?

FIGURE 8

PRINCIPLES FOR ECOLOGICALLY-BASED COMMUNITIES

- **Land use and design patterns based on smart growth principles that:**
  - Conserve natural resources
  - Preserve historic and cultural assets
  - Promote neighborhoods which are effectively integrated with educational, recreational, and business needs and combined with greenways
  - Provide a distribution and variety of housing choices that effectively incorporate all citizens into neighborhoods
  - Provide walking, cycling and transit as desirable alternative to automobiles
  - Provide urban to rural interfaces that support farm to in-town relationships
- **An inherent human resource renewal system that:**
  - Promotes formal/informal life-long learning for all citizens through intergenerational, peer-to-peer and team processes
  - Fosters strong mutual respect and interaction between schools, parents, other citizens and business
  - Provides processes by which health care, habilitation, and other human services are provided primarily by natural supports with professionals serving as a complement
  - Promotes an environment which nurtures and incorporates the diverse gifts and participation of all citizens
- **Strong local sufficiency In core infrastructural needs insured by:**
  - Local government-owned or authority-owned and operated services which are responsive to the voice of citizens
  - Private locally-owned and -operated services and/or
  - Locally designed and operated public/private partnerships
- **Industry/business strategy that:**
  - Is diverse and strongly invested in the community
  - Maximizes coexistence of local businesses with nationally-or regionally-owned chains
  - Seeks and negotiates agreements by which all industry/business participants are strongly Invested as corporate citizens
  - Seeks broad balance of business sectors that respect and support community integrity.

GUIDING RULE

Do the proposed actions promote the community pillar strengths of interdependency, self-sufficiency, self-regulation, self-renewal, efficiency, and diversity/versatility; while buffering the eroding trends of specialization/centralization, interventionist paradigm high import/export, and therapeutic approach?

Summary and Conclusion

Our generation, indeed, has experienced the immense benefits of modern knowledge and technology; however, we are also seeing the consequences of their unwise use. These consequences are manifested in economic, environmental, and sociological terms and are very compelling. Global environmental degradation and socioeconomic problems are reaching alarming magnitudes. In 1989 Odum discussed the four major sociological and economic gaps that threaten human and environmental quality. He identified the four gaps as:

- **income gap**– between the rich and poor, both within nations and between industrialized and non-industrialized nations. Between 1950 and 1980 the gap in per capita income between rich and poor nations increased from $3,617 to $9,648, (Seligson, 1984).
- **food gap**– between the well-fed and the underfed. High-input agriculture (fertilizers, pesticides, and other technological advances) has benefited the rich nations at a disproportionate level. In the US and Europe more food is produced on less land while in poorer countries increases in food production come largely by putting more land into cultivation.
- **value gap**– between market and non-market goods and services. Very high monetary values are assigned to human-made market goods and services, such as urban skyscrapers and automobiles; while non-market goods and services of nature, such as air, water, soil, production, and recycling are assigned limited monetary value.
- **education gap**– between the literate and illiterate, the skilled and the unskilled. Modern life has become so stressful that the literate are confined to an economically-competitive environment and the illiterate are struggling to eke out survival, so that there is little time to consider our common community and ecological issues, and the gap continues to grow.

Odum concluded that the common cause for all of these gaps is excessive waste of assets, both material and human, and our inability to make decisions in favor of sustainable rather than "boom or bust" economic development. Unfortunately, these gaps have increased rather than decreased in the last decade. We find sobering evidence for this fact presented by Tibbs (1996). He provides compelling arguments that the combination of 1) population growth, 2) expansion of food and biomass

consumption at a rate disproportionate to the entire land-based photosynthesis capacity, 3) consumption of our depleting stocks of fossil fuel, and 4) the exponential growth of an ecologically-adverse industrial system are presenting an imminent global crisis. A young Philipino man, Maximo Kalaw, reinforced Odum's ideas at the Global Tomorrow Conference which was held in Los Angeles in 1989. He challenged Western nations to do two things; 1) Begin to work once again in community to solve our problems and 2) Reconnect with our spirituality. Western economic greed and loss of connection clearly impacts the human spirit (This common ancestry of ecology and economy is surely not an accident, particularly when we think of an "economy of life" and the interdependence of all the communities that make up our world. However, this is a subject that exceeds the current scope of this paper and needs to be further explored.)

For years we have been, by-and-large, slow to respond in a personal and passionate way to environmental and sociological issues, unless they were in our "own backyard. " It has been easy to fall into the "everybody's business is nobody's business" lull. Also, business organizations, and environmental and social advocates often saw themselves on the opposite side of the policy fence. But the message is now clear. As documented by Anderson (1998), Senge et al. (1994), McKnight (1995) and others, these issues are closely connected, in the near-term, to our personal bank account. We maintain that these combinations of compounding environmental, economic, and social problems can be traced to the common denominator of the loss of ecologically-sound, therefore, sustainable, practices at local community levels. Thus, in the interest of our vested self-interest as well as that of future generations, we must rapidly make the transition to dealing with our economic, environmental, and social issues on the common ground that good ecologically-based communities are good business. Odum (1990) likens this transition to that of an individual from a youth to a mature adult.

The question is then, how do we make this transition? First and foremost, we must recognize that communities are indeed living systems and are interacting parts of other systems of the biosphere. Thus, these local communities are governed by the same ecological principles as are all other systems of the universe. In turn, human society's welfare is dependent upon our participation in and management of these local communities in accordance to these principles. As reflected in figure 7, we have identified six core principles upon which healthy communities are based. The current direction of modern trends and technologies tend to erode these inherent pillar strengths upon which healthy communities must be based, and promote unwise

economic development and community management practices which stress the economic, social, and natural resource fabric of our communities as shown at the left of figure 7. We must redirect these modern trends and technologies so as to realign them with and promote the ecologically-based pillars. Further, we must reframe our community development strategies and management practices so as to moderate the potential negative consequences of growth as shown at the right of figure 7, and we must base such growth on solid, integrated ecological principles.

The management of communities in accordance to ecological principles is in essence applied ecology. We recognize that such a process is complex and cumbersome. In fact, in accordance with the same ecological principles, the process has to be customized to each local community. Thus, no "cookie cutter" prescription can be given. However, we do feel that some general guidelines are appropriate and can be effectively used as a baseline tool for individual community decision making. Such a set of ecologically-based guidelines that integrate the principles we have discussed are presented in figure 8.

Surely, we all desire to give meaning and purpose to our lives. However, if our various vocations and collective knowledge are not directed toward sustainable communities for ourselves and our posterity, then to what end? In his recent book, *"Consilience: The Unity of Knowledge,"* Edward O. Wilson concluded his appeal for a common system of our great branches of knowledge by answering that question as follows:

> I believe that in the process of locating new avenues of creative thought, we will also arrive at an existential conservatism. It is worth asking repeatedly: Where are our deepest roots? We are, it seems, Old World, catarrhine primates, brilliant emergent animals, defined genetically by our unique origins, blessed by our newfound biological genius, and secure in our homeland if we wish to make it so. What does it all mean? This is what it all means. To the extent that we depend on prosthetic devices to keep ourselves and the biosphere alive, we will render everything fragile. To the extent that we banish the rest of life, we will impoverish our own species for all time. And if we should surrender our genetic nature to machine-aided ratiocination, and our ethics and art and our very meaning to a habit of careless discursion in the name of progress, imagining ourselves godlike and absolved from our ancient heritage, we will become nothing.

We close our appeal accordingly.

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