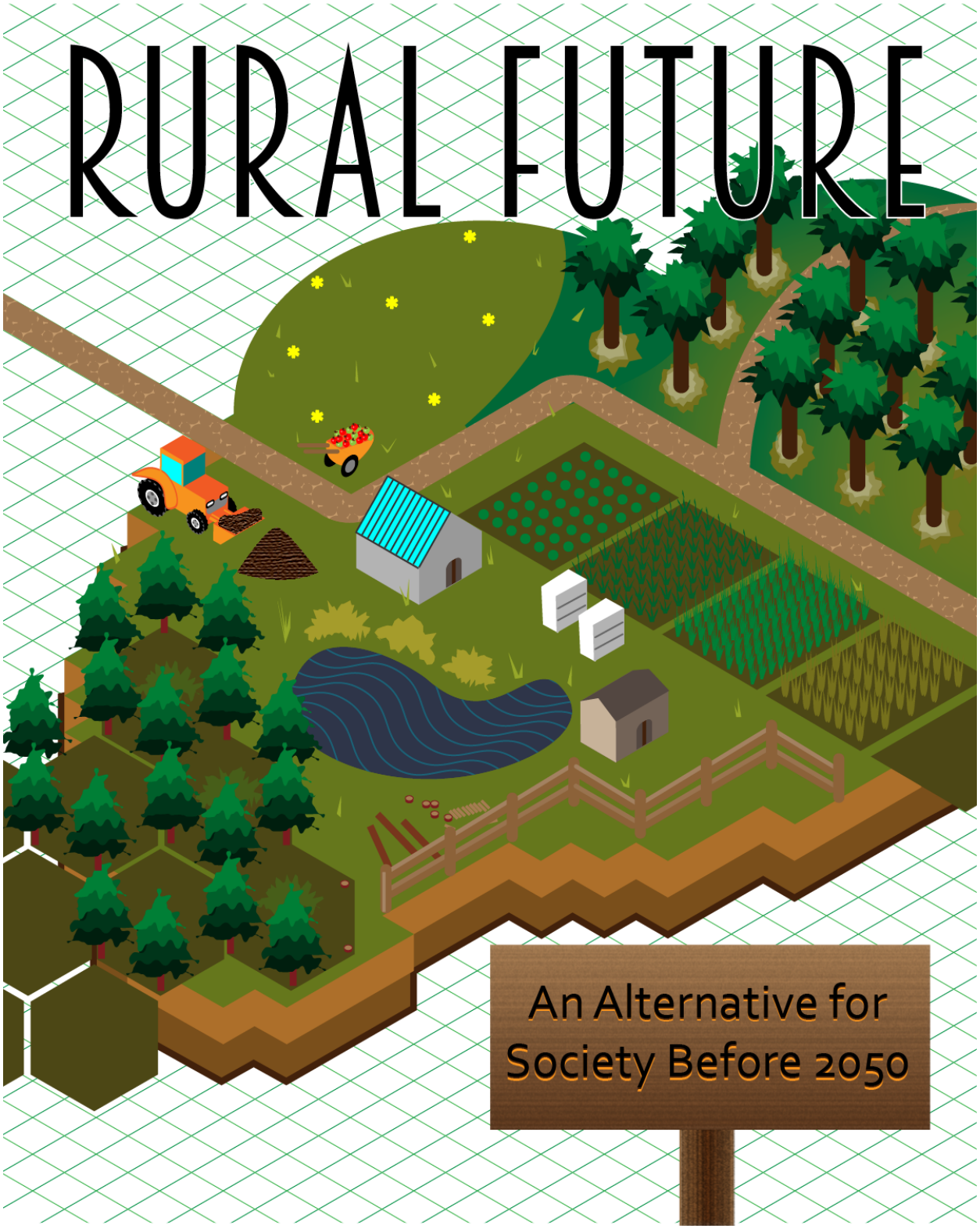
RURAL FUTURE



Rural Future

An Alternative for Society Before 2050 AD

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Editor's Introduction

Dr. Giles is a rare person who, identifying with and feeling compassion for humanity on an Earth-scale, sees the problems looming and multiplying and wants desperately to convince people to do *something* before it is too late to address predicted shortages of resources, particularly water shortages by 2030 and food shortages by 2050.

The *something,* specifically, is an idea at once wholly new, and filled with the very familiar. With so many problems converging at once, all inter-connected in their origins, Dr. Giles posits that small-scale solutions targeting specific problems will not be nearly enough. For a system of problems, we need a system of solutions.

Rural System is his plan for superior rural land management, computer-guided by a system of GIS and prescriptive software, informed by the latest science, and making stable profits within bounds over a planning period of 150 years. The computer software system would make precise prescriptions for management actions and business enterprises, carried out by interconnected, interdependent small businesses. Rural System, Incorporated, would be an integration of over 150 small businesses, called "Groups," meeting a diversity of needs and solving a diversity of rural problems, all guided by prescriptive software.

As a system of grand scope and scale, Rural System is new, calling for unprecedented levels of collaboration and investment in high-technology rural land management. The Groups, however, are familiar in their various specializations: System Central deals with business management, Marketing handles marketing for all Groups, The Fence Group handles boundaries, The Pasture and Range Group specializes in livestock management, and The Biking Group rents or sells bicycles and offers memberships for people to bike on lands under Rural System management. (Dr. Giles lists all of his imagined Groups in Appendix 1 of *Rural Future,* with brief descriptions for each.)

Having spent much of his life learning and teaching others about rural lands and natural resources, he stood back and realized that, while he had been focused on his research, most people in rural America had moved to the cities. Young people did not want to stay and farm, but older people were growing too old to manage the land. Increasingly, private lands not held by corporations are held by absentee individuals, who are unable or unwilling to continue to steward the land.

Meanwhile, growing urban populations still need nutritious food and clean water, and industrial farming will not be able to provide it once supplies of fossil fuels and phosphorous run low. Someone needs to do something to meet growing human needs with vital natural resources, without *exhausting* those natural resources.

Rural areas in America have long been prone to boom-and-bust economies, whether farming-, industry-, or mining-based. If natural systems are exploited completely in the present, such as clear-cutting an entire property, the "boom" of production will be followed by a "bust," where nothing much can be gotten from the land for a period of time. Rural communities in Western Virginia (the first target area of Rural System) are already suffering from extreme poverty and economic instability following the collapse of the mining and tobacco industries. People there need stable income in order to continue to live.

Rural System's large diversity of Groups, sharing resources for economies of scale, are likely to be able to provide the stability needed for communities to survive, and even prosper. Working with Rural System, small rural communities will be able to achieve greater marketing reach for their small businesses and non-profits, the people will be able to earn living wages, a

tax base will be built as property values increase, education will improve with tax revenues, and natural resource systems will improve in value, health, and resilience even as the human communities do.

The five Rural System objectives are:

> **Objective 1. Esthetic and Historical –** Achieve and enhance the history, beauty, and future estimates and interpretations of the rural region.
>
> **Objective 2. Salaries –** Provide meaningful work and related salaries for our local workers within our interrelated businesses.
>
> **Objective 3. Communities –** Provide funds and strategies for stabilizing small rural communities, with adequate related educational, protection, and social services.
>
> **Objective 4. Land Health –** Restore, enhance, manage, and stabilize high natural resource production of human benefits over a very long period. Achieve and stabilize, on Rural System lands and waters, high Rural Environment Health Syndrome indices.
>
> **Objective 5. Studies –** Conduct practical, profit-potential-increasing studies.

Given the power of modern technology (particularly GIS software) and the extensive scientific knowledge available on almost every aspect of rural land management (and some ecosystems), we can create a system that will benefit both humans and their environment.

In *Rural Future,* Dr. Giles introduces the philosophy and basic structure of Rural System, providing many examples of the Groups and of Rural System's planned action on the land. His work is addressed to a global audience of motivated people, who are ready to try something new to meet the coming crises.

I have been working for four years with Dr. Giles to communicate the messages of Rural System. Fundamentally, the child in me—taught to recycle in the fourth grade, aware from my earliest age that our planet requires thoughtful tending—is profoundly grateful to Dr. Giles for caring enough about future generations to dedicate his retirement to solving global problems. As an adult devoted to assisting future generations, I am proud to have been able to assist in offering what is, in fact, a beginner's manual for a new paradigm of natural resource management, one that is equitable, humanitarian, environmentally responsible, and consistent with the economic values of a proud, capitalist society.

Foreword

Let me tell you about your book and what it may mean to you and your family and friends. I prefer starting by telling you about current conditions and problems, as an introduction to the book's content, and as a rationale for what I write. Extremes are taboo for my presentation; exaggerations simply duplicate recent scare tactics of movies and damp the fires of meaningful action. Few now can spell "apocalypse" (or need to) while preparing for cataclysmic events and conditions. I'm genuinely concerned about the predictions that I make, and so I request that you concentrate on the information shared in the context provided, and ask that you reason from my observations and experiences and "bet" with me on a desirable, planned, well-implemented future, rather than a highly possible and disastrous alternative.

I'll tell you what I know and hope that you'll join me and act based on what you know about me, my former students, my writing, and my planned corporation, Rural System. I recommend using only a little knowledge perceived to be needed from history. Too much has changed and now changes. I don't recommend taking advice from singular experts or limited academic fields, those without diverse rural experiences, or from spiritual sources (tanks now empty). I share knowledge to influence behaviors beneficial to you and our colleagues… people of Earth.

I am 83 now. I met 50 citizens and the head of a park in Uganda in 2014; staff there explored potentials for further earth slides triggered by a rare hail storm, it having wiped out gardens, killing one child. I explored the feasibility of implementing Rural System in diverse ways in that country. I retired from Virginia Tech in 1998, where I had taught systems ecology, integrated pest damage management, wildlife management, and environmental dimensions of architectural design.

Work with graduate students often involved intensive computer applications (including GIS) in wildlife law enforcement, airport and power line placement, and routing impacts on the environment. I had been a state wildlife biologist for 5 years before starting a PhD program at Ohio State University. In Ohio, I explored effects of radio-isotope-labeled Malathion insecticide spray on the ecology of a hardwood forested watershed. My major professor was Dr. Tony Peterle. After graduating from Ohio State, I taught techniques of wildlife management and big-game management at the University of Idaho, and then I returned to Virginia Tech where I had gained a BS in forestry and an MS in biology. I taught at Virginia Tech for 40 years. I edited *Wildlife Management Techniques*[1] for The Wildlife Society, and authored *Wildlife Management*.[2] I've gained experience from professional visits in the USA, India, China, Nigeria, Uganda, and Senegal. I earned a teaching award and published *The Didactron*,[3] a book about modern teaching methods. Retired and well, I now work out of Blacksburg, Virginia, with two writing coaches and two helpful daughters nearby.

Experience can be useful. I write from those experiences and continued study as I describe thoughts and plans for Rural System (which I remain eager to implement, and see its

[1] Giles Jr RH, editor. Wildlife management techniques. Washington, DC: The Wildlife Society.
[2] Giles Jr RH. Wildlife Management (A Series of Books in Animal Science). 1978. W.H. Freeman & Co.
[3] Giles Jr RH. The Didactron. 2012. Blacksburg, VA: Handshake Media, Inc.

effects felt). I was told (as I discussed funding for getting Rural System started) to ignore "age discrimination," but no one will support massive work and investment led by an 83-year-old person! I share concepts for the common good, those that I believe are essential for future human populations (as in no time past, ever). I estimate having 13 years of functional, helpful life to share the ideas and concepts herein.

I'm rabid, especially about the ideas in Chapter 2!

I've had my rabies shots. I studied rabies for years with students, poorly funded because not enough people are killed by this virus to justify allocating funds for more study of the disease. No one wants to study it; it's too dangerous, personally risky for investigators and associates. One graduate student, however, bravely worked on the hypothesis that rabies is "stored" in the wild and then becomes a regional outbreak after abundant rabid animal-to-animal contacts. A contacted specimen sent to a health department required my student to take preventative inoculation shots… into her abdomen! Later I took preventative shots in the arm. I still work in the wilds and feel only a little safer. Some have had adverse reactions to the inoculation. I know that rabies can and has been transmitted by air (as once in a New Mexico lab among caged animals). It's transferred in the wild by sick animals biting others and, probably just as in curious pet dogs, nose to anus among infected animals living together within the dens of marmots.

The other way for its occurrence is probably through crowding stress, large populations (skunks, foxes, etc.) in season, excessively abundant in some years and, as in lab rats, undergoing adreno-pituitary stress. Thus, with the virus present, they develop rabies symptoms… but it is too dangerous to prove! How do you know? That base question, that line of epistemology (Chapter 5) is blocked. No, you can't learn, know everything from a teacher, dad, or lab. Watch out! There are alternative ways to learn… or not—give up!

I am stressed in every fiber of my "teacher core" by such words… I am rabid about the concept that we must work toward preventing the long-claimed convergence of an excessive human population with insufficient Earth-resources to support all people with diverse needs in diverse spaces.

Rabid is my feeling; I "know" —but probably don't—but must *act* as if I do in the face of the likely future. I risk little if in error. I share with you the constraints on my conclusion and recommendation, "the fences of the ball-field" where the rules are at work. I have to work with probabilities, things "known" within limits, constraints— "gained knowledge," available reports, or recent messages.

There are now many and major differences. I don't promote *the Rural System solution* herein for large family profit; the proposed work is not designed or in any way intended to be competitive with large, existing private farms and ranches, nor land owners, nor with natural resource agencies. There is rapidly-changing, useful technology now available. It was not available before in related periods of international crisis. Time available is critical and yet speed will be resisted, though warnings and stated-needs have been available since before 2000.

Perhaps, with you, I may risk violating every field of expertise in its separateness and uniqueness, but the payoff for the risk is probably high for creating at least an essential, functional, lasting system of sub-systems to serve Earth-around, one that balances, very soon, the water and food quality and quantity needs of human populations within their now-distinct areas, in over 196 countries, with available but still questionable supplies.

I gained encouragement from the guest editorial of the March, 2016 issue of *Frontiers in Ecology and the Environment*,[4] where I learned the UN Sustainable Development Goals, "represent a major potential turning point in the future of humanity. For the first time in recorded history we have a set of goals and targets agreed upon by all UN countries, which include the full range of factors that contribute to equitable and sustainable well-being," for nearly all of us… with a working concept and modern technology. New initiatives, new enterprises, and new Collaboratives must be planned and developed.

[4] Costanza R, Fioramonti L, Kubiszewski I. 2016. The UN Sustainable Development Goals and the dynamics of well-being. Front Ecol Environ. 14(2):59.

Preface

"Just tell readers what you want them to do," said my writing coach.

"I've spent a whole book trying!" I said.

"Try again, differently," she said. "The readers will realize you are serious; work only for them, your daughters, and Earth-payoffs. Readers know that neither you (nor anyone) wholly know what to do in the next few years before 2050 AD. They'll see the problems racing toward us and pick out tasks most suitable for them… one or a few that perhaps only they know now, and that can be used in new ways, new groups to act to meet the conditions and problems ahead.

"Write it again! Fewer specifics! Count on rapid advances occurring in science before 2050 AD. We'll all have to live now with hope and work together."

Alright: I want you to read, study, and learn together what's in *Rural Future*. It's a book about "rural Earth" and most of the rest of it, all linked together, inseparable. I want you to scan the premises that I offer (Appendix 2) for later thought and action, then to face the challenges with me in your own special ways.

1. Become aware that we're working together for lands and resources of Earth, where people are emigrating from rural areas to cities. (A twin problem, sums *left* in one place and *received* in another.)
2. Today, estimate your functional years (healthy, active ones) between now and 2050 AD. Carry with you the knowledge of the years ahead for effective work to reduce Earth crises.
3. Begin to study and apply the general systems approach presented throughout *Rural Future*, starting with clarified objectives for you and your habitat.
4. Help children and others move beyond learning about "ecology" as *the study of* plants and animals and their relations to *managing* resources and ecological systems.
5. Begin deep thought and planning for the unthinkable, that is, over 190 countries of Earth reaching inadequate essential resources—inadequate water in 2030 AD, and inadequate food in 2050 AD.
6. Create diverse local programs for regulated production of nutritious, energy-efficient foods for people on restored or newly-created food production sites (e.g., mountain-contour-slopes and fish-production waters).
7. Exploit existing databases and software to provide a unified computer system to aid countries and their neighbors to have equal inputs in international decision making.
8. Call for and act to renew and revitalize the UN, as well as relevant non-profits, to address the Earth-around shortages and healthy population needs in each country. At minimum, evaluate and begin action on reducing the extents of the wicked problem (Chapter 1):
    - Air pollution
    - GMO conflict
    - Climate instability

- Ocean level rise and water quality decline
- Ground water quantity and quality depletion
- Soil quantity and quality depletion
- Floral and faunal losses and invasions
- Pest floral and faunal effects, costs and losses (e.g., insect-related pathogens)

9. But, controlling or reducing action will not be sufficient. Implement ideas and activities sketched herein as elements of a working corporation—a Conglomerate—starting on abandoned rural lands.

"Get busy!" commands for readers will not work; very different, adjacent, country-scale action will promote war among competitors. Only a UN-like concept will work, for we are *all* now linked together, liked or not, by knowledge of threats: climate, energy, and nuclear-source potentials and limits, among other challenges. Together we can create Rural System or an improved version. It is possible! It is the first step toward hopefulness.

Introduction

A View from Here

"Hi Mary, where's Bob?"

"Upstairs, where he always is, saving the world."

Laughing, "I should have known. I'll just run on up."

"Hi Bob. Nice view from up here… among your books and all of this other… mess. What's all of this stuff?"

"Leave me alone," I demanded, smiling. "I'm saving the world… as she always says. Look at that autumn sunset!"

As on most days, I was living in my "literary nest," in piles of journals, files of cards (bc, before computers), collected papers on single topics, government publications, a not-very-neat-pile of notes and photos, and several drafts. Beside the computer and its accessories was a chair for my disrespectful, rarely humorous friend. We saw the need, the Earth-peril, clearly now… and we probably met for encouragement (never admitted).

"Beautiful view from up here… the evening light's mix of sunset, conifers, and autumn leaves."

I had been led by a regional expert to concentrate on the rural lands of "absentee farmers," after my retirement. These were lands within the state left behind by the hidden exodus of farm families in the past 20 years to the cities. I could hardly believe the numbers of migrants. I had concentrated on land use planning and specific natural resource issues. I had lost "the whole" view for "a part" ... a shift of scale. In my life, within "my" Virginia, the human population had shifted, transformed. I've learned, integrated, and I now see a pathway, though it's difficult and costly, to overcome conditions now and those emerging in my children's lifetimes within the region and the world.

People of Earth now head toward 60 percent living in cities. My grandfather used to discuss at the dinner table his amazement at the great technological and rural changes *he* had seen. I now had a feeling, one that must have been identical to his. I learned that the population of Virginia was (and is) 80 percent urban. While I wasn't watching, people had traded places from 80 percent rural to 20 percent! Virginia and other areas now have abundant "absentee land-owners," and as the population ages, more and more people are leaving farms, entering assisted-living facilities, and remembering the "good times."

All "times" were not good, for farming is difficult, economically risky, and dangerous. Farmers are now well-educated… and many have moved from the family farm to very diverse jobs throughout society. The farm is now the summer place or the hunters' lodge for the returning family members, or the tax burden and the place for some share-cropping, handled by a former local friend. It is also the speculator's realm where home-site landscape beauty is abundant, children few, regulations lax, electronic communication replaces traffic congestion, and remaining residents reluctantly pay for water and other extensions of county services.

More than the percentages have changed. School systems suffer because student numbers decline, affecting several budgetary and educational scoring procedures (bussing costs, staffing,

and salaries as well as safety are affected). Large stores move into some areas, changing the stability of small rural communities, numbers, taxes, and services. The Appalachian Regional Commission remains. Coal mining hesitates under transportation, regulations, safety, mining techniques, treatment, costs, natural gas competition, and doubts about climate change, its effects, causes, and its timely, cost-effective control.

With such great change, there are opportunities for action that may be profitable. With such change, there come near-demands for action, for major change, for state and even national governmental action. The scope of change is much beyond anyone's personal control, best wishes, or influence. The enormous perceived changes require new work of equivalent size and scope. It just does not seem available! No one seems to notice.

In this book, I tell a little of the changes that have been made, the needs, and the new abilities that are now "on the shelf" and being formed to meet these changes and their associated problems. That he or she was "right rural" may have been a comment from the past, now changed with education, the mixing of populations, transportation, and widespread travel. It's not changed enough to meet the number of pressing needs within multi-county rural regions of the Eastern US, very similar western and southern regions… and international areas that I have visited. (I write herein, for brevity and as a model, of western Virginia.)

You may want a little help in making your way through the many topics within this book. I'll try to help your reading, and I hope you'll notice:

1. the connections among the means to our objectives;
2. that we emphasize a systems approach, and "practice what we preach";
3. that we expect the opinion, "you're including too many topics" … but that's a point of emphasis: a world of topics, all interrelated and scrambled together;
4. each chapter is about a named subsystem, and intended (when in operation) to help achieve the objectives (Chapter 2);
5. that some chapters are intended to convince readers of relatively new insights into problems and good prospects ahead;
6. that we suggest we have a really big set of problems, too big for a quick list or analysis of each… all linked, all dynamic, and all within reach of solutions now, sooner than generally known possible;
7. that the concepts in Rural Future are not in my imagination, are possibly within current technology, with real danger ahead, requiring a complex response to the world catastrophe clearly ahead, and that I suggest "a way out" with readers' great effort; and
8. that I'll attempt responses to your questions on my blog at www.ruralsystem.com/category/blog.

Rural Future is just a snappy title for: "What to do with over hundreds of thousands of acres of mid-Eastern USA land and water when the people have left, community services are few and declining, agricultural land is worn-out or ruined, water is polluted and unstable, mining-income continues to decline, diverse jobs are absent, pastures are returning to brush-fields, and people, financially strapped, still love their lands and waters?"

I'm "right rural," meaning what Dad was as a child, and what many people were who I knew as I worked for a country veterinarian, gained a degree as a forester (Virginia

Tech), studied forest ecology at Ohio State University toward a PhD, owned a rural 20-acres, and visited farms in several distant countries. Farmers today, in Virginia, are college grads. “Rural” has many connotations, far from those of the past. I’m probably not rural enough; nevertheless, I want to share in this book the full awareness that “rural-as-now” won’t work, and that the messages herein—Rural System, as described—*will* work. Thousands of well-managed rural acres under the recommendations of Rural System are essential for us all.

I arrived at the need for a rurally-related corporation, after months of work. Millions of dollars of federal and various matching funds and contributions had done little to help citizens in rural Central Appalachia. Coal mines of international owners moved money as well as coal out of the region, leaving pitiful, small-community "camps" through the region. Mine reclamation addressed some surface areas, and performed some land reshaping. Thousands of acres were un-reclaimed, abandoned. The land, unrestored, is largely forested; the site quality for growing trees is poor. Nutrients have been leached from the soil... flooding is common.

Over-generalizing as I have just done is like an elevator speech about a business or a day-long drive through a section of a mountainous region. The speech will always be inadequate, i.e., neither enough of the old or the new. Unseen are problems of health, mining and agricultural injuries, inadequate diets, inadequate directed education, and instability in federal and state funding practices and procedures related to families in poverty, in a region with ever-changing forests, mines, agriculture, highway-related gains and losses, and big-box stores, all distant from urban centers.

With help, I’ve designed a corporation, Rural System, to meet the needs that I saw (remaining skeptical), aware that exceptions (well-known) are much easier to describe than a totally new response, unknown to land owners and thus risky. Federal efforts over many years need not be repeated. The needs are too diverse, players too many, stability missing, and fundamental personal and family independence have been lost in decades of well-meant financial support.

The view of rural lands and their people from here is hopeful, but I am convinced that past actions are unlikely to succeed. The view is the same Earth-around, and the successes locally will enliven those who suffer. I am motivated by the perils that I see and the children who suffer, and my daughters. Rural System will work; it is needed now.

I've had trouble explaining Rural System to too many people already over the last 12 years. I'll try again because it is important, but Rural System is new, complex, and counter-intuitive. There is no *best place* to start, so I must ask you to join me as I connect the parts, tend to the nodes, elaborate the processes, and assume common knowledge. I give you too little here in the introduction. The problem is large, the solution *very* large. Rural System, the topic and context of this book, is a corporation that can work in the world, with your help. I'm hoping for a diverse audience that *will* work more than a little with my message. I suspect the problems we face are bigger, more complex, changing, and contentious than human-kind has ever faced.

I’m not exaggerating; I think we have to join in some work together for a few years. I am not positive that we shall win. Not knowing how to find a way to join, or *what* to join may be *the* giant problem for people of good will, and *this* problem is what *Rural Future* addresses.

People have moved and continue to move from rural areas to the cities of the USA and the world. 80% of the US population is now urban. People have left behind lands, waters, resources and stressful conditions within small communities. Now we see collective loss of essential resources on an Earth-scale, below the blazes and clouds of war. Enough!

Rural residents may intend to escape very hard work, variable or low income, emigrating children, high living costs, aging land owners and workers, past poor land use, increasing production costs (e.g., crop fertilizer and big equipment), adverse legal action, counter-active messages from TV and modern technology, or decreasing voting-citizen knowledge of "modern farming"… or even all of these. *Rural Future* is about rural emigrants, especially about an imagined future for lands and waters around towns. A massively feasible alternative to "the well-known farm" is needed. The lands left need intensive care and management for an array of valuable human natural resource benefits, including those of food and abundant clean water, nationwide, soon Earth-around.

The US rural complexes, including yet-successful farms and some conventional farming, will no longer work. (There are wonderful, praiseworthy *exceptions.*) Current farming will not be adequate for the future. I contend that a new entity, Rural System, can provide the essential alternative. The world approaches 60% urban and people will be hungry and much-stressed by 2050 AD. (*Do the arithmetic: How many years are there for* you *from today's year until you will be 65 or more? This count is for years of potentially massive change.)* Consider your quality of life: past, now, and later! Change is needed *now* to improve conditions, using the sophisticated, comprehensive, modern management approach suggested in this book.

Carry with you the problem of understanding the relations and effects of implementing Rural System now, for the future. See my elevator speech, a brief talk planned to be made to a friend while on the way to the next floor of a building:

> "Hi, Bob, what are you doing nowadays?"
>
> "Hi Sarah. I'm developing Rural System, a new US corporation to meet the diverse needs of rural regions with many absentee landowners, people having emigrated from rural areas to cities. Not yet developed, it "rents" their lands and waters left behind, uses computer-aided precision agriculture, uses GIS and GPS, and integrates many diverse small businesses, aided by social media. It works for local people, schools, and small communities, and improves natural resource management. I'll see you later!"

Rural System, Inc. is a proposed Conglomerate business and foundation that unifies over 150 small, natural-resource-related businesses. It contracts with private rural landowners, most of them absentee owners, and then manages their land and water, providing new services, products, and profits. It shares profits with each owner from the total Conglomerate. It offers new employment and a community tax base by (1) gaining financial payoffs in planning, decision-making; (2) using sequenced value-adding strategies; and (3) using its computer maps and databases. Like share-cropping or a big lawn service, it develops rural land for annual landowner profits, for the long run.

Given many analyses of why small businesses fail and seeing consistent findings, I thought it reasonable that I not try to start a business with such "failure characteristics." I've noted them and made precise design decisions to eliminate them. Business systems also fail for "macro-factors," though: large ones beyond the influence of the small business founder. I try to face these in my own way, hopeful, unrealistic by some standards, improperly scaled, ignorant of the real scope of the problems, ignorant of human evil and its clandestine forces, disrespectful of natural forces (floods, tsunami, blights, epidemics, earthquakes), and of their lasting destruction. Alone I'll probably fail; with others, and with a novel design, I can and will win. That *win* must

be clear, because competing budgets and agency sales staffs' appeals to the gods or "waiting patiently" will not be sufficient for the people of future Earth.

Many farmers continue to farm, gambling in the face of unsure prices, markets, support, drought, storms, pests, disease, theft, fire, and more… now the threat of terrorists. Creating Rural System seems irrational! Let me describe my irrationality, an entity (sample size of one) believed and designed by me to be unique, thus not readily included within the categories of estate management, landscape experts, community developers, agritourism enterprises, or mega-farms.

Business success or failure is evaluated in return on investment (ROI) or related financial units. I have invested the equivalent of $500,000 in personal labor, employee time, and travel expenses on Rural System. This, like the personal investments of farmers and farm families, is not typically accounted well. There is yet no return on that investment and none expected. The expected investment return, however, is from life-saving, life-enhancing returns on vast Earth-around Conglomerates, linked, dynamic, managed systems, attentive to the quartet: adequate high-quality water, adequate high-quality food, timely energy, and adequate quality of life for humans.

Rural System is designed to provide regional employment, reasonable small community stability, and modern natural resource management, all indexed by profit. Return on investment is a secondary but real part. Other parts are those of history, scenic beauty, regional stability, protection of state tax funds, and the gains of social networks. When I began, the view may have seemed small, very narrow, but it was from a solid and recommended useful (now essential) modern general systems approach. It was clear that Rural System would need profit as grounds for accountability, and a pseudo-test would be needed to engage the hypothesis of this book: *that a sufficiently large first investment will be needed for a convincing scale to be achieved*.

"We the people" now get our food from many places. We depend upon these places, their people, and production systems. In 1972-73, surprisingly a series of events led to a sharp increase in the cost of food production and thus food supplies. Since then, much more information and its pathways have increased, and now we love the technology of an Earth-wide potential food inventory… but hate the result: we recognize there are too many people on the same food production pathway… calamity in 2050 AD! We are likely to be very short of fuel, feeds, fertilizer, and other "f" words of fine farm land. Committees saw the problem in '73, some of the data needs, and some solutions. Most of those who saw were "right poor," and the alternatives they saw were "right costly" and "right political," so they did little while speeding along to a "right bad" Earth-around situation (like our 1973 national one): very low food supply with very high demand.

The situation sounds like an agricultural problem, never discussed in public in 2016 by urban people. I'll die before 2050 AD but I write personally for my daughters and former students, Earth-around… *and* dear readers. Time's up!

My assumptions are as real as my pessimism; inaction for me is *not* real, as I act for my children. I assume this is much too personal-sounding, but I also assume you will be encouraging and aware of my genuine concern for humanity. I have other assumptions and they are fundamental to Rural System starting and becoming influential.

Based on the numbers, I have until 2026 as functional life during which to get Rural System started (beyond corporate formation). I assume that world populations will be enormous and need food, but that people and food supplies are not well-matched. For people in over 190 countries, we currently have a far greater problem in marketing and transporting nutritious food to people in need than we do in growing it.

I assume the population numbers are correct, or accurate enough to aid and influence policy. But quibbling over numerical accuracy when no one can describe the meaningful difference between 250,000 people now and later is a waste of time.

I assume "food" will be translated anew as packaged nutrients per energy unit needed for production. Right now, it costs too much energy to gather and process different crops (foods) for the nutrient content derived from each item. Rural System can help in this social evolution to "gain the good" from each item grown and purchased at explicit energy costs.

I assume that crop and property thefts and destruction will increase on Rural System tracts, thus crime prevention and related action will increase, as will related costs. Quality of life will decrease (including the general feeling of safety). Threats of addiction, labor uprisings, and extreme political differences will be deadly, exceeding "erosive." Rural System areas may not be as inviting as they once were or were planned. Terrorism will remain a topic as we address crime and potentials for equipment damage, forest fires, water pollution, and crop, food, or process poisoning by disloyal Earth-citizens.

I assume there will be large taxes on real estate, as well as personal property and corporate taxes. Land value will shift, increasing the need for Rural System services. We shall have to keep costs low to maintain visits and pleasant youth contacts for years later, when economic conditions may again change and they will return to rural areas.

I assume phosphorus will be available for growing crops. The supplies will decline,[5] prices will increase, transportation costs (energy dependent) will increase, and either new geo-strata will be found or oceanic-processed supplies of phosphorus will be created. Rural System will champion the use, recovery, and hoarding of phosphorus, and crop-rotation. Nevertheless, I assume excessive use of phosphorus fertilizers and its losses will continue. Some recovery will be made in water bodies and some applied to forests, but my assumption is one of disbelief and social apathy and the beginning of anomie. (There may be costly, contested extractive procedures ahead.)

I assume coal will become costlier as upper-level mines close, deep mine costs increase, safety problems increase, transportation costs increase, and expert demand increases. Regulated or not, there is little more coal of the right quality and amount that we can extract *and* deliver cost effectively.

I assume, based on a half-century of evidence, that a national energy policy will not be developed due to powerful competition, thus the energy crisis that is real and lasting at the regional- and community-level will necessitate personal strategies for gaining stable heating, cooling, and cooking. Rural System will participate actively in meeting these regional, community, and personal needs, including those for people moving back from cities to rural areas. People will move because their energy needs cannot be met in current urban settings.

I assume that people will move into communities or housing headquarters of Rural System's clusters to achieve improved quality of life and the many other gains as the current population ages. Changing needs for personal travel and small item delivery will move products and tourists from urban centers to community centers, some under Rural System management.

I assume gaining adequate human labor will remain a problem and that Rural System will experience continuing personal challenges to "invent" the new, intensive crop-producing areas or volumes needed on small ownerships (e.g., demonstrated in Western Virginia). I assume that

[5] "The exceptions—important resources which are not in inexhaustible supply—are fossil fuels (oil, natural gas, and coal), phosphorus, and a few elements which are essential in trace amounts for agricultural production, such as copper, zinc, and cobalt." The Population Bulletin. 1979. Population Reference Bureau. 34(3).

secondary benefits (other than salary and language education) will enable Rural System to employ adequate workers.

I assume that the rural emigration will continue with brief pulses of immigration by those who remember, who care, or who will find purposeful employment in enterprises within Rural System.

I assume that we have now gotten all that we can from farmers practicing traditional agriculture, being average, and eking out a family existence with rural yields as a second income. I assume that I can now make more than 10% greater annual income for them just by applying a set of recommended practices from the Cooperative Extension Service.

I assume that a 10% improvement in annual income will sound good to many people, but without knowing how, it is meaningless.

Rural System responds to the emerging world where being a break-even corporation is a desired condition, not one ripe for take-over or sale, but a stable one working well within society. We, the society, are endangered… and I assume that the government cannot/will not respond well or adequately within the time available before the convergence of two or more of the assumed forces. I write in *Rural Future* about what we must understand as *related*, and do together toward Rural System objectives.

About the Author

While many Americans are presently astonished at conditions in rural America, Robert Giles, Jr., Ph.D., has been working tirelessly for decades on planning solutions to interconnected rural problems. Dr. Giles is a Professor Emeritus of Wildlife Management at Virginia Tech where he taught for 30 years. His Bachelor of Science degree in Biology and Master of Science degree in Wildlife Management are from Virginia Tech. His Ph.D. in Zoology is from The Ohio State University.

Dr. Giles was born on May 25, 1933 in Lynchburg, Virginia. He attended E.C. Glass High School, during which he was awarded a Bausch and Lomb Science award for studies of the ring-necked pheasant. As an Eagle Scout, he was awarded the W.T. Hornaday National Award for Distinguished Service to Conservation and the James E. West Scouting Conservation Scholarship. During his undergraduate years at Virginia Tech, Dr. Giles was an editor for several magazines and the president of the V.P.I. Corps of Cadets of 6,000 students. He was also a member of seven national honorary societies.

During his time as a Professor in the Department of Fisheries and Wildlife at Virginia Tech, Dr. Giles was known for his innovative applications of computer programming and Geographic Information Systems (GIS) to land management questions well before such skills became standard practice within the field (and before GIS was a term). With the support of the Tennessee Valley Authority (TVA), he created the woodland resource management system of TVA, once used on 300 farms a year. With staff and students, he created the first wildlife information base (BOVA – Biota of Virginia database). As chairman of a local planning commission, consultant to the National Wildlife Refuge System, aid to the State Cooperation Commission, consultant for Wintergreen and several realtors, and as a landowner himself, he has developed a unique and alternative perspective on land and its management. He wrote the first plan for wildlife other-than-game for Virginia.

Dr. Giles began working on the Rural System concept in the early 1980s, but did not begin in earnest until his retirement in 1998. When asked about his aims for designing Rural System, he said, “I am now convinced that a superior demonstration of modern comprehensive natural resource management is badly needed and is now possible and most likely within the context of a new corporate rural structure. I do not want to do research. I do want demonstrations of the results of literally millions of dollars of unused research findings. I propose to bring all the power of the computer that I can to realistic and relevant use for parts of the region. This will include using that power already achieved by investments of resource agencies. I propose a system, subject to the law and to reasonable issues of cost, propriety, and community acceptance, that achieves such objectives.”

A colleague of his once said that Dr. Giles can come up with more ideas in an hour than most people can in a lifetime. His creativity is exceeded only by his humanity. Raised in Southwest Virginia, Dr. Giles knows the struggles of people in Central Appalachia, impoverished after the collapse of coal and tobacco industries. He has visited rural areas of Africa (Nigeria, Senegal, Uganda), China and India, and is well-educated in the sufferings of people in poverty worldwide.

Dr. Giles is a systems thinker. He believes that the problems faced by environmentalists and those of interest to humanitarians are interconnected, and that a system of problems must be met with a system of solutions. His career, his values, and his innovative capabilities make him

uniquely suited to tell the story of how a for-profit systems approach can best solve the rural problems of a progressive, capitalist society.

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