



Restoring the Amanah through Earth Repair: Islam, Permaculture, & Ecosystem Restoration Work

By Rhamis Kent

We are living in a time of great uncertainty. The poor ecological health of the planet is well documented: climate change, declining resources, degradation of the land and waterways, population growth, fresh water shortage, loss of biodiversity, dwindling energy resources, food, and health issues. Food & water security are fast becoming the most critically important issues to solve, with the Earth's population expected to exceed 9 billion by 2050. This dilemma is not easily resolved without the benefit of a strategic, knowledge-based approach. There exists a great need globally for such an effort to provide the means for building skills and capacity to effectively meet these challenges.

Interestingly, when attempting to analyse these problems in an effort to identify root causes for their emergence as a thematic phenomenon it is often clouded by the myriad considerations tied to a variety of topics ranging from politics, economics, the physical sciences, and social issues. It is the tendency to examine each as isolated entities – with apparently little to no connectivity or relation to one another - which hinders arriving at a proper rendering of viable solutions due to an improper & mistaken diagnosis.

We can broadly characterize what we see happening throughout the world as land abuse (misuse), which would include any and all life attached to it – animal, plant, etc.

[The American farmer, poet and novelist Wendell Berry further analyses this point further:](#)

If we are concerned about land abuse, then we must see that this is an economic problem. Every economy is, by definition, a land-using economy. If we are using our land wrongly, then something is wrong with our economy. This is difficult. It becomes more difficult when we recognize that, in modern times, every one of us is a member of the economy of everybody else.

But if we are concerned about land abuse, we have begun a profound work of economic criticism. Study of the history of land use (and any local history will do) informs us that we have had for a long time an economy that thrives by undermining its own foundations. Industrialism, which is the name of our economy, and which is now virtually the only economy of the world, has been from its beginnings in a state of riot. It is based squarely upon the principle of violence toward everything on which it depends, and it has not mattered whether the form of industrialism was communist or

capitalist or whatever; the violence toward nature, human communities, traditional agricultures and local economies has been constant.

The bad news is coming in, literally, from all over the world.

The proper business of a human economy is to make one whole thing of ourselves and this world. To make ourselves into a practical wholeness with the land under our feet is maybe not altogether possible — how would we know? — but, as a goal, it at least carries us beyond hubris, beyond the utterly groundless assumption that we can subdivide our present great failure into a thousand separate problems that can be fixed by a thousand task forces of academic and bureaucratic specialists. That programme has been given more than a fair chance to prove itself, and we ought to know by now that it won't work.

NOTE: To expand on this point, every aspect of our lives are affected by the nature & foundation upon which our economies are built; the politics governing a place and people are directly affected by and an outgrowth of the economics. At present, modern economics are predicated entirely upon a mass industrialisation of the world. John Kozy discusses this in his piece "[The Collapsing Western Way of Life](#)" highlighting the effects of this rendering (this is especially important to consider since most developing economies aspire to attain Western economic ideals):

The Industrial Revolution degraded human life to the status of coal. People became fuel for machines. Bought cheap, people are used until unneeded and then discarded like slag. Individuality, talent, imagination, originality—the best attributes of human beings—are suppressed to the point of extinction. The Industrial Revolution sucked the humanity out of the human race; people became things.

When the economic advantages of industrialization have dissipated, humanity will still be stuck in a world filled with bioundegradable junk, hazardous sites, raped environments, the unending consequences of the often accidental importation of alien species, polluted air and water, and numerous other consequences, the costs of which economists have never taken into consideration. And the progeny of both the rich and the poor alike will have to live with them. The pockets full of money that the rich have won't prevent their children and grandchildren from breathing bad air or drinking bad water or dealing with environmental degradation. These children and grandchildren may someday curse the days their fathers and grandfathers were born. Capitalism, as we know it, is reaching its endgame. The meek who inherit the earth will find it to be worthless...

The human brain has enabled mankind to discover and create wondrous things; it has also been used to inflict horrendous suffering and destruction. In fact, it would be difficult to design an economic system more destructive, wasteful, and dehumanizing than the industrial, and much of the destruction it has wrought may be irreparable. Industrialization does not efficiently allocate resources; it squanders them.

So, is mankind smart? Of course, but that is not the question. The ultimate question is, Is mankind smart enough to keep from outsmarting itself?...

It is worth highlighting that there is no need to distinguish between the socio-economic/socio-political systems of Capitalism and Communism, the dominant forces of the Industrial Era – they both have identical infrastructural mechanisms in common. To quote the prominent American Indian leader & activist [Russell Means](#):

I look to the process of industrialization in the Soviet Union since 1920 and I see that these Marxists have done what it took the English Industrial Revolution 300 years to do; and the Marxists did it in 60 years.

Seemingly, we have accepted industrialisation as a *fait accompli*, rarely - if ever - questioning its legitimacy as a viable basis for creating an economy. Solely judging upon the merits of the system based on what it has actually produced, it is extremely problematic – especially from the standpoint of the logic it subscribes to regarding what is considered to be capital, profit, and wealth. Quoting environmental filmmaker [John D. Liu](#):

The Studying of the Earth’s ecosystems is fascinating and can show us the way to sustainability if we are willing to act on the evidence before our eyes. When we consciously observe nature – the tides, atmosphere, movement of clouds, river systems, microbial communities, living soils, plants and animals – evolutionary logic is revealed. Nature is always adapting to changing conditions and seeking equilibrium. Everything has a purpose, nothing is lost, nothing is wasted, and nothing is extraneous. We know that the Earth’s naturally functioning ecosystems are the basis of life on Earth, providing air, water, soil fertility, raw materials and energy. It is also clear that the global economy does not recognise that the production and consumption of all goods and services depends entirely on the ongoing functionality of these ecosystems, and, as a result, fails to value it correctly. This is not surprising for a system that was founded on feudal privilege, military force, colonisation and slavery. While our stock market screens and bank accounts claim we have generated wealth, in reality, we have enriched a small minority of people while impoverishing a much larger majority of people on Earth, and destroyed ecological function over huge portions of the planet.

Now nature is warning us to stop and think. We currently face numerous challenges, including human-induced climate change, biodiversity loss, large-scale deforestation, desertification, hunger, economic crisis, social instability, migration, armed conflict, political revolution and war. Commenting on this “litany of sins”, Lester R. Brown, founder of the Earth Policy Institute and author of Plan B 4.0, recently said, “We must go beyond lifestyle changes and change the system, or civilisation will end”. In the face of such urgency, many of the assumptions that our civilisation has grown up with are thrown into question. Even the founder of that bastion of capitalist thought, the Davos World Economic Forum, Professor Klaus Schwab, recently declared: “Capitalism, in its current form, no longer fits the world around us”.

This dilemma applies to the Global Muslim community – especially the portion living within the industrialised nations. Ibn Khaldun spoke of the danger of falling prey to the “pleasures of civilization” and the effects thereof in his book, [The Muqaddimah](#). Generally speaking, an overarching historical narrative can be pointed to, having much more application for our time given the realities of life within industrialised, consumer-based societies.

There has been a collective failure to even begin to not only specifically identify industrialisation & consumerism as being profoundly flawed systems on a variety of levels – as opposed to being critical of certain aspects of the social & political structures which govern them; there has more importantly been an abject failure in specifying &

demonstrating a more reasonable alternative consistent with the ethical sensibilities which supposedly define and guide Muslims.

This immediately calls to mind the struggle of historically discriminated and oppressed minorities within an economy like that of the United States. Black Americans, for example, were forcefully placed and kept at the bottom of this socio-political/socioeconomic order since the inception of the country's founding. The very character of the system established there necessitated, in the minds of the system's designers, the dehumanizing & subsequent enslavement of not only black Africans to misappropriate their labour – it was also deemed necessary to dehumanize the Indigenous inhabitants of this part of the world in order to misappropriate their land. Through these means was the aggregation of enormous amounts of capital enabled for those not subject to such social, economic, & political exclusion.

The American entertainer and activist [Harry Belafonte touches on some of these points](#) reflecting upon his time with the celebrated Civil Rights leader Dr. Martin Luther King, Jr.:

Midway through the Civil Rights movement, Dr. Martin Luther King Jr. realized that the struggle for integration would ultimately become a struggle for economic rights. I remember the last time we were together, at my home, shortly before he was murdered. He seemed quite agitated and preoccupied, and I asked him what the problem was. "I've come upon something that disturbs me deeply," he said. "We have fought hard and long for integration, as I believe we should have, and I know that we will win. But I've come to believe we're integrating into a burning house."

That statement took me aback. It was the last thing I would have expected to hear, considering the nature of our struggle, and I asked him what he meant. "I'm afraid that America may be losing what moral vision she may have had," he answered. "And I'm afraid that even as we integrate, we are walking into a place that does not understand that this nation needs to be deeply concerned with the plight of the poor and disenfranchised. Until we commit ourselves to ensuring that the underclass is given justice and opportunity, we will continue to perpetuate the anger and violence that tears at the soul of this nation."

This is the very system Muslims have assiduously attempted to integrate themselves into.

It begs the question: is such an arrangement as this – one that requires the imposition of such widespread dehumanization and destruction; one that essentially seeks to make Reality into something that it is not intended to be - worthy of emulation and replication? Can it even be seen as a legitimate pursuit in light of the ethical & moral framework taught by this community's Prophet (May the peace and blessings of The Deity be upon him and his family)?

The Global Muslim community has been remiss in recognizing that the long & well-documented history of Islam and the various cultures which comprise it have modelled and demonstrated that solutions and viable alternatives exist. Fascinatingly, what have uniquely characterized these particular systems are the ethics & principles which are rooted within the heart of the Islamic tradition.

What is said to account for knowledge in this regard is where disputes may ensue. Within the Islamic intellectual tradition, there are epistemological explanations provided concerning the nature of the creation itself. Perhaps more importantly, there is an explicit responsibility placed upon the human being in relation to its form, function,

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and ability to acquire and act upon transmitted knowledge in how to properly interact with the creation. In a journal article written by William Chittick titled "[Ibn 'Arabi on the Benefit of Knowledge](#)", he writes with specific reference made to defining beneficial knowledge:

All of creation makes demands upon man, because he is created in God's form and has been appointed His vicegerent (khalifa). He has the God-given duty, woven into his original created nature (fitra), to recognize the haqq [right] of things and to act accordingly. It is this haqq that must be known if his knowledge is to be true, right, worthy, and appropriate, for this haqq is identical with the khalq [creation] that God has established.

In short, beneficial knowledge is knowledge of 'the what' and 'the why' of ourselves and of things. In order to know a thing truly and benefit from the knowledge, we need to know what it is—its reality (haqīqa), which is nothing but its khalq and its haqq—and we need to know how we should respond to it. What exactly does it demand from us, rightly, truly, and appropriately? To put this into a formula, tahqīq means knowing the haqīqa of God and things and acting according to their haqq: Realization is to know things as they truly are and act appropriately in every circumstance.

Only through this means of universal comprehension could we hope to properly discharge our God-given responsibilities. Defining and delineating the specific functional roles of each aspect of the creation is crucial for everything to occur as it was ideally intended.

From the standpoint of the Islamic ethical ideal, herein lies the fatal flaw of the Industrial worldview; its failure to properly recognize & acknowledge the right and reality of each and every created thing in existence. We have failed to act accordingly in honouring and respecting the creation given the form, function, and purpose of all which constitutes it.

This is an experiential & existential reality that must be acted upon – not an intellectual or theoretical abstraction to endlessly discuss & dissect. **A living praxis must result.**

In another journal article, authored by Othman Abd ar-Rahman Llewellyn titled "[Islamic Jurisprudence and Environmental Planning \(1984\)](#)", there is a particularly pointed reference made concerning the knowledge of the reality and right of the creation and how it must be managed in accordance with the human being's purposed role filtered through the lens of Islam's foundational legal principles:

An Islamic philosophy of the use of land and water, plants and animals, may be described in light of the objectives of Islamic law. All creatures are sustained by one *Rabb* or Lord and Sustainer, and He has created them in measure and proportion and has ordered and balanced them so as to sustain them by means of each other. Nothing is created without value and purpose. The purpose of each creature is to serve the Sustainer of all by filling its ordained role, thereby contributing to the cosmic design and purpose, to the welfare of the totality. All beings are thus united in aim, and benefiting the whole is a value that pervades the universe.

For human beings this role is expanded to the special responsibility of trusteeship (*amanah* and *khilafah*) over the earth. *Ihsan*, the most comprehensive term expressing nobility, denotes the perfection of moral rightness, practical benefit, and aesthetic artistry, and is due from humans toward everything, for the essence of worship is to do the greatest good to the entire creation.

Ihsan is translated into explicit administrative goals and legally enforceable principles through the duties of *Islah*: rightness, beneficiality, suitability, betterment of conditions, cultivation of earth, and establishment of peace, prosperity, and civilization. If the primary objective of Islamic law is to realize *ihsan* and maximize the welfare of the creation, the purposes of environmental planning may be defined as *islah*, revival of dead lands (*ihya al-mawat*), and *tahsin al-ard*: enrichment, enhancement, and beautification of the earth. The Prophet Muhammad, on whom be blessings and peace, declared that thus fructifying the earth is a profoundly ethical act:

Whoever revives dead land, for him is reward in it; and whatever any creature seeking food eats of it shall be reckoned as charity from him.

There is no Muslim who plants a tree or sows a field, and a human, bird, or animal eats from it, but it shall be reckoned as charity from him.

Operating from this premise, a persistent dilemma presents itself historically speaking. This role charged to humans has been seemingly misunderstood more often than not, viewing themselves as divinely-appointed dominators or subjugators of the creation rather than stewards.

Comprehensively, this has produced disastrous effects for both humans and the rest of creation with plenty of empirical evidence to refer to. The Ikhwan al-Safa' (Brethren of Purity) famously brought this issue to light in one of their fifty-two epistles, a "philosophically oriented compendium" tackling a number of topics entitled *Rasa'il Ikhwan al-Safa'* (or The Epistles of the Brethren of Purity,) called "[The Case of the Animals versus Man Before the King of the Jinn](#)" (Epistle 22). A description of the book's focus provided by Oxford University Press explains the intentions of the Ikhwan. An important theme emerges:

Their aim, as they explain, is 'to survey the merits and fine points of animals, their admirable traits and wholesome natures, and to touch on man's overreaching, oppression, and injustice against the creatures that serve him — the beasts and cattle — and his heedless ingratitude for God's blessings.'

Once given words, the animals have much to say, both about their own plight and about the human condition. They present themselves not as mere objects of study but as subjects with an outlook and interests of their own. That casts the essay into a moral mode: the animals warmly appreciate the bounty of Creation but passionately criticize human domination and systematically indict its underlying rationales as the products of human arrogance. The ingenious and insightful design of every creature, say the animals, testifies to God's creative and providential beneficence. But the natural piety, generosity, courage, and trust of the animals model virtues that human beings too often lack. The animals become living, speaking rebukes of human waywardness, faithlessness, negligence, and insensitivity.

Although it is actually the animals that have brought their case before Biwarasp the Wise, King of the Jinn, the humans see themselves as the plaintiffs. They expect animals simply to serve their needs. Outside the precincts of the court, in their own domains, they readily berate and belabour any domestic beasts that seem to shirk that role. Some even question God for creating beasts that they find useless, noxious, or repulsive. All creatures, the animals argue, have a place in God's plan. All play their roles in Nature. But, beyond such merely defensive remarks, the animals

turn the tables on their adversaries, goaded to a wide-ranging denunciation of human weaknesses. Their aim is to discredit the claim that man's innate superiority makes humans the owners of Nature and gives them a perfect right to treat all creatures as they please. Much of the fable is taken up with the animals' ripostes to such arrogance. In the end, most but not all of the claims the humans make are found groundless.

A legacy has been passed down through the ages – one marked with a tragic disregard for the very living systems which have made the development of human civilization possible and been the means for their success and well-being. There has perhaps been no more powerful illustration of this than what has been experienced during the present era of geologic chronological time some have denoted as the Anthropocene, in which human activity has had arguably the most significant impact on the functioning of the Earth's global ecosystems. This has had severe ramifications for the economic, political, and social unfolding of events for humans and all life on the planet.

A huge gulf exists which separates the manner in which human beings think nature operates from the way it actually works. The degree to which this separation translates into ill-advised action and poor decisions corresponds to the problems produced by this misunderstanding. The Qur'an certainly comments upon this directly:

And whatever of misfortune befalls you, it is because of what your hands have earned. And He pardons much. - Surat Ash-Shura, 30

Corruption has appeared on the land and sea, by reason of what your hands have earned. That [The Deity] may make them taste a part of that which they have done, in order that they may return. - Surat Ar-Rum, 41

There exists the suggestion of a deep-seated suspiciousness and mistrust of God and the creation within the human being which drives the desire to subjugate and alter the nature of Nature, forcing it to conform to what has proved itself to be a flawed understanding of the ways and means of The Creator and His Creation. It can be characterized as little else. Otherwise, why would the magnitude and frequency of the destruction meted out on the natural world be done purposely?

For most of the 20th century, modern economies have been based on industries that have created jobs which destroy and degrade the very ecosystems we depend on for our survival — and in turn, degrade us. Loss of biodiversity and ecosystem function results in serious reductions in the goods (such as food, medicines and building materials) and the services (such as clean water, oxygen and nutrient cycling/biogeochemical cycles) that the earth's ecosystems provide, making economic prosperity and human survival possible.

Quoting E.F. Schumacher, author of the seminal text **Small Is Beautiful: Economics as if People Mattered**, from Chapter 1 - "The Problem of Production":

"A businessman would not consider a firm to have solved its problems of production and to have achieved viability if he saw that it was consuming its capital. How, then, could we overlook this fact when it comes to that very big firm, the economy of Spaceship Earth and, in particular, the economies of its rich passengers?"

One reason for overlooking this vital fact is that we are estranged from reality and inclined to treat as valueless everything we have not made ourselves.

Now we have indeed laboured to make some of the capital which today helps to produce a large fund of scientific, technological, and other knowledge; an elaborate physical infrastructure; innumerable types of sophisticated capital equipment, etc. - but all this is but a small part of the total capital we are using.

Far larger is the capital provided by nature and not by man - and we do not even recognize it as such. This larger part is now being used up at an alarming rate, and that is why it is an absurd and suicidal error to believe, and act on the belief, that the problem of production has been solved."

In a book titled **Natural Capitalism: Creating the Next Industrial Revolution**, the authors (Paul Hawken, Amory Lovins and Hunter Lovins) see the world's economy as being within the larger economy of natural resources and ecosystem services that sustain us. The authors argue that only through recognizing this essential relationship with the Earth's valuable resources can businesses, and the people they support, continue to exist.

According to the authors, the "next industrial revolution" depends on the espousal of four central strategies:

1. The conservation of resources through more effective manufacturing processes.
2. ***The reuse of materials as found in natural systems.***
3. A change in values from quantity to quality and
4. ***Restoring and sustaining natural resources.***

(Our primary focus in reference to this piece will be on points 2 & 4 from a practical perspective.)

If we can see how natural ecosystems and the services they provide are the very foundation of our ability to create wealth and comprehensive well-being, it makes sense to conclude that industries could be created that have as their explicitly stated goal the maintenance and improvement of this vital natural infrastructure. Given this premise, it makes little sense to destroy a primary asset in an effort to make money. It creates a variety of unforeseen, and one would assume unintended, problems.

Logically speaking, one would do everything possible to either save or conserve the asset (at the very least) or improve its condition, subsequent worth and continued productivity (the ideal).

Specifically, ecosystems provide four types of services:

Provisioning services

- food (including seafood and game), crops, wild foods, spices
- water
- pharmaceuticals, bio-chemicals, and industrial products
- energy (hydropower, biomass fuels)

Regulating services

- carbon sequestration and climate regulation
- waste decomposition and detoxification
- purification of water and air
- crop pollination
- pest and disease control

Supporting services

- nutrient dispersal and cycling
- seed dispersal
- Primary production

Cultural services

- cultural, intellectual and spiritual inspiration
- recreational experiences (including ecotourism)
- scientific discovery

The ecosystem services that are provided by the natural world form the basis of all wealth creation - a nation's true primary asset.

As quoted from 2010's influential TEEB ("[The Economics of Ecosystems & Biodiversity 2008-2011](#)") Report:

"-there are no economies without environments, but there are environments without economies."

If the needs and concerns of business are permitted to overtake those of natural capital, a fatal error has been made. There is no possible way for a system of this type to be successful or sustainable due to its willingness to consume its primary, most functionally valuable asset in an effort to make money.

This would appear to be an egregious contradiction based upon an erroneous premise and mistaken logic.

Again, referring to John D. Liu's article, "[Functional Ecosystems as the Engine of the Green Economy](#)":

From the study of natural ecosystems comes an economic answer that goes to the fundamental question of 'what is wealth?'. Although everything that is produced and consumed comes from the bounty of the Earth, according to current economic thinking, the value of ecological function is zero. We now calculate the economy and money as the sum total of production and consumption of goods and services. By valuing products and services without recognising the ecological function from which they are derived, we have created a perverse incentive to degrade the Earth's ecosystems.

Functional ecosystems can be shown to be more valuable than production and consumption. A pathway to sustainability appears if, instead of the economy being based on production and consumption of goods and services, it were based on ecosystem function. This would mean a fundamental transformation of human society. This development trajectory can be seen to address

all of our most pressing problems. In an economy based on ecological function it would be economically disastrous to pollute. A functional economy would mean that conservation is not considered an expensive luxury, but the way to preserve wealth. It would also mean that restoration of degraded lands would be recognised as a means to increase wealth. Sequestering carbon would be a matter of course rather than an afterthought. A functional ecosystem-based economy would be much more fairly distributed, because those responsible for maintaining that function – currently those who suffer worst from the degradation inflicted by consumer capitalism – would be compensated for restoring and maintaining ecosystem functions.

Noted physiology & geography professor Jared M. Diamond in his book, **Collapse: How Societies Choose to Fail or Succeed (2005)**, examines the most common factors and failure modes which have historically contributed to the collapse of past civilizations.

In the prologue, Diamond summarizes his [methodology](#) in one [paragraph](#):

This book employs the comparative method to understand societal collapses to which [environmental problems](#) contribute. My previous book ([Guns, Germs, and Steel: The Fates of Human Societies](#)), had applied the comparative method to the opposite problem: the differing rates of buildup of human societies on different continents over the last 13,000 years. In the present book focusing on collapses rather than buildups, I compare many past and present societies that differed with respect to environmental fragility, relations with neighbors, political institutions, and other "input" variables postulated to influence a society's stability. The "output" variables that I examine are collapse or survival, and form of the collapse if collapse does occur. By relating output variables to input variables, I aim to tease out the influence of possible input variables on collapses.

Diamond identifies *five factors* that contribute to collapse: *climate change, hostile neighbours, collapse of essential trading partners, environmental problems, and failure to adapt to [environmental issues](#).*

He also lists 12 environmental problems facing mankind today. The first eight have historically contributed to the collapse of past societies:

1. [Deforestation](#) and [habitat destruction](#)
2. [Soil](#) problems ([erosion](#), [salinization](#), and [soil fertility](#) losses)
3. [Water management](#) problems
4. [Overhunting](#)
5. [Overfishing](#)
6. Effects of [introduced species](#) on [native species](#)
7. [Overpopulation](#)

8. Increased per-capita impact of people

Further, he says four new factors may contribute to the weakening and collapse of present and future societies:

1. [Anthropogenic climate change](#)
2. Buildup of [toxins](#) in the environment
3. [Energy shortages](#)
4. Full human utilization of the [Earth's photosynthetic](#) capacity

Interestingly, the top three (3) factors listed (i.e. – Deforestation and habitat destruction, Soil problems, and Water management problems) share the same origin, all being products of the sustained degradation of landscapes due to mismanagement.

These persistent problems heavily impact issues of state and human security in ways which are inextricably linked. Obviously, this would also have unfavourable consequences for economies.

Quoting Luc Gnacadja, Executive Secretary of the United Nations Convention to Combat Desertification:

“We need to reconcile State security and human security. Where does the responsibility to protect start? The drylands, which cover more than 40% of the Earth’s land mass, are the most conflict-prone regions of the world. But why are the drylands so important? They are important because for every three people in the world today, one lives in the drylands. Nearly half of world food production systems are in the drylands. And it is in the drylands that land degradation goes by the name of desertification.”

“According to UN Water, by 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity. But we do not have to wait until 2025 to believe that conflicts over vital water resources are on the way.”

“In this context, traditional definitions of state security and sovereignty are inadequate. If our pursuit of human security is built on the overconsumption of renewable resources, in a period of climate change created by the overconsumption of non-renewable resources, land degradation, desertification and conflict requiring massive humanitarian intervention and protection of populations are almost inevitable outcomes.”

“If left unchecked, the coming ‘soil peak’ will have worse implications than the current ‘oil peak’.”

“About a third of the global population lives in the drylands. 90% of these or 1.8 billion people are in developing countries. Nearly 650 million live directly off the land. Land is their only asset. It is their primary source of food and water.”

“So we have a scenario where our consumption patterns lead to climate change. Climate change alters the renewable resource structures in the drylands, affecting the communities and states least able to anticipate, respond and cope with the crises and without the institutional mechanisms to

support adaptation and resilience. This increased vulnerability is the source of much of the conflict in the world today."

"Many of the best models to minimize land-based vulnerability have been developed from the bottom-up. They employ sustainable land and water management technologies. For sure, government support will be essential, especially on the level of institutional mechanisms..."

Where do we go from here?"

"We need a paradigm shift that will generate new governance for a holistic approach to the management of renewable resources, where human security and long-term sustenance of renewable resources provides the basis for international cooperation."

<http://www.unccd.int/Lists/SiteDocumentLibrary/secretariat/2011/Doc%201%20WWF%20-%20Land%20Degradation,%20Our%20Blind%20Spot%20-%20Luc%20Gnacadjia.pdf>

The strategic design for the collective behaviour required to fix these problems is in place. Of critical importance in advancing these efforts is sustained institutional, financial, and material support to develop the necessary human capital to do the job.

A broad range of inspirational examples demonstrate that it is indeed possible to rehabilitate eroded areas. Once stakeholders understand how to integrate restoration with sensible economic models, a business case may emerge, forming the catalyst for a new and dynamic global economic engine potentially rivalling that of the Industrial Revolution of the 20th Century. The difference here is that the engine is fuelled by repairing critical ecological infrastructure, not industrial.

Earth Repair Work is a means by which to re-establish functional, stable, productive, and bio-diverse natural ecosystem infrastructure through intelligent natural capital asset management using what could broadly be called Recommended Management Practices, or RMPs.

The ultimate purpose of this work is to rehabilitate, restore, & regenerate the Earth's severely degraded ecological base which has provided the foundation for any and every stable society and successful economy on Earth throughout human history. There exists an acute need to enable people in areas of severe land degradation to repair the damage.

The impact of undertaking this type of endeavor will mean that the inhabitants of these degraded regions will have developed the internal capacity to provide access to clean water, a secure supply of food, stable ecological and environmental infrastructure, improved health, increased educational opportunities, an overall better quality of life and a means to develop a self-sustaining economy leading to healthier, more productive lives.

Quoting noted Australian soil scientist Dr. Christine Jones from an article she authored entitled "[Creating Topsoil](#)":

"The most meaningful indicator for the health of the land, and the long-term wealth of a nation, is whether soil is being formed or lost. If soil is being lost, so too is the economic and ecological foundation on which production and conservation are based."

Franklin Delano Roosevelt, the 32nd President of the United States, was famously quoted as saying:

"The nation that destroys its soil destroys itself."

(SOURCE: Letter to all State Governors on a Uniform Soil Conservation Law, 26 February 1937)

The damage is done and undeniable – but it can be repaired & reversed, even at this point in history as demonstrated by the documenting of a number of successful and on-going projects of this variety from around the globe:

Al-Jazeera's "earthrise" – Greening the Desert (<http://youtu.be/uYk21PLKGgg>)

Behind Greening the Desert (<http://youtu.be/LJ8piOG4pXI>)

Green Gold (<http://youtu.be/J3WisjXYik4>)

Hope in a Changing Climate (http://youtu.be/z_xET5iZSy0)

2000 Year Old Food Forest (<http://youtu.be/hftgWcD-1Nw>)

These video clips feature core members of our team which include permaculture specialist Geoff Lawton & filmmaker John D. Liu.

The following approaches are used to establish food & water security by designing productive landscapes that are not only sustainable – they are also regenerative, bringing dead land back to life. Proper ecosystem function is also effectively replenished, providing the critical services needed for a stable, habitable physical environment.

Some of these Recommended Management Practices include:

- Agroecology/Eco-Farming (<http://youtu.be/938PECAJ920>, <http://youtu.be/Wk2E2RORL48>)
- Permaculture (Permanent Agriculture - <http://youtu.be/2Lv3R4HrY6w>)
- Regenerative Agriculture (<http://youtu.be/7Ix3JO2yo7s>)
- Biological Farming (<http://youtu.be/g9ssyPkvI60>)
- Carbon Farming (<http://youtu.be/hYrmeU43pw0>, <http://youtu.be/q0F5VEqXq4g>)
- Holistic Management (<http://vimeo.com/8239427>)
- Keyline Design (<http://youtu.be/00puSBSRmDQ>)
- Pasture Cropping (<http://youtu.be/khNprFGW0N8>)
- Farmer Managed Natural Regeneration (<http://youtu.be/E9DpptI4QGY>)
- Extensive use biologically active soil amendments, such as compost & compost teas (Soil Food Web - <http://youtu.be/o7Fsp3qw2so>)
- Water-harvesting earthworks (http://youtu.be/UFeylOa_S4c)
- Bio/Myco/Phyto-Remediation technologies (<http://youtu.be/XI5frPV58tY>)

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- **Tree Planting/Reforestation (<http://youtu.be/JgocCk2pGlg>)**

In particular, the design science of Permaculture encompasses and articulates the principles upon which Earth Repair Work is predicated. Created by Australian Bill Mollison in the early 1970's, this concept of developing a purpose-driven permanent agriculture is guided by an ethic: Care of the Earth, Care of People, & Fair Share of the Surplus.

Referencing Bill Mollison's definition (taken from his **Permaculture: A Designer's Manual** text):

Permaculture (permanent agriculture) is the practical conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems.

It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs in a sustainable way.

Permaculture developed and emerged as "a response to a perceived social problem".

Permaculture, as a design system, attempts to integrate fabricated, natural, spatial, temporal, social, and ethical parts (components) to achieve a functional whole.

To do so, it concentrates not on the components themselves, but on the relationships between them, and on how they function to assist each other.

It is in the arrangement of parts that design has its being and function, and it is the adoption of a purpose which decides the direction of design.

Permaculture is concerned with the institutional and functional design of the dynamic infrastructure provided by the natural world in the form of ecosystem services.

We are given a concrete means of intelligently managing natural capital in a way that strengthens it while supplying our needs in an ethical, conscious manner.

The aforementioned techniques & strategies are science-based design systems which also make full use of participatory approaches. Sample projects with favourable results include the African Re-greening Initiative of Dr. Chris Reij (see <http://www.africa-regreening.blogspot.com>). One of the specific projects featured in Dr. Reij's work can be seen in a film titled **The Man Who Stopped the Desert** featuring Yacouba Sawadogo from Burkina Faso (http://youtu.be/Dzah_5y65AU).

We have found that there has been considerable interest within the Muslim world in this work given its focus on issues that are heavily affecting the people and places where Muslims live. I have taught permaculture design courses in [Palestine's Occupied West Bank](#), southern Ethiopia, and Yemen (Tarim, Hadramout), with [additional project work in Afghanistan](#), the [flood ravaged Sindh province of Pakistan](#), [Western Sahara](#), and large-scale project work in Somalia. Our group has worked in virtually every country in the Middle East, including [design work for UAE's Masdar City](#) and [eco-village development work within Saudi Arabia's governorate of Mecca](#). [Princess Basma bint 'Ali of Jordan has been a strong endorsee of Permaculture](#), with work being done within the country – most notably [Geoff Lawton's "Greening The Desert" project in the Jordan River Valley](#). The influential Yemeni scholar Habib 'Umar bin Salim bin Hafidh has expressed his strong support for this work, saying that it was obligatory for Muslims to discharge their duty in safeguarding and properly tending to the creation of God as a matter of piety.

There is a wealth of evidence provided speaking to the very favourable return on investment (ROI) realised by restoring and improving natural capital as an economic concern - as powerfully demonstrated by the Loess Plateau Watershed Rehabilitation Project conducted by The World Bank's International Development Association:

With a total budget of approximately \$500 million USD applied over an area covering 35,000 square kilometres (3.5 million hectares), the investment per unit area for the Loess Plateau Project was just under \$143 USD per hectare. In terms the benefits reaped from the project, they include:

- **More than 2.5 million people in four of China's poorest provinces – Shanxi, Shaanxi and Gansu, as well as the Inner Mongolia Autonomous Region – were lifted out of poverty, reducing the rate of poverty from 59% to 27%.**
- **Through the introduction of sustainable farming practices, farmers' incomes doubled or tripled, employment diversified and the degraded environment was revitalized.**
- **The projects' principles have been adopted and replicated widely. It is estimated that as many as 20 million people have benefited from the replication of the approach throughout China.**

(SOURCE: <http://www.worldbank.org/projects/P003540/loess-plateau-watershed-rehabilitation-project?lang=en>)

[The United Nations Environment Programme](#) published a report in 2010 titled "[Dead Planet, Living Planet – Biodiversity and Ecosystem Restoration for Sustainable Development: A Rapid Response Assessment](#)" that presents compelling arguments for performing this work that speak to the concerns of business & economics just as much as it does of those concerned about the state of our global ecology and environment. Doing so will prove to be invaluable in helping to attract funding in amounts befitting the vital importance of this work.

Below, excerpted portions of the report's summary detail the benefits of restoration:

- **Ecosystems, from forests and freshwater to coral reefs and soils, deliver essential services to humankind estimated to be worth over USD 72 trillion a year – comparable to World Gross National Income. Yet in 2010, nearly two-thirds of the globe's ecosystems are considered degraded as a result of damage, mismanagement and a failure to invest and reinvest in their productivity, health and sustainability.**
- **Biodiversity and ecosystems deliver crucial services to humankind – from food security to keeping our waters clean, buffering against extreme weather, providing medicines to recreation and adding to the foundation of human culture. Together these services have been estimated to be worth over 21–72 trillion USD every year – comparable to the World Gross National Income of 58 trillion USD in 2008.**
- **Effective conservation is the cheapest and most optimal option for securing services, costing only from tens to a few hundred USD per hectare.**
- **Indeed, restoration costs range from hundreds to thousands, or even hundreds of thousands of USD for every hectare restored, or over 10 fold that of effectively managed protected areas. These numbers, however, are dwarfed compared to the long-term estimated costs of losing these ecosystem services.**
- **Well planned, appropriate restoration, compared to loss of ecosystem services, may provide benefit/cost ratios of 3–75 in return of investments and an internal rate of return of 7–79%, depending on the ecosystem restored and its economic context, thus providing in many cases some of the most profitable**

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public investments including generation of jobs directly and indirectly related to an improved environment and health. Ecological restoration can further act as an engine of economy and a source of green employment.

- **A worldwide survey of studies looking at restoration and conservation of ecosystem services shows us that conservation and restoration provides a highly profitable, low-cost investment for maintaining ecosystem services. Increases in biodiversity and ecosystem service measures after restoration are positively related. Restoration actions focused on enhancing biodiversity should support increased provision of ecosystem services, particularly in tropical terrestrial biomes. Conversely, these results suggest that ecosystem restoration focused mainly on improving services should also have a primary aim at restoring biodiversity.**

It is of essential importance to create the institutional infrastructure required to realize this vision. There is a void which must be filled in this regard. The establishment of an effort of this type would have far reaching implications environmentally, politically, socially, and economically for the entire world. This is an idea whose time has come.