

Economic Support for Global Earth Repair Work & Ecosystem Restoration: Making The Case

In 1997, in one of the first efforts to calculate a global number, a team of researchers from the United States, Argentina, and the Netherlands put an **average price tag of US\$33 trillion a year** on the fundamental services provided by healthy natural ecosystems. These ecosystem services are largely taken for granted because they are assumed & considered to be free. **That is nearly twice the value of the global gross national product (GNP) of US\$18 trillion.**

(http://earthtrends.wri.org/features/view_feature.php?fid=15&theme=5)

Exactly what are these ecosystem services being referred to?:

- moderate weather extremes and their impacts
- disperse seeds
- mitigate drought, floods and fires
- protect people from the sun's harmful ultraviolet rays
- cycle and move nutrients
- protect stream and river channels and coastal shores from erosion
- detoxify and decompose wastes
- control agricultural pests
- maintain biodiversity
- generate and preserve soils and renew their fertility
- contribute to climate stability
- purify the air and water
- regulate disease carrying organisms
- pollinate crops and natural vegetation

(<http://www.actionbioscience.org/environment/esa.html>)

The ecosystem services that are provided by the natural world form the basis of all wealth creation - it's natural capital & an investor's primary asset. Given this premise, it makes no sense to destroy your primary asset in an effort to make money. 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).

Ecosystem services play a similar role as the involuntary functions of the body. Their value and essential importance is not realized until they are no longer available. When attempts are made to replace them, it is then seen how costly and difficult it is to duplicate their role.

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. If we can see how natural ecosystems and the services they provide are the very foundation of our ability to create wealth, it makes perfect sense for us to conclude that industries could be created that have as its explicitly stated goal the maintenance and improvement of these vital natural ecosystem.

The Millennium Ecosystem Assessment (MA) was called for by the United Nations Secretary-General Kofi Annan in 2000. Initiated in 2001, the objective of the MA was to assess the consequences of ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being. The MA has involved the work of more than 1,360 experts worldwide. Their findings, contained in five technical volumes and six synthesis reports, provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems and the services they provide (such as clean water, food, forest products, flood control, and natural resources) and the options to restore, conserve or enhance the sustainable use of ecosystems.

What are the main findings of the MA?

1. Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.
2. The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.
3. The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals.
4. The challenge of reversing the degradation of ecosystem while meeting increasing demands for services can be partially met under some scenarios considered by the MA, but will involve significant changes in policies, institutions and practices that are not currently under way. Many options exist to conserve or enhance specific ecosystem services in ways that reduce negative trade-offs or that provide positive synergies with other ecosystem services.

The bottom line of the MA findings is that human actions are depleting Earth's natural capital, putting such strain on the environment that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted. At the same time, the assessment shows that with appropriate actions it is possible to reverse the degradation of many ecosystem services over the next 50 years, but the changes in policy and practice required are substantial and not currently underway.

<http://www.millenniumassessment.org/en/About.aspx>

How do we effectively/practically address this problem?

Fortunately, there are a number of very experienced, highly capable organizations, networks and individuals who have demonstrated the effectiveness of a variety of earth repair techniques and approaches that are easily scaled up for widespread use and global implementation:

The Permaculture Research Institute of Australia (Geoff Lawton)

www.permaculture.org.au

<http://www.youtube.com/watch?v=KUHm4nLuIIw>

<http://www.youtube.com/watch?v=SjQOZmlqiyk>

TrustNature Natural Systems Technology (Paul Taylor)

www.trustnature.com.au

Holistic Management International (Allan Savory)

<http://www.holisticmanagement.org/>

Australia Felix Permaculture (Darren Doherty)

<http://www.permaculture.biz/education/darrenCV.php>

<http://picasaweb.google.com/permaculture.biz/PermacultureDesignPortfolio#>

Trees For Earth (Matt Kilby)

www.treesforearth.com.au

Rainwater Harvesting (Brad Lancaster)

<http://www.harvestingrainwater.com/>

Renewable Soil (Dr. Christine Jones)

<http://renewablesoil.com/dr-christine-jones.html>

Soil Food Web, Inc. (Dr. Elaine Ingham)

<http://www.soilfoodweb.com/>

Dr. Rattan Lal - Soil Scientist and Carbon Sequestration expert at Ohio State University

<http://cwc.osu.edu/contacts/bios/lal.php>

Mycoremediation/Mycorestoration expert - Paul Stamets

<http://www.fungi.com/>

<http://www.youtube.com/watch?v=7xueDUI4U3Y>

<http://www.youtube.com/watch?v=7xueDUI4U3Y>

The Rodale Institute (Leading researchers in Regenerative Agriculture & its effect on reducing global warming)

http://www.rodaleinstitute.org/global_warming

http://www.rodaleinstitute.org/files/Rodale_Research_Paper-07_30_08.pdf

LawrieCo Biological Farming

<http://www.lawrieco.com.au/>

Natural Sequence Farming (Peter Andrews)

<http://www.naturalsequencefarming.com/>

Keyline Design (P.A. Yeomans)

<http://www.keyline.com.au/>

Many of the above are Australia-based operations that have done indispensable, groundbreaking work in the areas of regenerative, whole natural systems design and earth repair as expressed through **permaculture, biological farming, holistic management, keyline design, bio/myco/phyto-remediation, carbon farming, natural sequence farming, earthworks/rainwater harvesting** and **regenerative agriculture**. Also included in this discussion are new understandings in recent years about soil biology, its application in relation to ecosystemic design practice and its profound effect on mitigating climate change through carbon sequestration and water storage.

Australia has provided a perfect “worst case scenario” for the aforementioned approaches to be pioneered and tested: It is the flattest continent, with the oldest

and least fertile soils on Earth. It is also the driest inhabited continent on Earth.

All of the aforementioned represent cutting edge environmental design techniques. As mentioned, they have been pioneered and developed in places which have seen severe degradation of natural and agricultural resources and ecosystem services, forcing a change in land management methodologies and practical approaches.

How can we provide infrastructure to facilitate training in these earth repair techniques and whole natural system design approaches?

The infrastructure already exists, but it's chronically short of financial capital. It is a testament to the effectiveness & soundness of the methodologies employed to be able to meet with the level of success seen thus far given the lack of funds and material support. This is arguably THE most critical field of human endeavor given the current state of things - but it is inadequately supported in relation to its vital importance.

There is no need to reinvent something that already exists. The missing component is secure, adequate and sustained funding.

Training is perhaps best embodied in the form of the long-running Permaculture Design Certification course which has been conducted since 1981 all over the world.

The Permaculture Design Certificate course is an internationally-recognized, seventy-two hour course resulting in a Permaculture Design Certificate. It provides an introduction to permaculture design as set forth by movement founder Bill Mollison.

The PDC serves as foundation for further permaculture work and study and is a prerequisite for the Diploma in Permaculture Design, offered through The Permaculture Institute. Credit for this course is now accepted by a growing number of universities around the world.

To date, thousands of permaculture designers worldwide have been certified through this course, and now comprise a global network of educators, ecological activists who influence major corporations, individuals creating new business alternatives and groups of committed people working together to change the way we view and design into our landscapes.

The course covers sustainable living systems for a wide variety of landscapes and climates. It includes the application of permaculture principles to food production, home design, construction, energy conservation and generation, and explores alternative economic structures and legal strategies supporting permaculture solutions.

Specific topics include:

- * Theory and principles of permaculture
- * Eco-friendly house placement and design
- * Energy conservation techniques for cold climates
- * Recycling and waste management

- * Organic food production
- * Water harvesting and management
- * Ecological pest control
- * Drought-proofing
- * Soil rehabilitation and erosion control
- * Livestock
- * Aquaculture
- * Catastrophe preparedness and prevention via intelligent resource use, planning & management
- * Windbreaks and fire control

The foundation for this course is **Permaculture: A Designer's Manual** by Bill Mollison.

The PDC provides one example of how effective training is facilitated.

Ecological training and education for children and young people can be provided, as well. One of the best examples of what curriculum could look like is seen in Janet Millington & Carolyn Nuttall's book **Outdoor Classrooms: A Handbook For School Gardens** (www.outdoorclassrooms.com.au). It is based on permaculture design principles and practice.

At present, there are various governmental entities seeing the need to act in a definitive and substantive manner, as seen in Australia's CSIRO publication "Managing Australia's Soils: A policy discussion paper":

http://www.triplehelix.com.au/documents/Soil-Policy-Discussion-Paper-Oct08_000.pdf

and UK DEFRA's "Safeguarding Our Soils: A Strategy for England":

<http://www.defra.gov.uk/environment/quality/land/soil/documents/soil-strategy.pdf>