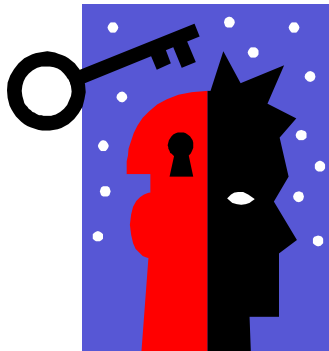


A Strategy for
THE LEMELSON FOUNDATION



Invention for Sustainable Development Program

I. INTRODUCTION

“People all over the world have high hopes that new technology will lead to healthier lives, greater social freedoms, increased knowledge and more productive livelihoods.”

United Nations Human Development Report, 2001

The Lemelson Foundation is exploring avenues for nurturing individual creativity to transform fundamental challenges of human existence into opportunities for sustainable progress. Drawing on a decade of experience supporting invention and innovation in the United States, the Foundation will recognize inventors and innovators in developing countries, foster the institutions that support them, and apply their inventions to meet basic human needs and advance sustainable development.

This document describes the strategy for the Foundation’s Invention for Sustainable Development Program. It identifies the Program’s desired impact, sets forth a strategy for achieving the Program mission, and outlines the Foundation’s approach to evaluation.

INVENTION FOR SUSTAINABLE DEVELOPMENT PROGRAM

MISSION, GOALS and GUIDING PRINCIPLES

Mission

The Invention for Sustainable Development Program fosters and unleashes human creativity and invention to meet basic human needs and build sustainable livelihoods for the world’s poor people.

Goals

The Program supports three broad goals:

- Recognizing** - To recognize, encourage and learn from inventors and innovators in developing countries who are tackling the fundamental challenges of human existence;
- Mentoring** - To foster institutions that mentor and nurture inventors and entrepreneurs committed to meeting basic human needs and advancing sustainable development; and
- Disseminating** - To accelerate the development and adoption of technologies and innovations that improve the lives of poor people and support environmental sustainability.

Guiding Principles

The Foundation is guided by the beliefs that invention and innovation can be fostered and channeled to transcend fundamental challenges of human existence, that human creativity and inventiveness exist in people the world over, and that the seeds of invention are planted early in life.

We believe that:

- Successful inventions and innovations can spring both from inspired *individuals* and *collaborative efforts* involving teams of individuals representing a diversity of perspectives, disciplines, and talents;
- Programs are most successful when they are *demand driven* and determined by, and respectful of, local conditions and priorities; and
- Invention and innovation can be motivated by both *economic incentives* and the *desire to improve society*.

The goals of the Foundation's domestic and international programs are shared, mutually supportive, and gradually converging. Within each program, collaboration across funded organizations is supported to *maximize effectiveness, impact, and learning*.

II. OUR APPROACH

“The market is a powerful engine of technological progress, but it is not powerful enough to create and diffuse the technologies needed to eradicate poverty.”

United Nations Human Development Report, 2001

While development efforts over the past half century have yielded important progress, a significant majority of the world’s people continue to be subjected to lives of destitution. Most practitioners agree that we are yet to embark on a path toward global sustainable development. Recent works by economists Easterly and Stiglitz document why the world needs a fresher approach – compared to those of the last fifty years – in improving the lives of the majority of the world’s people. The Lemelson Foundation believes that locally generated inventions and innovations could offer hope for poor people, enable them to lead themselves out of poverty and advance the sustainability of the world.

This conclusion has been echoed by others. In its 2001 *Human Development Report*, the United Nations declared: “If any form of development is empowering in the 21st century, it is development that unleashes human creativity and creates technological capacity.” Similarly, *The Economist* global environment survey cited technological innovation, along with decision-making at the local level and market forces in environmental matters, as the source of the greatest progress made thus far in sustainable development (2002). A recent survey of leaders in international development identified promoting innovation and entrepreneurship among public, business and private actors as a top priority for development (Global Marshall Plan Conference, 2003).

Inventors and innovators have driven a number of the greatest successes of the development movement. These successes have come both from developed and developing countries, as well as from collaboration between the two.

- A new vaccine developed in the last century helped arrest the spread of Influenza, a draconian disease which killed 20 million people in just two years.
- Development of high yielding crop varieties, made possible through the work of scientists in both developing and developed countries, sparked the Green Revolution and kept millions from starving.
- The treadle pump, originally invented by a Norwegian engineer, has been redesigned and disseminated in numerous developing countries so that it can be locally built to optimize irrigation for local conditions.
- The Freeplay Wind-Up Radio, invented and disseminated through a British-South African partnership, enables sustained delivery of radio information and education to parts of the world where batteries and affordable energy are scarce or non-existent.
- Oral Rehydration Therapy, invented in Bangladesh, saves millions of infants around the world from death caused by diarrhea.

As the above examples illustrate, inventions in the industrialized world can contribute to meaningful progress in the developing world, particularly if the transfer and adaptation of new technology is driven by developing county partners and informed by traditional knowledge. In addition, discoveries in the developing world have much to offer the industrialized world and may help us identify more sustainable ways of living.

Nonetheless, invention and innovation alone are not the answer. The Foundation is aware of the often unintended consequences of new discoveries, and the importance of context in determining the relevance of technology. Our approach is to support inventors and innovators in developing countries who understand the particular challenges they face, and to encourage development that is bottom-up and demand driven. We aim to improve women’s livelihoods through new breakthroughs, recognizing that when women’s incomes increase, so do investments in children’s health and education, enhancing development for the broader community.

To achieve its vision, The Foundation will work directly with organizations connected to local communities as well as with those that create and sustain an enabling environment for invention and innovation. We will draw on those meaningful and relevant lessons from our experience in the United States as we reach out to meet the challenges faced by the majority of the world's people. These national efforts include recognizing student and adult inventors through a national prize program at the Massachusetts Institute of Technology, advancing our understanding of invention through the Smithsonian Institution's Lemelson Center for the Study of Invention and Innovation, and helping student teams from all over the country develop and take to market their new ideas through the National Collegiate Inventors and Innovators Alliance.

Finally, our approach is to be as creative as possible, to step forward and take risks where the potential for transformational change exists. As Robert Greenleaf, organizational strategist reminds us: What distinguishes foundations from other institutions is their unique ability, and social responsibility, to be creative - *"bringing into being socially useful ideas...that institutions more harried by market pressures are not likely to produce, or to produce as soon"* (Greenleaf, 1977). In designing the Program, the Foundation has deliberately emphasized creativity and learning. We will be both strategic and opportunistic, and are pursuing a phased approach that allows the program strategy to be refined based on experience and new opportunities.

The first phase of Program design took place in 2002-2003. Extensive research, relationship building and analysis efforts culminated in a strategy symposium that brought together approximately 25 leaders in invention, innovation, science, technology, policy and sustainable development from a dozen countries. Symposium participants provided advice to the Foundation regarding the strategy and focus of the Program.

The second phase of the Program begins in 2003. Initial grants will support the three Program goals and allow the Foundation to explore a variety of approaches for encouraging invention and innovation in the developing world. The third phase will be guided by knowledge and insight gained from the previous phases and will involve scaling up activities supported by the Foundation. Approaches that demonstrated promise during phase two will be supported more vigorously, and opportunities to share strategies across a wider regional scale will be explored. In addition, the Foundation will remain open to new opportunities and will continue testing promising models.

The Lemelson Foundation - U.S. Program

- The world's largest prize for invention and innovation is awarded by **The Lemelson-MIT Program**. Established in 1994, the program inspires the next generation of scientists, engineers and entrepreneurs.
- Over 200 colleges and universities are involved in The Foundation's **National Collegiate Inventors and Innovators Alliance (NCIIA)**, which supports student inventing teams as they develop products and take them to market.
- **The Smithsonian Institution's Jerome and Dorothy Lemelson Center for the Study of Invention and Innovation** explores the critical role played by inventors in America's social, cultural and economic life.
- **The Lemelson Assistive Technology Development Center (LATDC)** at Hampshire College is one of only a handful of research centers in the country focused on technology for people with disabilities.
- The Foundation also supports **The Lemelson Center at the University of Nevada, Reno**, and the **African-American Male Achievers Network (A-MAN)**.

III. FOCUS AND IMPLEMENTATION

“Two things are unlimited: the number of generations we should feel responsible for and our inventiveness.”

Jan Tinbergen, Nobel Laureate Economist, 1992

Promoting the unique and powerful role of invention and innovation in advancing human development is the focus of the Program’s activities.

The Foundation envisions three core areas of program implementation and aims to connect all three through complementary initiatives:

1. **Pilot implementation program** – this program will support projects that disseminate meaningful technologies to people in greatest need. Funded organizations may include those who have: a). identified or developed meaningful inventions and innovations; and/or b). created models for disseminating those discoveries. The Foundation will seek partners who can scale-up successful pilot projects.
2. **Institution building** – this program will be multi-faceted in nature, building capacity for student and grassroots inventors by improving access to mentoring, skill development and financial resources across all phases of the invention and innovation process – from discovery, to trial and modification, to production and dissemination.
3. **Recognition program** – this program will seek through competitions or prizes to encourage invention and recognize, reward and learn from those who are developing solutions to common problems in order to inspire individuals and build supportive environments for invention.

The Foundation defines invention to include both high and low-tech products as well as inventive processes. The Program supports both traditional knowledge and frontier science, and emphasizes the potential for progress when the two are combined.

Geographical areas supported by the Program are selected based on an assessment of opportunities to foster invention and innovation and to make significant improvements in the quality and sustainability of people’s lives. The Foundation works in countries free of extensive conflict.

Working in concert with the global development agenda

The UN has articulated five priority areas, collectively referred to as WEHAB, which include water, energy, health, agriculture and biodiversity “in which progress would offer all human beings a chance of achieving prosperity” (U.N. Secretary General, May 2002).

The Invention for Sustainable Development Program supports the realization of the global development agenda by encouraging invention in any area that improves poor people’s ability to achieve their aspirations. This includes the WEHAB priority areas as well as areas in which invention and innovation help create jobs, establish enterprises, and promote literacy and education.

Enterprise creation – Joblessness is one of the greatest challenges facing developing countries. New enterprises can be built on meaningful inventions, thus generating jobs and reducing hopelessness.

Literacy and education – According to UNDP, 113 million children lack access to primary education. Appropriate technologies and innovations can create new educational opportunities, leading to more stable livelihoods.

Rural and urban infrastructure – The world’s urban population is expected to triple in the next fifty years. Invention and innovation can help us design sustainable building and transportation systems to meet both rural and urban needs.

WEHAB Priorities

Water and Sanitation More than 1 billion people are without safe drinking water. Twice that number lack adequate sanitation. And more than 3 million people die every year from diseases caused by unsafe water.

Energy More than 2 billion people are energy poor. Dependence on unclean and unsustainable sources of energy traps them in the cycle of poverty and contributes to women’s work load, environmental degradation and poor health.

Health More than 1 billion people breathe unhealthy air, and nearly 2 million women and children die each year from indoor air pollution caused by burning wood and dung. Tropical diseases such as malaria and tuberculosis threaten millions, while seven African nations report more than 20 percent of their population is infected with HIV.

Agriculture Land degradation affects as much as two thirds of the world’s agricultural land. As a result, agricultural productivity is declining sharply and unique crop varieties are being lost, while the number of mouths to feed continues to grow.

Biodiversity and Ecosystem Management Biodiversity is declining at an unprecedented rate — as much as a thousand times what it would be without the impact of human activity. Half of the world’s tropical rainforests and mangroves have been lost; three quarters of marine fisheries have been fished to capacity; and 70 percent of coral reefs are endangered.

IV. PARTNERSHIP

To achieve its vision, the Foundation is committed to exploring avenues of collaboration with other funders, the private sector, governments, non-governmental organizations, and the media. The Foundation works directly with some actors on joint initiatives, while coordinating with others focused on providing the legal, regulatory and financial framework necessary for inventors to bring their discoveries to life.

Activities of joint initiatives may include:

- Recognizing, rewarding and learning from successful inventors and innovators
- Promoting new models to integrate meaningful technologies into the lives of poor people
- Providing mentoring and financial resources to support the invention and innovation process – from discovery, to trial and modification, to production and mainstreaming
- Creating opportunities to share experience and new learning

While the Program is engaged directly in funding projects, it is critical that a supportive environment for invention and innovation is established.

The Program works collaboratively with those committed to:

- Advocating public policies that support invention and innovation
- Supporting institutions that teach or promote engineering and entrepreneurship that benefits poor people
- Promoting government support for science and technology directed towards the needs of the poor and sustainable development
- Building the legal, financial and policy frameworks necessary to support invention, innovation and social entrepreneurship

Funded organizations and project criteria

The Program is committed to learning from the experience of funded organizations, supporting them to improve their organizational effectiveness, and advancing our understanding of how invention and innovation can be encouraged to meet basic human needs and build sustainable livelihoods for poor people.

In particular, we seek to fund organizations that:

- Share the vision of The Lemelson Foundation
- Understand the invention and innovation process
- Possess strong links to the communities they serve and a positive track record working in developing countries
- Promote equal representation of women within their organizational and decision-making structures
- Exemplify the highest standards of transparency and accountability in all operations

At the project level, we seek to support activities that:

- Meet basic human needs
- Ameliorate environmental conditions and build sustainable livelihoods
- Exhibit strong potential for replication, scaling-up and becoming self-sustaining
- Improve the livelihoods of women, thus enhancing community development

V. EVALUATING AND LEARNING

As Porter and Kramer (1999), organizational strategists, suggest, one of the most powerful ways in which Foundations create value is to advance the state of knowledge and practice in a given field. The Invention for Sustainable Development Program encourages funded organizations to develop information sharing strategies to maximize learning and identify promising new approaches. The Foundation will share lessons and explore connections between its activities in the United States and those in developing countries to enhance the learning and impact of both programs.

The Foundation is committed to assessing its work in order to learn from mistakes as well as successes. We work with funded organizations and other collaborators to establish clear, measurable goals, and develop metrics to determine the impact of our activities. The Foundation will allocate as much as 10% of project grants to support monitoring and evaluation.

VI. CONCLUSION

Karen Armstrong, historical scholar, suggests that a modern society can only emerge when two major characteristics are present: 1). independence; and 2). innovation. The Lemelson Foundation is committed to fostering the spirit of invention and innovation within individuals, communities and institutions in the developing world to forge unanticipated paths of progress and independence. While the challenges are immense, we believe individual creativity holds a key to unlocking our sustainable future. Jerome Lemelson reminds us that “every inventor chases rainbows,” and his lifetime of achievement challenges us to realize the transformational potential of human creativity. We call on others who share this vision to join us.



Visit www.lemelson.org for more information about The Lemelson Foundation.