

## Deteriorating Global Ecosystem

# Aiming at a Post Material Economy and Society

### A Corporate Quest For Eco Designs

**T**he global environment is rapidly deteriorating. If the current pattern of mass production, mass consumption and mass disposal is continued, the finite natural resources will rapidly be depleted, leaving the environment in a state of disorder. Some say this will occur as early as the middle of this century. Yet, regardless if it is this century or the next, the fact remains that natural resources are finite and running out. But what does society have to do to avoid this possible collapse? What realistic alternatives exist? We asked Dr. Ryoichi Yamamoto, a professor at the

University of Tokyo advocating "eco-materials" designed with environmental preservation in mind. Such materials have reduced effects on the environmental load and are recyclable. Dr. Yamamoto also researches design ideas with the aim of integrating with other aspects of industry from formulation and production to distribution and salvage in one environmental friendly package known as "eco design".

### Nature's "Eco Service"

When one reflects on the mass-production, mass-consumption, mass-disposal society model of the 20th century, one often refers to the depletion dilemma most clearly exemplified by voracious

consumption of oil by the world economies. However, Dr. Yamamoto and associated specialists believe that their research shows that not just oil will be depleted in the near future.

For example, in the case of metal resources, mankind has already exploited some 80% of mercury, 75% of silver and lead and 50% of copper resources on the earth. Moreover, such exploitation has been taken from easily accessed ore veins. When such veins are subsequently depleted, future mining and processing will require far greater outputs of energy to access more hard to get veins. Moreover, immense energy expenditures will be needed to recycle already exploited resources. Such energy consumption will prompt discharges of vast amount pollution into the environment.



**Ryoichi Yamamoto**

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*The Sahara Desert in Africa keeps expanding. All-out effort has been made by planting shrubs around the living area to prevent the shifting of sand hill due to wind blowing. (Photographs: courtesy of Action for Greening Sahel)*

In the words of Dr. Yamamoto, "We humans are extracting various resources from our tiny world, using them and then simply discarding them. That action is destroying the environment of our irreplaceable earth, destroying its ecosystem. If we carry on as we are, the services provided to us by the ecosystem ("eco service"), which maintains life and lifestyles, will cease to function before resources such as oil and metals run out."

### Rapidly Depletion of Natural Assets

To live, one breathes in oxygen from the air and exhales carbon dioxide. One also takes water from nature's circulating supply to drink and use domestically before returning it to nature.

The "eco service" concept is the interpretation of the actions involved in receiving this service from nature. Specialist calculations show this "eco service" is the equivalent of 39 trillion dollars of services used annually presently by mankind. The world's leading

economy, the United States, only has a GDP of 7.4 trillion dollars while the combined GDP of the 15 EU countries amounts to 7.3 trillion dollars. Such comparisons make it easy to understand how big this "eco service" really is.

Mankind used to take advantage of the "eco service" within a sustainable range for nature's reusable resources, but now that range is being vastly exceeded, so that we are already eating into the natural "capital" assets of our world (calculated to be 500 trillion dollars). Such reduction in natural "capital" assets includes the unchecked desertification in Africa and China and the loss of rain forests in places like South America. In addition, according to the third assessment report of the IPCC (Intergovernmental Panel on Climate Changes), the output of greenhouse effect gases is traceable to the actions of mankind. And the destruction of the global ecosystem caused by this warming also eats into nature's assets. Considering an annual global population growth of 78 million people on top of the current six billion, then it is obvi-

ous that sooner or later human society is heading for collapse.

### Sustainable Economic Development Through Enhanced Environmental Efficiency

What does society need to do to avoid this collapse? The only option is to cutback on the amounts of resources and energy used in human economics together along with the waste accompanying those economic activities. There are various concepts and opinions concerning the extent and makeup of such cutbacks. And many primary factors complicate matters because of the thorny issues of establishing a sense of equality among all nations and estimating future population growth. On the one hand, 20% of the global population live in advanced nations with peaked high economic growth. Yet, they utilize of 80% of the world's resources and produce 50% of the carbon dioxide. On the other hand emerging nations are seeking future growth.

While many researchers have produced well-reasoned cutbacks of resource and energy consumption by advanced nations ranging from one quarter to one twentieth of current consumption, all universally agree that "eco-efficiency" has to be raised. This "eco-efficiency" denotes not merely the efficient use of energy or importance of labor productivity in conventional economic activities but rather a total grasp of economic activities and product manufacturing focused on environmental costs. Such thinking discards the traditional idea that environmental protection and sustainable economic growth are incompatible, and states that sustainable economic growth through eco-efficiency by innovations in technology and social systems is possible.

## Moving Away From Product Purchases Toward Function and Service Purchases

In this scenario, technology stands for eco materials and eco designs. It is a quantum leap in performance improvement concurrently combined with enhanced production, distribution, utilization, salvage, disposal and recycle processes that offer a total manufacturing platform while placing the least burden on the environment. This is the eco platform with which society must endeavor in order to achieve a post material economy and society. Post material does not mean returning to a primitive era or

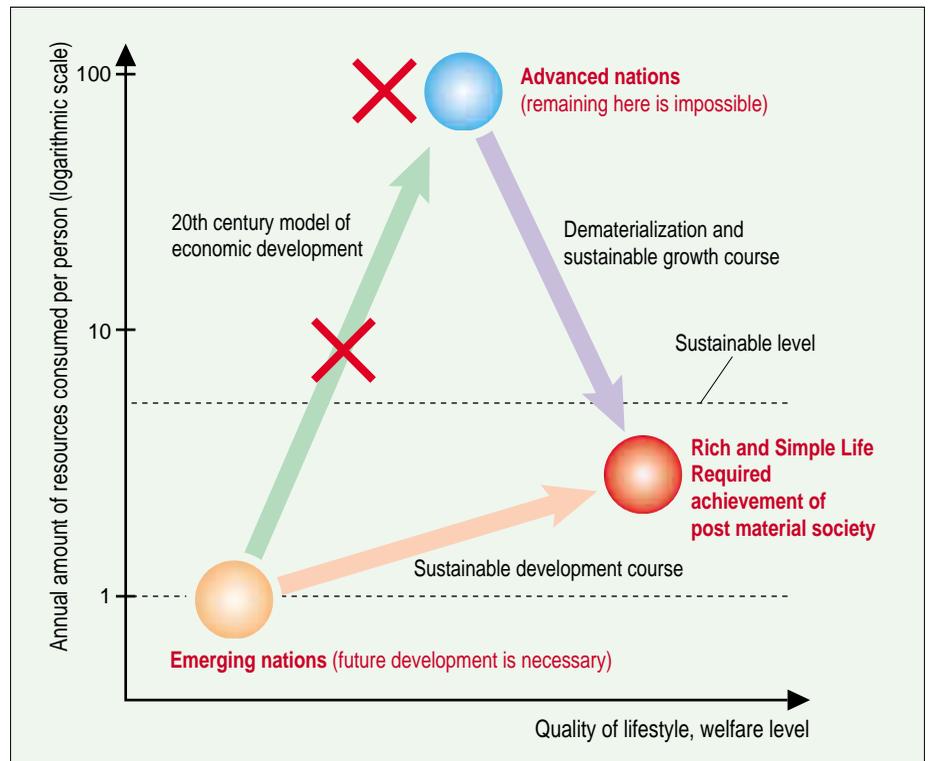
making do with a fettered lifestyle; but rather, consumers will no longer purchase products but rather they will purchase functions and services offered via those eco products. This is one form of a post material economy.

Who will shoulder the responsibility of actually implementing such a new service economy? Dr. Yamamoto predicts that it can be no other than the business world when he states: "our lives as modern human beings would not exist without the products and services offered by business enterprises. Our very lifestyle is held afloat by business. Individual pursuit of eco design is futile; business enterprises are the only entities with accumulated assets,

human resources, data and technology capable of such a quest."

"Business enterprises and environmental considerations must become inseparable components of future social awareness." In other words, each individual citizen can assist by purchasing green products and services with excellent eco-efficiencies, supporting business enterprises that promote eco designs and politically supporting the development of a social system that backs up such corporate activities.

It is because business enterprises play such an important role with vast responsibilities in our current society that Dr. Yamamoto expects and demands so much of them.



**The Two Remaining Sustainable Development Courses For Mankind**  
Global environmental destruction and social collapse will result from either advanced nations continuing current economic strategies that consume vast amounts of resources and energy or emerging nations pursuing economic growth identical to that of advanced nations in the 20th century. (A chart created from Dr. Yamamoto's diagram.)

# Harmony Between Global Environmental Protection And Business Activities



## Global Environmental Protection Activities In Three Fields

We at Shimadzu Corporation - with the operational principle of "For the Well-being of Mankind and the Earth" - have taken the issue of harmonizing global environmental protection and business activities as one of our top priorities. As a result, we are tackling global environmental protection issues in the following three fields:

- (1) Reduction of environmental loads accompanying business activities
- (2) Contributions to global environmental protection through technology developments
- (3) External development of technology and knowledge for environmental protection

Shimadzu is fully aware of its business responsibilities in modern society. Thus, we acknowledge the manufacturing-related load placed on the global environment and energetically promote various policies to reduce that load. For example, we are obtaining ISO14001 (globally accepted environment management system) certification not only for offices, plants, and labs in Japan but also for Shimadzu-affiliated companies around the globe.

Naturally, such approval is just the beginning. The independent

certifying organization, Japan Audit and Certification Organization (JACO) conducts external reviews while internal environmental auditors perform periodic and intermittent inspections. In addition, Shimadzu is making general improvements that include the formation of an environmental committee in the top management to monitor whether or not activities based on its environmental policy are being implemented correctly and the internal inspection system is functioning effectively.

## Cooperating in the Environmental Protection Project of the United Nation University

While producing and retailing numerous monitoring and analytical instruments, Shimadzu has many opportunities by which to contribute to global environmental protection. High hopes are held for our carbon dioxide immobilization technology currently undergoing validation testing. Many expect this technology to contribute to the reduction of carbon dioxide, one of the major culprits in global warming.

Enterprises prioritizing the balance between environmental protection and business activities

while also giving full consideration to reducing the environmental load accumulate a multitude of knowledge and technology. We at Shimadzu promote the public development of such in-house knowledge and technology to aid external organizations working to protect the environment. For instance, Shimadzu supports the United Nations University's project on "Environmental Monitoring and Governance - EDC pollution in the East Asian Coastal Hydrosphere" through funding, lending of analytical instruments, and analysis work assistance. Also, we annually accept several hundred trainees for business visits and training courses related to "air pollution measures", "water control" and "environmental management technology." The trainees, many of whom come from emerging nations, visit Japan under the international technology cooperation scheme implemented by the Japan International Cooperation Agency (JICA).

