Usha Thorat: The economics of ecosystems and biodiversity

Inaugural address by Mrs Usha Thorat, Deputy Governor of the Reserve Bank of India, at "The Economics of Ecosystems and Biodiversity (TEEB) D2 Workshop", Mumbai, 13 April 2010.

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Ladies and Gentleman,

Herman Daly, a leading ecological economist, who received the 1996 Right Livelihood Award for "defining a path of ecological economics that integrates the key elements of ethics, quality of life, environment and community", said:

> *"There is something fundamentally wrong with treating the earth as if it were a business in liquidation."*

I am extremely happy to inaugurate this workshop on The Economics of Ecosystems and Biodiversity (TEEB) organised by the Indian Institute of Technology (IIT), Mumbai, the Conservation Action Trust (CAT), the Bombay Natural History Society (BNHS) and the Green India States Trust (GIST). TEEB is a major international initiative to draw attention to the global economic benefits of biodiversity, to highlight the growing cost of biodiversity loss and ecosystem degradation, and to draw together expertise from the fields of science, economics and policy to enable practical actions moving forward.

The TEEB study, led by Pavan Sukhdev, was launched by Germany and the European Commission in response to a proposal by the G8+5 Environment Ministers (Potsdam 2007) to develop a global study on the economics of biodiversity loss. I understand that the Interim Report of TEEB, released in May 2008, provided strong evidence of significant global and local economic losses and human welfare impacts attributable to the ongoing degradation of ecosystems. As already mentioned, the year 2010 has been declared as the International Year of Biodiversity and will culminate in the 10th conference of the Parties to Convention on Biodiversity at Nagoya in October 2010, where phase 2 of the TEEB study will be presented. We are therefore indeed extremely fortunate that Pavan himself is leading today's workshop.

For a layperson, such as me, having accepted Pavan's invitation, it meant starting from scratch. I needed to understand the jargon. What do the terms biodiversity and ecosystem services mean? Why is it important for us to think and talk about these issues? What is the value of biodiversity and ecosystem services? Why should we attribute monetary value to biodiversity and ecosystem services? More importantly, how do we attribute monetary value to these services? Finally, how do we integrate the process of attributing monetary value to these concepts into decision-making on investment projects and use of natural resources – whether in the public or private sectors? What should be the policy framework, and consequently the regulatory framework, to implement these policies?

I find that the National Biodiversity Action Plan published by Government of India, Ministry of Environment and Forests in 2008 highlights as an action point the valuation of goods and services provided by biodiversity and use of economic instruments in decision making processes. More specifically, the Action Plan states

- To assign appropriate market value to the goods and services provided by various ecosystems and strive to incorporate these costs into decision making, management and sustainable utilization of biological diversity resources.
- To factor-in natural resource accounting (NRA) in the national economic planning processes and encourage financial institutions to adopt appropriate NRA appraisal practices so that risks to biological diversity are adequately considered in the financing of projects.

This clearly puts in perspective the significance of assigning value to natural resources, biodiversity and ecosystem services in economic policy.

So, what are biodiversity and ecosystem services and why and how do we measure their value? *Wikipedia* defines biodiversity as the variation of life forms within a given ecosystem, biome or on the entire Earth. Biodiversity is often used as a measure of the health of biological systems. The biodiversity found on Earth today consists of many millions of distinct biological species. Many biologists now believe that ecosystems rich in diversity gain greater resilience and are, therefore, able to recover more readily from stresses such as drought or human-induced habitat degradation. Possibly, the greatest value of the variety of life may be the opportunities it gives us for adapting to change. The unknown potential of genes, species and ecosystems is of inestimable. but certainly of high value. Genetic diversity will enable breeders to tailor crops to new climatic conditions. The Earth's biota is likely to hold still undiscovered cures for known and emerging diseases. A multiplicity of genes, species, and ecosystems is a resource that can be tapped as human needs change.

Almost all scientists acknowledge that the rate of species loss is greater now than at any time in human history, with extinction occurring at rates hundreds of times higher than background extinction rates. The factors that threaten biodiversity have been variously categorized. Jared Diamond describes an "Evil Quartet" of habitat destruction, overkill, introduced species, and secondary extensions. The IUCN has a detailed list of direct threats to biodiversity.

Humankind benefits from a multitude of resources and processes that are supplied by natural ecosystems. Collectively, these benefits are known as ecosystem services. Some of these ecosystem services are air quality, climate (both global CO2 sequestration and local), water purification, pollination, and prevention of soil erosion. While scientists and environmentalists have discussed ecosystem services for decades, these services were popularized and their definitions formalized by the United Nations 2004 Millennium Ecosystem Assessment (MA), a four-year study involving more than 1,300 scientists worldwide. The study grouped ecosystem services into four broad categories: *provisioning*, such as the production of food and water; *regulating*, such as the control of climate and disease; *supporting*, such as nutrient cycles and crop pollination; and *cultural*, such as spiritual and recreational benefits.

If the world's economies are rationally organized, it would suggest that biodiversity and ecosystem services must have less economic value than the economic activities giving rise to its loss. Many of the activities that threaten biodiversity have lower economic value, but the market does not recognize the economic value of biodiversity and eco system services and that is the reason for loss of biological diversity. If we can address this issue, there is a chance of addressing biodiversity loss. The reason why market value fails to capture intrinsic economic value is because of the gap between what is good for the individual and what is good for society – the problem of externality. The other reason is the time horizon factor viz. the initial returns and long term sustainability of the returns. Again, what may be worth preserving from a global perspective may not be affordable from a national perspective. Hence if we have to make rational allocation of natural resources from a global societal and inter-generational perspective, one will need to attribute monetary values to biodiversity and the costs and benefits should include such values for decision making. The ongoing challenge of prescribing such value to nature is critical in how we recognize and manage the environment, social responsibility, business opportunities, and our future as a species.

In a speech at the Financial Student Association, Amsterdam, on 28 April 2009, Andrew G Haldane, Executive Director, Financial Stability, Bank of England, drew an interesting parallel between the recent global crisis and ecosystems. He cited the collapse of fisheries that came to a head during the 1970s. and 1980s, leading to the imposition of fishing quotas for various species. In setting quotas, no account was taken of interaction between species and the surrounding eco-system. Relating this to the global crisis, he observed that the existing regulatory rules for financial institutions echoed the fisheries management of the 1970s. Risk quotas are calibrated and applied node by node, species by species approach, which takes

no account of individual nodes' system-wide importance – for example, arising from their connectivity to other nodes in the network or their scale of operations. Apart from interconnectedness, Mr Haldane also uses the natural relationship between diversity and stability to show how lack of diversity was a reason for collapse of the financial system. Studies of coastal eco-systems, he said, reveal some dramatic patterns. For around 800 years, between the years 1000–1800 AD, fish stocks and species numbers were seemingly stable and robust. Since then, almost 40% of fish species across the world's major coastal eco-systems have "collapsed" – defined here as a fall in population of greater than 90%. That is systemic by any metric. There appear to be many environmental reasons for this collapse, some natural, others man-made. The financial system, Mr. Haldane observed, has mirrored the fortunes of the fisheries, for many of the same reasons. Since the start of crisis many banks have seen their market capitalization fall by a significant amount- the fisheries equivalent of collapse. But what took marine eco-systems two hundred years to achieve has been delivered by financial engineers in two!! In explaining the collapse in fish and finance, lack of diversity seems to be a common denominator.

I am sure that during the workshop, you will be discussing the various ways in which the costs and benefits of projects can be realistically assessed by incorporating the monetary value of the risks or threats to biodiversity or ecosystem services. What is equally important is for the workshop to discuss issues surrounding how to ensure that these costs and benefits actually get incorporated in a project appraisal. Perhaps, the principles and rules for making for Environment Impact Assessments (EIAs) should be broadened to include all aspects of environmental costs and benefits, such as impact on biodiversity and ecosystem services, instead of merely the immediate impact, say, on pollution. Gains and losses to natural and human capital will thus need to factored-in as a mandatory requirement. Once the assessment is done in this manner to ensure a rational allocation of resources, it is essential that goods and services are priced appropriately reckoning such costs and benefits as are not reflected in market valuations. Where such costs and benefits are not fully captured in the pricing there would be an issue of subsidies and taxation to ensure appropriate incentives. Protocols and best practices for such EIAs may have to be drawn up taking into account the work done in the area of ascribing monetary values to the costs of threats to ecosystem and biodiversity and the benefits from such ecosystem services and biodiversity.

I would like to take this opportunity to draw attention to Hon'ble Union Finance Minister's Budget Speech for 2010–11, in which he announced a number of measures for addressing environment/climate change issues and preserving biodiversity. I am sure all concerned will take advantage of these announcements, actively support and involve in the initiatives for protecting ecosystems and preserving biodiversity.

Finally, I would like to close with a quote from the speech that Hon'ble Prime Minister Dr. Manmohan Singh delivered on June 30, 2008 while formally launching India's National Action Plan on Climate Change:

> *"India has a civilizational legacy which treats Nature as a source of nurture and not as a dark force to be conquered and harnessed to human endeavour. There is a high value placed in our culture to the concept of living in harmony with Nature, recognizing the delicate threads of common destiny that hold our universe together. The time has come for us to draw deep from this tradition and launch India and its billion people on a path of ecologically sustainable development".*

It gives me great pleasure to inaugurate this TEEB D2 Workshop and wish it all success.

Thank you.