"Summary of article by Glenn-Marie Lange and Faye Duchin: Integrated Environmental-Economic Accounting, Natural Resource Accounts, and Natural Resource Management in Africa"

In the traditional approach to national income accounting, Net Domestic Product (NDP), which is defined as Gross Domestic Product (GDP) minus the value of produced capital used up in the course of production, has been interpreted as a measure of sustainable income. However, because NDP does not consider the maintenance of natural capital, it overestimates sustainable income. Many aspects of natural capital are omitted from the traditional accounts since they are not subject to market transactions. Natural Resource Accounts (NRA) are designed to rectify this problem. The design of NRA is still in a nascent stage and no conventional format has been agreed upon, though the UN's recently published handbook on NRA helps rectify this situation. Nevertheless, two major categories can be identified: Summary NRA and Management-Oriented NRA. This paper discusses the conceptual and methodological problems associated with these two categories of NRA and their application to policy issues. It argues that Management-Oriented NRA are more appropriate than Summary NRA to understand economic-environment interactions.

SUMMARY NATIONAL RESOURCE ACCOUNTS

Summary NRA attempt to calculate a single monetary value for all natural resource use and environmental deterioration, and then subtract this number from NDP to arrive at Environmentally-Adjusted Domestic Product (EDP). Among the measures included in calculating the deterioration of natural capital are defensive expenditures (expenditures on pollution prevention and clean-up), and the value of depletion and degradation of marketed and non-marketed natural resources.

There are three conceptual problems with EDP as a measure of sustainable income:

1) In calculating EDP, it is assumed that produced and natural capital are near-perfect substitutes for each other. However, as natural capital is depleted, the scope for substitution of one for the other decreases. A single index that blurs the distinction between produced and natural capital is not useful from a policy perspective.

2) The lack of markets for a number of environmental resources requires imputing values for these resources when calculating EDP, but there are two serious problems with these values. First, because of the wide variety of valuation techniques and assumptions on which they are

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based, EDP can take on almost any value - an unacceptable outcome for national accounts. More fundamentally, imputed values are by definition hypothetical. If these costs were actually incurred, all economic transactions would change. It has been argued that this is more appropriately treated as a modeling exercise, not an accounting exercise, since EDP would require estimating the new economic transactions.

3) Two important omissions in traditional national accounts also effect EDP estimates: the accumulation of human capital, and the informal sector. Both of these factors are important in understanding and formulating sustainable development policies, especially in developing countries.

How good is EDP as a measure of sustainable income and how useful is it for policy makers? The above discussion indicates that NRA are not a comprehensive measure of sustainable income. While proponents of Summary NRA would agree, they would also claim that Summary NRA are better than traditional income accounts, and therefore a step in the right direction. However, differences in methods and assumptions adopted to calculate EDP in each country can result in very different measures of sustainable income, but there is no basis for standardizing these methods and assumptions for use in all countries. Moreover, even if EDP could be estimated in a meaningful manner, their usefulness for policy are questionable, because the implications of the numbers are unclear. In addition, Summary NRA do not provide the sectoral detail required for most policy analysis.

MANAGEMENT-ORIENTED NATURAL RESOURCE ACCOUNTS

Management-Oriented NRA record the extraction and use in production of resources, as well as the discharge of waste materials associated with each economic sector and with households. The UN has recommended that the NRA be linked to the input-output table of the System of National Accounts (SNA) to bring out the interconnections between the environmental and economic activities. Management-Oriented NRA are based on a physical approach to accounting. The physical data are then interpreted in policy terms through the use of physical indicators (like sustainable yields) and economic valuation. They can also be used to calculate EDP, subject to the weaknesses identified above.

The compilation of data at the sectoral level poses a considerable challenge, especially for developing countries with limited financial and human resources. This is one of the serious drawbacks of Management-Oriented NRA. However, a large amount of data are already collected or can be estimated from technical parameters calculated in other countries for similar problems. In these circumstances, the challenge of constructing NRA becomes the difficult but less daunting one of integrating diverse datasets. In order to assure the usefulness of the NRA, it is essential that this undertaking be guided by a country's development problems and strategies. The paper describes how a country could pursue simultaneously identification of sustainable development strategies and compilation of NRA.

USE OF MANAGEMENT-ORIENTED NATURAL RESOURCE ACCOUNTS IN DEVELOPING COUNTRIES

Management-Oriented NRA can and already are being used for policy analysis and decision making in both developed and developing countries. They can be used to monitor resource use and environmental degradation at both the sectoral and economy-wide levels. They can also be used for policy analysis and planning, especially when linked to an input-output or related (SAM, CGE) model which brings out the direct and indirect effects of possible changes in the economic and environmental sectors. This is critical at the economy-wide and regional levels, where coordination among sectoral policies is necessary and spillovers or trade-offs must be identified.

While developing countries can learn from the experience with MNRA of developed countries like Norway, France, and the Netherlands, developing countries may benefit from different emphases, e.g., the importance of including both formal and informal sectors, creating NRA for distinct geographical regions, and concentrating on different environmental issues such as biodiversity.

Management-Oriented NRA are already being used in developing countries like Indonesia and the Philippines to address issues such as the feasibility of continued food self-sufficiency as income growth changes the average diet of an increasing population, and the environmental impact of establishing a large pulp and paper industry or liberalizing trade.

In Africa, only Botswana has begun to construct NRA, but a number of other African countries are planning to do so, including the Gambia, Zimbabwe, Namibia, and Ghana. Construction and effective utilization of NRA requires that a number of obstacles be overcome. In addition to the data issues mentioned above, and the need to coordinate development policy with the construction of NRA, NRA pose institutional challenges: the compilation and use of NRA cuts across ministries and professional disciplines - it cannot be the activity of one agency alone. Leadership is needed that can coordinate ministries, international donors, and university and professional research organizations, and which can link both data collection and policy analysis.