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Economics in policy-making **7**

Beyond GDP: Valuing what matters and measuring natural capital

This briefing summarises the debate around GDP (Gross Domestic Product) and alternatives to it. It will explain what GDP is and how it is calculated, consider the problems with GDP, and outline some of the alternatives. It will conclude by exploring the relevance of this debate for environmental NGOs, and suggest some criteria for how environmental NGOs should judge these alternatives.

Introduction:

GDP (Gross Domestic Product) "measures everything except that which makes life worthwhile". These oft-repeated words were first spoken by US Senator Robert Kennedy back in 1968. And yet GDP is still heavily relied upon, not just as a measure of production within the market economy, as it was intended to be, nor even just as a measure of economic performance, but indeed as a measure of the success of society itself. Countries are categorised and afforded privileges on account of their GDP, politicians stand or fall based on the trends that GDP takes during their terms, and influential economists provide policy advice both to developed and developing countries on the grounds of the expected impact on GDP.

What is GDP?

GDP measures the values of goods and services produced within a country's borders over a given time period, and can be expressed using the following formula:

GDP = consumption + investment + government spending + exports − imports

Value of goods and services is measured in terms of market prices. GDP is calculated from the National Accounts, which are a systematised, comprehensive set of accounts covering many aspects of a country's economy. GDP is derived in three ways:

- The sum of the value added during production (e.g. the difference in value between bits of leather and a completed shoe)
- The sum of expenditures on final goods and services by households, firms and government (expenditure on the shoe by a consumer counts as a *final good*, but expenditure by a bootmaker on leather doesn't as this case leather is an *intermediate good*)
- The sum of income generated during economic activities (wages, rental income, corporate profits).

In theory, these three different calculations of a country's GDP should lead to the same number, though differences in data sources mean they are never exactly the same.

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Other commonly used measures of the economic activity of a nation include:

- Net Domestic Product (NDP): GDP minus the depreciation of assets and capital (e.g. the amount that one needs to spend on repairing or replacing factories and machines).

- Gross National Product (GNP): The value of goods and services produced through capital owned by residents of a country, regardless of whether that production takes place at home or abroad. For example, the value of a T-shirt produced in China by a British company would be counted in UK GNP, but not UK GDP.

There are reasons for arguing that some of these other numbers are conceptually more meaningful as indicators of economic performance, but they have played a subsidiary role to GDP for reasons of pragmatism (NDP, for example is harder to calculate) and politics (in particular, tracing GDP growth rather than GNP growth makes development in developing nations look more impressive, as much GDP growth in developing countries is actually the result of foreign companies generating profits on their territory).

What's wrong with GDP?

Many criticisms have been levied at GDP. Some are more technical, others criticise GDP not as a measure of production, but rather as it is used as a measure of overall progress and de facto key performance indicator of a nation. The main criticisms are as follows:

1. GDP includes what is called 'defensive expenditure', i.e. it goes up when money needs to be spent to clean up an oil spill or to buy security alarms. Neither of these actions contribute to well-being, and often these expenditures are a defence against damage done by other sectors of the economy.

2. GDP relies on market prices to value things, which (a) assumes that markets correctly price things (see briefing 8), and (b) means that services that are not provided by the market – i.e. by the state, households or the informal economy – are not valued appropriately.

3. GDP ignores issues of distribution (i.e. the distribution of the benefits / wealth).

4. GDP captures no sense of futurity or sustainability, and indeed tends to go up with increasing environmental damage. It does not reflect scarcity of ecological resources, nor debts.

5. Fundamentally, treating GDP as our key measure of progress implies that the more we consume in the market, the better. It means that other things which might be important – e.g. knowledge, leisure, social relations, health and peace – are only considered to the extent that they increase market activity.

What alternatives do we have?

Many alternative 'beyond GDP' indicators or indicator sets have been proposed. What defines them as being 'beyond GDP' is that they attempt to somehow comprehensively capture a sense of how well a country or part of a country is doing. They can mostly be divided into three groups:

1. Adjustments to GDP. Many early attempts took GDP as a starting point and attempted to add or subtract factors to address the concerns listed above. The main approach of this kind is the Index of Sustainable Economic Welfare (ISEW, also called the Genuine Progress Index, GPI) or Genuine Savings as exemplified in the World Bank publication '*Where is the wealth of Nations*?'.

2. Dashboards and indicator sets. The majority of 'Beyond GDP' initiatives today propose a set of indicators to capture 'progress', 'national well-being' or 'sustainable development'. These are often structured into between seven and ten domains covering areas such as material conditions, social relationships and crime. Sometimes dashboards of up to ten indicators are produced; other times all the indicators are presented independently (often numbering in dozens). Many official government bodies have or will have such dashboards or indicator sets including the UK, the OECD, Switzerland, Scotland, and Italy.

3. Composite indicators. Some initiatives based on dashboards, such as the Canadian Index of Well-Being and the Italian Quality of Regional Development Indicator (QUARS), produce an overall headline indicator by taking an average of all the component indicators. These tend not to be official initiatives, but the UN has produced a high-profile example, the Human Development Index (HDI).

4. Subjective well-being approaches. Many dashboards have incorporated subjective well-being measures – survey data on how people feel about their lives. But some initiatives go beyond this to place subjective well-being as central. They treat survey data from subjective well-being questions (for example asking respondents how satisfied they are with their lives overall) as representing the population's overall assessment of life. Some approaches, such as **nef**'s Happy Planet Index, then combine an overall subjective indicator with environmental impact – progress is in effect defined as increasing the amount of well-being achieved per unit of resource consumption.

Horses for courses – which alternative to GDP should we use?

Which of the above four approaches one prefers tends to depend on one's reason for going 'beyond GDP'. Adjusted GDP measures have proved an effective communication tool in terms of highlighting the flaws

in GDP, but – beyond this simple overall message – they are hard to communicate and interpret, and involve many assumptions about how to price different 'goods' and 'bads'. Dashboards and data sets provide lots of detailed information useful for policy-makers and analysts, but do not help much when making normative judgements. Presented with 60 indicators, it is hard to make a judgement about whether a society is progressing or not. A dashboard is neither likely to capture as much media and public attention nor inspire politicians as a single indicator like GDP. A composite indicator based on such a dashboard could potentially overcome these problems, and has the advantage of being directly linked to the individual indicators within the dashboard. However, producing such a composite is fraught with difficulties in terms of deciding on weighting and determining constituent domains.

The subjective well-being approach avoids this difficulty because, in effect, survey respondents are carrying out their own personal weighting before responding to well-being questions. The argument is that subjective well-being data provides an overall picture by integrating people's experience of all aspects of their lives. Respondents implicitly weight what is important to them. If someone lives in an area with lots of crime, but that does not bother them, then their life satisfaction will not be impaired by it. Conversely, something which might not be measured by objective measures, but is very important to an individual, will influence their life satisfaction.

From an environmental perspective, the debate around alternative measures of progress can be looked at from two perspectives. Firstly, one could focus on ensuring that environmental harm is directly integrated into measures of progress. A society which is increasing its environmental damage would then be shown to be doing badly. This is the most direct approach. The risk is that indicators seen as 'environmental' are side-lined in policy and treated as secondary to, and indeed, in conflict with, the important business of growing the economy. Furthermore, producing a single indicator combining environmental impact with other elements of progress risks the dangers of what is known as 'weak sustainability' (i.e. the belief that man-made capital is substitutable for environmental capital) – i.e. increasing environmental pressure could be compensated for by increasing quality of life.

The second perspective is to strive for measures of progress that are not overtly environmental but that lend themselves to green policy. It is not a given, but over the last 60 years data shows that GDP has a very tight relationship with environmental impact: when one increases so does the other. Subjective well-being, for example, does not. There are countries that achieve relatively high levels of subjective well-being with relatively low environmental impact. Focusing on maximising subjective well-being, if done intelligently, could lead to environmentally beneficial policies such as reducing long-distance commuting, curbing excess wealth, and attempting to tackle materialism. This perspective does not mean that measurements of environmental impact should be ignored. Rather, it ensures that the goal of reducing our environmental harm is not seen to be in conflict with our goals in terms of improving lives.

CASE STUDY

Now that you have read about GDP and the issues surrounding it, let's look at some key facts and figures about the various uses of the marine environment and their relative contribution to GDP and employment.

We'll start by looking at the contribution to GDP by all marine sectors (1), then think about an imaginary fishery (2) to see how GDP can actually increase as the fishery declines and collapses; and finally (3) we will look at what other approaches are being investigated by Defra.

(1) From a macroeconomic perspective the **Crown Estate** provides an economic assessment of the UK marine economy.[1] This report estimates the economic (and employment) statistics for marine activities in the UK economy. For 2005/2006, for example, direct marine-related activities comprised 4.2 per cent of the total UK GDP (a total value of £46 billion). Of the total UK employment, 890 000 jobs were marine-related, 2.9 per cent of the total. This gives a total direct and indirect contribution of marine activities to the UK economy of between 6.0 and 6.8 per cent.[2]

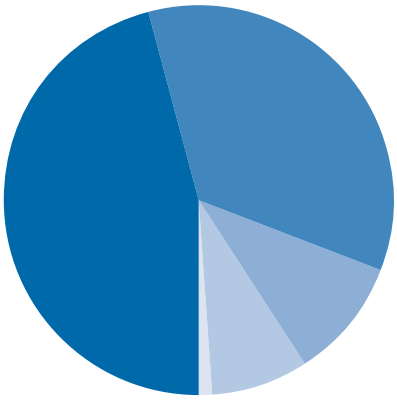
Considering UK fisheries (Figure 1) it becomes clear that fishing *just* manages to stay in the 'top ten' marine industries by turnover and by employment. In 2007 for example, the UK commercial marine fishery landed 611000 tonnes of fish and shellfish into the UK and abroad, worth almost £650 million at first sale. Shellfish and demersal fish species currently contribute around 40 per cent each to the total market value of the catch, with the remaining 20 per cent comprising pelagic species such as mackerel and herring. Secondary activities can be equally important with fish processing from sea fisheries contributing £385 million GVA in 2007.[3]

Figures 1 and 2 provide a sense of the main economic uses of the marine environment, but as noted in earlier briefings, not all the benefits of the oceans are encapsulated in the strict statistics of national GDP (they include 'defensive' expenditures, are hampered by issues with price and distribution, don't account for sustainability and the future, and imply that 'more consumption is better' as only market activity is measured).

Figure 1: Summary of all economic sectors in SIC order

	'year'	Turnover £m	Gross value added £m	GDP = 1000	Employment	UK=1000
Fish	2004	3,740	808	0.7	31,633	1.0
Oil and gas	2005	28,693	19,845	18.1	290,000	9.4
Aggregates	2006	242	114	0.1	1,670	0.1
Ship and boat building	2004	2,720	1,193	1.1	35,000	1.1
Equipment	2004	7,880	3,268	3.0	181,688	5.9
Renewable energy	2005-6	32	10	0	50	0
Construction	2005-6	558	228	0.2	6,200	0.2
Shipping operations	2004	8,820	3,399	.31	28,100	0.9
Ports	2005	8,108	5,045	4.6	54,000	1.8
Navigation and safety	2005	450	150	0.1	5,000	0.2
Cables	2005-6	4,993	2,705	2.5	26,750	0.9
Business services	2004	3,006	2,086	1.9	14,100	0.5
Licence and rental	2005-6	93	90	0.1	50	0
R and D	2005-6	797	426	0.4	10,360	0.3
Environment	2005-6	981	482	0.4	16,035	0.5
Defence	2005-6	8,185	2,841	2.6	74,760	2.4
Leisure and recreation	2005-6	7,435	3,326	3.0	114,670	3.7
Education	2006	73	52	0.1	350	0.01
Totals		**86,806**	**46,041**	**42.0**	**890,416**	**29.0**

Figure 2: Marine value added by aggregated sectors



Extraction: oil and gas; renewable energy; fishing; licensing and rent; aggregates.

Transport: shipping; navy; business services; communications; navigation and safety.

Manufacture: ship and boat building; equipment; construction.

Appreciation: recreation and leisure; environment.

Understanding: research and development; education.

Extraction: dominated by oil and gas, is the major (46%) sector. All the various aspects of transport added together constitute 35% of the total value added. Understanding is lowest with 1%. Manufacturing and appreciation contribute 10% and 85 respectively.

Extraction 46% Transport 35% Manufacture 10% Appreciation 8% Understanding 1%

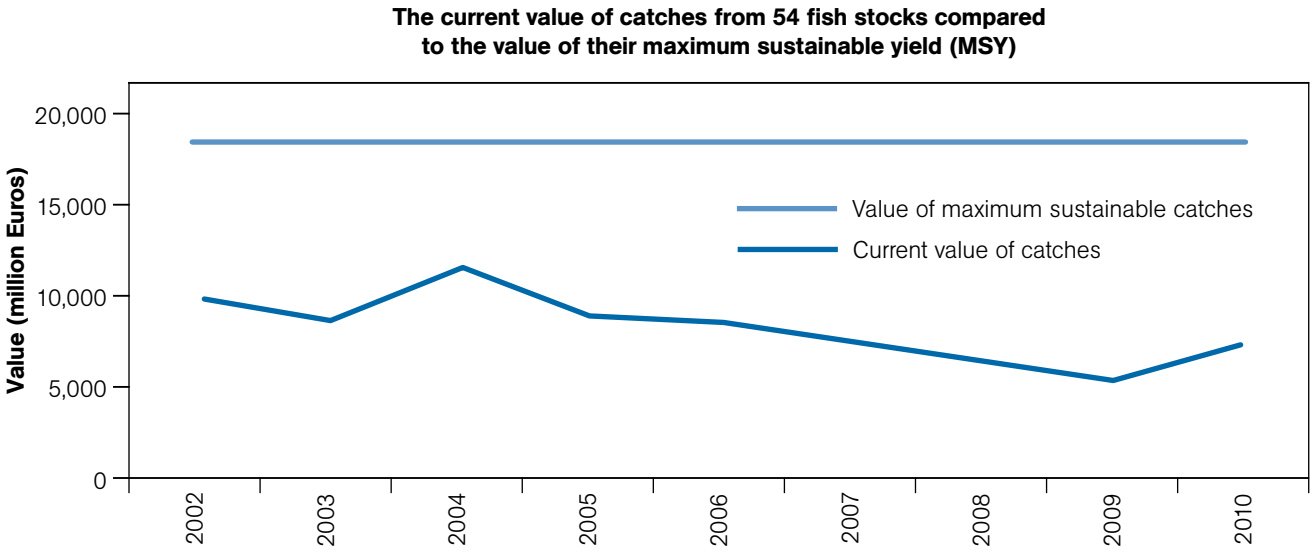
(2) This **case study** now briefly presents an *imaginary fishery* and demonstrates conceptually how GDP actually increases as the fishery declines and collapses.

- Let's imagine a fishery. Over time, due to overfishing, it becomes overexploited. No regulations or enforcement are brought in and the stock collapses. The fishery is closed. All the fishermen who made a living from fishing that stock now have no jobs and need to be compensated. Bizarrely, along the way all, of these steps show up as positives when it comes to GDP. Money changes hands each time (the final years of landings, the bailout for fishermen, the scrapping schemes or onward sales of boats, gear, etc.) and therefore it is reflected as a 'positive' or 'good' thing in terms of GDP
- Clearly this is an irrational goal to pursue (GDP 'growth' if it means collapsed fisheries and people out of work in the long term).

Points to note about current UK fisheries:

- In the UK, the value of the resource asset (i.e. the fish stock) is not explicitly estimated.
- The focus of attention is the economic performance of the sector (income).
- This encourages actions that improve present income, at the expense of future income (sustainability).
- For this reason, green accounts are one of the ingredients of an economically sustainable fishery.

Figure 3: Taken from nef's *no catch investment* report, this shows a good example of depreciated capital (overfished stocks – light blue line) versus one which has appreciated (i.e. fishing at MSY level – dark blue line).[4]



Source: www.neweconomics.org/nocatchinvestment

- Overfishing counts as positive in GDP – what makes more sense is to measure Natural Capital as one component of GDP (in this case the stocks of various fish species in an area) and use that as a measure of progress, sustainability, and value. Overfishing would then count as negative.

(3) The shortcoming of GDP as a measure of progress is fully recognised and acknowledged by Defra:[5,6,7]

'Recent landmark studies such as The Economics of Ecosystems and Biodiversity (TEEB) and the UK National Ecosystem Assessment (NEA) have demonstrated that reflecting the full value of the natural environment in policy decisions is essential for prosperity and wellbeing, now and in the future. This is also UK Government policy as set out in the 2011 Natural Environment White Paper. Economic valuation techniques are now well established, and have an essential role to play for incorporating the value of marginal changes in environmental quality or ecosystem services in social cost-benefit analysis. However, too often, when valuation is not applied to them the implicit value attributed to social or environmental impacts is zero. In some cases, monetary valuation alone cannot provide a meaningful or complete picture of the costs or benefits of a given policy change and the use of nonmonetary evidence may be more appropriate. For example, there are limits in understanding of the links between biodiversity and the ecosystem service it provides, as well as limits to our capacity to value biodiversity as a service in itself.'

Now, returning to the concept of 'green accounting', we can summarise the concept of **national fishery accounts** (and the ways in which national fishery accounts could be supplemented by other measurements of performance,[8] i.e. a 'dashboard of indicators) taken from a report for Defra, conducted by Vivid Economics in 2008.

Fishery accounts

- Physical accounts record estimates of the total stock at the open and close of a year and landings during the year. They may record changes due to growth, recruitment, natural mortality, and migration, as well as harvesting.
- Economic accounts record income and changes in the value of the stock.
- The value of the stock is the sum of discounted future rents (i.e. NPV), where the rent is *the market value of the fish less the costs of harvesting it.* Costs include consumables such as food, fuel, ice, etc., compensation to employees (crew share), consumption of fixed capital (the depreciation of the vessel and equipment), normal returns to capital employed (interest on bank loans and dividends to investors), and subsidies (which reduce the price paid by fishermen for some products to below normal market prices).

Externalities

- Fishing imposes costs on other parties that are not borne by the fishermen themselves. These are known as *externalities* (see briefing 8 on market failures).
- There are two significant externalities: the costs of climate change caused by carbon dioxide from fuel combustion and the loss of biodiversity and benthic habitat caused by fishing gear.
- These could, in theory, be subtracted from fishery accounts. The accounts could be stated both with and without the inclusion of these costs, so as to provide resource management information (e.g. gear impacts need to be measured and considered separately as well).
- There are external costs which individual fishermen impose on each other through congestion and stock-depletion, but these costs are captured within the accounts through the other fishermen's costs, and so do not need to be accounted for separately.

The complexity of fisheries around the UK, the movement of stocks and international overlap makes it difficult to define the resource.

Proposed indicators

The following are suggestions for a suite of indicators (a 'dashboard') to monitor the state of the UK fishing industry.

There are three groups of indicators set out in the 2008 Defra report, which describe:[9]

- The value created by good (or destroyed by bad) management; indicators such as biomass, landings / MEY ratios; reduction in the growth of the stock; price; value; opportunity costs, etc.
- The economic health of the national fleet, total effort, changes in capital use, cost per unit effort, income, etc.
- The costs to the public purse/government, such as enforcement, grants, research, management, royalties, subsidies, etc.

The three tables outlining the full list of indicators can be seen in detail in Defra/Vivid Economics 'the economic benefits of fisheries management' (2008); page 27 onwards.[10]

National fishery accounts provide a more meaningful measure of the health and value of our fish stocks than a 'GDP only' approach.

Further reading and useful resources

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The project aims to build socio-economic capacity and cooperation between NGOs and aid their engagement with all sectors using the marine environment.

1 Pugh, D. (2008). *Socio-economic indicators of marine-related activities in the UK*. London: HMSO, Crown Estates. Retrievable from http://www.thecrownestate.co.uk/media/207045/socio_economic_uk_marine.pdf

2 For a further useful summary see Defra (no date) *Productive seas.* Retrievable from http://chartingprogress.defra.gov.uk/chapter-5-productive-seas

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