Sea Around Us

Briefing at the United Nations on global fisheries

by Ussif Rashid Sumaila

The Group of 77 (G77) consists of 130 member (developing) countries at the United Nations (UN). The current Chair of the G77, from Pakistan, feels the need for the influential group at the UN to be more proactive regarding the oceans and their sustainable management. Hence, the Chair convened a briefing in New York for its members on the state of the world's oceans, the implications of this for developing countries, and what policy options G77 countries should be pursuing. This led to me being invited to give a briefing at the UN, together with Callum Roberts of the University of York, UK and Karen Sacks of Greenpeace International.

Rashid Sumaila addresses the UN briefing (top); and delegates attending the briefing (bottom).
Photos by Steven Lutz, Marine Conservation Biology Institute

The briefing was opened by Pakistan's Deputy Permanent Representative to the UN, Mr Farukh Amil, who spoke passionately about the importance of ocean and natural resource protection to the global community. Karen Sack then provided an overview of high seas conservation and discussed access agreements by countries in the North to fish in the South. I followed with a presentation on the state of global oceans over the period 1950 to the present, based on *Sea Around Us* data, describing the implications for developing countries. Callum Roberts commented on the misconception that creation of marine protected areas (MPAs) takes away from the fisheries. Rather, MPAs and marine reserves rebuild the resilience of depleted populations, he argued. Concluding the briefing, Mr Amil stressed that "As G77 countries, we need to preserve our natural resources in a sustainable

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manner. We have to be vigilant of over-exploitation."

The key points I made in my presentation included: (i) global fisheries are in trouble (Pauly *et al.* 2002); and (ii) the current state of global fisheries has resulted in: (a) a rise in distant water fishing (Alder and Sumaila 2004); (b) an increase in fishing access agreements between countries in the North and the South (Kaczynski and Fluharty 2002); (c) an increase in global trade of fish products (Anderson 2003); (d) increasing use of fisheries subsidies (Milazzo 1998; Sumaila and Pauly 2006); (e) rise in illegal, unreported and unregulated fishing (OECD 2004; Sumaila *et al.* 2006, High Seas Task Force, 2006); (f) drive to extend fishing to the deep and high seas (Morato *et. al.* 2006; Sumaila *et al.* 2006); and (g) increasing (and misplaced) faith in aquaculture as the solution to dwindling wild fish stocks (FAO 2007; Liu and Sumaila in press). I explained the implications to developing countries of each of these developments.

... modern fisheries development should be seen in terms of maintaining and rebuilding overfished stocks ...

Until now, fisheries development simply meant more boats and more people out fishing. Instead of this, I suggested that modern fisheries development should be seen in terms of maintaining and rebuilding overfished stocks such that they can continue to produce benefits to both current and future generations in a sustainable manner. Modern fisheries management should seek to optimize the net benefits from each unit of fish taken from the ocean, that is, we should focus on quality rather than the current emphasis on the quantity of fish caught.

Three foundations of modern fisheries development as conceived here are: (i) know the state of your fish stocks and ecosystems; (ii) know the value (in a broad sense) of your fishery resources; and (iii) strengthen fisheries management, especially monitoring, control and surveillance. Without these three foundations, G77 countries cannot engage in global fish trade, sign access agreements and/or provide subsidies that are ecologically sustainable, and economically and socially beneficial to their coastal communities. I also identified desirable elements that modern fisheries development should include: (i) engage only in mutually beneficial global trade/access agreements that are ecologically sustainable;
(ii) use subsidies rarely and only those that do no harm to the resource base; (iii) where feasible, assign fishing rights or dedicated access privileges to fishing communities;
(iv) engage only in sustainable aquaculture that contributes to fish protein supply and increases food security;
(v) emphasize smart small-scale inshore fisheries; and (vi) use marine protected areas as insurance against uncertainty and management failures.

I concluded by highlighting the role of the international community in working with G77 countries in their effort to transit from the current notion of fisheries development to modern fisheries development. I also took the opportunity to stress the need for a concerted effort to educate fishers because education is the key to finding alternative jobs and livelihoods thereby making people less dependent on fishing for a living. To do this effectively, we must educate the educators, from governments to NGOs, using information from works such those of the *Sea Around Us* project.

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The *Sea Around Us* website may be found at www.seaaroundus.org and contains up-to-date information on the project.

The *Sea Around Us* project is a Fisheries Centre partnership with the Pew Charitable Trusts of Philadelphia, USA. The Trusts support nonprofit activities in the areas of culture, education, the environment, health and human services, public policy and religion. Based in Philadelphia, the Trusts make strategic investments to help organisations and citizens develop practical solutions to difficult problems. In 2000, with approximately $4.8 billion in assets, the Trusts committed over $235 million to 302 nonprofit organisations.

Large Marine Ecosystems and the *Sea Around Us* project

by
Daniel Pauly, Jackie Alder, Shawn Booth, William W.L. Cheung, Chris Close, Ussif Rashid Sumaila, Wilf Swartz, Ar'ash Tavakolie, Reg Watson, Louisa Wood and Dirk Zeller

Introduction

Fisheries have traditionally been seen as local affairs, largely defined by the range of the vessel exploiting a given resource. The need for countries to manage all fisheries within their Exclusive Economic Zones (EEZ), a consequence of the United Nations Convention on the Law of the Sea (UNCLOS), led to attempts to derive indicators for marine fisheries and ecosystems at the national level (see e.g., Prescott-Allen 2001). Also, it was realized that, given the large scale migration of some exploited stocks, and of distant-water fleets, an even better integration of fisheries could be achieved at the level of Large Marine Ecosystems (LMEs, Sherman *et al.* 2003).

However, no national or international jurisdiction reports, at the LME level, catches and other quantities from which fisheries sustainability indicators could be derived. Indeed, if the fisheries of LMEs are to be assessed, and if comparisons of the fisheries in, and of their impact on LMEs, are to be performed, then the fisheries within LMEs must be assembled for these explicit purposes, mainly by assembling data sets from national and other sources.

The *Sea Around Us* project was created in 1999 with the aim of assessing the impact of fisheries on marine ecosystems and of developing policies which can mitigate this impact (Pauly 2007). Thus, we set ourselves, from the very beginning, the task of assembling data on all the fisheries that impacted on 'places', i.e., areas of the sea, since whatever one's definition of an 'ecosystem' is, it must include reference to a place.

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When dealing with the fisheries of places such as LMEs, the physical and other features that are relevant to the fisheries must also be expressed at the LME scale. The *Sea Around Us* website (www.seaaroundus.org) provides such statistics, which can be used in LME-specific accounts, as will be presented in Sherman and Hempel (in press). These are:

1) The percentage of global coral reef area in a given LME (rather than the area itself, which is highly variable between sources), based on a global map produced by the World Conservation Monitoring Centre (www.unep-wcmc.org);
2) The percentage of seamounts in a given LME (rather than their number, for the same reason), based on a global map of Kitchingman and Lai (2004);
3) The percentage of the area of a given LME that is part of a Marine Protected Area (MPA), based on an MPA database documented in Wood *et al.* (in press).

Other fisheries-relevant information, not presented here, but available through the 'Biodiversity' option on our website, are fish species by LME (from www.fishbase.org), and marine mammals and other marine organisms, to be consolidated in SeaLifeBase (www.sealifebase.org). Additionally, the 'Ecosystem' option allows access to maps of primary production, major estuaries (Alder 2003), and other features of LMEs.

However, the major exhibit of the website, and the major product of the *Sea Around Us* project are time series of fisheries catches by LME, obtained by aggregating catches previously mapped in 180,000 spatial cells of ½ degree lat.-long. (Watson *et al.* 2004).

As these aggregates of spatial cells can then be combined with other data, for example, the

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price of the fish therein, or their trophic level, one can straightforwardly derive other time series, e.g., of indicators of the value, or the state of fisheries in any of the 64 LMEs presently recognized in the world ocean. As this capability is globally unique to the *Sea Around Us* project, we were recently asked to collaborate on a report on the LMEs of the world (Sherman and Hempel in press). Our role was to help characterize the fisheries of each LME, by producing for each of them a set of 5 graphs presenting catch trends and time series of indicators of the status of fisheries, and commenting on them. (The only exceptions were 6 Arctic LMEs, for which catch data time series had been previously unavailable, and where we limited ourselves to presenting new time catch series, recently derived in the context of another initiative by the *Sea Around Us* project.)

We believe in the power of good graphs

An emphasis on compelling graphs

We believe in the power of good graphs. Thus, while we wrote a chapter for a UNEP report (from which this account was adapted) which presented the methods, data and assumptions behind each of the indicators we used to describe the fisheries of LMEs, we put our emphasis on the five graph types used to document the fisheries of LMEs. We reproduce two of these types of graphs here, for all LMEs combined, as they provide a nice summary of world fisheries. Further details can be found on our website (www.seaaroundus.org), and in the above-cited book, which should become available at the end of 2007.

Figure 1 shows the landings, by species for all LMEs in the world.

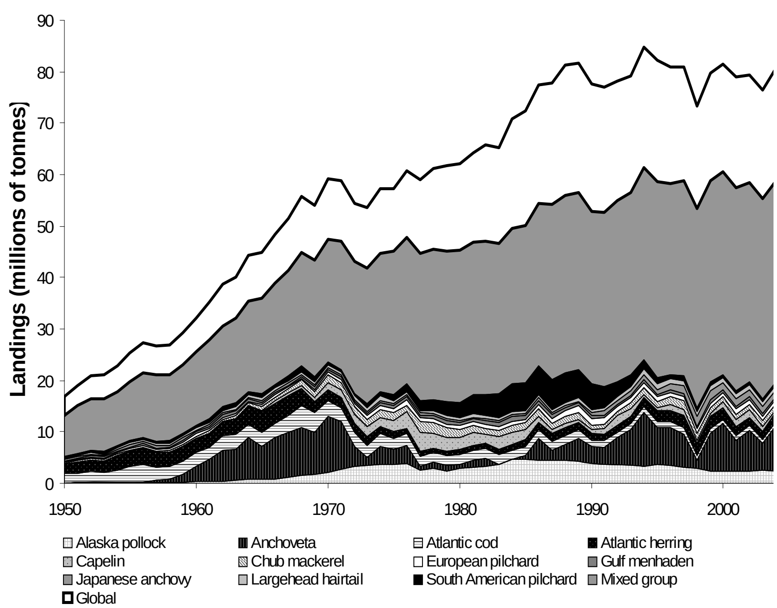

Figure 1. Landings by species in all LMEs (shaded time series), and in the world ocean (top black line). Our website (www.seaaroundus.org) also presents landings by 'Commercial groups', 'Functional Groups, as used in Ecopath models (see www.ecopath.org), 'Country fishing', and 'Gear', based on Watson et al. *(2006).*

Since this graph is normalized to show the 11 most abundant species (with the remainder pooled into 'mixed group'), and not many species are globally important, this graph exhibits more 'mixed group' landings (as 12th category) than typically occur in any specific LME. Also, it will be noted that LMEs account for the overwhelming part of the world catch. Indeed, the only major group not caught primarily in LMEs is represented by large pelagic fishes, predominantly tunas.

Figure 2 illustrates the dual nature of newly derived Stock-Catch-Status Plots, for all LMEs in the world combined. It illustrates that, overall, 70 % of global stocks within LMEs are deemed overexploited or collapsed (Figure 2, top), while only 30% of the stocks remain fully exploited. However, the latter provide 50% of the globally reported landings biomass, while overexploited and collapsed stocks provide the remainder (Figure 2, bottom). This confirms the common observation (e.g. Worm *et al.* 2006) that fisheries tend to affect biodiversity even more strongly that they affect biomass.

Discussion

The five types of graphs used to characterize each LME (only two types were presented here for all LMEs combined) allow comprehensive overviews of the general status of fisheries of LMEs. Catch and catch values indicate status and trends of the fisheries, through changes in catch levels and composition. These relate strongly to the status of

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stocks in the LME, as indicated by the Stock-Catch-Status Plots developed here. These graphs, however, require accurate and complete catch data. Such catches are not available for all LMEs. The methods we use for re-expressing FAO's global reported landings dataset on a spatial basis, here through LMEs, cannot compensate for these limitations. Rather, it makes them visible, and emphasizes the need for catch reconstruction at the national level (*sensu* Zeller *et al.* 2007), from which LME catch time series can then be derived. Hence the present emphasis by the *Sea Around Us* project on catch reconstructions, i.e., on accounting for IUU catches.

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... fisheries tend to affect biodiversity even more strongly that they affect biomass

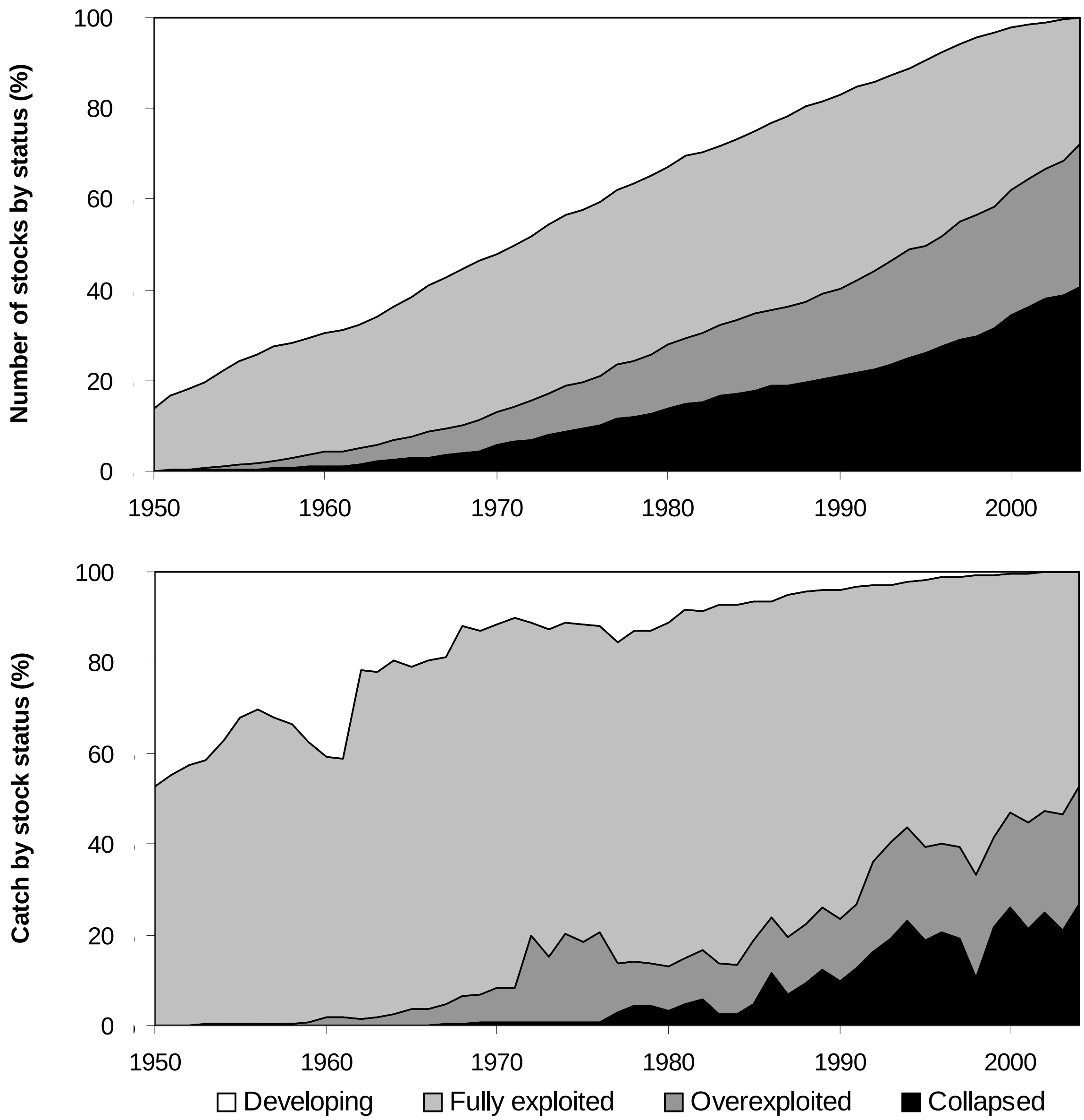

Figure 2. A newly proposed type of paired 'Stock-Catch-Status Plots' (here presented for all LMEs in the world combined), wherein the status of stocks, i.e., taxa with a time series of landings in an LME, is assessed, based on Froese and Kesner-Reyes (2002), using the following criteria (all referring to the maximum catch in the series): Developing (catches < 50 %); Fully exploited (catches >= 50%); Overexploited (catches between 50% and 10%); Collapsed (catches < 10%). Top: Percentage of stocks of a given status, by year, showing a rapid increase of the number of overexploited and collapsed stocks. Bottom: Percentage of catches extracted from stocks of a given status, by year, showing a slower increase of the percentage of catches that originate from overexploited and collapsed stocks. Note that the number of 'stocks', i.e., individual landings time series, only include taxonomic entities at species, genus or family level, i.e., higher and pooled groups have been excluded.

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References

Alder, J. 2003. Putting the Coast in the Sea Around Us Project. The Sea Around Us Newsletter. No. 15:1-2.

Froese, R. and K. Kesner-Reyes. 2002. Impact of Fishing on the Abundance of Marine Species. Rainer. ICES CM 2002/L:12, 15 p.

Kitchingman, A. and S. Lai. 2004. Inferences of potential seamount locations from mid-resolution Bathymetric data. p. 7-12. In: T. Morato and D. Pauly (eds). Seamounts: Biodiversity and fisheries. Fisheries Centre Research Reports 12(5).

Pauly, D. 2007. The Sea Around Us Project: Documenting and Communicating Global Fisheries Impacts on Marine Ecosystems. AMBIO: a Journal of the Human Environment 34(4): 290-295.

Prescott-Allen, R. 2001. The Well-Being of Nations: a country-by-country index of quality of Life and the environment. Island Press, Washington, D.C., 342 p.

Sherman, K. and G. Hempel (Editors). The UNEP Large Marine Ecosystem Report: a Perspective on Changing Conditions in LMEs of the World's Regional Seas. UNEP Regional Seas Reports and Studies No. 182 (in press)

Sherman, K., T. Ajayi, E. Anang, P. Cury, A.J. Diaz-de-Leon, P. Fréon, N.J. Hardman-Mountford, C.A. Ibe, K.A. Koranteng, J. McGlade, C.E.C. Nauen, D. Pauly, P.A.G.M. Scheren, H.R. Skjodal, Q. Tang and S.G. Zabi. 2003. Suitability of the Large Marine Ecosystem concept. Fisheries Research 64: 197-204.

Watson, R., A. Kitchingman, A. Gelchu and D. Pauly. 2004. Mapping global fisheries: sharpening our focus. Fish and Fisheries 5: 168-177.

Watson, R., Revenga, C. and Y. Kura. 2006. Fishing gear associated with global marine catches: I Database development. Fisheries Research 79: 97-102.

Wood, L., L. Fish, J. Laughren and D. Pauly. Assessing progress towards global marine protection targets: shortfalls in information and action. Oryx (in press).

Worm, B., Barbier, E.B., Beaumont, N., Duffy, J.E., Folke, C., Halpern, B.S., Jackson, J.B.C., Lotze, H., Micheli, F., Palumbi, S.R., Sala, E., Selkoe, K.A., Stachowicz, J.J., and R. Watson. 2006. Impacts of biodiversity loss on ocean ecosystem services. Science 314: 787-790.

Zeller, D., S. Booth, G. Davis and D. Pauly. 2007. Re-estimation of small-scale for U.S. flag-associated islands in the western Pacific: the last 50 years. Fisheries Bulletin 105: 266-277.

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References

Alder, J. and Sumaila, U.R., 2004. Western Africa: a fish basket of Europe past and present. Journal of Environment and Development, 13(2), 156-178.

Anderson, J.L., 2003. The International Seafood Trade. Woodhead Publishing, Oxford.

FAO, 2007. The State of World Fisheries and Aquaculture 2006. Fisheries and Aquaculture Department, Food and Agriculture Organization of the United Nations, Rome, Italy. 180p.

Kacznski, V. M. and Fluharty, D.L., 2002. European policies in West Africa: Who benefits from fisheries agreements? Marine Policy, 26: 75-93.

High Seas Task Force, 2006. Closing the net: stopping illegal fishing on the high seas, Governments of Australia, Canada, Chile, Namibia, New Zealand, and the United Kingdom, WWF, IUCN, and the Earth Institute at Columbia University.

Liu, Y. and Sumaila, U.R., *in press*. Can Farmed Salmon Production Keep Growing? Marine policy.

Milazzo, M., 1998. Subsidies in World Fisheries: A Re-examination. World Bank Technical Paper No. 406, World Bank, Washington, p. 86.

Morato, T., R Watson, Pitcher, T.J., Pauly, D., 2006. Fishing down the deep. Fish and Fisheries 7, 24.

OECD, 2004. Fish Piracy. Combating Illegal, Unreported and Unregulated Fishing. Organisation for Economic Development and Cooperation, Paris, France.

Pauly D., Christensen V., Guenette S., Pitcher T.J., Sumaila U.R., Walters C. J., Watson R. and D. Zeller, 2002. Towards sustainability in world fisheries; 418 (6898): 689-695.

Sumaila, U.R., Pauly, D. (eds.), 2006. Catching more bait: A bottom-up re-estimation of global fisheries subsidies. Fisheries Centre Research Reports 14(6), 114 pp. Fisheries Centre, the University of British Columbia, Vancouver, Canada.

Sumaila, U.R., Alder, J. and Keith, H., 2006. Global scope and economics of illegal fishing. Marine Policy 30: 696-703.

Sumaila, U.R., Khan, A., Teh, L., Watson, R., Tyedmers, P., Pauly, D. 2006. Subsidies to high seas bottom trawl fleet and the sustainability of deep sea benthic fish stocks. In Sumaila, U.R., Pauly, D. (eds.), Catching more bait: A bottom-up re-estimation of global fisheries subsidies. Fisheries Centre Research Reports 14(6), pp. 47-51. Fisheries Centre, University of British Columbia, Vancouver, Canada.

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