

Both those contributions are derived from papers presented at the International Workshop on Traditional Marine Tenure and the Sustainable Management of Marine Resources in Asia and the Pacific, held at the University of the South Pacific last July (see note in the Information Section).

A fourth contribution, by Michael D. Lieber, describes traditional fishing methods and strategies

on the Polynesian atoll of Kapingamarangi, Pohnpei State, FSM. It is based on his recently published monograph, *More than a living: fishing and the social order on a Polynesian atoll*, Westview Press, Boulder (1994). This monograph will be reviewed in the next *Information Bulletin*.

Kenneth Ruddle



Beyond Malthusian overfishing: The importance of structural and non-demographic factors

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Abstract

Daniel Pauly's concept of Malthusian overfishing states that fisheries over-exploitation in tropical developing countries is caused primarily by excess human population. While it is certainly true that growing numbers of people are causing pressure on fishing resources, the concept of Malthusian overfishing downplays other, possibly causally prior factors such as relations of power in society, income distribution, and technological development. This article points out some possible pitfalls of making family planning the cornerstone of efforts to alleviate fishing pressure.

Introduction

Daniel Pauly (1993) has defined 'Malthusian overfishing' as a situation where small-scale fishers in developing countries engage in 'wholesale resource destruction in their effort to maintain their incomes.'

The cause of this situation is seen to be an excess of fishers over available resources, and an inability of fishers to move to other forms of employment, even in the face of resource decline, because of lack of alternative employment opportunities. Pauly (1993) states that the key element in a strategy to mitigate Malthusian overfishing is to provide women the means to limit the number of children they want to bear. He also proposes alternative employment opportunities, 'traditional' management mechanisms, 'modern' gear restrictions, and sanctuaries as means to alleviate pressure on fisheries.

There is good reason for drawing attention to the issue of population in fishing villages. Clearly, the number of people in artisanal fisheries has exploded in recent decades, with dire consequences for the state of coastal and aquatic resources. The prognosis is that the population of coastal areas will grow enormously in decades to come (WRI/UNEP/UNDP, 1992).

Be that as it may, it may be ill-advised to put population control front and centre among the possible ways to confront the problem of overfishing.

There are four general reasons for this. First, rapid population growth may be an epiphenomenon of other social forces causing overfishing. Second, small-scale fishers are not the only party responsible for over-exploitation of coastal fisheries. Third, some of the growth in the numbers of small-scale fishers may not be attributable to population growth *per se*. Fourth, it is not clear that the path out of fishing to non-fishing livelihoods is blocked, as is commonly thought. This article will explain each of these four lines of reasoning in sequence.

It should be noted in advance that there are not sufficient data to support the concept of Malthusian overfishing. Nor are there sufficient data to refute the concept out of hand. It is possible, however, to raise preliminary objections at the level of theory and on the basis of case study information. This article will merely summarise some of these preliminary objections while pointing out the need for further research.

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Theories of population growth

One of the central tenets of Malthusian and neo-Malthusian theory is to see the growth of human population as an independent, exogenous force governing the state of human affairs.¹ It has frequently been stated in neo-Malthusian writings, for example, that population increase is the primary cause of poverty, famine and environmental degradation.² It has also been assumed in neo-Malthusian theory that parents who bear children beyond the limits of their material resources are being irrational.

Non-Malthusian theory reverses this causal sequence and sees rapid population growth in the developing world as a consequence of poverty and income inequality.³ A corollary of this view is that poor people bear large numbers of children as a rational survival strategy. Often, for resource-poor families, it is argued, the larger the number of children, the larger the amount of household income from childhood labour and remittances, and the greater the degree of security of parents when they reach old age. The implication of this theory is that rapid population growth can only be adequately addressed by first taking measures to alleviate poverty.

Over the years, proponents of both theories have made concessions. For example, some of the more ardent past proponents of neo-Malthusianism now readily acknowledge that socio-economic conditions have a strong role in conditioning fertility rates.⁴

Many non-Malthusians concede that there is much unmet demand for family planning services among the poor in developing countries. However, significant differences between the two bodies of theory remain.

The point here is not to take sides in the demographic debate, but rather to point out that — regardless of what theory is assumed — it is by no means clear that fertility control should be the first order of business in confronting overfishing. In fishing villages where poverty underlies a perceived need to have many children, a focus on

family planning will not be an effective way to safeguard the fishery. In fishing villages where there is unmet demand for contraception and fertility control, family planning will not be an effective way to safeguard the fishery. In this situation, family planning services may help in alleviating resource pressure. However, for reasons that are explained below, even in the latter case, we must be wary of exaggerated expectations of how much fertility control can, or even should, accomplish toward resolving the problem of overfishing.

Commercial exploitation of coastal fisheries

Small-scale and commercial fishers often compete for the same resources in coastal capture fisheries (Smith, 1979; Thomson 1980; Bailey, 1986; Bailey, 1987a). In some cases, we know that the proportion of fish taken by commercial gears is quite substantial.

In San Miguel Bay, Philippines, it was found in 1980 that 75 small trawlers, 3 per cent of the fishing units, were earning more than the remaining 2,300 fishing units in the Bay (Smith & Mines, 1982). On the north coast of Java, small-scale fishers experienced a serious decline of catches and some were forced to leave fishing as the numbers of commercial trawlers grew in the 1970s (Bailey, 1986; Bailey, 1987a; Bailey, 1988). With the imposition of a trawl ban in 1980, there was a remarkable recovery of demersal fish stocks (Dwiponggo, 1992), the fisheries were able to accommodate a growing number of small-scale fishers, and the incomes of these fishers reportedly grew (Bailey, 1987a; Chong et al., 1987).

These two cases suggest that we cannot conclude that a growing number of small-scale fishers is invariably the primary cause of overfishing. The experience in North Java should provoke us to ask if there are other fisheries in the developing world where a ban on trawls or other forms of commercial fishing might alleviate fishing pressure and also raise the living standards of marginal fishers. Furthermore, in cases where the premises of non-Malthusian theory are correct, a trawl ban and subsequent increase in the living standard of marginal fishers might help induce those fishers to bear fewer children.

¹Malthusian theory (as espoused by its originator, the economist Thomas Malthus) promoted sexual abstinence, celibacy and delayed marriage as the means to control fertility. The theory did not promote contraception, viewing it as a vice. Neo-Malthusianism differs in believing that contraceptive technology is a necessary and harmless means to control population (Humphrey & Buttel, 1980:36 & 72).

²See for example Ehrlich (1968), Hardin (1977), and Brown et al. (1985).

³See for example the work of Mamdani (1972) and Murdoch (1980).

⁴Of particular note is the change over time in the writings of Ehrlich (1968, 1991) and passages on population in the State of the World reports of the Worldwatch Institute.

Migration into the fishing sector

In his article, Pauly (1993) explains that population increase in artisanal fishing villages results both from internal growth and also from migration into these villages⁵. It is possible to argue that migration of resource-poor people into fishing is merely part and parcel of the broader problem of excessive human population growth at-large in a given country. But this is not necessarily the case. Entry into fishing can also be viewed as a shift in employment caused by various forms of migration-inducing factors. Among these we might consider distributional, technological, and ecological causes of displacement.

'Distributional displacement' would involve the migration of people as a result of a re-apportionment of resources from less powerful to more powerful sectors in society. A national-level example would be appropriation of land resources by rural elites, forcing farmers (under conditions of resource scarcity) to look for non-farm employment.⁶ An international-level example might be the combined effects of the declining world prices for primary agricultural commodities since the early 1980s, and the declining terms of trade and increasing debt of developing countries. Lower profits, in particular for marginal agricultural livelihoods, may have propelled some people into fishing.

An example of 'technological displacement' would be the effect of farm mechanisation on the rural labour force. Investment in large-scale, capital-intensive agriculture and the use of 'labor-saving' machinery is one of the reasons for migration out of farming (UNFPA 1993:13).⁷

'Ecological displacement' may be one of the reasons for increasing population in fishing villages. Examples would include farmers entering fishing after trying and failing to make a living on marginal/fragile land, or fishers migrating from an over-exploited fishery to one not yet overfished. Here again, one of the underlying causes may be overall population growth, but we cannot ignore possible non-demographic causes of ecological damage. For example, farming in ecologically sen-

sitive areas can result from 'distributional displacement', or from other factors disrupting the lives of rural people.

The case of south-eastern Rajasthan in India is instructive. There, the government has assisted 2,300 people in three tribal groups to transfer out of forest-degrading livelihoods and into fishing. An excess of people over available land resources was clearly part of the problem. However, another dimension of the problem is the ethnic history of the region. The tribal groups have taken refuge in hilly lands and jungles to avoid persecution by the dominant Rajput people; this is one key reason why they have taken up forest-based employment on marginal land (Kulshreshtha, 1990).

Spontaneous adjustment to overfishing

Pauly (1993) notes that alternative employment options for fishers are limited and he implies that labour mobility and/or migration out of fishing is not a leading option for mitigating overfishing. This may be true in some settings, but not others.

Panayotou & Panayotou (1986), in their longitudinal study of Thai fishing villages in four coastal provinces, found that mobility in and out of the villages is considerable and that '(m)obility of labour out of fishing is, if anything, greater than mobility into fishing'.

Research in overfished San Miguel Bay, Philippines, found that although the absolute numbers of fishers had increased between 1939 and 1980, there had been a substantial net outmigration over that period of time (Bailey, 1982). A recent study of the same area found that the population of the Bay's 74 fishing villages had grown 25 per cent between 1980 and 1993, but the numbers of fishers had declined (unpublished data). It appears that under conditions of overfishing, the local non-fishery sector has been absorbing a greater share of growth in the labour force than in the past and may also be accommodating some people who have left fishing. Since many of the government's efforts to provide alternative employment for fishers in the Bay have failed, one can only conclude that there

⁵For references to movement from agriculture and inland areas into coastal fishing in developing countries, see Cordell (1973), Smith (1979), Bailey (1982), Cordell & McKean (1986), Panayotou & Panayotou (1986), Bailey (1987b), Signey (1987), Kendrick (1988), and Pauly & Thia-Eng (1988).

⁶Kendrick (1988) observed that several fishers in a small fishing village in Masbate, Philippines, originally moved to the village to avoid armed conflict occurring inland. This form of migration is possibly a derivative of 'distributional displacement.'

⁷In some areas of Asia, technological displacement may have occurred on a significant scale in spite of the labour-absorbing effects of the Green Revolution. Boyce (1993) has shown that — on balance — the combined effect of the Green Revolution and farm mechanisation in rice agriculture in the Philippines has been displacement of labour. Similar trends have been observed in other Asian countries (Jayasuriya & Shand 1986).

has been a degree of unplanned adjustment in the Bay economy to the problem of overfishing.

These two cases do not necessarily demonstrate that non-fisheries livelihood options offer a better way to deal with overfishing than family planning. They do, however, demonstrate the need to know if spontaneous adjustments to the problem of overfishing offer more promise as a solution than previously thought.

Conclusion

Daniel Pauly has made a contribution to fisheries science by drawing attention to the damaging effect of growing human population on the long-term integrity of fisheries resources. He has made the important observation that the capture fisheries sector — unlike agriculture — cannot be made to produce more fish through mechanical or biochemical intervention.

Nonetheless, the concept of Malthusian overfishing suffers from a serious drawback. In the tradition of Malthusianism and neo-Malthusianism, Pauly's concept focuses on the poor as agents of environmental decay, with scant attention to the structural antecedents of poverty and high fertility. The concept gives disproportionate attention to physical rather than systemic agency in environmental degradation.

In spite of these weaknesses in Pauly's (1993) formulation of the problem of overfishing, he has clearly demonstrated elsewhere a thoughtful understanding of the need to consider socio-economic factors influencing human reproduction. For example, with regard to the problem of population pressure on fisheries, he has written: 'Because poverty is the root of an array of fishery-related and other socioeconomic problems, solutions to fishing problems will be forthcoming only when the central issue, poverty itself, has been resolved' (Pauly & Thia-Eng 1988). Pauly's future writings on the problem of overfishing would have greater theoretical rigor and would be more persuasive if they more consistently followed this line of reasoning.

If a workable theory of overfishing is to be constructed, it must: (1) avoid those tenets of Malthusianism and neoMalthusianism that are questionable; (2) take due account of the structural/systemic factors leading to overfishing; and (3) give attention to the specifically non-demographic factors underpinning the problem of overfishing.

Fisheries management in tropical developing countries would be well served by a cogent theory of overfishing focussing on the human dimension. For lack of such a theory, we run the risk of treating symptoms as causes and of not getting at the root of the problem. In order to create a well-grounded theory, research must be conducted on the relative significance of social and economic factors leading to overfishing, and on the causal relationships among these factors.

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