

The Impacts of El Niño on Philippine Fisheries*

R.D. Guerrero III

Introduction

The El Niño phenomenon is an "anomalous climatic condition in the tropical Pacific region which occurs every two to seven years and affects the global climate" (NOAA 1997). There is a greater increase in the water surface temperature of the eastern tropical and central tropical Pacific during an El Niño episode relative to that of the western tropical Pacific. The phenomenon causes fluctuations in rainfall, resulting in drought in some areas and heavy rainfall in others.

During the El Niño of 1990-1992, the damage caused by the drought in the Philippines was estimated to be P4.1 billion (PhP24 = US\$1). While the damage to agriculture is well documented, the impact on fisheries has not been considered.

The impacts of the El Niño episode of 1997-1998 were assessed in the Philippines by the field personnel of the Department of Agriculture and representatives of the private sector in the 15 regions of the country (Fig. 1). Data on the losses caused by the

phenomenon were obtained from interviews, surveys and reports of local government units and provincial agricultural offices for the period October 1997 - June 1998. The effects of El Niño on aquaculture, marine fisheries and inland fisheries were determined.

Assessment of El Niño Impacts

During the El Niño episode of 1997-1998, the number of tropical cyclones which entered the Philippines' area of responsibility was only 14 compared to the usual average of 20. The rainfall recorded for the period was about 50% of the national annual average rainfall of 2 400 mm (Amadore, pers.com.).

A summary of the reported fisheries losses due to the most recent El Niño is shown in Table 1. The total estimated loss was P7.248 billion (PhP40 = US\$1). Almost 85% of the economic loss was in the aquaculture sub-sector, followed by marine fisheries with 14.78% and inland fisheries with 0.26%. In the case of open water fisheries, the marine municipal (subsistence) fishing sub-sector had a loss of 18 401 t while commercial fishing in marine waters lost 4 522 t and inland fishing had a loss of 599 t.

In terms of individual products, seaweed farms in coastal waters incurred the biggest loss of 131 198 t followed by milkfish and shrimp production in brackishwater ponds with a loss of 102 857 t and tilapia production in freshwater fishponds with 19 828 t.

The regions of Central Luzon (III), Western Visayas (VI) and the Autonomous Region in Muslim Mindanao (ARMM) suffered the greatest economic losses.

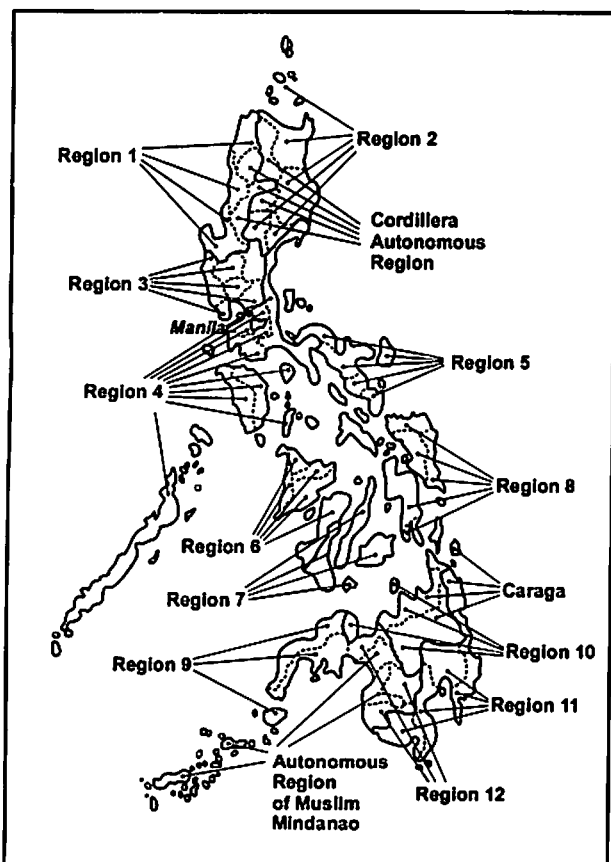


Fig. 1. Regions of the Philippines.

Table 1. Reported losses in Philippine fisheries during the El Niño of 1997-1998.

Sub-sector	Production loss (t)	Economic loss (PhP million)
Aquaculture	260 375	6 154.95
Brackishwater fishponds	102 857	3 558.20
Freshwater fishponds	19 828	913.10
Cages/pens	6 000	120.00
Mariculture	131 690	1 566.65
Seaweeds	131 198	1 561.80
Mussels	492	4.85
Marine fisheries	22 923	1 071.60
Commercial	4 522	221.00
Municipal	18 401	850.60
Inland fisheries	599	18.93
TOTAL	283 897	7 248.48

* An excerpt of the proceedings of the National Workshop on the Assessment of the Impacts of El Niño on Philippine Fisheries, 20-21 August 1998, Los Baños, Laguna, Philippines.

Brackishwater ponds in El Niño-affected areas had high water salinities due to the reduced rainfall. Slow growth of cultured species and fewer croppings were experienced by fishfarmers. The mariculture of seaweeds, *Kapphycus* and *Eucheuma*, was also adversely affected with the profuse growth of filamentous green algae (e.g., *Enteromorpha*), which impeded the seaweed growth with high surface water temperature.

Cage and pen culture of tilapia and milkfish, respectively, in Laguna Bay, had decreased yields because of a low water level and reduced stocking rates.

For marine fisheries, municipal fishers operating in nearshore, shallow coastal waters had a lower catch per unit effort (CPUE) while commercial fishers operating in deep waters using ringnets and Danish seines had relatively high CPUE during El Niño. There was an apparent movement of small pelagic fishes (i.e., sardines, roundscad and Spanish mackerel) from the shallow to the deeper waters (Armada 1998). A slight decline in the catch of tuna (i.e., yellowfin, big-eye and skipjack) was noted in Philippine waters. This was attributed to the natural migration activity of the tuna stocks as a result of the warm water spreading towards the eastern tropical Pacific causing the fishes to have a wider dispersal space (Barut 1998).

Conclusions

In summary, the impacts of El Niño on Philippine fisheries varied with the region and resources. The regions adversely affected were Central Luzon, Western Visayas and the Autonomous Region in Muslim Mindanao. Aquaculture was the most affected fisheries sub-sector with seaweed mariculture, brackishwater ponds and cage/pen operations incurring heavy losses. The catch of the municipal fishers was reduced with the apparent movement of the small pelagic fishes from the shallow to the deeper waters. The catch of the commercial fishers in offshore waters, however, improved with the extended "good weather" that favored fishing.

For future El Niños, fishfarmers and seaweed growers in adversely affected areas have been advised to minimize culture operations in fishponds, shallow lakes and coastal waters to avoid heavy losses. The use of appropriate fishing gear by municipal fishers in deeper coastal waters is recommended.

References

- Armada, N. 1998. An evaluation of the effect of El Niño on the small pelagic fishes of the Visayan Sea. Paper presented at the National Workshop on the Assessment of the Impacts of El Niño on Philippine Fisheries, 20-21 August 1998, Los Baños, Laguna, Philippines. 10 p.
- Barut, N.C. 1998. The effects of El Niño on tuna stocks in the Philippines. Paper presented at the National Workshop on the Assessment of the Impacts of El Niño on Philippine Fisheries, 20-21 August 1998, Los Baños, Laguna, Philippines. 8 p.



Fishpens in Laguna de Bay had lower yields due to water drawdown during the El Niño episode.



With lack of rain and low supply of ground and surface water, freshwater aquaculture utilizing fishponds declines during an El Niño episode.



*The seaweed (*Eucheuma*) mariculture industry of the Philippines has been adversely affected by El Niño.*

National Oceanic and Atmospheric Administration. 1997. What is El Niño-Southern Oscillation (ENSO)? U.S. Department of Commerce. 6 p.

R.D. GUERRERO III is Executive Director, Philippine Council for Aquatic and Marine Research and Development, Los Baños, Laguna, Philippines.