

Endogenous wages and property rights in a small resource community¹

Pescado is a small town with 5000 fishers. Because they have little education, the fishers of Pescado cannot do anything else than fish to make a living. Next to town, there are only two lakes where fishers can catch fish, lake Tilapia and lake Loyola (named after a Jesuit missionary who lived there at a time when fish scarcity was not an issue).

The *total* output function on lake Tilapia is given by $y_T = 12x_T - 2x_T^2$ while that of lake Loyola is $y_L = 7x_L - \frac{1}{2}x_L^2$, where $x_T \times 10^3$ and $x_L \times 10^3$ denote the respective quantities of fishers on lakes Tilapia and Loyola, and y_i denote the total catch in thousand of pounds of fish. The price of one pound of fish is fixed and equal to \$1.

- a) What is the distribution of fishers between the lakes in a regime of exclusive ownership? (Suppose that each lake is exploited by a different owner who hires the fishers and takes the wage as given. The wage is however endogenous to the model.) Argue that this leads to an efficient distribution of the fishers between the two lakes. (We assume no transaction costs.)
- b) What will be the distribution of fishers between the lakes in a regime of *open-access*? (Recall that under open access, there is no owner/employer. Each fisher is free to go on the lake that gives the highest individual return and keeps her entire catch.) Explain intuitively why the distribution is different from the one in (a) and why it is inefficient.
- c) Which property regime is preferred by the fishers? Explain. (In the exclusive access case, assume that the owners are not part of the fishing community.)
- d) Argue that individual fishers have an incentive to violate the exclusive ownership property regime.
- e) Suppose now that in the exclusive ownership regime, excluding access to a lake requires a fixed cost of \$3000 per lake in terms of policing efforts. This cost is paid for by the lake's owner. Which property regime is efficient? Justify.

¹This problem is based on Samuelson (1974).

- f) Suppose now that the fixed cost of exclusion is \$5000. Show that exclusive ownership can only hold on one lake in equilibrium. Is this an efficient outcome?