Modelling Palau Fishery Economics

James Hogan, SPC - FAME

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The basic model, outlined in Tietenberg and Lewis (2018):

Equation : Fisheries Biomass Growth Equation

where:

g = the growth rate of the biomass,

r = the intrinsic growth rate for this species,

S = the size of the biomass, and

k = the carrying capacity of the habitat.

The *sustainable harvest* removes only the growth in the biomass from the fisheries stock:

Fishing activity is modelled through a “harvest” function, which is similar in concept to a production function in production theory. The harvest function relates the biomass extracted to the quantum of fisher effort, and the relative size of the biomass stock:

Equation : Fisher Harvest Equation

where:

q = a constant (known as the “catchability coefficient”) and

E = the level of effort.

S = the biomass stock size.

Connecting and becomes:

and

Equation : Stock Size Effected by Effort

Inverting the harvest function,, to express biomass stock as a function of volume harvested, and substituting into produces:

Equation : Sustainable Harvest, as a function of Effort

This is a reference to .

# References

Tietenberg, T, and L Lewis. 2018. “Environmental and Natural Resource Economics, 11th Edition.” Routledge.