

Computation of viability kernels: a case study of by-catch fisheries

Jacek B. Krawczyk *

J.Krawczyk@vuw.ac.nz

WEB: www.vuw.ac.nz/staff/jacek_krawczyk/

Managers who use traditional optimisation models for policy-making usually receive a single optimal or equilibrium strategy, regardless of how reliable their underlying model is. We present an alternative approach using viability theory which establishes “satisficing” (viable) policies that maintain systems within imposed constraints and which are, generically, multiple and amenable to each manager’s prioritisation. We introduce VIKAASA, a MATLAB application for computing approximations to viability kernels, which are crucial for viable policy determination. We apply viability theory and VIKAASA to a problem of by-catch fisheries and provide rules concerning fish biomass and fishing effort for the overall sustainability of the fishery.

This is a joint work with Alastair Pharo, School of Economics and Finance, Victoria University of Wellington, NZ, E-mail: asppsa@gmail.com; Oana S. Serea, Université Perpignan Via Domitia, Laboratoire de mathématiques et physique, EA 4217, F-66860 Perpignan, France, E-mail: oserea@yahoo.fr; Stewart Sinclair, School of Economics and Finance, Victoria University of Wellington, NZ, E-mail: sinclastew@gmail.com.

*School of Economics and Finance, Victoria University of Wellington, PO Box 600, Wellington, 6140, NEW ZEALAND.