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Workshop
Uncertainties of Scenario Simulations
SMHI, Norrköping, 14 October 2010

BALTIC SEA FISHERY MANAGEMENT: BAYESIAN UNCERTAINTY COMMUNICATION

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Outline

- **Formally singular probability statement**
- **Bayesian uncertainty communication**

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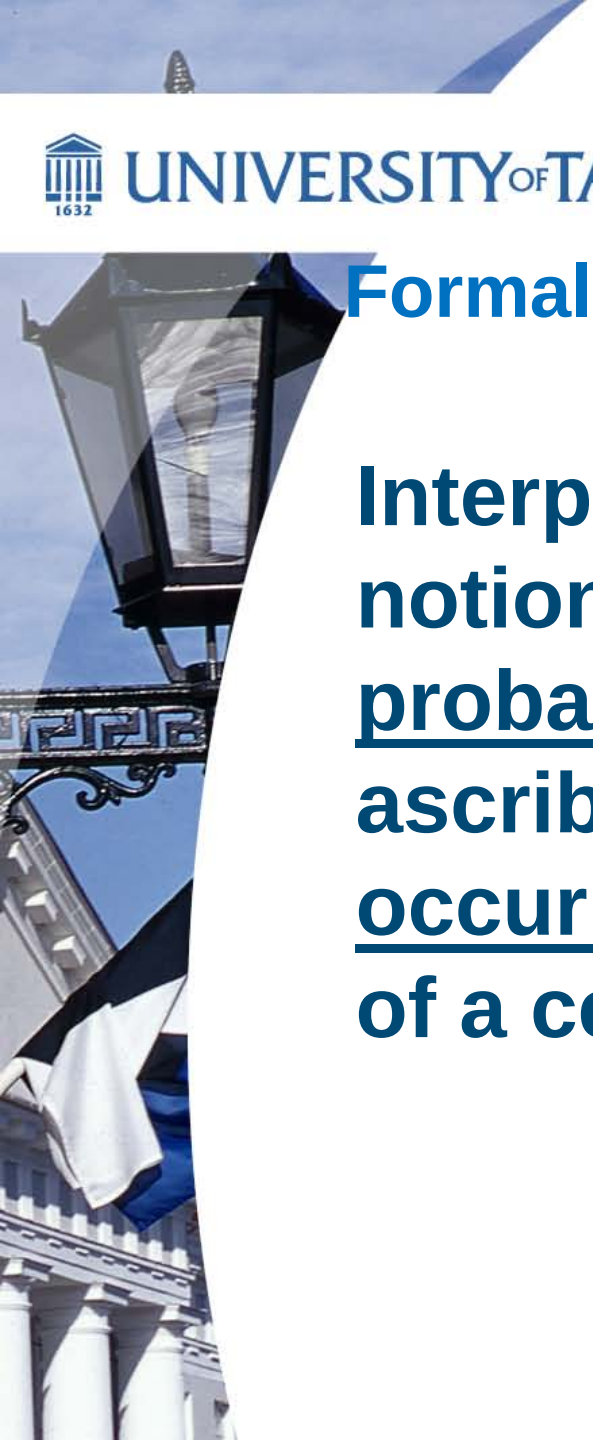
Formally singular probability statement



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Formally singular probability statement

Interpretation is building on the notion of formally singular probability statement when it ascribes a probability to a single occurrence, or to a single element of a certain class of occurrences

(Popper, 1999)

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Formally singular probability statement

$$\alpha P k(\beta) = \alpha F(\beta) \qquad (k \in \alpha)$$

The formally singular probability that the event κ has the property β - given that κ is an element of the sequence α - is, by definition, equal to the probability of the property β within the reference sequence α .

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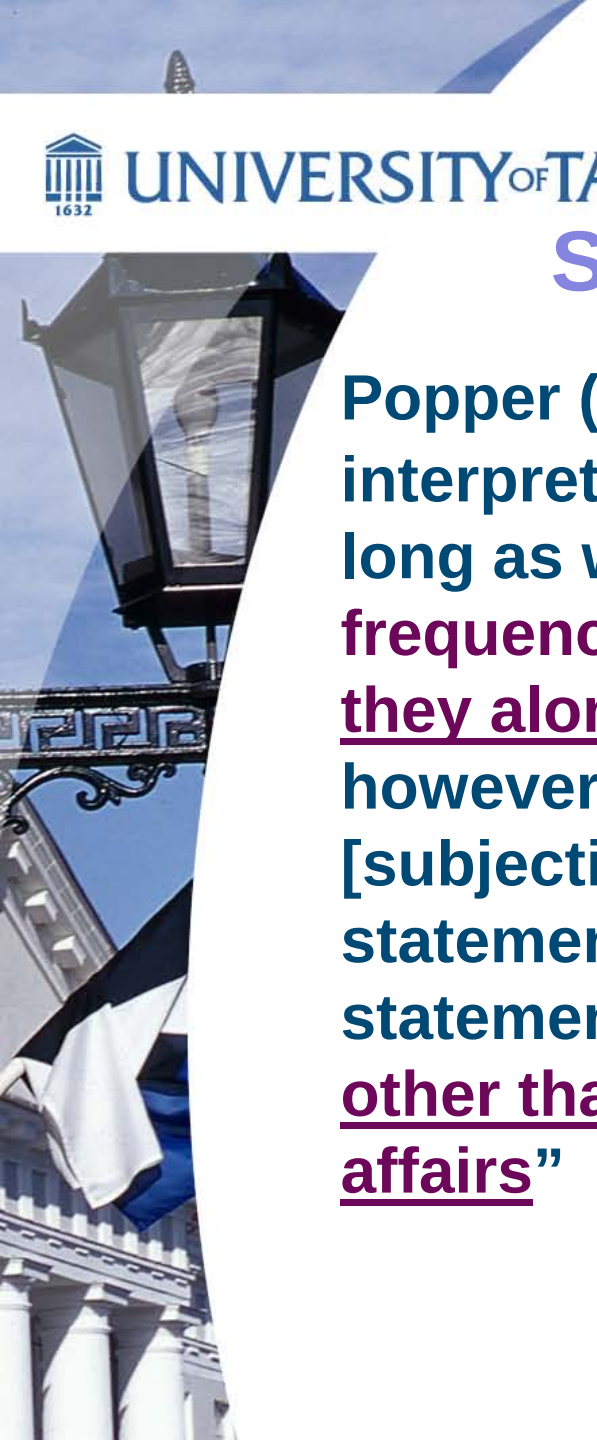
Subjective interpretation

- **Popper (1999): the subjective interpretation of probability statements about single events does not enable us to predict what the property of the event in question will be, but it enables us to express all we know about it by means of a formally singular probability statement – an indefinite prediction about the particular event in question**



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Subjective interpretation

Popper (1999): "I do not object [subjective interpretation of probability statements] … so long as we clearly recognize that the objective frequency statements are fundamental, since they alone are empirically testable. I reject, however, any interpretation of those [subjective] formally singular probability statements – these indefinite predictions – as statements about the objective state of affairs, other than the objective statistical state of affairs"

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Probability estimates

- **Popper (1999): "Probability estimates are not falsifiable. Neither, of course, are they verifiable, and this is for the same reasons as hold for other hypotheses, seeing that no experimental results, however numerous and favorable, can ever finally establish that the relative frequency of "heads" is ½, and will always be ½."**
- **Empirically testable!**

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Bayesian uncertainty communication

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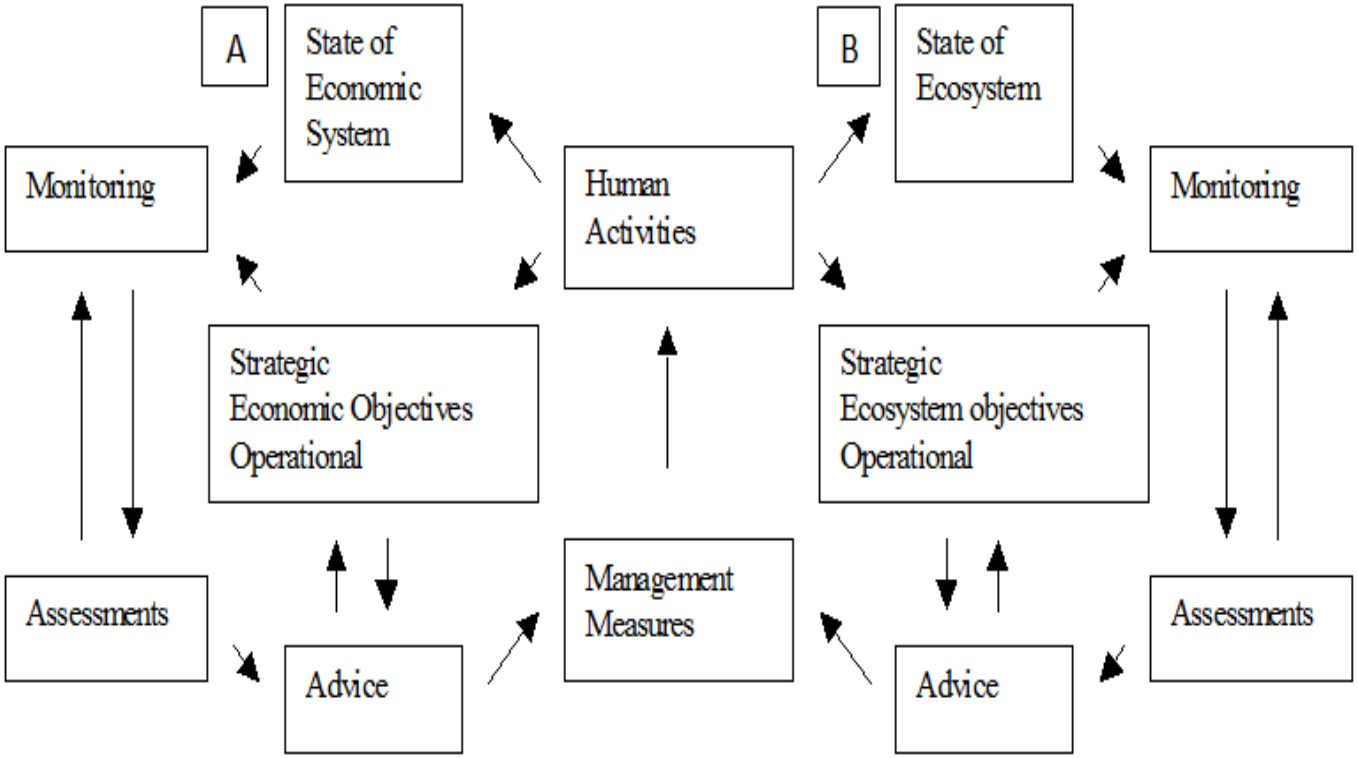
Coupled economic and ecological system



Aps et al., 2010

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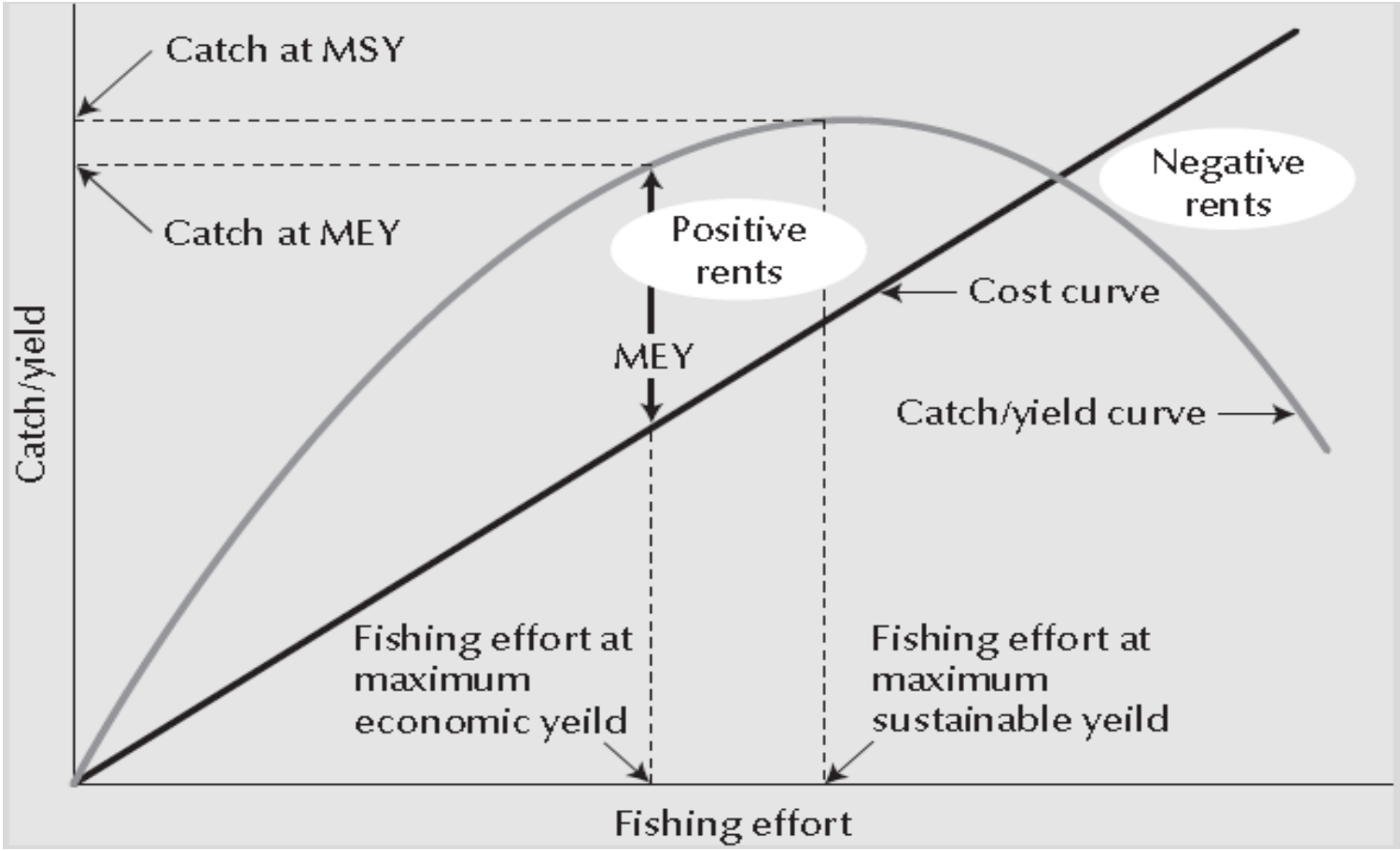
MSY & MEY



WB-FAO. The Sunken Billions. 2008

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Fishing fleet overcapacity & overfishing

- **Fishing fleet overcapacity is a major cause of persisting overfishing**
- **Creates a strong incentive to catch more than is sustainable**
- **Overcapacity and the associated low economic resilience impose a high political pressure to increase short-term fishing opportunities at the expense of the future sustainability of the industry**

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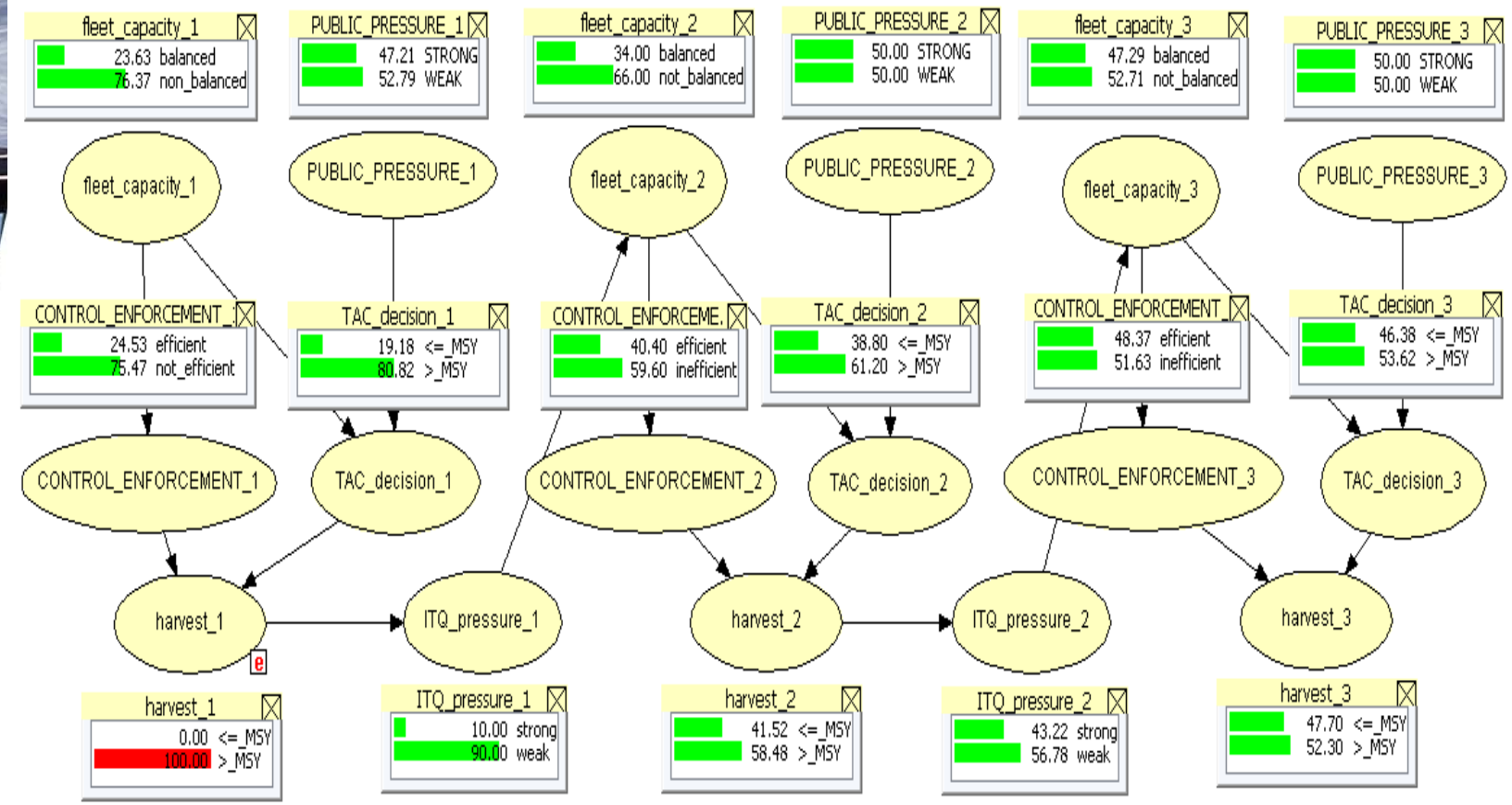
Baltic Sea herring



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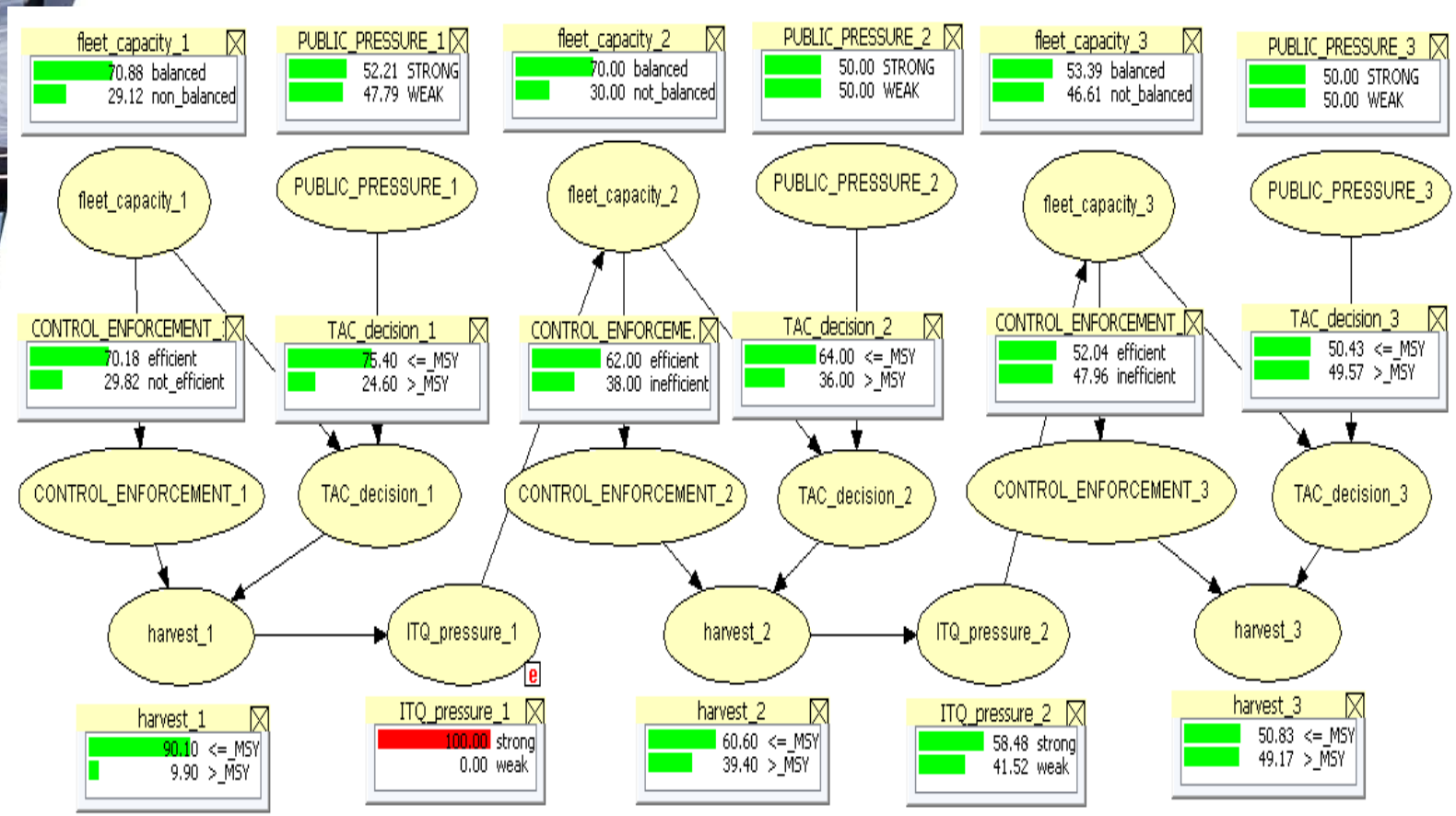
ITQ system – smart control - negative feedback loop



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Acknowledgment

This study was supported by the Estonian target financing program SF0180104s08, Estonian Science Foundation Grant No 7609, and by the BONUS+ Project IBAM: "Integrated Bayesian risk analysis of ecosystem management in the Gulf of Finland"

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Thank you for your attention!