1.
The Scientific Committee has started working on the development of quantitative evaluations of alternative management options for IOTC stocks. I would like to present to you the main elements of this approach, report on the workplan and intentions of the SC, and specially explain what essential part the commission needs to play in this work.

The SC has decided to provide IOTC with the best advice on management plans by applying Management Strategy Evaluation, also called the Management Procedure Approach.

2.
This approach differs from the usual cycle of catch and biological data being collected and used in an stock assessment to evaluate the status of the stocks and then provide management advice, for example on maximum catch levels.

3.
Instead, a model of the fishery system, both the fish stock and the fleets operating on it, is constructed. This model includes both our best knowledge on the dynamics of the system, but also our best estimates of its uncertainties and variabilities.

4.
This is what we call an Operating Model, and from this point it will provide us with a virtual reality inside which we can carry out experiments with different management alternatives.

5.
The combination of data collection, estimation of stock status and a management rule forms the Management Procedure: a set of practices and rules that attempt to best infer the status of the stock and propose an appropriate management decision that best allow us to achieve our objectives.

6.
We can now proceed with running this system for a large number of times, so that we can observe how different sources of uncertainty make alternative management rules fail or not.

This in itself is already a change in the direction of the scientific work, as the focus is now on comparing the performance of different management options under various states of nature. But MSE is really about adopting a new way of working, in which various steps must be carried out by the different parts of the IOTC system.

7.
The seven steps widely recognized to be essential for the development of sucessful plans start with a precise definition of the management objectives we are trying to achieve. Do we want stocks to stay at the MSY values? Is catch stability important? Should we minimize bycatch?

8.
We also need to think about limits,

9.
like levels of biomass we do not want to reach.

10.
We can now turn these into performance measures, like what is the risk of biomass going below the limit?

11.
A number of management procedures need to be identified and selected for testing. They need to involve some kind of rule that can be evaluated and applied automatically given the inputs that are available on the status of the stock, the activities of the fleet or the environment. They can take the form, for example, of a scale of fishing mortality the changes as the stock gets closer to the limit value,

12.
which can then be translated into a decrease in effort

13.
or a closed area or season that expands and contracts as the stock moves up and down the scale

14.
Once the Management Procedure our consideration is defined, simulations are conducted always acknowledging that uncertainty is present

15.
and we will really be comparing them in terms of risks and probabilities.

16.
We can then summarize the performance of each Management Procedure across a range of objectives

17.
and finally select the one that best fulfills our needs as set out at the start

18.
This process is not without drawbacks, starting with the amount of work involved, specially in a setting like IOTC. But the benefits appear to clearly outweight the problems, and that is why this way of working is gaining acceptance. CCSBT, for example, has just adopted a management procedure developed under this paradigm. And a Kobe workshop on MSE has just started work across all tuna RFMOs

19.
So what next? The Scientific Committee has agreed on a plan of work and as tasked the Working Party on Method with the development of the necessary simulations and analysis, which we hope could already be presented to the Commission meeting in 2014.

We are trying to establish some capacity building initiatives associated with this work, as well as a peer review process to ensure its quality. Of course there are possible budgetary implications that could be considered, specially given the already limited human resources at the scientific level.

20.
For all of this to happen, certain steps need to be taken. First, the IOTC needs to agree on a clear set of objectives and priorities. Then, limits and risks need to be discussed. Scientists will then be able to work on evaluating management procedures and present to the Commission their findings. But I think it could be very beneficial if this process also establishes new avenues for feedback between science and management. This dialogue I think will be key to establishing a solid management setting for the Indian Ocean tuna stocks and fisheries. Thank you very much.