

SFA & IRD - 40 years of research partnerships

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I. CONTEXT

IRDs principal mission is to generate science centred on the intertropical and Mediterranean zone and founded on equitable scientific partnership with the higher education and research communities (ESR) of the countries and regions concerned. This mission has a dual purpose:

- Contributing to advances in scientific knowledge in matters of sustainable development
- Helping to give development policies a better grounding in science.

IRD is present in Seychelles since 1980 (Port of Victoria in 1982 in front of the three of four French purse seiner).



IRD has structured his research around SDG implementation and Seychelles priorities, especially on preserving biodiversity and sustainable management of ocean resources.

IRD has been working on different domains:

- the history of Seychelles (published in 1983),
- a botanical inventory of the Seychelles' flora in the 1980s and a book published in 2014
- but IRD has mainly worked on fisheries and their impacts in collaboration with SFA (i.e "The Seychelles's blue gold", 2014).



An overview of some studies are presented below.

II. FISHERIES STUDIES

A. FADIO (2003 - 2006) - 10 partners (IRD, SFA,...) from 6 countries

FADIO (Fish Aggregating Devices as instrumented Observatories of pelagic ecosystems) is a project funded by the EU with two mains goals :



- Objective 1: Development of prototypes: new electronic tags and instrumented buoys to observe fish aggregations around FADS
- Objective 2: Improving knowledge on on pelagic fish around FADS



Three main achievements:

- Contributed to the development and successfully tested the first satellite-linked acoustic receiver (listening station) that allows remote, real-time monitoring of open ocean fish implanted with sonic transmitters
- Obtained first scientific descriptions of the species that comprise the community of animals associated with drifting FADS.
- Obtained first measurements of residence times and swimming depths of tuna and other pelagic fish around drifting FADS. Estimated the orientation distance of dolphinfin on FADS using an experimental approach.

B. MADE (2008 - 2012) - 13 partners (IRD, SFA,...) from 8 countries

MADE (Mitigating ADverse Ecological impacts of open ocean fisheries) aims at proposing measures:

- To reduce by-catch of sharks and juvenile swordfish by pelagic longliners.
- To reduce by-catch of sharks and turtles, and juvenile tunas by tuna purse seiners.
- To assess the effects of FADs on fish ecology (to assess how much the release of FADs modifies the habitat and affects the ecology of fish).



The project follows a multidisciplinary and integrated approach to achieve its objectives:

- Behavioural studies, electronic tags (pop-up archival and acoustic tags) on sharks, juvenile swordfish and tuna.
- Biological studies, trophodynamism, growth of sharks.
- Socio-economical studies, economic efficiency indicators.

FOCUS: Results to reduce the shark mortality

- Two independent methods have shown the extent of the issue of entanglement of sharks in nets of FADs in the Indian Ocean ==> future design of FADs should not have any netting
- Guide of good practices to reduce the mortality of sharks and rays

III. DATA MANAGEMENT FOR PELAGIC FISHERIES (FROM 1984)

During the 1980s and 1990s, IRD and SFA scientists have developed different fisheries monitoring systems in Seychelles. Since 2000, IRD and SFA have collaborated to develop a shared information system focused on large pelagic monitoring.

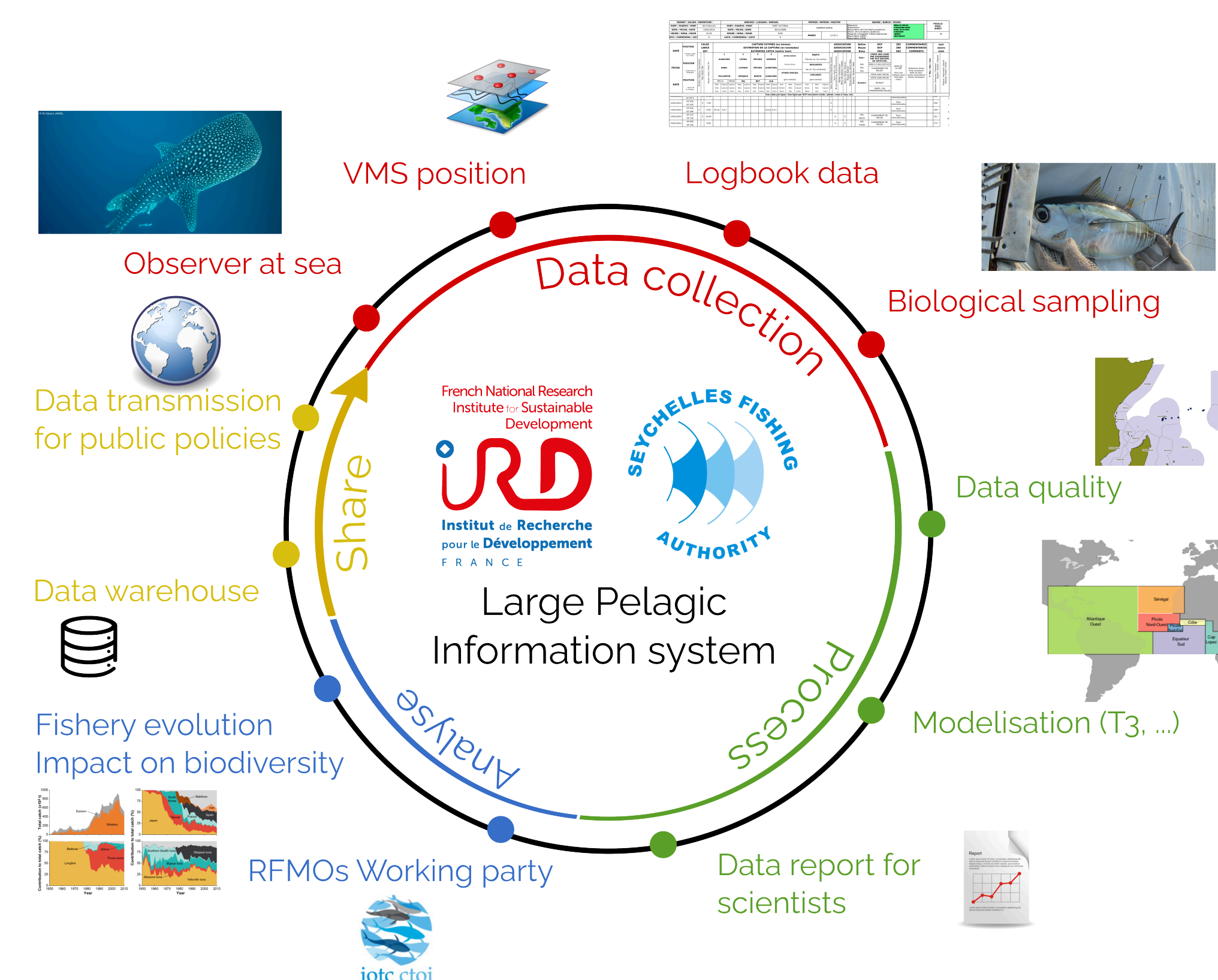


Figure 1: Example of collected data and associated data flow

IV. BIOLOGY STUDIES

IRD and SFA have conducted many studies to better understand the biology and the food web of the pelagic species, like in 2014 with the EMOTION project on tuna reproductive cycle.

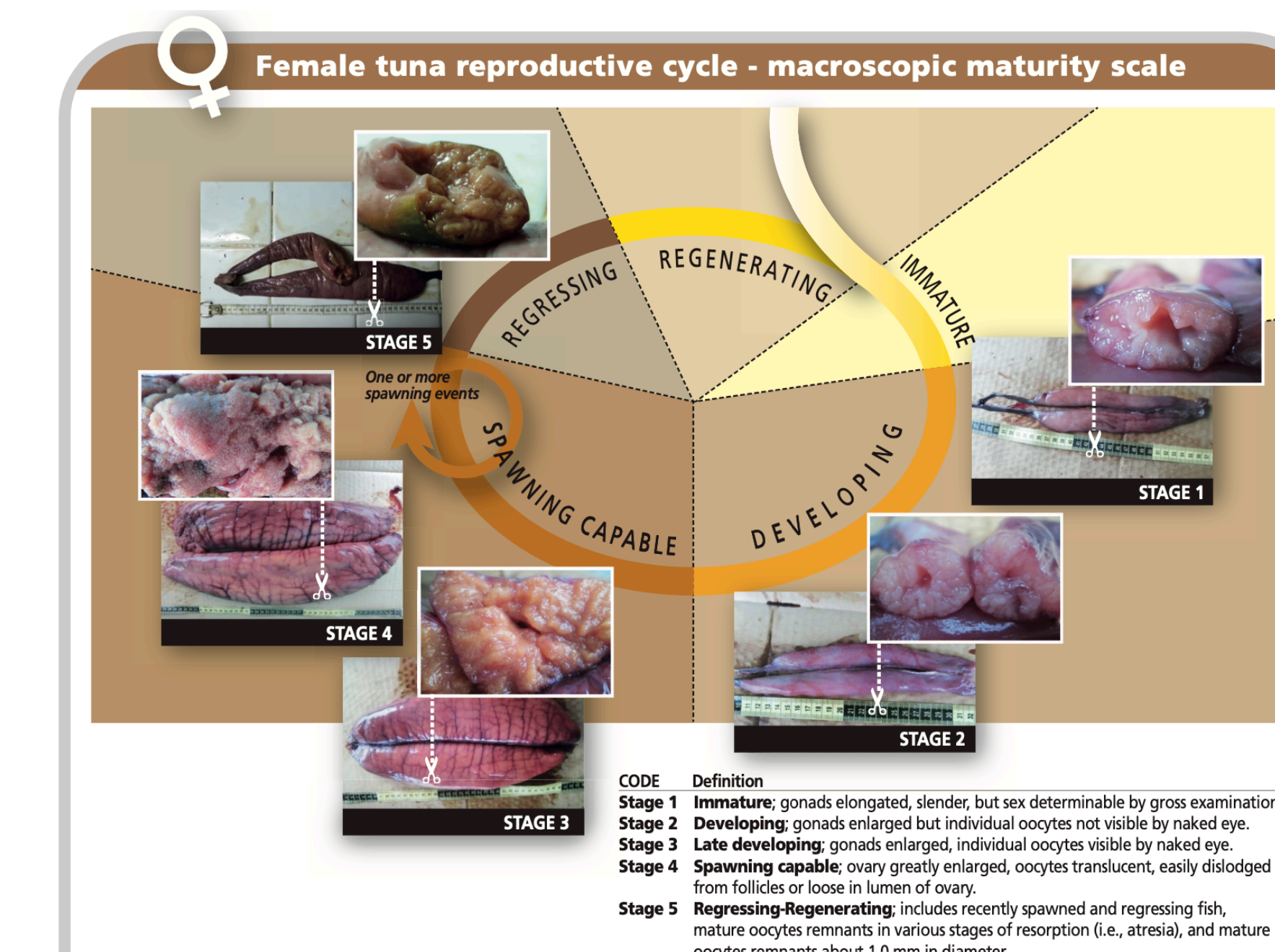


Figure 2: Female tuna reproductive protocols

V. ECONOMIC STUDIES

The blue economy and the vulnerability of small island states

Small Island Developing States (SIDS) face unique social, economic and environmental challenges. They derive most of their wealth from tourism and fishing, making them vulnerable to external shocks such as a pandemic, an extreme climatic event or new international fisheries management regulations. This is why IRD, in partnership with several Seychellois institutions, has been developing macroeconomic models with an environmental extension for the last 15 years, enabling to analyse the local consequences of these shocks, as well as to assess the ecological footprint associated with activities, or to measure the effects of a public policy aimed at protecting the country's natural resources.



- Economic value assessment of Seychelles tuna fisheries regarding a Marine Protected Areas (MPA)
- How fisheries can support a small island economy in pandemic times
- Baseline socio-economic study of semi-industrial longline vessels
- Macroeconomic impact of an international fishery regulation on a small island country
- First IO-based assessment of the carbon and plastic footprints of Seychelles

40 years of collaborative projects for sustainable fisheries and a better understanding of its impact

18 co-publications between 2020 and 2024