

## Intern Summary

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**Duration of internship/Thesis Research with MDPI:**

**Internship/Thesis Research title:** TURFs have the potential to solve user conflicts that do arise from overlaps between artisanal and commercial fishing gears but may not achieve sustainable yield goals.

### **Introduction:**

In 2009 ANOVA initiated the Fishing & Living™ initiative: a Fisheries Improvement Program for the Handline Yellowfin fishery in Indonesia. The primary goals of this program are to reach Marine Stewardship Council (MSC) certification and improved living and working conditions within fishing communities. To that end, Fishing & Living™ is involved in various aspects of the fishery: improving fisheries data collection, building strong relationships with the government, NGO's and seafood industry to build capacity and generate opportunities to improve fisheries management, community development projects, and research activities to improve our knowledge on social and economic aspects of artisanal fisheries. Tuna fisheries, in a developing country like Indonesia, are fascinating because they are not just about ecological aspects but also about important social and economic values.

During my thesis, I investigated the opportunities and constraints for implementing a right-based form of management: Territorial User Rights for Fisheries (TURFs). TURFs consist in allocating an exclusive fishing right to fishermen or communities within a certain territory. The handline tuna fishery I investigated operates around anchored Fish Aggregating Devices (FADs) that are often owned privately, either by fishermen or a FAD owner. Therefore, when a FAD is set, fishermen implicitly claim (exclusive) fishing rights around it. This behaviour is very close to a system of TURFs. However, TURFs have mostly been implemented for fisheries that exploit sedentary species, such as molluscs, and in spatially defined ecosystems, such as coral reefs. In these cases, TURFs function well as the rights-owner exploits a resource that stays within an area and whose quantities depend (almost) directly on his level of exploitation: almost like a garden! In the case of tuna, this relationship between the TURF territory, the area around the FAD, and the resource area of yellowfin tuna that migrates across the Coral

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Triangle and beyond is very loose! As a consequence, tuna fishermen may not develop incentives to fish more sustainably as would a coral reef fisherman fishing on giant clams. Tuna is being fished by many people and many different types of fishing gears all over the Coral Triangle: the action of one affects the catch of the others. So, TURFs may not achieve sustainable yield goals unless they are implemented for all fishermen in Indonesia or when combined with catch limits. Nevertheless, TURFs have the potential to solve user conflicts that do arise from overlaps between artisanal and commercial fishing gears.

### Methods:

To investigate the feasibility of TURFs locally, I assessed how the handline fishermen are organized, and their experiences at sea as well as encounters with other gears. I wanted to understand the spatial organization of the FAD-based handline tuna fishery and identify whether a good basis exists to establish territorial user rights from a social and economic point of view. After a literature review on existing forms of local management, I interviewed fishermen and suppliers, as part of a case study in Lombok.

### Results

During my research, I became aware that artisanal fishermen, who are often forgotten by management authorities, still lack a voice to influence the management of their fishery. Therefore, the first step towards improving the management of the handline yellowfin fishery is to gain more knowledge and understanding on the human and ecological dynamics as well as include fishermen in decision-making processes.

### Follow-up steps for MDPI:

- Continue and expand the port sampling activity initiated in Labuhan Lombok
- Establish co-management initiatives to include the fishermen in the provincial decision-making process
- Investigate the potential use of vessel monitoring devices to better understand the spatial distribution and activity of the fishery