

2014). An example of the latter is in Greenland, where the implementation of a Securing Sustainable Small-scale Fisheries (SFF) Guidelines increased the bargaining power of small-scale fishers and large scale buyers (Jentoft et al., 2017). Furthermore, many governments consider eco-labelling certification schemes as a helpful additional tool for fisheries management (Gulbrandsen, 2014).

Problems with traceability schemes

Traceability can be defined as being able to track a product through every stage of the overall production and handling process from fishing ground to plate (Popper, 2007). The traceability scheme of tuna pole-and-line in this study consists of two types: manual and electronic schemes. These findings are consistent with a study undertaken by (Leal et al., 2015) which reported that tuna traceability may consist of manually or electronic recordings. In Larantuka, the tuna processing companies use manual and electronic schemes to track their tuna products as part of their product traceability. Other studies found that in Bitung, Indonesia, a manual traceability scheme has been adopted by tuna processing companies (Parenreng et al., 2016). Three lesson can be learned from these traceability schemes. The first lesson is that the active involvement of all stakeholders including fishers, processing companies government retailers and end-consumers, is crucial to their success (Bush et al., 2017). The basis of the traceability process was food safety (Leal et al., 2015).

CONCLUSIONS

In Larantuka, tuna supply lines from both the processing and frozen companies showed that the traceability system was applied in their marketing strategy for both export and national markets. The pole-and-line fishers have a limited choice between sending their fish directly to the local market or selling it to the tuna processing companies. The marketing system for small-scale pole-and-line tuna fisheries in Larantuka, Indonesia controlled by middlemen and processors, who provide financial and other operational help to fishers to enable them to continue fishing, in return for which fishers are required to deliver their fish at prices set by the middlemen and/or processors.

References

- [1] Adhuri, D. S., Rachmawati, L., Sofyanto, H. & Hamilton-Hart, N. 2016. Green Market For Small People: Markets And Opportunities For Upgrading In Small-Scale Fisheries In Indonesia. *Marine Policy*, 63, 198-205.
- [2] Adolf, S., Bush, S. R. & Vellema, S. 2016. Reinserting State Agency In Global Value Chains: The Case Of Msc Certified Skipjack Tuna. *Fisheries Research*, 182, 79-87.
- [3] Alimina, N., Wiryawan, B., Monintja, D. R. O., Nurani, T. W. & Taurusman, A. A. 2015. Comparing Different Small-Scale Tuna Fishery Suppliers: A Case Study On Trolling Line And Pole And Line In Southeast Sulawesi, Indonesia. *Aacl Bioflux*, Vol.8(4), Pp.500-506.
- [4] Boyd, E. & Folke, C. 2012. *Adapting Institutions : Governance, Complexity, And Social–Ecological Resilience*, New York, Cambridge University Press.
- [5] Bush, S. R., Bailey, M., Van Zwieten, P., Kochen, M., Wiryawan, B., Doddema, A. & Mangunsong, S. C. 2017. Private Provision Of Public Information In Tuna Fisheries. *Marine Policy*, 77, 130-135.
- [6] Chandler, D. 2014. *Resilience: The Governance Of Complexity*, London, Routledge.
- [7] Chandler, D. & Reid, J. 2016. *The Neo-Liberal Subject: Resilience Adaptation And Vulnerability*, London, Rowman & Littlefield International.
- [8] De Graaf, G. J., Nuno, F., Ofori Danson, P., Wiafe, G., Lamptey, E. & Bannerman, P. 2015. International Training Course In Fisheries Statistics And Data Collection. *Fao Fisheries And Aquaculture Circular No. 1091*. Rome: Food And Agriculture Organization (Fao).
- [9] Duggan, D. E. & Kochen, M. 2016. Small In Scale But Big In Potential: Opportunities And Challenges For Fisheries Certification Of Indonesian Small-Scale Tuna Fisheries. *Marine Policy*, 67, 30-39.
- [10] FAO. 2016. *The State Of World Fisheries And Aquaculture 2016: Contributing To Food Security And Nutrition For All*, Rome, Food And Agriculture Organization.
- [11] FAO. 2017. *Globe Fish Highlights 2017: A Quarterly Update On World Seafood Markets*, Rome, Food And Agricultural Organization.
- [12] Fernández-Polanco, J. 2016. An Overview Of The Global Tuna Market. Rome: Food And Agriculture Organization.
- [13] Gulbrandsen, L. H. 2014. Dynamic Governance Interactions: Evolutionary Effects Of State Responses To Non-State Certification Programs. *Regulation & Governance*, 8, 74-92.
- [14] Hadjimichael, M. & Hegland, T. J. 2016. Really Sustainable? Inherent Risks Of Eco-Labeling In Fisheries. *Fisheries Research*, 174, 129-135.
- [15] Hamilton, A., Lewis, A., McCoy, M. A., Havice, E. & Campling, L. 2011. Market And Industry Dynamics In The Global Tuna Supply Chain. In: Foundation, T. O. F. C. (Ed.). Japan: The Overseas Fisheries Cooperation Foundation, Government Of Japan.
- [16] Huang, H. & Leung, P. 2011. Testing For Market Linkages Between Hawaii And Japan's Tuna Markets. *Fisheries Research*, 109, 351-359.
- [17] Jentoft, S., Chuenpagdee, R., Barragen-Paladines, M. J. & Franz, N. 2017. The Small-Scale Fisheries Guidelines: Global Implementation. In: Jentoft, S. (Ed.). Switzerland: Springer.
- [18] Leal, M. C., Pimentel, T., Ricardo, F., Rosa, R. & Calado, R. 2015. Seafood Traceability: Current Needs, Available Tools, And Biotechnological Challenges For Origin Certification. *Trends In Biotechnology*, 33, 331-336.
- [19] Longo, C., Anderson, L. & Erikson, L. 2017. *Global Impacts Report 2017*. London: Marine Stewardship Council
- [20] Parenreng, S. M., Pujawan, N., Karningsih, P. D. & Engelseth, P. 2016. Mitigating Risk In The Tuna Supply Through Traceability System Development. *International Food And Agribusiness Management Review*, 19, 24.
- [21] Popper, D. E. 2007. Traceability: Tracking And Privacy In The Food System. *Geographical Review*, 97, 365-388.
- [22] Stemle, A., Uchida, H. & Roheim, C. A. 2016. Have Dockside Prices Improved After Msc Certification? Analysis Of Multiple Fisheries. *Fisheries Research*, 182, 116-123.
- [23] Stratoudakis, Y., Mcconney, P., Duncan, J., Ghofar, A., Gitonga, N., Mohamed, K. S., Samoily, M., Symington, K. & Bourillon, L. 2016. Fisheries Certification In The Developing World: Locks And Keys Or Square Pegs In Round Holes? *Fisheries Research*, 182, 39-49.
- [24] Suhana, Kusumastanto, T., Adrianto, L. & Fahrudin, A. 2016. Tuna Industries Competitiveness In International Market: Case Of Indonesia. *Aacl Bioflux*, 9, 9.
- [25] Sunoko, R. & Huang, H.-W. 2014. Indonesia Tuna Fisheries Development And Future Strategy. *Marine Policy*, 43, 174-183.
- [26] Watson, R. A., Nichols, R., Lam, V. W. Y. & Sumaila, U. R. 2017. Global Seafood Trade Flows And Developing Economies: Insights From Linking Trade And Production. *Marine Policy*, 82, 41-49.
- [27] White, C. 2017. Indonesian Tuna Fishery Enters Marine Stewardship Council Assessment. Available: <https://www.seafoodsource.com/news/environment-sustainability/indonesian-tuna-fishery-enters-marine-stewardship-council-assessment>.
- [28] Yongil, J., Reid, C. & Squires, D. 2008. Is There A Global Market For Tuna? Policy Implications For Tropical Tuna Fisheries. *Ocean Development & International Law*, 39, 32-50.
- [29] Vinay, A., Ramasubramanian, V., Krishnan, M., Kumar, N.R. and Ayoob, A.E., 2017. Economic analysis of tuna pole and line fisheries in Lakshadweep. *Indian Journal of Geo Marine Sciences*. 46 (05):947-957
- [30] Widodo, A.A., Wudianto, W. and Satria, F., 2016. Current Status Of The Pole-And-Line Fishery In Eastern Part Of Indonesia. *Indonesian Fisheries Research Journal*, 22(1):43-52.
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