

A Drop of Water for the Thirsty Ground: Implementing Drip-Irrigation System as an Alternative to the Existing System to Promote Sustainable Livelihoods in the Archipelagic Dryland East Nusa Tenggara, Indonesia

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Abstract : East Nusa Tenggara, together with part of East Java, West Nusa Tenggara, and Maluku, has been included as part of global drylands defined according to the ratio of annual precipitation (P) and annual potential evaporation (PET) and major vegetation types of grassland and savannah ecosystems. These tropical drylands are unique because, whereas drylands in other countries are mostly continental, here they are archipelagic. These archipelagic drylands are also unique in terms of being included because of more on their major vegetation types than of their P/PET ratio. Slash-and-burn cultivation and free roaming animal husbandry are two major livelihoods being widely practiced, along with alternative seasonal livelihood such as traditional fishing. Such livelihoods are vulnerable in various respects, especially because of drought, which becomes more unpredictable in the face of climate changes. To cope with such vulnerability, semi-intensive farming using drip irrigation is implemented as an appropriate technology with the goal of promoting a more sustainable alternative to the existing livelihoods. The implementation was started in 2016 with a pilot system at the university field laboratory in Kupang in which various designs of installation were tested. The modified system consisting of an uplifted water reservoir and solar-powered pump was tested in Papela, the District of Rote-Ndao, in 2017 to convince fishermen who had been involved in illegal fishing in Australia-Indonesia transboundary waters, to adopt small-scale farming as a more sustainable alternative to their existing livelihoods. The system was again tested in a larger coverage in Oesena, the District of Kupang, in 2018 to convince slash-and-burn cultivators to adopt an environmentally friendlier cultivation system. From the implementation of the modified system in both sites, the participating fishermen in Papela were able to manage the system under tight water supply to grow chili pepper, tomatoes, and watermelon and the slash-and-burn cultivators in Oesena to grow chili pepper in a more efficient water use than water use in a conventional irrigation system. The gross margin obtained from growing chili pepper, tomatoes, and watermelon in Papela and from growing chili pepper in Oesena showed that small-scale farming using drip irrigation system was a promising alternative to local people in generating cash income to support their livelihoods. However, before promoting this appropriate technology as a more sustainable alternative to the existing livelihoods elsewhere in the region, better understanding on social-related contexts of the implementation is needed.

Keywords : archipelagic drylands, drip irrigation system, East Nusa Tenggara, sustainable livelihoods

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