

The roads to economic development in small scale fisheries in Ende, Flores, Indonesia: Institutional and socio-cultural shortcomings in implementing sustainable strategies.

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In 2009, Budy Resosudarmo and Frank Jotzo wrote about the challenges of fighting poverty in the Nusa Tenggara Timur through sustainable policies. Environmental pressures and degradation present significant limitations to socio-economic development, vulnerability and adaptation measures. Even when new mentalities in terms of sustainability and community based resource management guide many of these goals and efforts, at the local scale implementations result in the failure or partial completion of objectives. In this article, I discuss the institutional and socio-cultural contexts that explain policies to incentivize marine resource use and extraction among small scale fisheries in Ende, Flores, Indonesia. I also discuss the plans that are being developed by NGOs and by the provincial government to introduce alternative livelihood programs. The Ende regency has experienced irregular intensification of its fishing effort over the last twenty years resulting in the entrenchment of inequality and wealth distribution in coastal villages. It has also become, next to socio-economic and environmental uncertainty, a pressure that has paradoxically prevented the eradication of non sustainable fishing techniques like dynamite and cyanide fishing. Through

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ethnographic (participant observation, interviews) and ecological tools, I analyze how decentralization, isolation and corruption impede real co-participatory mechanisms from being developed at the local level. The lack of political agency, external mining pressures and the absence of economic opportunities converge in migration and further pauperization. I conclude by underscoring the importance of a political ecology approach to the study of conservation policies and climate change adaptation measures.

Keywords: alternative livelihoods, conservation, development, fisheries



The roads to economic development in small scale fisheries in Ende, Flores, Indonesia: Institutional and socio-cultural shortcomings in implementing sustainable strategies.

In 2009, Budy Resosudarmo and Frank Jotzo wrote about the challenges of fighting poverty in the Nusa Tenggara Timur (NTT) through sustainable policies. This province is characterized by high levels of endemic poverty, with regencies like Ende having in 2011 a GDP (Gross Domestic Product) of 2,970, 200 million rupiahs a year (BPS NTT 2011). In addition, NTT is often described as a set of “specialized [environments], with a higher proportion of endemic species in an overall depauperate community” (Monk et al., 1997; Auffenberg, 1980:45). Ecological conditions result in poor natural resources for farming and cash crop livelihoods (Tomascik et al., 1997; Monk et al., 1997).

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Agricultural potential is limited by low precipitation indexes and increasingly frequent droughts (Metzner, 1987).

INSERT FIGURE 1 HERE

The Sawu fishing grounds, on the other hand, are known for their wealth of marine species, especially tunas (*Scombridae* Family), marlins (*Istiriophoridae* Family) and cetaceans (Weber, 1902). However, the lack of sustainable management policies until recent decades have created highly degraded ecosystems with damaging fishing practices like dynamite and cyanide use still present. Ende has only 15% of indigenous forest left, nearby coral reefs are considered in poor state (Munasik et al, 2011), and fisheries are possibly overexploited (Ramenzoni, forthcoming).

Environmental pressures and degradation present significant limitations to socio-economic development, vulnerability and adaptation measures. At the same time, transnational processes of modernization and market integration increase the pressure on local regencies to secure viable and sometimes non-ecologically sound programs of resource exploitation. Even when new mentalities in terms of sustainability and community based resource management are becoming more prevalent at middle to upper policy design practitioners (Williams and Staples, 2010), at the local scale implementations result in the failure or partial completion of objectives (Ostrom, 2009).

Zonification processes or Marine Protected Areas, like the one, in Lamalera, Lembata were introduced in 2008 with the support and advice of WWF (World Wildlife Fund) and TNC (The Nature Conservancy). The goal was to control the hunting of cetaceans, a traditional practice of that community, and to shift livelihoods towards ecotourism. However, simultaneous plans were proposed by private Chinese enterprises to relocate the town to allow for mining companies to look for gold. This created an acrid conflict between locals, conservationists and external actors that concluded with the expulsion of WWF personnel from the area (Kompas 05/29/2010). The following year the Taman Nasional Laut Savu was declared, and multiple MPAs were created. Lembata was not included, even though it constitutes a critical route for the migration of cetaceans, and thus has critical importance for biodiversity conservation (TNC, personal

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communication). The outcome might have been different if local people had been engaged since the beginning. This speaks to the misconceptions inherent in conservation, government and NGOs initiatives on what should constitute the livelihoods of local people.

In this article, I discuss the institutional and socio-cultural contexts that explain policies to incentivize marine resource use and extraction among small scale fisheries in Ende, Flores, Indonesia. I also discuss the plans that are being developed by NGOs and by the provincial government to introduce alternative livelihood programs. Ende regency has experienced irregular intensification of its fishing effort over the last twenty years resulting in the entrenchment of inequality and wealth distribution in coastal villages. Mechanization of fishing fleets also become, next to socio-economic and environmental uncertainty, a pressure that has paradoxically prevented the eradication of non sustainable fishing techniques like dynamite and cyanide fishing (Lowe, 2006).

Through ethnographic (participant observation, interviews) and ecological tools, I analyze how decentralization, isolation and corruption impede real co-participatory mechanisms from being developed at the local level. The lack of political agency, external mining pressures and the absence of economic opportunities converge in migration and further pauperization. I conclude by underscoring the importance of a political ecology approach (Peluso, 1992; Brosius et al., 2005) to the study of conservation policies and climate change adaptation measures.

Methods

The data in this article was collected over multiple field seasons and with the guidance and help of Dr. Pujo Semedi. From November 2010 until January 2011 I collected primary archival information in Ende and Jakarta, and visited the Nature Conservancy Offices in Denpasar, Bali. From June 2011 until December 2012 I resided in Ende and Pulau Ende where I carried out ethnographic, ecological and archival research along my field assistants, Shakti Adhima Putra and Julica Gravita Sari. In addition, during a short break in July and August 2012, I visited the Royal Tropical Institute (Koninklijk Instituut voor de Tropen) in Amsterdam and the Catholic Archives

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at Radboud University in Nijmegen, The Netherlands. I also consulted the Ludwig Maximilian Universitat in Munich, Germany, the Perpustakaan Umum at the University of Gadjah Mada and the Perpustakaan Kolese Ignatius, Yogyakarta, The Candraditya Seminar Library and the Ledalero Seminar Archive both in Maumere, Flores, Indonesia. I carried out interviews with conservation practitioners and local government staff in Ende and in Kupang, Timor, Indonesia.

To explore perceptions and decisions about the environment, policy and subsidies, resource use, damaging fishing practices, uncertainty and climate change, I conducted ethnographic research, using semi-structured interviews and participant observation. I interviewed about 120 fishermen, and had repeated conversations with NGO and government and police officials. I also participated in meetings with fishermen and different organizations to socialize coral conservation and garbage disposal initiatives, and I attended an official workshop on the implementation of conservation, risk reduction and disaster management policies. Moreover, I carried out a visual coastal monitoring survey that included the assessment of perceptions of climate change, changes in fish species, drastic events, adaptability, and damaging fishing practices among other things. The sample size for the survey was 85 fishermen in the southern coasts of Ende Regency. Data analyses included a combination of qualitative and quantitative techniques (bivariate statistics, theme coding) with the software packages JMP Pro 10, Gnumeric 1.10.16 and MaxQDA 11.

Ende and the southern coasts of Flores

Ende city, the capital of the Ende Regency, is inhabited by 15,062 people (BPS Ende, 2011). Along the coast, villages and smaller cities stretch for about 30 km until reaching the regency limit a few kilometers off Nangapanda. Across the bay from the Ende is Pulau Ende, a fishing center that includes seven villages with a total of 7754 people. In total, the area which is covered by this study encompasses a population of about 100,000 inhabitants.

Coastal Endenese have a complex origin emerging from the combination of local groups ('*Ata Lio*'), with Javanese and Chinese traders, Bimanese warriors, Sumbanese

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slaves, and migrant Bugis, Butonese and Makassarese fishermen (Tule, 2004; Nakagawa, 1984, 1996; Sareng Orin Bao, 1969; Dietrich, 1983; Knaap and Sutherland, 2004; Needham, 1968, 1980). Islam spread in the area in the 16th century. As a consequence, Buginese cultural traits consolidated with local practices and Islamic culture weaving an intricate set of traditions (Edjid, 1979; Van Suchtelen, 1921; Roos, 1877; Banda, 2005).

In comparison to other parts of Indonesia like Kalimantan or Java, development programs have progressed at a slower rate in Flores (Resosudarmo and Jotzo, 2009). In Ende, fishing is still carried out by traditional boats (*sampans*) or smaller motorboats with 4.5 to 1 inch gillnets. Activities are for subsistence, supporting small-scale trade. There are no fishing industries operating in the district or any external/private investment subsidies to develop fishing capacity.

The impact of low salaries –among 128,000 to 372,000 rupiahs per week depending on the season—and general socioeconomic uncertainty has an important correlate in terms of health and morbidity. Malnutrition has been reported as 6.23 % (NTT Ende, 2011), with a 52% prevalence of stunting for children under the age of 6 years (Reinhard, 1997). Adult underweight among fishing households is around 12% (Ramenzoni, 2013).

In addition, availability/access to resources is difficult. This increases the local perceptions of vulnerability and uncertainty. Electricity is only available at night and is highly unreliable. There is no running water, and in some areas the proportions of freshwater wells to people is about 3 or 4 wells to 8000 people. Access to health facilities like village clinics is slightly better, though consultation is infrequent.

Results: Diminishing landings and non-sustainable practices

Researchers estimate that Indian, Eastern, and Western Pacific waters of South East Asia are being overfished and/or intensely harvested (UNEP, 2008). Organizations such as WWF (World Wildlife Fund) or The Nature Conservancy (TNC) have reported decreases in tuna catches of one third in the last ten years in the seas surrounding Flores (Ingles, 2008). Tunas have also been heavily fished as boats and location devices have

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facilitated their access (Mc Ilgorm et al., 2010; Ellis, 2009; Helfman, 2007). Similar decreases in overall productivity are expected to occur with increases in sea surface temperature over the next hundred years (Cheung et al., 2009; UNEP, 2008). Climate change is expected to drive tropical and subtropical species' ranges toward the poles and temperate areas, critically impacting the composition of local ecosystems and creating unpredictable consequences in biological interactions between marine and freshwater communities (Badjeck et al., 2009; Perry et al., 2003, 2005).

Over the last twenty five years, Ende has suffered the intensification of fishing activities driven by eclectic state or provincial level aid programs. For example, in 1986 the number of fishing boats was 196 *jukungs*, 613 *papans*, and 72 motorboats. By 2009 these numbers had increased many fold. According to BPS Ende (2012), there are now 343 *jukungs*, 1078 *papans*, 268 *tempels* and 927 motorboats of which 158 are big purse seiners (*pukat lempara*). The catch per unit of effort has been decreasing steadily (see Figure 2). Oscillations in the composition of the yields since late 1980s point to a substitution of bigger pelagic to smaller pelagic catches and modifications in the trophic levels of some species.

INSERT FIGURE 2.

The uncertainty in catches creates additional stressors that fishermen feel inadequate to deal with. Many have resorted to migration, as employment in other sectors of the industry is unavailable in Ende. During my interviews, fishermen usually complained about the speed of intensification and the unpredictability of weather conditions that would affect the catch. According to most fishermen, it is widespread knowledge that fishing patches are selected on the basis of an annual calendar regulated by the monsoon seasons and moon phases that help predict the presence and abundance of certain species. But as a consequence of increased climatic alterations, the onset of the dry and wet monsoon seasons has changed and no predictability is possible on species timing.

Most significantly, my interviews with former bomb users and fishermen revealed that prevailing uncertainties have made the use of damaging practices an alternative solution. Positions regarding bomb use were complex and contradictory. And in some

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cases reflected different perceptions of how resources should be used. On the one hand, Endenese fishermen are well known for exploiting far off fishing grounds, and especially for their use of bombs (TNC personal communication). They do not necessarily follow any rationale in terms of limiting access to their own fishing grounds consistently and they always search for spots where permits are not required or regulations not enforced. Many have been in jail for fishing without proper licenses or in protected areas like the Komodo National Park.

On the other hand, interviews showed that this seems to be changing as younger generations become aware of conservation initiatives, degradation and the benefits of managing a sustainable fishery. For this reason, many fishermen complained about how coral blasting and potassium use were creating unsustainable conditions for the future. In the surveys, almost all of the interviewees indicated that they experienced a reduction in the size of the catch over the last thirty years and directly blamed damaging fishing practices and illegal fishing as the cause.

Despite widespread agreement on the damaging effects of bombing, the anger expressed in these narratives often belied the continued benefits that many received from bombs or cyanide, either through their direct use or through a piece of the catch. Or censorship was short lived due to the existence of what were considered valid excuses for using bombs and cyanide to obtain money quickly. The issues discussed among fishermen were of a different kind from those formulated in NGOs or government offices. Whereas in institutional contexts there is a prevailing concern on adaptation to climate change and on imposing restrictions to overfishing, among fishing households we commonly heard complaints about increasing prices, increasing school fees and the impossibility of finding other employment.

People were disappointed by long-standing institutional promises to provide more powerful engines, nets and contracts with processing plants to develop the fishery. “Sudah lama kejanjian ini dan belum jadi” (It has been long promised but it has not happened yet). Market pressures were also creating more demand for high value fish items like groupers (*Serranidae* family), snappers (*Lutjanidae* family) and wrasses

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(*Labridae* family) and big tunas (*Thunnus albacares* and *Thunnus obesus*) that were directly exported to Bali and then Singapur and Hong-Kong through aircrafts. With lower catches as a result of more fishing pressure, climatic change, and illegal foreign fleets, with highly uncertain returns after substantial investments in fuel and energy, and debts, it was understandable that, on occasion, the blasting of corals could be employed as a political mechanism.

The lack of a state, policy and decentralization

How can we explain this institutional disconnection among uncertainties, policies and local realities? I think one possible way to answer this question lies in analyzing how the Endenese regency has dealt with regulating and developing marine resources. To do so, I will briefly discuss the history of policy development in Indonesia and the changes introduced through decentralization.

Despite being one of the largest producers of marine products, Indonesia has only recently (in the last 15 years) begun to address the problem of developing their fish based industries (Chouzin, 2008). Before the movement towards democratic government in 1998, the country was under the influence of neoliberal policies from the New Order at the hands of Suharto (Vatikiotis, 1998). Those policies put considerable emphasis in the agricultural sector in detriment to other local economies. For this reason, it should not be surprising that the Ministry of Marine Affairs and Fisheries was created only in 1999 (Chouzin, 2008). The lack of attention in fisheries before this time might have had a critical impact on the development of sustainable policies and the continuity of damaging fishing practices.

Comprehensive historical analysis of marine fisheries in Southeast Asia have discussed the different assumptions in which exploitation and intensification of fishing effort were justified among these countries (Butcher, 2004, 2005; Semedi, 2001; Fox, 2005). The idea that the seas were limitless in their potential¹ brought many demersal,

1 As Allison and Ellis clearly point out (2001:377) there is an underlying tenet in marine fishery policies that states that fishing capacity actually reflects the productive capacity of the resource. Improving productivity by modernizing and developing fisheries, thus, can only lead to the achievement of bigger yields. However intuitive this

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reef and benthic species to extinction (Boomgard, 2005; Lowe, 2006; Semedi, 2001). Indonesia was no exception to this. The decades that follow World War II saw an intensification of the pressure in the Southeast Asian seas. Such initiative has been characterized as the “great fish race” (Butcher, 2005; Henley and Osseweijer, 2005). This is when destructive methods, like dynamite fishing, became popular. The following decades saw a reduction of fish biodiversity in the Gulf of Thailand up to 90% and in the Javanese coasts (Semedi, 2001).

Regulation progressed early up until the 1980s when trawling was declared illegal in the Indonesian seas (with exception of the Arafura and Banda seas). By this time, the depletion of fisheries and the impacts of unregulated harvesting were critical. As a consequence of the trawling ban, large fishing fleets commenced a migration of their fishing effort to eastern areas of the archipelago where control and regulation were not as efficient as in more populated areas (Monk et al., 1997; Boomgard, 2005). This eastward movement continues until the present, where some areas like the Banda Seas have been characterized as “clouded by the illegal operations” of mainly by Taiwanese, Philippine, Korean, and Japanese trawling boats (Fox, 2005).

Taking into account this story of an absent state in terms of producing effective marine regulations, many of the limitations in achieving efficient and sustainable governability of the open-access fisheries can be contextualized. 1999 is not only the year in which the most important organism of marine regulation comes into existence, but also when new regulations are approved in term of autonomy and jurisdiction (*Undang-undang Otonomi Daerah No. 22, 25 /1999, and No. 32/2004*). Through these new legislative acts, the development and control of fisheries was transferred from the central to the local government.

perspective seems, it has been proved far from the empirical reality (McIlgorm et al., 2010). Not only do fish stocks oscillate in response to complex environmental variables that are only partially understood, but also increased fishing fleets has led to smaller yields as particular fish populations—i.e.: cod (Kurlanski, 1997) and tunas (Ellis, 2009)-approach extermination.

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The integration of smaller authorities and communities to policy design and implementation, was one of the goals of the decentralization process enacted by the *Undang Undang 22/ 1999*, the Local Autonomy Law (Hill, 1998; Satria and Matsuda, 2004). Decentralization was supposed to transfer the control and management of resources to the local administration. Provinces would have a 12 mile zone of control beyond their shores, and district or local governments would have authority for the first 4 miles. At the community level, the UU 22/1999 meant that the system of resource management (governance) would depend on their own regulations, the *adat* or the *sasi*, and on district regulations. This would lower the costs of a centralized administration and reinforce traditional laws that were undermined in the legislation of the previous periods. Most importantly, it stated that district or local governments were in charge of exploration, exploitation, conservation, management, and law enforcement of regulations (Satria and Matsuda, 2004:438).

As well intended as they were, the implementation of these new policies not only proved unsuccessful in developing small-scale fisheries in certain regions of NTT, but might have also contributed to the emergence of conflicts and constraints to effective management (Satria and Matsuda, 2004). The lack of resources, infrastructure, and personnel to put these changes into effect is one of the most significant stressors and it can be seen in the weak institutional presence in Ende and in the emergence of confrontations between the local fishermen in terms of fishing gear. In brief, local fishing commissions left to their own in the management of fishing incentives, establishing rules and permits, and controlling the enforcement of laws, had different rates of success depending on the level of corruption and institutional bureaucracy.

Overall, for Ende, the lack of an effective co-management program signifies the loss of opportunities in administering and developing their own fishery and seaweed aquaculture. It keeps the living standards within the community at subsistence levels.

General Discussion and Conclusions

So how can social sciences assist in the design of conservation and development policies that are appropriate to the challenges faced by Eastern Indonesia? A way to start

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is by recognizing the failure of fishery management schemes that treat different individual motivations alike; that look at intentions and agents as purely influenced by selfishness or blind altruism.

Among fishery management biologists, conservation officers, and politicians there has been a common assumption that local fishermen are mainly driven by maximization and intensification in their allocation of fishing effort (Cordell, 1974; Allison and Ellis, 2001; Perry et al., 2003). Rational choice has been the underlying principle explaining resource exploitation and the absence or existence of conservation practices (Gowdy, 2008). This misconception of motivations arises from a lack of studies on fishing behavior. Such studies could inform marine policies about resource use (Bene and Tewfik, 2001; Colfer et al., 1999). Fisheries have also been mischaracterized in their aspect of open-access resource systems; assuming that common property implies that everybody's property is nobody's (Gordon, 1954; McCay, 1981).

Whereas it is highly indisputable that commercial fisheries in South east Asia are creating unnatural pressures on fish stocks of species such as bluefin tuna (*Thunnus thynnus*), groupers, snappers, wrasses, and sharks through non-sustainable fishing practices (i.e.: Ellis, 2009; Bailey et al., 2000; Helfman, 2007; Butcher, 2004), there is no equal certainty of the role of small-scale fisheries in this process. Decision-making about resource use is multifaceted (McGoodwin, 1990; Bene and Tewfik, 2001); and even when fish are harvested without management or controls, there are other factors at work aside from mere economic motivation that explain decisions about sustainability. It is only in relation to a socio-political context that motivations can be explored. Therefore, fishery sciences and policies need to be humanized, that is, address local interests, systems of values, and needs if they are to devise responsible and effective strategies (McGoodwin, 1990).

Research in Common Pool Resources, Open access systems and Governance throughout the world has emphasized the importance of understanding the factors that affect local participation in the regulation of resource use (Ostrom, 2009; Basurto and Ostrom, 2008; Basurto, 2005; Filipe et al., 2008; Wamukota et al., 2011). Many of these

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approaches stress that successful policy-making has to “encourage local governance and assist in the development of resource rights that align individual self-interest with the long-term health of the resource” (Berkes et al., 2006:1558).

My interviews with multiple NGO and government officers have shown that programs in Eastern Indonesia are indeed designed to incorporate all stakeholders in plans and initiatives. Many of these ideas reflect major trends in participatory conservation promoted by government institutions in Java and Bali or transnational NGOs like the Red Cross or the Nature Conservancy. However, new programs that propose zonification in terms of coastal environments, ecotourism, and marine protected areas do not originate at the regional scale or as a result of communal initiatives. As an environmental officer once mentioned “Saya lihat ke Jawa dulu” (I look at Java, the West, first). This creates a series of problems.

First, it presupposes that even when solutions are designed to incorporate local communities, the space of integration is reduced. Local populations participate only in limited ways and through forms of engagement that are predetermined by extra-local actors. Secondly, without ensuring democratic participation emphasizing the need to include all stakeholders, it reifies and essentializes the local context. Mental frameworks of local realities do not change, but acquire a patina of moral relativity that can potentially allow for more exclusion. In the case of damaging fishing practices, it offers the necessary prescriptive narrative of good and bad ways of making a living that make efforts at eradication anachronistic (Lowe, 2006).

Hence, sustainable governance in the case of Ende should assume the form of a real co-participatory regime, where all stakeholders participate in all processes. Co-participation should occur in the 1) recollection of necessary diagnostic information about resources, uncertainties in socio-economic and ecological spheres, livelihoods and alternative investment sources; 2) design of rules that control and define the potential use of resources and fishing grounds; 3) create documentation and materials for community and institutional education; 4) generate a set of solutions to possible threats

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that might affect the fishery; 5) generate a collective perspective of the future of the system and all stakeholders.

To attain this objective it is central that all stakeholders recognize that resources are embedded in networks of socio economic relations that occur at multiple scales (Peluso, 1992; Brosius et al., 2005). Political ecology can be an emancipatory tool in facilitating such institutional awareness of the positionality of power, narratives, and knowledge (Haraway, 1991; Robbins, 2011). For that, cross institutional and academic collaboration is essential.

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Appendix 1.

Figure 1. Map of study area

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ECONOMIC DEVELOPMENT IN SMALL FISHERIES ENDE, FLORES

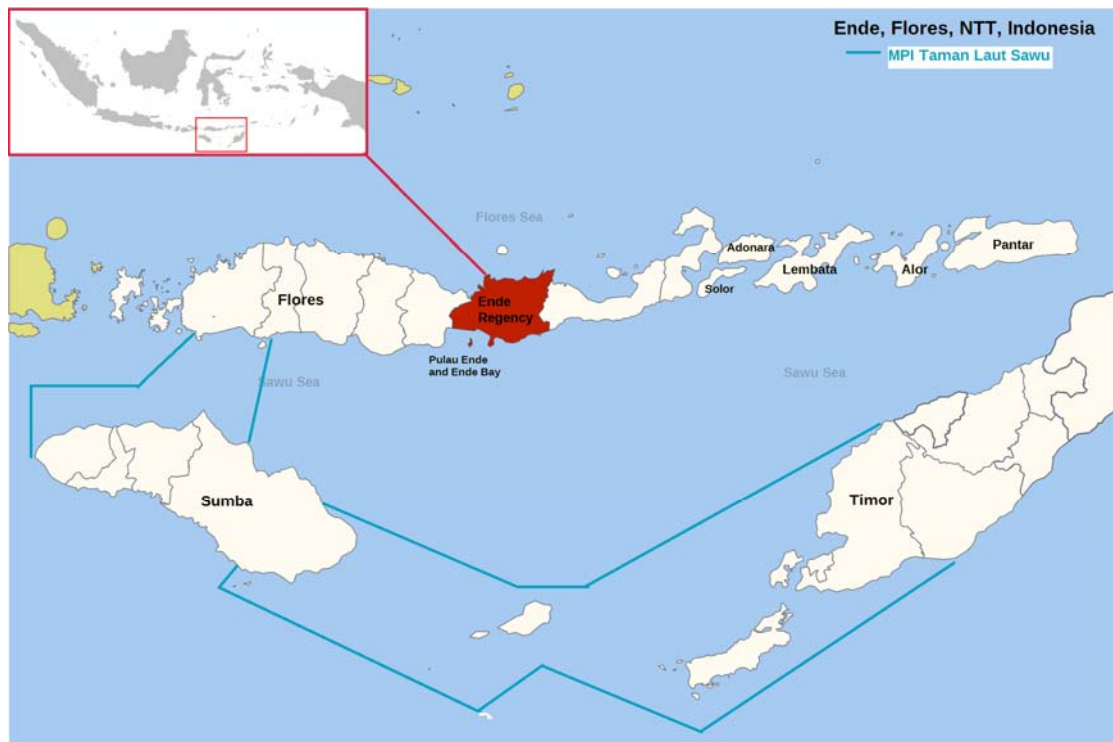
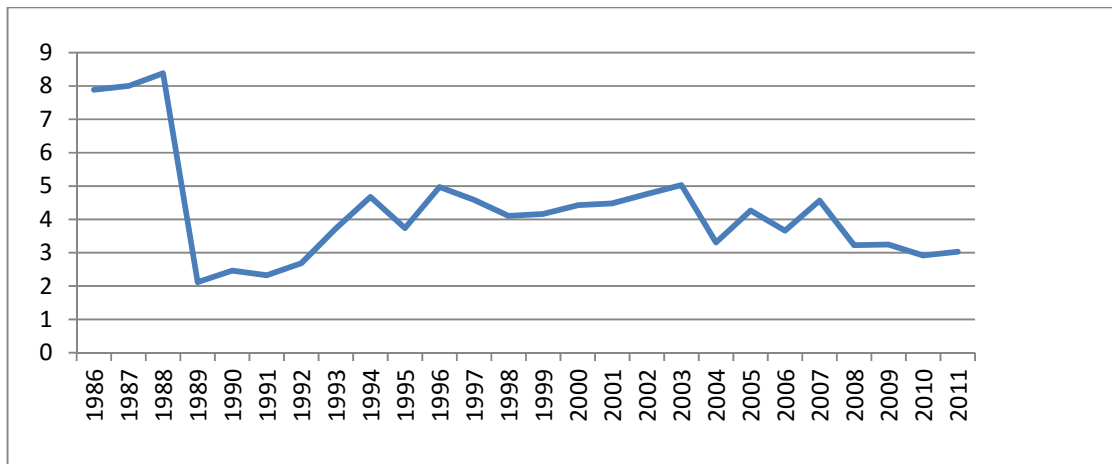
**Appendix 2**

Figure 2. Catch per unit of effort (CPUE) decline and evolution of catch.

Catch per unit of effort (yields per number of boats) evolution (1986-2011).

ECONOMIC DEVELOPMENT IN SMALL FISHERIES ENDE, FLORES



Evolution of catch composition (kg) for the past six years

