

An Economic Return to Education in Small-scale Fisheries in North-East Madagascar

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Keywords: Education, fishing income, pluri-activity, Madagascar

Abstract — The link between fishers' income and educational level was investigated amongst small-scale fishing communities in north-east Madagascar. We found that educational level is low in Malagasy fishing communities and that there is an overall positive and significant relationship between educational level and fisher's income. Marine conservation projects should thus focus on informing and educating fishers to improve their income and reduce threats to marine resources.

INTRODUCTION

Considerable literature has documented the contribution of education to the economy, society and well-being of humans over the years (Psacharopoulos & Patrinos, 2002; Fang, 2006 and Huffman & Orazem, 2007). This contribution is commonly named the 'economic return to education' and can be divided into: the private return (Wirz, 2008); social return (Martins & Jin, 2010); and labour productivity return (Leigh & Ryan, 2008, Kwon, 2011). Most studies on the economic return to education reveal that educational level has a positive linear influence on an individual's income (Handa *et al.*, 2005; Ajakaiye & Kimenyi, 2011; OECD, 2001; Oketch, 2006; Manteaw, 2012), confirming the social return to education.

According to Deininger & Olinto (2001), 'pluri-activity', or livelihood diversity, is of particular importance in rural areas in developing countries and may contribute 45% to the total household income. Furthermore, the contribution of income from sources unrelated to fishing has grown substantially in small-scale fishing communities over the last two decades (Davis *et al.*, 2010).

METHODS

Study areas

We assessed the economic return to education by assessing the income (productivity return) of north-east Madagascan fishing communities at three levels of schooling at the primary

(<5 years education), secondary (5-9 years education) and tertiary level (>9 years education). The different levels of pluri-activity were identified within these three categories of fishers to establish the link between their educational level and livelihood diversification. Fishers (N=200) were interviewed about their education level, fishing activity, annual income, livelihood activities and the number years involved in these occupations.

RESULTS

The results are summarised in Table 1. Of the 200 fishers surveyed, 70% had less than five years of education, 25% had 5-9 years of education, and 5% had more than nine years of education. The mean educational level was 3.03 years and the lower the education level, the greater the number of years that fishers were involved in their occupation, i.e. older fishers had less education. In terms of pluri-activity, fishers had few livelihood options and most had no other occupation.

The mean pluri-activity ratio within the fishing communities was 1.13. While fishers with more than nine years of education had the highest pluri-activity ratio (mean = 1.28), those with 5-9 years of education had the lowest pluri-activity (mean = 1.16).

The mean annual income of fishers with less than five years of education (2 552 065 Ariary) was almost half that of those with 5-9 years of education (4 500 645 Ariary); those with more than nine years schooling again earned double that of fishers with 5-9 years of education (8 081 811 Ariary). However, educational level did not appear to have any effect on the type of fishing equipment used; this was similar at all education levels.

DISCUSSION

The mean educational level of 3.03 years amongst the north east Madagascan fishing community was extremely low but slightly higher than the 2.09 years mean education found elsewhere in rural Madagascar (Glick

Table 1. Educational and income statistics of north-east Madagascan fishing communities.

	Education level (Years)	Annual Income (Ariary)	Equipment (Ariary)	Pluri-activity	Years of activity
Total sample (N=200)					
Mean	3.03	4 610 077	72 717	1.138462	16.91
SD	3.11	17 100 000	108 681	0.524646	15.28
Median	2.00	2 120 000	20 000	1	10
Educational level <5 years					
70% of fishers					
Mean	1.41	2 552 065	74 335	1.16129	18.13
SD	1.54	3 463 630	108 615	0.537512	15.99
p50	1	1 800 000	20 000	1	10
Educational level 5-9 years					
25% of fishers					
Mean	6.35	4 500 645	75 484	1.032258	13.87
SD	1.42	4 898 592	118 774	0.4069292	13.71
p50	6	2 900 000	20 000	1	10
Educational level ≥9 years					
5% of fishers					
Mean	10.71	8 081 811	35 714	1.285714	11.71
SD	1.11	8 025 983	30 472	0.755928	10.09
p50	11	8 490 000	20 000	1	10

Note: 2000 Ariary = 1 USD)

& Sahn, 2006). However, it was lower than the optimal level at which individual income is likely to be maximized (Leuven *et al.*, 2010).

The higher the education level, the higher the income was. This confirms the benefits of education to individual income and well-being (Agarwal *et al.*, 2009; Psacharopoulos & Patrinos, 2002). The optimal point at which educational level yielded maximum income appeared to be around five years of schooling. This would be similar to the results of other studies in rural areas (Wedgwood, 2007; Leuven *et al.*, 2010). It is thus understood that, in the small-scale fisheries sector, income enhancement can be quickly achieved in terms of schooling. The mean educational level in the small-scale fisheries sector (3.03 years) also fell below this level, making income enhancement possible with little extra education. Education would thus be essential to improve fishers' income in Madagascar.

Education had a positive effect on pluri-activity, or livelihood diversification. We estimated that nine years of education incurred an increase of 20% in pluri-activity. Diversification in livelihoods and economic activity is likely to have the beneficial effects of reducing anthropogenic impacts on the environment and generating fresh social and economic development in a system. However, fishers discourage their children from pursuing schooling and obtaining a secondary education because the social and economic risks associated with these years are 'expensive' (Breidlid, 2009). This cost is exacerbated by limited public spending on education (Birdsall, 1996). Marine conservation projects should thus focus on informing and educating fishers to improve their income and reduce threats to marine resources. Environmental NGOs working on marine and fisheries resource governance could contribute to such initiatives and also develop programmes to incentivise secondary and high school education. These initiatives could further promote the adoption of alternative livelihoods to encourage income generation from activities other than fishing, thus promoting the concept of green economies.

Acknowledgments – The John D and Catherine T MacArthur Foundation provided funding for this study. Thanks are due to Conservation International for technical and logistical support, as well as Gisele Bakary and all surveyors for their field assistance. We also thank reviewers for their helpful comments.

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