Research article

Marine fishery dependence, poverty and inequality nexus along the coastal lowlands of Kenya

Mohamed Idris Somoebwana[1],*, Oscar Ingasia Ayuya[1] and John Momanyi Mironga[2]

[1] Department of Agricultural Economics and Agribusiness Management, Egerton University, P.O. Box 536-20115, Egerton, Kenya
[2] Department of Geography, Egerton University, P.O. Box 536-20115, Egerton, Kenya

* **Correspondence:** Email: idris4003@gmail.com.

Supplementary

Appendix

Table A1. Endogeneity test on the effect of ocean fishery dependence on poverty and inequality.

Multidimensional poverty indices	Durbin (score) chi2(1)	Wu-Hausman F(1,368)
Household deprivation score	0.2489 (p = 0.6178)	0.2387 (p = 0.6254)
Multidimensional poverty dummy	3.0250 (p = 0.0820)	2.9220 (p = 0.0882)
Multidimensional poverty intensity	0.7887 (p = 0.3745)	0.7574 (p = 0.3847)
Number of observations	384	

Table A2. Tests on the validity of the selected instrumental variables.

Variable	Coefficients	Robust standard error
Distance to the fishery market	−0.2582***	0.0624
Distance to the ocean resource	−0.0246	0.0538
Constant	1.6316***	0.1752
Wald test	65.0400***	
Number of observations	384	

Note: ***significant at 1%.

Table A3. General propensity score function model of multivalued treatment on the covariates.

Non-dependence = 1	(Base outcome)			
	Low dependence = 2		High dependence = 3	
Variable	Coefficients	Std Error	Coefficient	Std Error
Distance to the fishery market	−0.5932**	0.2466	−0.9261***	0.2253
Distance to the ocean fishery resource	0.4542**	0.2170	0.4127*	0.2125
Constant	−0.0341	0.3619	1.7185***	0.2868
Log likelihood	−322.8773	[0.000]		
N	384			

Note: *significant at 10%, **significant at 5%, ***significant at 1%.

Table A4. Predicted probabilities for each dependency level.

Variable	Number of observations	Mean	SD	Min	Max
Dependence = 1					
Pred0	123	0.5296	0.2602	0.1194	0.8986
Pred1	123	0.1350	0.0671	0.0131	0.2994
Pred2	123	0.3355	0.2104	0.0776	0.7445
Dependence = 2					
Pred0	69	0.2825	0.2149	0.0020	0.8138
Pred1	69	0.1759	0.0409	0.0610	0.3105
Pred2	69	0 .5416	0.1981	0.1252	0.7936
Dependence = 3					
Pred0	192	0.2312	0.1821	0.0006	0.8895
Pred1	192	0.1697	0.0357	0.0145	0.2966
Pred2	192	0.5990	0.1739	0.0960	0.7971

Table A5. Potential outcome means of household deprivation score, multidimensional poverty dummy and multidimensional poverty intensity at different dependence levels.

	Household deprivation score		Multidimensional poverty dummy		Multidimensional poverty intensity	
	POM	S.E	POM	S.E	POM	S.E
Non-dependency	0.1632	0.0212	−0.0539	0.0708	−0.0356	0.0343
Low dependency	0.2558	0.0234	0.3335	0.0581	0.1545	0.0295
High dependency	0.3305	0.0143	0.4079	0.0370	0.2074	0.0210
Number of observations	384					

Table A6. Potential outcome means of per capita income at different ocean fishery dependence levels within Quantiles of per capita income.

	25th percentile		50th percentile		75th percentile	
	POM	S.E	POM	S.E	POM	S.E
Non-dependency	0.0833	0.0587	0.2083	0.0467	0.2499	0.0554
Low dependency	0.0833	0.0485	0.2291	0.0416	0.3541	0.0515
High dependency	0.2083	0.0216	0.2708	0.0173	0.4166	0.0392
Number of observations 384						

Table A7. Balancing test of GPS estimates: t-statistics for mean differences (MD) between treatment intervals for the DRF.

Variable	Treatment 1		Treatment 2		Treatment 3	
	MD	t-value	MD	t-value	MD	t-value
Age	−0.1857	−0.1303	0.0104	0.0060	0.2001	0.1525
Gender	0.0116	0.2709	0.0030	0.0623	−0.0050	−0.1486
Education level	−0.1025	−1.0996	0.0428	0.3180	0.0684	0.7209
Household size	0.0168	0.0519	0.0128	0.0339	0.0015	0.0049
Log Agric. assets	−0.3122	−0.3107	−0.0379	−0.0313	0.3043	0.3356
Group membership	0.0754	2.0189	−0.0318	−0.54726	−0.0460	−1.0939
Credit	−0.0517	−1.0322	0.0196	0.3020	0.0349	0.7319
Land tenure	−0.0226	-0.4082	0.0024	0.0364	0.0205	0.4120
Land size	0.0633	0.0319	−0.2116	−0.1341	0.2224	0.1408
Distance to ocean	−0.3523	−0.8398	0.1105	0.2002	0.2353	0.6100
Distance to market	−0.3941	-0.9879	0.1202	0.2217	0.2830	0.7359
Rainfall shock	0.0030	0.1257	−0.0054	−0.2242	0.0021	0.1056
Flood	0.0324	0.4746	−0.0192	−0.2366	−0.0197	−0.3379
Health	0.0025	0.0629	−0.0062	−0.1405	0.0030	0.0863
Price	0.0703	2.2012	−0.0338	−0.6093	−0.0427	−1.1192
Number of observations	261					

Table A8. Estimation results of the coefficients of the dose response function.

	MPI		Household deprivation score		Per capita income	
	Coef	Std. Err	Coef	Std. Err	Coef	Std. Err
T	−0.6697	0.4803	−0.3795	0.3510	−13.6092***	1.7357
T^2	0.8776*	0.3835	0.6942**	0.2803	12.5139***	1.4678
GPS	−0.0885	0.1311	−0.1380	0.0958	−2.4987***	0.4742
GPS^2	0.0004	0.0429	0.0363	0.0314	0.2079	0.1306
T*GPS	−0.0467	0.1194	−0.0858	0.0873	0.6447**	0.3188
Cons	0.3708*	0.2058	0.3619**	0.1504	5.8030***	0.6915
Number of observations	261					

Note: *significant at 10%, **significant at 5%, ***significant at 1%.