Do Integrated Approaches Yield Higher Impact?

Results from the Analysis of IPOPCORM's Operations Research Data (2001-2007)

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PHE Links in the Philippines

Country Population Facts (2007 Census)

- 88.6 Million (vs. 60 Million in 1990)
- 2.04% growth rate (vs. 2.36% in 2000)
- 37% of people aged 15 and under
- 65% of future population growth will be driven by the country's high population momentum [Herrin 1996]

Coastal population

- 60% of country lives in coastal areas
- 3.9% growth rate (2000)
- Rural but densely populated - 286 people/km2 (vs. 255 Philippines)

PHE Links in the Philippines

Environment Facts

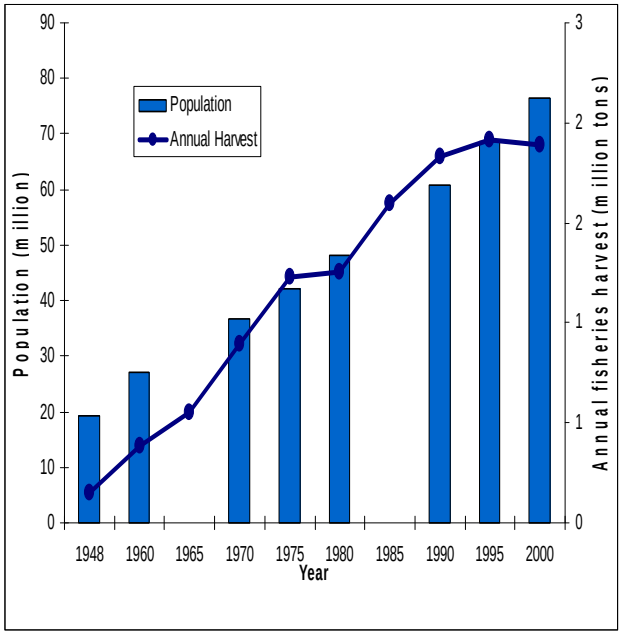
- 1 of 17 mega diverse countries
- Global epicenter of marine biodiversity
- High environment stress due to population and consumption

  < 5% of reefs excellent condition (White & Cruz Trinidad 1998)

Marine Hotspot populations

- Exceptionally high growth rates i.e., TawiTawi (5.6%)
- Population densities exceed 500 people/Km2 (Danajon Reef)
- Half of people under age 17 years

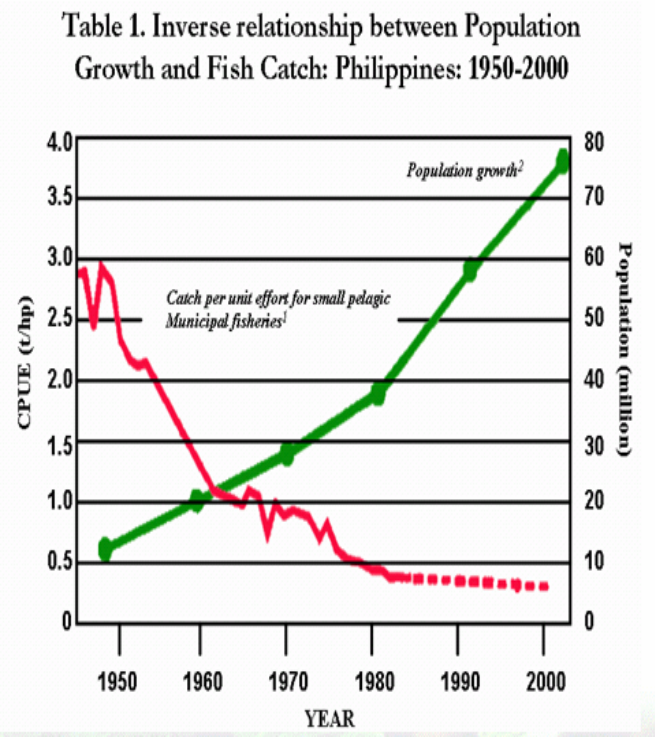
Fishing Dependent



Annual trend of Philippine marine fisheries harvest & human population [FISH Project 2007]

- Fish is primary protein source
- Fishing industry employs 1 million (5% of national labor force)
- Contributes $1.35 billion to economy
- Increasing demand → overfishing
  - Fish being harvested at a level 30% to 50% higher than natural production capacity [World Bank 2005]
  - Annual harvest no longer keeping pace with population growth [FISH 2007]

Destructive Fishing

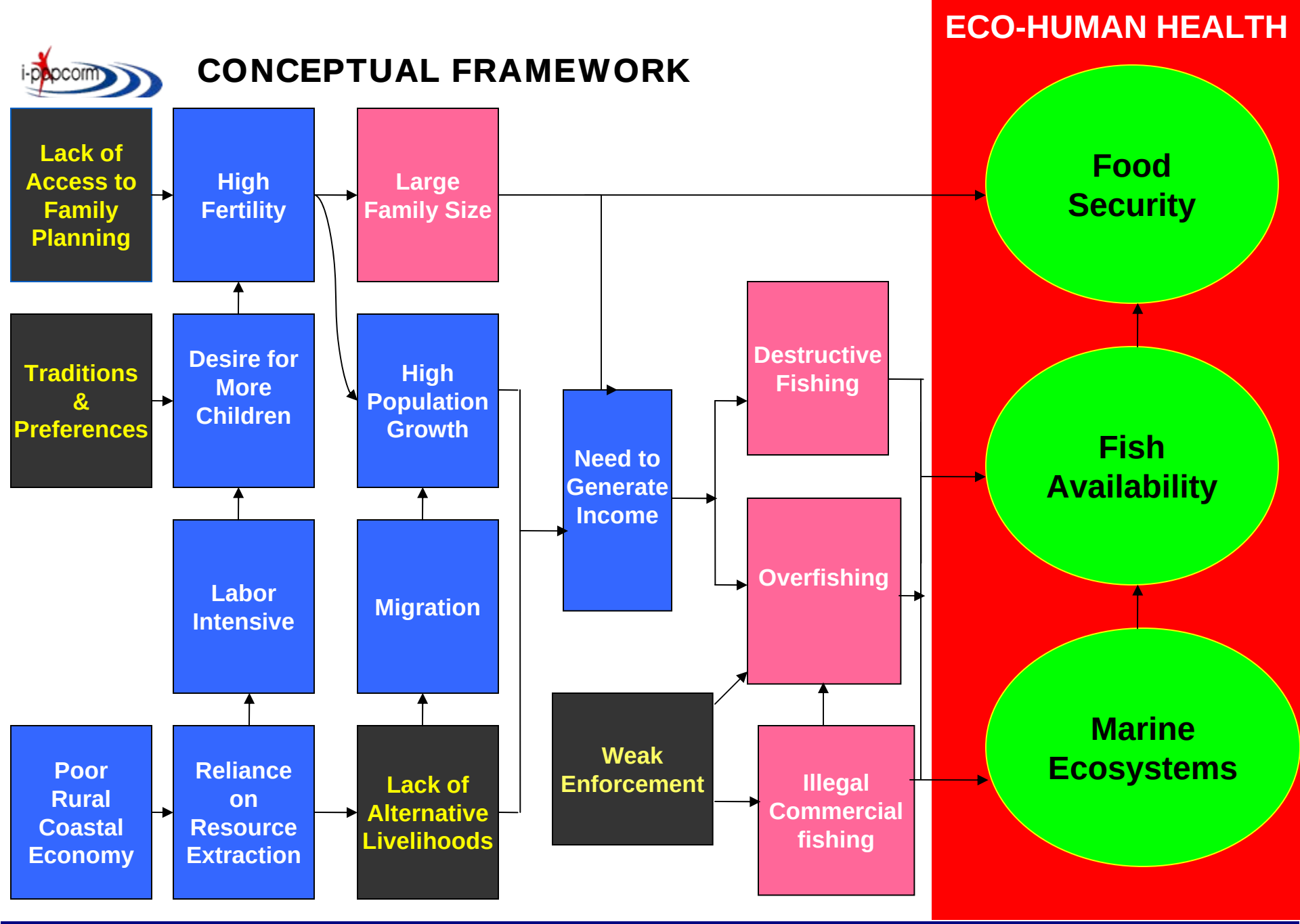


As fish catch declines, poor fishers resort to more efficient but also more destructive methods of extraction

In order to feed their families and maintain their income

"If current trends of population growth and coastal resource exploitation continue, availability and affordability of fish to provide a crucial protein source for the Philippines will be lost" (DENR, DA-BFAR 1999)

CONCEPTUAL FRAMEWORK



Informed the design of the PHE approach and intervention mix

IPOPCORM Approach

- Uses a symbiotic strategy to link sectors
- Focuses on food security from the sea
- Targets fishers, women and youth living in
- High-growth top-priority marine biodiversity conservation areas

Goals and Objectives

Goal:

Improve quality of life of fishing-dependent communities while maintaining integrity of life-sustaining coastal habitats

Objectives:

- Improve RH outcomes
- Build CB-CRM capacity
- Increase public and policymakers' awareness of PHE linkages and support for integrated approaches

Intervention Mix

FP/RH & ASRH

CRM and Habitat Protection

Policy Advocacy

Economic Development

FP/RH Interventions

Advocacy - targeting Mayor & MHO

- for CBD involving private sector
- for municipal budget allocation to RHU for FP commodities

Train & support CDB agents

- Sari-sari, Peoples Organization
- Socially marketed products (pills, condoms, injectable)

Mobilize & Train Peer Educators

- couples, men, youth to deliver BCC

Develop Referral Mechanism

- Upgrade FP/RH skills of RHU staff
- Referrals for LTPM and STD care

Youth Activities - Community IEC

- Public education using traditional media i.e., community theater

EED Training and Micro-credit

- Targeting women and youth

CRM Interventions

- **Advocacy – targeting Mayor & MPO**
- CRM for food security
- MPA tenure agreement
- Ordinance to ban destructive gear
- **Community IEC**
- CRM for food security & value of marine resources
- **MPA Establishment & Management**
- Participatory Coastal Resource Assessment
- Demarcation of MPA (core & buffer zones)
- Organize/train MPA management committee and fish wardens
- Routine patrol, apprehend illegal fisher
- **Youth Activities**
- Coastal clean-up & Youth ecology camps
- **EED Training and Micro-credit**
- Targeting fishers, women and youth

Where is the integration?

Population response

Environment responses

Synergies

- Linked BCC messages, resonate with local communities
  - Peer educators communicate about Pop+CRM for food security
- Target Groups participate in both activities
  - Peer educators are involved in MPA establishment
- Policy and Advocacy activities
  - Development plans include policies/budgets for FP/RH and CRM
    - municipal environment plan, barangay development plan
- One organization implementing both strategies in coordinated fashion

How to measure synergy?

- **Test IPOPCORM's central hypothesis:**

  "There will be a statistically significant improvement in CRM outcomes and RH/FP outcomes by delivering these services in an integrated fashion as opposed to delivering either intervention in isolation"

- **Quasi-experimental evaluation design**

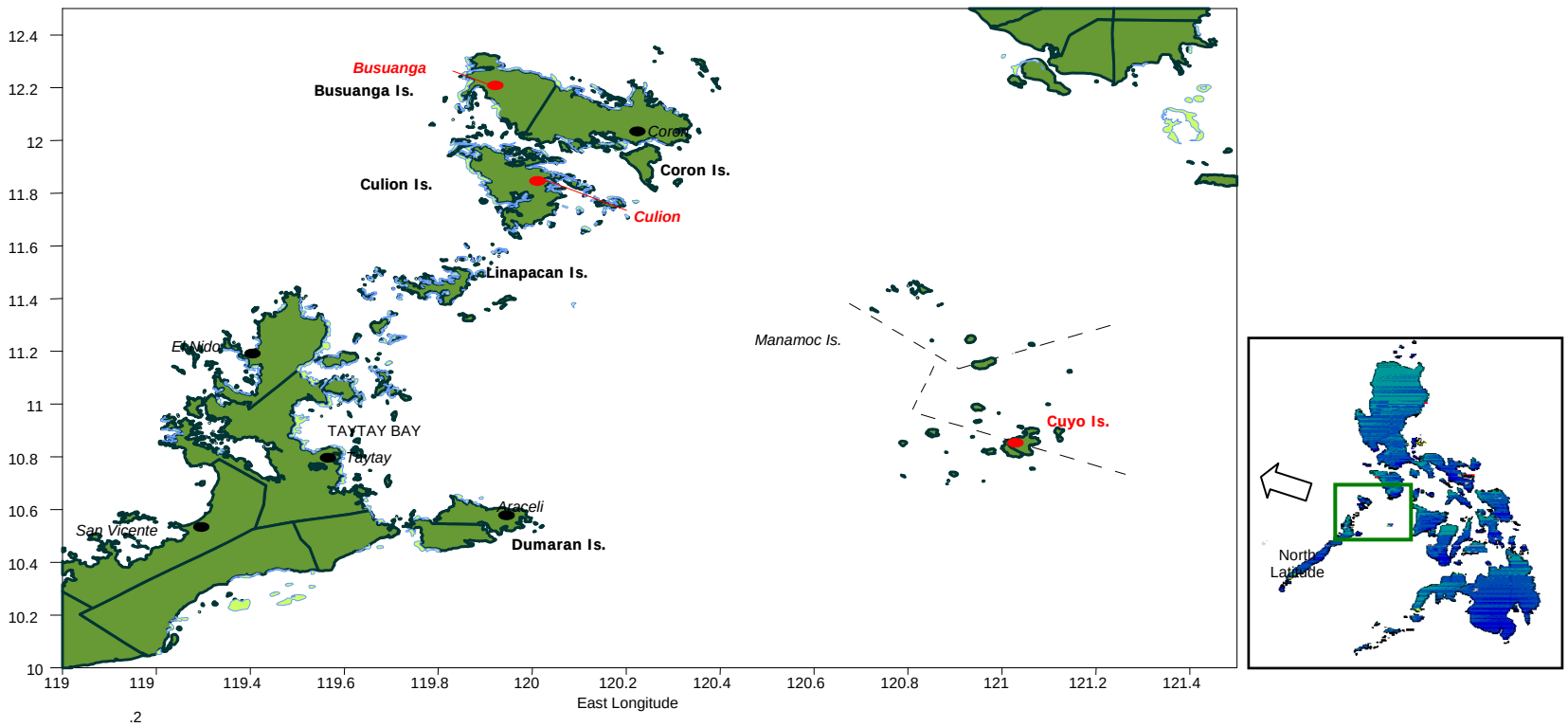
- **Difference-in-difference approach and logistic regression were the statistical tools used to test the hypothesis**

Quasi-experimental design

3 Intervention Groups

	Identifier	Description of the Intervention
Intervention 1	X_1	The IPOPCORM intervention (X_2+ X_3)
Intervention 2	X_2	The RH intervention
Intervention 3	X_3	The CRM intervention

Operations Research Sites



Dependent Variables

- **Indicators for RH Dependent Variables**

- CEB - Children ever born to WRA (parity)
- CPR among WRA (15-49 years)
- Contraceptive use by youth (15-24 yr) first and last sex
- Sexual activity among young males (15-24 yr)

Dependent Variables

- **Proxy Indicators for Food Security Dependent Variables**

- Households with full-time fisher
- Know someone personally that uses dynamite in fishing
- Know someone personally that uses cyanide in fishing

Dynamite fishing destroys coastal habitats and endangers human health

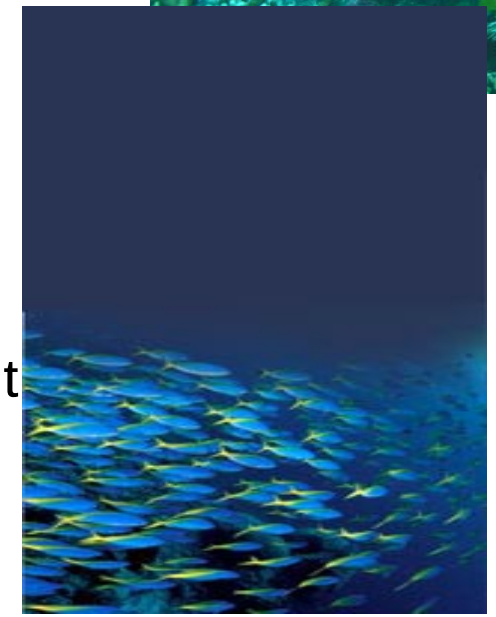
Indicators for CRM Dependent Variables

Benthic Lifeform (coral)

- live coral coverage
- coral mortality index
- coral development and condition and succession indices

Reef Fish

- species richness (all and target species)
- biomass (total species and target
- size frequency (target species)



Mangrove Condition

- Volume
- Density
- Mean Density at Breast Height
- Mean Height
- Regeneration

Methods

- **Pre-intervention (2001) and post-intervention (2007) measurement of dependent variables**

- **2 types of surveys implemented by research partners**

  - Community household survey (DRDF 2001 & FACE 2007)
  - Biophysical survey of island ecosystems and habitats (MERF 2001 and 2007)

Data Collection Methods

Community household survey

- Sample of 9 *barangays* - randomly selected using PPS
- Complete list of households, including all HH members, was then obtained from each study *barangay*
- From the list, sampling frames of different study populations were derived
- Then a sample of individuals was drawn using the systematic random sampling technique
- Once a sample of households was selected for one age-sex group, those households were no longer eligible for sampling in the succeeding age-sex groups
- Separate samples were used for the pre (O1) and the post (O2) measurements

Household & Respondent Sample

Identifier	Households		Adults		Youth	
	2001 (400)	2007 (400)	2001 (100)	2007 (100)	2001 (300)	2007 (300)
X_1	406	344	130	110	388	293
X_2	396	331	101	97	308	267
X_3	400	410	101	108	333	302
Total	1202	1085	332	315	1029	862

Data Collection Methods

Biophysical Survey

- Sample of shallow coastal habitats located within the jurisdiction of the local government unit
- Corals, reef fish, mangrove and marine plants
- Resource & ecological assessment (REA) methods to collect data
  - Coral - Line intercept and video transect
  - Mangrove-transect line plot & line intercept
  - Reef fish – fish visual census
- Same GPS coordinates for 2001 and 2007 surveys

Statistical Methods

Statistical Test

1. **Bivariate analysis**
2. **Multivariate analysis**

CRM Variables

- Ordinary Least Squares (OLS) regression analysis
  - To determine spatio-temporal trends for each study area and year
- PC-ORD Analysis software
- Statistical significance = 0.05 levels

RH + Food Security Variables

- OLS and Probit regression analyses
  - Difference in difference test
- STATA analysis software
- Statistical significance = 0.10 level

Independent Socioeconomic Variables

- Wealth index
- Age
- Education
- Tenure (length of residence)
- Working
- Married
- Household size
- Full-time fisher

A set of independent variables was included in the regression analysis to control for the differences in the characteristics of the respondents and households that are shown in other studies to influence the RH dependent variables

Multivariate regression analysis results

The IPOPCORM intervention:

- Generated the desired impact on all 9 of the RH and food security indicators
- Exceeded the impact of the RH intervention and the CRM interventions for 5 of 9 indicators and
- Performed equally as well for the remaining 4 indicators

Difference-in-difference (DID) results

Multivariate regression analysis results for the effects of intervention and other independent variables on indicators in pooled 2001 and 2007 surveys	Intervention		
	IPOPCORM	RH-only	CRM-only
RH and Food Security Indicators			
Contraceptive use by youth (first sex)	❑		
Sexual activity among young males	❑		
Household with full-time fisher	❑		
Know someone that uses dynamite	❑		
Know someone that uses cyanide	❑		

❑ = *Statistically significant trend only*

Multivariate Analysis Results – CRM

- Of the eighteen CRM indicators, the IPOPCORM site experienced:

  - no statistically significant change in 14 indicators
  - 3 statistically significant increases in two categories (benthos and mangrove), and only
  - 1 statistically significant decrease (mangrove regeneration).

- By comparison, the RH and CRM municipalities each experienced 3 statistically significant decreases and only 1 statistically significant increase

Multivariate Analysis Results

	Intervention		
	IPOPCORM	RH-only	CRM-only
CRM Indicators			
Coral reef: condition index	❑		
Reef fish: target species richness			❑
Reef fish density (# per sq. meter)		❑	
Mangrove volume (cu. meter per hectare)	❑	❑	❑
Mangrove density (# per hectare)		❑	❑
Mangrove mean diameter at breast height (cm)	❑		
Mangrove regeneration (# per hectare)	❑		❑

❑= *Statistically significant increasing trend*

❑ = Statistically significant decreasing trend

Intervention cost: 2001-2007

Identifier	Intervention	Source of Funds		Total Cost Pesos (US $)
		Project Budget (PHP)	Counterpart from LGUs (PHP)	
X_1	IPOPCORM	**10,862,318**	**92,500**	**10,954,818** (US$219,096)
X_2	RH	**5,049,159**	**237,500**	**5,286,659** (US$105,733)
X_3	CRM	**6,924,185**	**369,050**	**7,293,235** (US$145,865)
Cost of $X_2 + X_3$				**12,579,894** (US$251,598)

Conclusion

- Overall, the IPOPCORM intervention generated a greater impact on the majority of the indicators used in the analysis to measure improvements in human and ecosystem health and food security from the sea

- These data support IPOPCORM's central hypothesis that integrated approaches to population and coastal management yield higher impact than sectoral approaches

Implication

- It will be difficult to ensure long term sustainability of CRM and prevent over use of natural resources unless integrated forms of coastal management that combine conservation with family planning are delivered simultaneously

- And IPOPCORM is a cost efficient approach to obtain synergies that maximize their impact

What made the difference?

IPOPCORM's appeal to youth

- **Encouraging youth to become "stewards of their sexuality and the environment "**

Community feedback

- **IPOPCORM fits with our life style**

LESSON

- **IPOPCORM's synergistic approach lends sustainability to CRM interventions, while CRM provides a comprehensible context for coastal residents to recognize the necessity of limiting family size to achieve food security and improve family welfare**

- **With appropriate training and support, environmental NGOs can develop the capacity to implement community based family planning activities**

Study Limitations

- The introduction of certain activities (i.e., non-project interventions) in some study sites, which could possibly contribute positively or negatively to the indicator of interest, is beyond the control of the project.

- The level of penetration or reach of the interventions in the study municipalities varied from site to site due to the different rates of maturation of the three interventions and the variations in the performance of the different implementing NGO and LGU partners

Thank you !

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Methodology

- Ordinary Least Squares (OLS) and Probit multivariate regression models used for POP/RH outcomes
- Pooled cross-section household survey data from pre-intervention (2001) and post-intervention (2007)
- Both intervention specific and time-specific effects are controlled for
  - Therefore unobservable differences between the three interventions which are time invariant are controlled for
  - Time-interaction variable for each intervention tests for differences in changes in outcomes over time across the three interventions (difference-in-difference test)
  - Since intervention not randomized, other independent socio-economic variables which influence the outcomes are included in the regressions to account for differences across interventions

Regression Models

- Ordinary Least Squares (OLS) used for parity, a continuous dependent variable
- dProbit technique used for all other POP/RH outcomes which are dichotomous dependent variables
  - dProbit reports the marginal effect, that is change in probability of an outcome
  - For infinitesimal change in a continuous variable
  - Or for discrete change in categorical variable
  - OLS used for CRM variables to test first differences for each intervention