



Decision Support for Coral Reef Fisheries Management: Community Input as a Means of Informing Policy in American Samoa

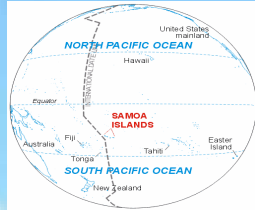
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Background

American Samoa is a U.S. Territory located in the South Pacific, approximately 2,600 miles southwest of Hawaii. The territory encompasses five volcanic islands and two coral atolls, where coral reefs extend approximately 2 to 3 miles offshore. Historically, fishing has been an important part of the American Samoan way of life and remains so today. The Department of Marine and Wildlife Resources (DMWR) is the lead agency in fishery management.



Problem Statement

Evidence suggests that over the past two decades reef fish and invertebrates have declined in both abundance and size in American Samoa. Our study addresses overfishing by creating a decision support tool for DMWR based on socioeconomic and geographic data. We recognized three policy areas towards which to focus management strategies.

Research Questions

Regulation

- What is the current perception of fishery regulation?
- With which types of regulations are people most likely to comply?
- What are the factors that influence people's agreement level with regulations?
- Is there a difference of opinion between user groups regarding attitudes and opinions towards fishery regulations and management policies?
- What spatial level of management is most preferred?

Education

- Where do American Samoans currently receive most of their coral reef fishery education?
- Specifically, from which sources and how frequently do user groups receive fishery education?

Geographic Prioritization

- How can DMWR incorporate spatial variation in demographic and environmental factors in order to enhance fishery management strategies?

Methods

	Survey Statistics	2000 Census
% Preferred Samoan Language	65.2	68.6
% Female	48.9	48.8
Average Household Size	7.44	6.05
% American Samoan citizens	55.0	57.4

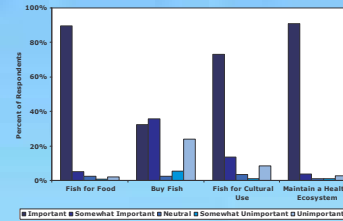
Using a random, stratified sampling technique, we surveyed 34 villages throughout the Territory. We administered a total of 425 surveys in both English and Samoan.

To analyze our data, we used a variety of statistical methods, including summary statistics, analysis of variance tests (ANOVA), chi-squared tests, and multivariate regression analysis.

Results and Discussion

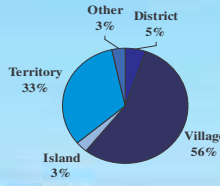
Fishery Use

The majority of survey respondents felt that maintaining a healthy ecosystem and fishing for food were important uses of the fishery. Commercial use of the fishery (buying and selling) and recreational fishing were considered important by a significantly fewer number of respondents.

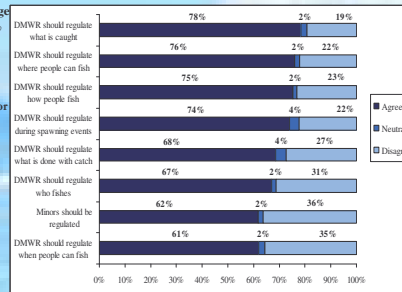


Regulation

Percent Preference of Spatial Level of Management



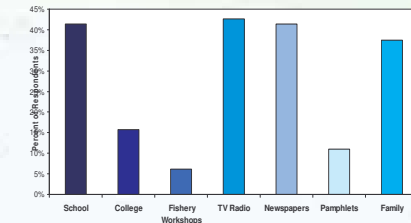
The majority of the total respondents show a preference for village level management.



Based on our regression analysis, we found the following socioeconomic factors to be significant in influencing people's overall agreement with regulation:

- > Age
- > Citizenship
- > Curfew status
- > Social education
- > Fishing frequency

Education



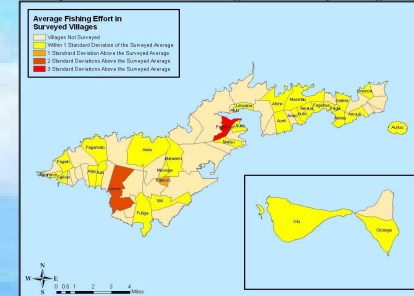
The education sources utilized most frequently by the greatest number of respondents are TV and radio, newspapers, and school. Both the summary statistics and regressions for the education policy area indicate that media education is not received significantly more by any particular demographic group.

Geographic Prioritization

We calculated values for 11 socioeconomic and biophysical factors to highlight spatial variation and detect trends among surveyed villages. For example, per capita fishing is lower in villages with higher populations. However, total population has a greater effect on total effort than per capita fishing.

Village Name	Total Population over Age 15	Per Capita Fishing for Food	Total Effort
Amanave	-0.41	1.60	0.49
Amama	-0.63	1.46	-0.34
Amouli	-0.09	1.10	0.85
Asili	-0.46	-0.30	-0.62
Aumi	-0.47	1.75	0.93
Fagatogo	2.02	-0.42	3.88
Faleniu	1.66	-0.56	1.21
Iliili	2.46	-0.93	0.27
Leone	3.78	-0.71	2.43

Spatial Variation in Total Fishing Effort in Surveyed Villages



We created maps of the socioeconomic and biophysical factors to provide visual representations of the analyses and potentially allow managers to identify broader regions of concern. For example, this map shows spatial variation in total fishing effort.

Conclusions

Regulation

- Nearly half of the respondents think current regulations are too lenient.
- Compliance is estimated to be greatest with the following four regulation types:
 - "DMWR should regulate what is caught."
 - "DMWR should regulate where people fish."
 - "DMWR should regulate how people fish."
 - "DMWR should regulate during spawning events."
- Respondents from villages with a strong social structure are more likely to agree with regulations.
- Above average fishers are less likely to agree with regulations than other people.

Education

- Education through media sources reaches the most people most frequently.
- People who attended a fishery workshop were more likely to agree with regulations.
- On average, people who fish are receiving more social and school education than non-fishers.
- Participants in the community based fishery management program are receiving more workshop education than American Samoans not in the program.

Geographic Management

- There is significant spatial variation in perceptions and opinions about fishery management and education.
- The remote villages have the highest reef complexity and average to above average per capita effort, but their residents have the lowest mean agreement with DMWR regulations and higher proportions of the populations prefer village level management.

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