

A Method to Measure Social Vulnerability and Adaptive Capacity to Climate Variability in Coastal Communities of the Dominican Republic

Un Método para Medir la Vulnerabilidad Social y la Capacidad de Adaptación a la Variabilidad del Clima en las Comunidades Costeras de la República Dominicana

Une Méthode pour Mesurer la Vulnérabilité Sociale et la Capacité d'Adaptation à la Variabilité Climatiques dans les Communautés Côtières de la République Dominicaine

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EXTENDED ABSTRACT

Introduction

This study modifies the IUCN's (2010) *Framework for Social Adaptation to Climate Change: Sustaining Tropical Coastal Communities and Industries* to assess resource dependency and its relationship to adaptive capacity in Dominican Republic coastal communities. It measures vulnerability and adaptive capacity across individuals who share certain local social characteristics but are exposed to different occupational pressures. Six factors related to social resilience and adaptive capacity were identified and compared across direct resource dependents to indirect resource dependents.

The capacity of natural-resource dependent communities to adapt to unavoidable climate impacts requires immediate attention because global changes in climate patterns alter the accessibility, quality, and availability of natural resources (Marshall and Marshall 2007). This in turn impacts social and economic systems. A survey method was utilized to assess adaptive capacity at the individual and household levels in Dominican coastal communities.

Communities that are highly dependent on natural resources are particularly vulnerable because climate-caused changes to the environment will directly affect their livelihoods (Bailey and Pomeroy 1996). Recent research on impacts of climate variability on resource dependent groups has focused primarily on individuals whose livelihood is based on the abundance and health of certain natural resources. There has been insufficient focus on the impacts to communities as integrated systems of individuals with diverse livelihoods that *directly and indirectly* rely on natural resources. Therefore, this work focuses on the impacts to communities that rely on natural resources both directly (e.g. fishers, tour operators) and indirectly (e.g. restaurateurs, shop keepers).

Methods

A total of 175 individuals, comprised of 90 direct resource dependents and 85 indirect resource dependents, were surveyed through random sampling in the coastal communities of La Caleta/Boca Chica, Samana, and Montecristi. The survey consisted of a demographic section followed by a series of statements with a Likert scale (1-4) response approach. These statements measured an individual's perceptions of their livelihoods and communities.

Results

A principal component analysis resulted in six factors related to resilience and adaptive capacity. These factors are:

- i) Attachment to occupation,
- ii) Ability to plan, learn, and reorganize,
- iii) Occupational mobility,
- iv) Attachment to place,
- v) Occupational competitiveness, and
- vi) Occupational confidence.

A regression analysis was employed to compare direct resource dependents to indirect resource dependents across these factors. Results showed significant differences in the user groups' attachment to occupation, with direct resource dependents showing more attachment than indirect resource dependents. Furthermore, responses to each individual statement were compared using a Mann-Whitney U test. The survey statement *The occupation I have now is a lifestyle-it is not just my job* shows statistically significant variation in response, with direct resource dependents more likely to agree than indirect dependents.

Conclusions

In a time of dwindling resources and climate variability, resource dependents' livelihood security must be addressed. The attachment to occupation seen in direct resource dependents presents serious challenges for alternative livelihood considerations, as a lack of interest in changing occupations may contribute to the high frequency of failed alternative livelihood projects (Mansfield and Pain 2005).

A recommendation for short-term mitigation of this issue is stricter resource management and enforcement to sustain availability and access to natural resources, and minimize the vulnerability of those with dependent livelihoods. Long-term considerations include greater educational and training opportunities for a younger demographic, thus providing alternative opportunities to those who are not already attached to a vulnerable occupation. This tailored alternative livelihoods approach would provide education and training to a population that may be more responsive to outreach efforts.

This study builds on previous work that identified natural resource dependents as particularly vulnerable to changes in climate and resource availability. Individuals and communities that rely on natural resources for a living may be more vulnerable due to these characteristics, and this study further acknowledges that the attachment to occupation felt by many direct resource users may negatively affect their adaptive capacity.

LITERATURE CITED

- Bailey, C. and C. Pomeroy. 1996. Resource dependency and development options in coastal southeast Asia. *Society and Natural Resources* 9:191-199.
- Marshall, N.A., P.A. Marshall, J. Tamelander, D. Obura, D. Malleret-King, and J.E. Cinner. 2010. *A Framework for Social Adaptation to Climate Change: Sustaining Tropical Coastal Communities [sic] and Industries*. IUCN, Gland, Switzerland. 36 pp.
- Marshall, N.A. and P.A. Marshall. 2007. Conceptualizing and operationalizing social resilience within commercial fisheries in northern Australia. *Ecology and Society* 12(1):1.
- Mansfield, D. and A. Pain. 2005. *Alternative Livelihoods: Substance or Slogan?* Afghanistan Research and Evaluation Unit, Kabul, Afghanistan.