

A Community-based Participatory Approach to Vulnerability Analysis for Pelagic Sargassum Influxes in the Eastern Caribbean: Composite Indicators, Drivers and Conceptual Frameworks

Un enfoque participativo basado en la comunidad para el análisis de vulnerabilidad de los flujos de sargazo pelágico en el Caribe Oriental: indicadores compuestos, impulsores y marcos conceptuales

Une approche participative communautaire de l'analyse de la vulnérabilité des afflux de sargasses pélagiques dans les Caraïbes orientales : indicateurs composites, moteurs et cadres conceptuels

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EXTENDED ABSTRACT

This research evaluated the vulnerability of three rural, fishing communities in Saint Lucia, namely, Dennery, Praslin and Micoud to extraordinary pelagic sargassum influxes. Using a mixed method approach with both quantitative and qualitative techniques, 18 robust, relevant, and representative indicators were selected for the 3 components of vulnerability, namely exposure, sensitivity and adaptive capacity. The indicators were carefully selected based on five criteria: (1) their analytical soundness, (2) measurability, (3) relevance to the issue under investigation, (4) their interconnectedness, and (5) the availability of data.

The indicators were aggregated to form a combined vulnerability index for pelagic sargassum for each community. The approach chosen for the creation of the composite index is an adaptation of the Multidimensional Poverty Index (MPI), henceforth referred to as Multidimensional Vulnerability Index (MVI). The MPI is a useful tool which measures the proportion of people in a given population who experience multiple deprivations (or vulnerabilities in our case) i.e., incidence (H) as well as the intensity of the deprivations (A). The specific method chosen is the Alkire-Foster (AF) method, which calculates the MPI as a product of H and A (Alkire et al. 2015). The MPI-AF Methodology was specifically adapted for this research context through a change in the terminology, dimensions and corresponding indicators, the first cut-off and the scale at which it was applied.

This method facilitated the identification and understanding of variations in the vulnerability of the three communities to pelagic sargassum and guided the adaptive planning process. Praslin had the highest MVI of 0.44 or 44%, which represented a medium level of vulnerability. This was followed by Micoud with 0.29 and Dennery with 0.27, both revealing low to medium level vulnerability. Praslin also had the highest percentages of damage to property and household appliances (79%), poor social cohesion (62%), use of inadequate coping strategy (52%) and no participation in EAP and capacity building related to sargassum (0%). Dennery demonstrated the highest percentages for health implications (43%), loss/reduction of uses of the beach (98%) and limited understanding of sargassum (48%). Micoud showed the highest rate of unemployment (37%), no economic survival and social security (61%) and persons who had not completed a Secondary School level of education (64%). All the communities revealed high percentages in no alternative uses of sargassum and no knowledge of the draft National Sargassum Management Plan, while conversely communities had high percentages in access to insurance coverage and loans.

The data was also disaggregated by age, gender, employment, and a few other more fundamental indicators. This information was used to create risk maps and to conduct statistical analyses. All three communities demonstrated a statistically significant relationship between location (zone) and damage to property and household appliances. Dennery and Praslin both reported statistically significant relationships between zone and limited understanding of sargassum, while Dennery alone reported a statistically significant relationship between zone and health implications and Micoud alone, a relationship between zone and economic lifelines affected by sargassum and zone and loss/reduction of uses of the beach. None of the three communities displayed disparities in the incidence of vulnerability and age. Dennery and Micoud both reported differences between groups of different educational levels and Praslin and Micoud both demonstrated divergence in different types of employment. Only Dennery showed differences in the incidence of vulnerability and gender.

Having represented community-specific vulnerability, it becomes necessary to understand the role that this vulnerability plays in determining each community's susceptibility to pelagic sargassum influxes. This involved exploring how environmental, economic and social factors drive community vulnerability (Ciurean, Schröter and Glade 2013). Each community had its unique set of drivers, influenced by specific priority indicators. The three communities had similar

drivers including climate change, geographic location, physical environment, management and coping strategies, and social cohesion and security. Praslin had some distinct drivers related to topography, small size, population density, remoteness, and perception of sargassum. The drivers for Dennery and Micoud were very similar.

Drivers were diagrammatically depicted to demonstrate the interconnections between the driver types, categories, and driver indicators. This also allowed for comparisons between communities and helped to understand how to effectively deal with these similarities and differences. The drivers were also used as the basis for the development of conceptual frameworks for Community-specific Adaptation and Management Plans. Frameworks were developed by the community members, fisherfolk and key informants, under the guidance of the researcher. Special consideration was given to the UWI-FAO framework for Sargassum Adaptative Management Strategies (SAMS) and the recommendations emanating from the Validation and Scenario Planning Workshop. It is anticipated that each framework should serve as a roadmap for the development, execution, and sustainability of the local Management Plan, that could hopefully feed into the revised National Sargassum Management Plan.

A unique feature of this research is the ‘Voice of the Invisible’, which specifically targeted the poor, disabled, women and minority groups who may have been excluded from previous data collection. Through this research, three creative, informative, and interesting participatory videos (PVs) were produced by the members from each community. The videos demonstrated the ability of community members to identify and effectively communicate the negative impacts of sargassum and the corresponding solutions. Residents were allowed to add their perspective to sargassum management in their community and are now in a better position to demand accountability, transparency, and responsibility on the part of local and national government.

The communities continue to demonstrate that despite existing vulnerabilities, most residents are interested in being actively involved in sargassum management. They welcome capacity building and training related to sargassum and continue to seek financial and research support for alternative uses of sargassum. A few however believe that sargassum is here to stay, and simply accepting it as a new part of life, is the best way forward.

KEYWORDS: sargassum, participatory approach, vulnerability, drivers, conceptual framework

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