



Dynamic capabilities and NGO sustainability: The mediating role of organizational ambidexterity in Lebanon

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ABSTRACT

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Lebanon, a crisis-affected region, has witnessed an active presence of non-governmental organizations (NGOs) that play a crucial role in addressing developmental challenges. NGO's strategic adaptability is required to sustain activities in a volatile environment. While dynamic capabilities sensing, seizing, and reconfiguring have been thoroughly investigated within corporations, they remain poorly understood in NGOs. This research studies the impact of dynamic capabilities on the sustainability performance of NGOs in Lebanon. It also investigates the role of organizational ambidexterity in mediating the relationship between dynamic capabilities and sustainability performance. The paper uses a quantitative approach, utilizing a structured survey questionnaire aimed at managers in NGOs. The analysis employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationships between dynamic capabilities, sustainability performance, and organizational ambidexterity. A total of 407 managers from diverse NGOs participated in the survey, providing data to evaluate the proposed hypotheses. The structural model demonstrated robust explanatory power, with R^2 values of 0.551 for sustainability performance. The findings reveal that reconfiguring (RC) and seizing (SEC) capabilities significantly influenced both OA and OS (p -value < 0.01). Notably, sensing capabilities (SC) impacted sustainability only through the mediating path of OA ($\beta = 0.067$, p -value = 0.009). Organizational ambidexterity was found to be a powerful predictor of sustainability ($\beta = 0.434$, p -value = 0.000) and serves as a vital mediator for all dynamic capabilities. These results suggest that NGOs in Lebanon achieve sustainability by leveraging dynamic capabilities to balance exploration and exploitation strategies, navigating environmental turbulence through strategic flexibility.

Contribution/Originality: This study extends dynamic capabilities theory to the NGO context by empirically demonstrating how sensing, seizing, and reconfiguring capabilities enhance sustainability performance through organizational ambidexterity. It provides robust PLS-SEM evidence from a crisis-affected setting, highlighting ambidexterity as a key mechanism translating strategic capabilities into sustainable outcomes.

1. INTRODUCTION

Non-Governmental organizations NGOs operate under continuous pressure to sustain in fragile contexts, maintaining their mission while trying to meet broader sustainability expectations (David, Marouani, Nahas, & Nilsson, 2020). In practice, sustainability at NGOs involves not only continuous funding and programs but also maintaining capacities and social value in unstable environments (Kabbara & Ozgit, 2023). This article highlights the importance of sustainability in NGOs operating in unstable environmental conditions and resource scarcity, such as

Lebanon, which has faced significant socio-economic and political crises over the past decade (Besiou, Pedraza-Martinez, & Van Wassenhove, 2021).

Dynamic capabilities theory (Teece, Pisano, & Shuen, 1997) provides a useful framework for explaining how organizations adapt in a turbulent context. Dynamic capabilities, which are conceptualized by sensing, seizing, and reconfiguring capabilities (Teece, 2007), allow organizations to identify opportunities and threats, use resources to respond, and reconfigure systems and routines to adapt to the changing circumstances. While the dynamic capabilities theory is elaborated at the corporate level, how NGOs apply and use concepts of dynamic capabilities to enhance sustainability performance remains unexplored (Besiou et al., 2021).

Building on this gap, this article also examines organizational ambidexterity, which is the ability to balance both exploration and exploitation, as a key approach for explaining how dynamic capabilities affect sustainability performance. In the case of NGOs operating in Lebanon, ambidexterity sets the organization between two critical considerations for immediate response and long-term sustainability at the same time.

Lebanon provides a relevant setting for studying those relationships, as between 2011 and 2015, around two million Syrian refugees arrived in Lebanon, making it the country with the highest refugee-to-population ratio worldwide (Kraft & Smith, 2019). NGOs in Lebanon have operated in an overlapping social, economic, and political disruptions, which required their proactive involvement in providing humanitarian assistance while also performing sustainably (Kraft & Smith, 2019; Nassar & Stel, 2019).

Accordingly, this paper examines how NGOs' dynamic capabilities affect sustainability performance and whether organizational ambidexterity mediates their relationship.

The structure of the paper is as follows: The literature review and hypothesis are presented in Section 2. The methodology is reviewed in Section 3, while the results are outlined in Section 4. And last, Sections 5 and 6 cover the implications and conclusion.

2. LITERATURE REVIEW AND HYPOTHESES

2.1. Dynamics Capabilities Theory

The dynamic capabilities theory, which was elaborated by Teece et al. (1997), explains how organizations adapt in changing environments by their sensing, seizing, and reconfiguring capabilities. Different studies have revisited these concepts with different classifications, such as (Kareem & Alameer, 2019; Teece, 2012).

In sustainability research, dynamic capabilities are extensively used to justify the ability of organizations to sustain and outperform in dynamic circumstances and uncertainty (Arend, 2014). Positive relationships have been recognized between dynamic capabilities and sustainability performance in different studies, which varied in contexts and times (Dangelico, Pujari, & Pontrandolfo, 2017; Harun, Hogset, & Mwesiumo, 2023). Most studies have explored the relationship between dynamic capabilities and sustainability performance in large corporations, leaving unanswered questions about how sensing, seizing, and reconfiguring capabilities influence NGOs' sustainability performance.

2.2. Dynamic Capabilities and Sustainability Performance

2.2.1. Sensing Capabilities and Sustainability Performance

Sensing capabilities are the abilities of organizations to scan and interpret contexts, including stakeholders, regulations, and communities, to identify opportunities and threats (Teece, 2012). As sensing capabilities enable organizations to identify sustainability requirements, potential threats, and prioritization actions, it supports sustainability performance (Buzzao & Rizzi, 2021). Other studies examined how sensing capabilities reinforce sustainability by identifying risks, highlighting awareness of opportunities, and guiding the adaptation of strategies (Arend, 2014).

2.2.2. Seizing Capabilities and Sustainability Performance

Seizing capabilities is the capacity to mobilize resources, make strategic decisions, and act upon them (D. J. Teece, 2012). While sustainability performance requires taking action and aligning resources with sustainability objectives, seizing capabilities is the driven key (Bari, Chimhundu, & Chan, 2022). Studies have suggested that seizing capabilities help organizations execute sustainability-oriented strategies (Buzzao & Rizzi, 2021).

2.2.3. Reconfiguring Capabilities and Sustainability Performance

The reconfiguring capabilities as elaborated by Teece (2007), give the organization the ability to redesign processes, recombine present structures and resources, and reengineer operating models. While sustainability performance urges organizations to implement sustainable practices in unstable environments, reconfiguring capabilities reinforce practical mechanisms that enable sustainability practices to persist through change (Bari et al., 2022). Empirical studies model how dynamic capabilities enable organizations to shift towards sustainability performance in fragile environments (Buzzao & Rizzi, 2021).

2.3. Organizational Ambidexterity Theory

Ambidexterity, as the ability of organizations to maintain a steady balance of resources, is essential for taking in information and understanding community requirements (Yunita, Sasmoko, Bandur, & Alamsjah, 2023). Various academic literature has discussed alternative practices that could help managers understand the concept of ambidexterity and its application (Papachroni & Heracleous, 2020). Ambidexterity, linked to exploitation, focuses on an organization's capacity to identify opportunities (Yunita et al., 2023). However, the ability of an organization to effectively align itself to fulfill the needs of exploitation is related to the reconfiguration of capacities (Kumkale, 2022). Through his empirical study, Chen, Zhou, and Xie (2014) elaborated that ambidexterity improves environmental and economic performance in the framework of sustainable development. The concept of ambidextrous sustainability was first proposed by Maine and Svensson (2018), who showed how an ambidextrous approach to "sustainability resources" improves sustainability performance.

By improving the capacity to research and implement procedures learned or modified from other organizations, organizational ambidexterity sets itself apart from dynamic capability (Yunita et al., 2023). The relationships between the ideas of ambidexterity and dynamic capacities have been studied and explored by researchers (Popadiuk, Luz, & Kretschmer, 2018). Ambidexterity is viewed as the use of dynamic capacities by Maijanen and Virta (2017), who integrate it into a broader framework. However, Yunita et al. (2023) contends that this interpretation is incorrect since ambidexterity has a distinct scope and is more focused on organizational settings and structures. Dynamic capacities, on the other hand, are primarily focused on resources and tactics.

2.4. Dynamic Capabilities and Ambidexterity

Different studies have explored the overlap between organizational ambidexterity (balancing exploration and exploitation) and dynamic capabilities, which at times generate ambiguity about whether ambidexterity is itself an organizational dynamic capability or an outcome enabled by dynamic capabilities. Through their study, Popadiuk et al. (2018) explicitly positioned dynamic capabilities as the capacities to sense, seize, and reconfigure, while ambidexterity operates as a mechanism translating those capacities into sustained outputs such as sustainability performance. This academic outcome emphasizes (Teece, 2007) that dynamic capabilities comprise identifiable managerial and organizational processes underpinning sensing, seizing, and reconfiguring, enabling organizations to adapt and sustain performance in dynamic environments.

This distinction aligns with the framework emphasizing the importance of dynamic capabilities in managerial decision-making and resource exploitation, utilizing existing competencies while developing new ones to become an ambidextrous organization (Birkinshaw, Zimmermann, & Raisch, 2016). Dynamic capabilities enable an organization

to sustain change, while ambidexterity provides the balancing logic between exploration and exploitation of resources. Additionally, other studies explore how dynamic capabilities, sensing, seizing, and reconfiguring support an organization's ability to be ambidextrous (Popadiuk et al., 2018).

Each measure of dynamic capabilities can be perceived as an antecedent to organizational ambidexterity.

Sensing: Sensing capabilities enrich organizations' capabilities with contextual interpretation, opportunity identification, and organizational competency in taking exploratory and exploitative actions when needed (Birkinshaw et al., 2016).

Seizing capabilities reinforce resource mobilization, enabling managers to allocate scarce resources across both exploration and exploitation, which are critical for sustained ambidexterity (Popadiuk et al., 2018).

Reconfiguring: Reconfiguring capabilities are translated through transforming structures and routines, preventing rigidity and enabling exploration and exploitation of organizations (Yunita et al., 2023).

Considering the above, dynamic capabilities reinforce ambidexterity, which can be reflected through the organization's ability to balance exploration and exploitation.

2.5. NGOs Context

2.5.1. Sensing Capabilities and Sustainability Performance at NGOs

Nassar and Stel (2019) have proposed sustainable strategies for addressing the needs of Syrian refugees in Lebanon. Seddiky, Giggins, and Gajendran (2020) have used Bangladesh as a case study to examine the approaches used by NGOs to strengthen their community-based disaster risk reduction (DRR) programs and integrate the adopted DRR principles into development activities to attain sustainability. The latest matches the approach executed by NGOs operating in Lebanon, where they have been implementing disaster risk reduction (DRR) strategies and integrating them into sustainability initiatives as a vital component for ensuring continuity and recovery from prolonged crises (Kraft & Smith, 2019). In Lebanon, proactive NGOs introduced preventive strategies to lessen the frequency and severity of impacts after a crisis (Kraft & Smith, 2019). NGOs have demonstrated sensing capabilities in facing continuous challenges, showing reconfiguring capabilities to ensure sustainability (Seddiky et al., 2020). By adopting a comprehensive framework that studies vulnerabilities, engages communities, and incorporates innovative technologies, organizations are making sustainable strides toward developing more sustainable societies (Bhamra, Dani, & Burnard, 2011).

NGOs in Lebanon have effectively implemented sustainable strategies by leveraging their dynamic capabilities. These skills allow organizations to identify changes and reorganize resources and processes efficiently, enhancing their ability to respond effectively to emergencies (Kraft & Smith, 2019). The proactive sensing of risks and potential opportunities, while adapting ongoing strategies have ensured that organizations maintain sustainability (Seddiky et al., 2020). NGOs have improved their resilience and reduced the effects of disasters by integrating sensing dynamic capacities into their organizational procedures. In this context, research conducted by Harun et al. (2023) analyzed the impact of sensing capabilities on sustainability performance, demonstrating a positive correlation.

H₁: The dynamic sensing capabilities (SC) are positively related to NGOs' sustainability performance (OS).

2.5.2. Seizing Capabilities and Sustainability Performance at NGOs

According to Besiou et al. (2021), international financial supporters have been essential in guaranteeing sustainability during times of crises by empowering local communities. NGOs have taken action by executing projects that enhance present local infrastructure, markets, and supplier relationships, with a focus on livelihoods, food security, and training programs aimed at building local capacities (Besiou et al., 2021). Through better preparedness, these programs aim to increase countries' capacity to withstand future calamities. As a result, NGOs operating in Lebanon have been able to improve their adaptability through dynamic seizing capabilities, which enable them to more successfully negotiate difficult situations and accomplish their sustainability objectives.

In Lebanon, the complex socioeconomic situation in addition to the Syrian crisis have lead NGOs to adaptability in adjusting their functions to address social tensions, mobilize resources, and engage in policymaking (Anholt & Sinatti, 2020). Leveraging their seizing capabilities, adapting to environmental changes, forming partnerships, and leading initiatives to improve community sustainability, organizations have demonstrated that they can recognize and seize opportunities arising from changing conditions (Harun et al., 2023).

H₂: The dynamic seizing capabilities (SEC) are positively related to NGOs' sustainability performance (OS).

2.5.3. Reconfiguring Capabilities and Sustainability Performance at NGOs

NGOs in Lebanon are able to promptly identify and react to shifts in opportunity, modifying their activities as necessary (Drnevich & Kriauciunas, 2011). These organizations take the initiative to foresee changes in community demands and quickly modify their plans and assets to respond accordingly. They adapt to changing circumstances and maximize their performance. Sustainability involves more than just sensing risks and opportunities; it also involves a system's ability to transform and withstand calamities (Herbane, 2019). From local communities to the government, it is critical to acknowledge the necessity of sustainability; this entails using dynamic capabilities in all operations to enhance readiness and adaptability (Bhamra et al., 2011). For Lebanese NGOs to sustain, it is essential to incorporate their reconfiguring and transforming capabilities, as well as their cooperative efforts at all phases (Anholt & Sinatti, 2020). NGOs in Lebanon have proven to be dynamic in recognizing changes in the environment, taking advantage of opportunities, and modifying procedures as necessary (Nassar & Stel, 2019). This proactive approach, which emphasizes adaptation, contrasts with the conventional reactive approach to catastrophe management. By optimizing their dynamic capabilities, organizations can improve their sustainability management strategies and efforts (Harun et al., 2023). In conclusion, an organization's ability to achieve its sustainability performance demonstrates both its transformational ability to incorporate different sustainable practices into its operational framework and its proactive adaptability (Karman & Savanevičienė, 2021).

H₃: The dynamic reconfiguring capabilities (RC) are positively related to NGOs' sustainability performance (OS).

2.6. Mediating Role of Organizational Ambidexterity

Organizational ambidexterity is a concrete mechanism that organizations use to convert their dynamic capabilities into sustainable performance. As the dynamic capabilities empower an organization with the capacity to sense emerging demands and threats, seize them through strategic actions, and reconfigure structures and routines to sustain changing environments (David et al., 2020). Acquiring sustainability performance requires balancing exploration and exploitation, which are core to ambidexterity theory (Popadiuk et al., 2018). According to Turner, Swart, and Maylor (2013), there is often a dearth of practical guidance on how to attain ambidexterity in which its implementation can take multiple forms in various environments and industries. Therefore, organizational ambidexterity plays a major role in mediating the effect between dynamic capacities and sustainability performance.

H_{4a}: Organizational Ambidexterity (OA) mediates the relationship between dynamic sensing capabilities (SC) and sustainability performance (OS).

H_{4b}: Organizational Ambidexterity (OA) mediates the relationship between dynamic seizing capabilities (SEC) and sustainability performance (OS).

H_{4c}: Organizational Ambidexterity (OA) mediates the relationship between dynamic reconfiguring capabilities (RC) and sustainability performance (OS).

An integrated conceptual framework is developed to demonstrate the connections between organizations' dynamic capabilities and sustainability performance, aiming to investigate sustainability performance and the role of managers in NGOs in Lebanon (refer to Figure 1). The conceptual framework was based on a model developed by Karman and Savanevičienė (2021) which has also studied the effect of dynamic capabilities on sustainability performance of a company. Additionally, this article uses Organizational Ambidexterity Theory which was developed

by O'Reilly and Tushman (2008), and Dynamic Capabilities Theory which was elaborated by Teece et al. (1997). The combination of both theories was utilized to create a model that connects the concepts of sustainable performance sensing, seizing, and reconfiguring capabilities, mediated by ambidexterity.

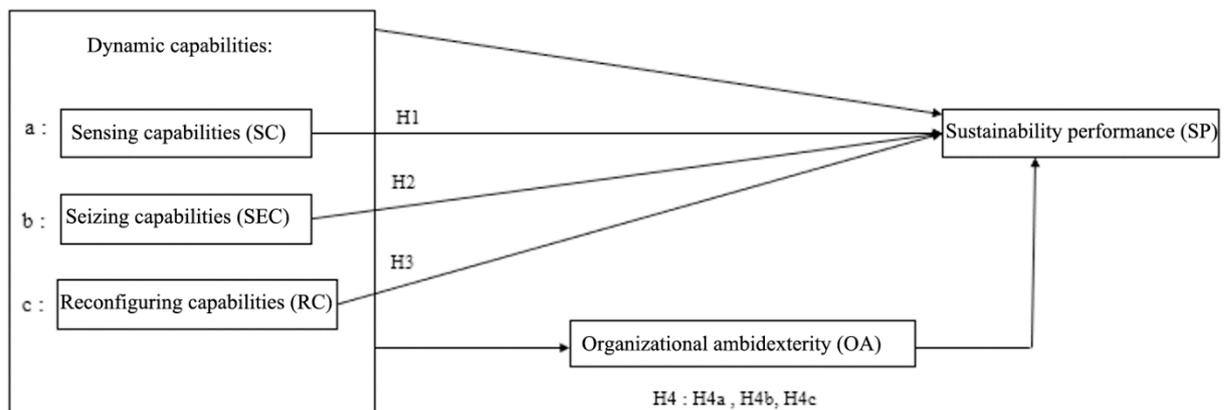


Figure 1. Conceptual framework.

3. METHODOLOGY

3.1. Research Design

A methodical examination of the connection between dynamic capabilities and sustainability performance among NGOs in Lebanon is made possible by the quantitative approach, which aligns with positivist and pragmatic research philosophies. The deductive approach provided a theoretically grounded analysis of how NGOs achieve sustainability in crisis-prone environments by supporting the empirical testing of hypotheses guided by Dynamic Capabilities Theory (Teece et al., 1997) and Organizational Ambidexterity Theory (O'Reilly & Tushman, 2008). The research uses an explanatory framework to investigate how organizational ambidexterity regulates the relationship between dynamic capabilities and sustainability performance. This method facilitates understanding of how NGOs promote sustainability in the long term (Saunders, Lewis, & Thornhill, 2018). Although this study uses organizational ambidexterity as a mediating key method linking dynamic capabilities to sustainability performance, both direct and indirect paths are tested. First, the dynamic capabilities theory considers that sensing, seizing, and reconfiguring capabilities can directly affect organizations' sustainability performance by recognizing opportunities and threats, mobilizing resources, and necessary transformations (David J Teece, 2007; David J Teece et al., 1997). Hence, dynamic capabilities influence sustainability performance directly. Second, the ambidexterity theory suggests that sustainability performance relies on an organization's capacity to balance exploration and exploitation, which implies an indirect pathway (O'Reilly & Tushman, 2008; Raisch, Birkinshaw, Probst, & Tushman, 2009). In parallel, dynamic capabilities strengthen organizational ambidexterity, which in turn improves sustainability performance. In such cases, mediation occurs between dynamic capabilities and sustainability performance.

Methodologically, testing both effects is crucial to correctly identify the form of mediation and avoid misleading inferences that can occur when only the mediated path is examined (Zhao, Lynch, & Chen, 2010). In line with PLS-SEM best practices, the study estimates a model that includes direct effects of sensing, seizing, and reconfiguring on sustainability performance (H1a–H1c), the effects of DC dimensions on OA (H3), and the indirect (mediated) effects through OA (H4a–H4c). This specification indicates whether OA is the primary transmission mechanism or whether dynamic capabilities also exert additional direct effects on sustainability performance in NGO settings.

3.2. Data Collection and Measures

Standardized questionnaires were distributed to NGO managers as part of a survey-based approach to data collection. Key elements, such as organizational ambidexterity, sustainability performance indicators, and dynamic

capacity, were assessed using Likert-scale questions (Hair, Hult, Ringle, & Sarstedt, 2022). Managers and senior posts from NGOs participated because they were involved in leading and maintaining the sustainability of organizations. Convenience sampling was used, which increased accessibility and ensured varied participation. The final sample size of 407 NGO managers was determined using Cochran's approach, guaranteeing statistical power. An online poll addressed practical concerns and enabled widespread participation. To ensure its reliability and clarity, the questionnaire was pretested and revised in response to expert feedback. It included assessments of dynamic skills (Teece, 2007), sustainability indicators (Elkington, 1997), ambidexterity metrics (Smith & Umans, 2013), and demographic questions.

3.3. Data Analysis

As of 2024, Lebanon hosts more than 11,000 registered NGOs, including local organizations, youth groups, and international NGOs (Lebanese Development Network, 2024). Other sources report that around 10,472 organizations in mid of year 2023 (Aleph-Lam, 2023) and other older academic estimates of up to 15,000 NGOs (Salem, 2023). Most of the Lebanese NGOs are small or medium size organizations, with surveys indicate that around 20–25% of staff are in managerial posts (Salem, 2023; Scholar Works AUB, 2023).

While the exact number of NGO managers in Lebanon is not officially published, the above estimates provide a starting point for approximating the managerial population in organizations operating in Lebanon. This work adheres to PLS-SEM methodological guidelines, which prioritize statistical power and model complexity over population size. A maximum of four structural paths leading to a single endogenous variable can be found in the study model, which consists of four exogenous constructs and one mediating construct. According to Hair et al. (2022), at least 40 observations are needed for a minimum sample size of ten times the maximum number of structural routes. The sample significantly surpasses these requirements with 407 valid replies, guaranteeing sufficient statistical power, reliable parameter estimation, and robustness of the PLS-SEM results. As a result, the sample size is considered suitable for evaluating the suggested model and theories.

The sample was selected based on a combination of population estimates, statistical sampling methods, and practical considerations. Sample size was determined based on standard survey approaches (Cochran, 1977) with a 95% confidence level and a 5% margin of error. The surveys collected ensured proper representation across different NGO types, sizes, and sectors. Managers' participation was based on their availability and willingness to contribute, hence balancing methodological rigor with feasibility. The discussed approach confirms that the findings are representative of NGO managerial practices in Lebanon despite the absence of a precise nationwide count.

The sample size in any survey using probability sampling with a known and finite population size is given by the following formula.

$$n = n_0 / (1 + (n_0 - 1) / N), \text{ and } n_0 = (1.96 * 1.96 * P * (1 - P)) / (E * E) \text{ where:}$$

P = The probability of the parameter of interest.

E = Sampling Margin of Error.

N = Population size.

Assuming the target population is most heterogeneous concerning a certain parameter, let $P = 0.5$ (having equal probabilities for a certain outcome), $E = 5\%$, and $N = 11,000$, then the desired sample size is $n = 371$. The sample size was increased from 371 to 407 to ensure statistical power and rigorous SEM model implementation.

In general, surveys contain two types of error.

Sampling error (known as type I error) and non-sampling error (known as type II error). Sampling error is included in the sample size calculation formula, while non-sampling error has several sources, including interviewer bias, poorly designed questionnaires, and respondents not being in the right mood to answer questions (some respondents might lie in their responses).

Since there are no theoretical models to assess non-sampling errors, the researcher cannot provide a percentage figure reflecting it. The researcher did her best to reduce this error through reliability and validity checks and by simplifying the questions.

3.4. Outer Model and Measurement Model Validation

A synthetic overview of the measurement items and construct validation is presented in Table 1. Composite Reliability (CR) was used, yielding coefficients between 0.877 and 0.914, to assess the internal consistency of the five primary latent variables. These results surpass the widely accepted threshold of 0.7, and since elevated CR levels reflect strong inter-item correlations, the results confirm that the constructs are sufficiently free of measurement error and possess robust reliability. Indicator reliability was evaluated through standardized factor loadings. While a loading of 0.7 or higher is ideal, as it indicates that the construct explains more than 50% of the indicator's variance, several items (e.g., EP3 (OS6) at 0.663 and SC1 at 0.668) exhibited loadings between 0.40 and 0.70. Following the protocol established by Hair, Ringle, and Sarstedt (2011), these items were retained rather than deleted because their removal did not lead to a significant increase in CR or AVE, and their inclusion maintains the content validity of the scales. Finally, convergent validity was evaluated using the AVE, which measures the ratio of variance captured by a construct versus the variance resulting from measurement error. This metric dictates that indicators within a single construct must correlate positively, a requirement satisfied when the AVE is at least 0.5. For this study, the AVE values for the data ranged from 0.517 to 0.681, all of which exceeded the 0.5 minimum, thereby confirming that convergent validity has been fully established.

Table 1. Constructs and an item's reliability.

Constructs and measurement items	Loadings	Composite Reliability (CR)	AVE
OS		0.914	0.517
ENP1(OS1)	0.715		
ENP2(OS2)	0.684		
ENP3(OS3)	0.755		
EP1(OS4)	0.688		
EP2(OS5)	0.707		
EP3(OS6)	0.663		
SP1(OS7)	0.769		
SP2(OS8)	0.696		
SP3(OS9)	0.775		
SP4(OS10)	0.731		
OA		0.895	0.681
OA1	0.801		
OA2	0.837		
OA3	0.866		
OA4	0.796		
RC		0.895	0.632
RC1	0.809		
RC2	0.770		
RC3	0.821		
RC4	0.723		
RC5	0.846		
SC		0.877	0.590
SC1	0.668		
SC2	0.747		
SC3	0.804		
SC4	0.799		
SC5	0.812		
SEC		0.912	0.675
SEC1	0.826		
SEC2	0.800		
SEC3	0.863		
SEC4	0.818		
SEC5	0.798		

Discriminant validity was evaluated to assess the extent to which each construct remains distinct and unique from other models. This property ensures that a specific latent variable captures phenomena not otherwise represented by different constructs in the structural framework. The Heterotrait-Monotrait ratio (HTMT) served as the statistical diagnostic for this assessment, applying a stringent threshold of 0.9. Values exceeding this 0.9 benchmark would indicate a lack of significant discriminant validity. But, as detailed in Table 2, all constructs remained below this limit. Consequently, the empirical criteria were satisfied, confirming the distinctiveness of the constructs. The results demonstrate that the reliability of the model, convergent validity, and discriminant validity are all statistically guaranteed.

Table 2. Discriminant validity matrix.

Constructs	HTMT values				
	OA	OS	RC	SC	SEC
OA					
OS	0.756				
RC	0.761	0.711			
SC	0.674	0.512	0.735		
SEC	0.769	0.686	0.872	0.793	

4. RESULTS

4.1. Structural Model

The structural model in Partial Least Squares Structural Equation Modeling (PLS-SEM) is central to this research, outlining the hypothesized relationships between latent variables. The model shows significant explanatory power, with R² values of 0.509 and 0.551 for OA and OS, respectively. This indicates that 50.9% of the variance in OA and 55.1% of the variance in OS are explained by their predictors.

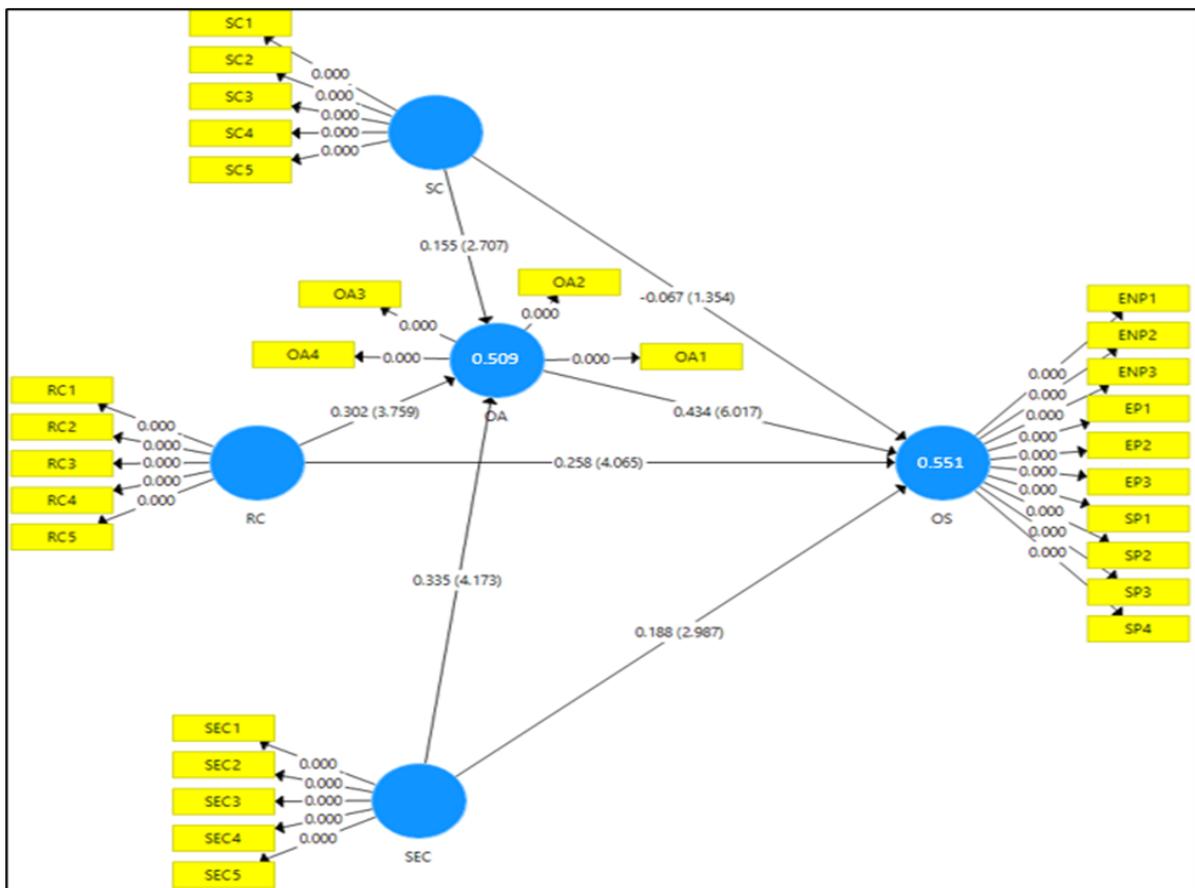


Figure 2. PLS-SEM model.

Figure 2 illustrates the structural equation model and the hypothesized relationships among the latent constructs. The model shows that SC, RC, and SEC have significant positive effects on OA, explaining 50.9% of its variance ($R^2 = 0.509$). OA, in turn, has a strong positive effect on OS, while RC and SEC also exert direct positive effects on OS. Together, the predictors explain 55.1% of the variance in OS ($R^2 = 0.551$). In contrast, the direct path from SC to OS is negative and weak. All constructs are measured reflectively by their respective indicators, which exhibit significant loadings. Overall, the model demonstrates adequate explanatory power and supports the proposed structural relationships.

Several fit indices were calculated, as presented in the estimated model results in Table 3, to assess the global fit of the structural model. The Standardized Root Mean Square Residual (SRMR) was used as the primary absolute fit measure. The model yielded an SRMR of 0.078, which falls below the established threshold of 0.08. This result indicates that the discrepancy between the observed correlations in the data and the model correlations is within an acceptable range, confirming a satisfactory model fit.

Further evaluation of the exact fit was conducted using the squared Euclidean distance (D_{ULS}) and the geodesic distance (D_G), which were 2.671 and 0.810, respectively. These indices quantify the distance between the empirical covariance matrix of the data and the model covariance matrix. The low value of D_G specifically suggests that the model's probability distribution aligns well with the data distribution.

While the Chi-Square value of 1864.759 is relatively high, a common occurrence in SEM due to its sensitivity to sample size, the Normed Fit Index (NFI) was also examined. The NFI of 0.754 indicates that the model explains a substantial portion of the variance compared to a baseline null model. Finally, the RMS Theta value of 0.143 provides insight into the degree of residual correlation. While slightly above the benchmark of 0.12, it remains within a range that suggests the structural model is generally well specified. Collectively, these statistics provide empirical evidence that the model is a valid representation of our data.

Table 3. Goodness of model fit indices.

	Estimated model
SRMR	0.078
D_{ULS}	2.671
D_G	0.810
Chi-Square	1864.759
NFI	0.754
RMS Theta	0.143

4.2. Direct Effects

The evaluation of the structural inner model began with an assessment of the direct relationships between the latent variables. As illustrated in Table 4, the direct path from OA to OS is positive and highly significant ($\beta = 0.434$, $t = 5.948$, $p = 0.000$), with a 95% bootstrap confidence interval $[0.282, 0.567]$ that excludes zero. Regarding the predictor variables, RC exerts a significant positive direct influence on both OA ($\beta = 0.302$, $t = 3.920$, $p = 0.000$) and OS ($\beta = 0.258$, $t = 4.134$, $p = 0.000$). Similarly, SEC demonstrates significant positive direct effects on OA ($\beta = 0.335$, $t = 4.293$, $p = 0.000$) and OS ($\beta = 0.188$, $t = 3.008$, $p = 0.003$). However, while the path from SC to OA is significant and positive ($\beta = 0.155$, $t = 2.719$, $p = 0.007$), the direct relationship between SC and OS is statistically non-significant ($\beta = -0.067$, $t = 1.357$, $p = 0.175$), as the confidence interval $[-0.168, 0.025]$ includes zero.

4.3. Indirect Effects

The indirect effects were examined via bootstrapping. Table 4 reveals that all three indirect paths through OA are statistically significant. The indirect effect of RC on OS is 0.131 ($t = 3.386$, $p = 0.001$), supported by a 95% confidence interval of $[0.065, 0.217]$. For SEC, the indirect effect on OS is 0.145 ($t = 3.315$, $p = 0.001$), with a

confidence interval of [0.074, 0.250]. Finally, the indirect path from SC to OS through OA is significant at 0.067 ($t = 2.612, p = 0.009$), with a confidence interval of [0.022, 0.124]. The significance of these indirect effects confirms that OA serves as a functional mediating mechanism within the model.

4.4. Total Effects

The total effects within Table 4 represent the sum of direct and indirect influences. The total effect of RC on OS is strong and significant ($\beta = 0.389, t = 6.214, p = 0.000$), as is the total effect of SEC on OS ($\beta = 0.333, t = 5.027, p = 0.000$). Notably, the total effect of SC on OS is non-significant ($\beta = 0.000, t = 0.004, p = 0.997$). A non-significant total effect does not preclude the existence of mediation; rather, it often indicates that a significant indirect effect is being neutralized by a non-significant or opposing direct effect, which is observed here in the relationship between SC and OS.

4.5. Mediation Typology and Classification

The mediation effects were classified into specific typologies based on the significance and signs of the effects. For the paths involving RC and SEC, the data demonstrates complementary mediation. In the case of RC, both the indirect effect of 0.131 and the direct effect of 0.258 are significant and share the same positive direction. Similarly, for SEC, the indirect effect of 0.145 and the direct effect of 0.188 are both significant and positive, suggesting that OA partially mediates the relationship while leaving room for other potential mediators.

Conversely, the relationship between SC and OS is classified as indirect-only mediation. While the indirect effect of 0.067 is statistically significant, the direct effect of -0.067 is non-significant. This confirms that the influence of SC is channeled entirely through the mediating mechanism of OA. This rigorous classification confirms that the data fulfills the requirements for mediation across all tested paths, validating the central role of OA in the structural model.

Table 4. PLS-SEM results for direct, indirect, and total paths.

	Based sample	Mean	St Dev	T	P	Confidence interval	
						2.5%	97.5%
Direct Effect							
OA -> OS	0.434	0.434	0.073	5.948	0.000	0.282	0.567
RC -> OA	0.302	0.307	0.077	3.920	0.000	0.153	0.451
RC -> OS	0.258	0.260	0.062	4.134	0.000	0.136	0.380
SC -> OA	0.155	0.156	0.057	2.719	0.007	0.041	0.263
SC -> OS	-0.067	-0.068	0.049	1.357	0.175	-0.168	0.025
SEC -> OA	0.335	0.329	0.078	4.293	0.000	0.188	0.487
SEC -> OS	0.188	0.192	0.062	3.008	0.003	0.058	0.304
Indirect Effect							
RC -> OA -> OS	0.131	0.133	0.039	3.386	0.001	0.065	0.217
SC -> OA -> OS	0.067	0.067	0.026	2.612	0.009	0.022	0.124
SEC -> OA -> OS	0.145	0.143	0.044	3.315	0.001	0.074	0.250
Total Effects							
OA -> OS	0.434	0.434	0.073	5.948	0.000	0.282	0.567
RC -> OA	0.302	0.307	0.077	3.920	0.000	0.153	0.451
RC -> OS	0.389	0.393	0.063	6.214	0.000	0.253	0.502
SC -> OA	0.155	0.156	0.057	2.719	0.007	0.041	0.263
SC -> OS	0.000	-0.001	0.056	0.004	0.997	-0.116	0.105
SEC -> OA	0.335	0.329	0.078	4.293	0.000	0.188	0.487
SEC -> OS	0.333	0.335	0.066	5.027	0.000	0.205	0.463

4.6. VIF (Variance Inflation Factor)

Referring to Table 5, all VIF values for OA (2.035), RC (2.653), SC (2.009), SEC (3.033), RC-OA (2.468), SC-OA (1.960), and SEC-OA (2.805) are well below the threshold of 5. This indicates that multicollinearity is not a significant concern in this structural model, and the estimated path coefficients are reliable and not influenced by high

correlations among predictor latent variables. This ensures the robustness of coefficient estimates within the PLS algorithm.

4.7. F-Square (Effect Size) and Practical Significance

Examining the "F-square" and "Effect size" in Table 5, we observe that OA has an f^2 of 0.207, classified as a moderate effect, suggesting a practical impact on the R^2 of its dependent variable. RC ($f^2 = 0.056$), SC ($f^2 = 0.005$), SEC ($f^2 = 0.026$), RC-OA ($f^2 = 0.075$), SC-OA ($f^2 = 0.025$), and SEC-OA ($f^2 = 0.081$) all show small effect sizes. These f^2 values provide valuable insights into the practical relevance of each predictor. While many effects are statistically significant, their practical impact, as indicated by f^2 , might be small. The moderate effect size of OA is noteworthy, suggesting its considerable explanatory power within the model.

A path coefficient's statistical significance indicates that a relationship exists, and its magnitude, combined with the f^2 effect size, indicates its practical importance. For instance, the direct effect of OA on OS ($\beta = 0.434$, $f^2 = 0.207$) is not only statistically significant but also demonstrates a moderate practical impact. Conversely, while other constructs have statistically significant direct and/or indirect effects, their f^2 values are generally small. This implies that, although they contribute to the model's explanatory power, their unique contribution to the R^2 of the endogenous variables, when considered in isolation, is less noticeable compared to OA.

Table 5. VIF, F-square, and Effect size.

	VIF	F-square	Effect size
OA	2.035	0.207	Moderate
RC	2.653	0.056	Small
SC	2.009	0.005	Small
SEC	3.033	0.026	Small
RC-OA	2.468	0.075	Small
SC-OA	1.960	0.025	Small
SEC-OA	2.805	0.081	Small

4.8. Relationships Between Variables

Examining the f-square effect sizes in the current model provides key insights into the strength of relationships between dynamic capabilities, organizational ambidexterity, and NGO sustainability performance, as well as the practical significance of these connections. We can interpret the results using Cohen's guidelines, where an effect size of 0.02 is considered small, 0.15 moderate, and 0.35 or higher large. The findings show that organizational ambidexterity (OA) has a moderate effect ($f^2 = 0.207$) on sustainability performance (OS). This means OA explains a noticeable portion of the differences in OS, indicating that other factors do not account for this variation. This moderate impact highlights the importance for NGOs to nurture organizational ambidexterity through balancing exploration of new opportunities and exploitation of existing strengths if they aim to improve their sustainability outcomes.

On the other hand, the direct impact of reconfiguring capabilities (RC), sensing opportunities (SC), and seizing opportunities (SEC) on a company's sustainability and ability to balance current and future needs is not significant. These effects are relatively small, typically ranging from 0.005 to 0.081. For instance, regarding reconfiguring capabilities, their influence on organizational balance and sustainability is positive but not very strong, with a measure (f-square) of around 0.056.

Sensing capabilities show one of the weakest direct effects ($f^2 = 0.005$). This indicates that they are not sufficient on their own, even though they matter statistically, especially when considering how they work through the mediating effect. At the same time, the seizing capabilities have slightly more substantial, though still minor, effects (around 0.026 to 0.081). This suggests that they play a slightly more noticeable role in shaping the organizational balancing act, which, in turn, affects sustainability performance.

The hypotheses (H2 and H3), which suggest that seizing and reconfiguring capabilities have a positive, direct impact on the sustainability of NGOs, are generally supported by the statistics. While H1, which claims that sensing capabilities have a positive, direct impact on the sustainability performance of NGOs, is not supported by the analysis. However, these effects tend to be reasonably small. This aligns with the theory of dynamic capabilities, which states that these abilities are important but, on their own, are probably not enough to achieve sustainability performance. Their real power seems to emerge when they are combined through how an organization works, such as when it is ambidextrous, able to handle exploration and exploitation effectively. For example, the direct link between sensing capabilities and sustainability (H1) was not strong enough to be statistically proven in this model. This suggests that even if sensing capabilities are of added value, their main benefit likely stems from indirectly encouraging flexible organizational behaviors rather than fulfilling immediate gains in sustainability.

Hypotheses H4a, H4b, and H4c support the mediating role of organizational ambidexterity in the relationship between dynamic capabilities and sustainability performance. The relative effect size of OA mediation (moderate f-square) underscores its crucial role in translating the latent potential of dynamic capabilities into sustainability performance. Significant indirect effects via ambidexterity reinforce this point. For example, reconfiguring capabilities contributes to sustainability through OA, with an indirect effect size that is both statistically significant and substantive, indicating that the flexible realignment of resources leads to improved sustainability only when coupled with ambidextrous managerial practices. Seizing and sensing capabilities follow a similar pattern, wherein organizational ambidexterity serves as a vital conduit for these capabilities to exert a positive influence on sustainability; thus, H4a, H4b, and H4c are supported.

The results reached are important both in theory and in practice, even though the overall impact observed is only minor to moderate. It is normal to observe minor effects in organizational studies, as factors such as performance are highly complex and influenced by different internal and external factors. However, even these modest impacts, which were found in this research, can add up significantly and make a considerable difference for sustainability over time, mainly when spread across different parts of an organization. This revisits the concept that developing and nurturing "organizational ambidexterity" enhances an organization's capability to adapt, hence maximizing its "dynamic capabilities." Moreover, it suggests that for NGOs, this is a crucial strategy if they want to enhance their sustainability performance, particularly in uncertain times.

Moreover, the low to moderate F-square values suggest room for further research to identify additional predictors and boundary conditions that can strengthen these relationships. It may be beneficial to explore contextual factors, such as leadership styles, institutional support, or stakeholder engagement, which could interact with dynamic capabilities and ambidexterity to produce larger effect sizes and a more practical impact.

5. DISCUSSION

NGOs should invest in strategies that improve their ability to recognize and react to changes in the environment while balancing short-term stability with long-term sustainability. NGOs operating in unstable environments, like Lebanon, should also proactively create flexible organizational structures that allow them to take advantage of new opportunities and respond to external constraints. The results emphasize how important dynamic capabilities such as sensing, seizing, and reconfiguring are as tactical instruments for improving NGOs' operational efficacy and long-term sustainability.

Contrary to theoretical discussions, the sensing capabilities did not exhibit a statistically significant direct association with sustainability performance. However, they showed a significant relationship with organizational ambidexterity and a significant indirect effect on sustainability performance through ambidexterity. This suggests that the sensing capabilities of organizations function as a preliminary interpretive capability that would enhance the awareness of relevant stakeholders' needs, potential risks, and opportunities, rather than acting toward sustainability outputs and performances. In volatile environments like Lebanon, the input of information and insights does not

automatically translate into performances unless converted into real actions. Accordingly, organizational ambidexterity provides this conversion mechanism by enabling NGOs to explore adaptive responses while exploiting and stabilizing core routines. Hence, sustainability performance may require both sensing capabilities and decision processes captured by ambidexterity, which justifies the indirect effect.

An important takeaway is that to balance short-term adaptive reactions and long-term sustainability goals, NGOs must foster organizational ambidexterity. According to earlier research, companies can improve their flexibility and resilience by skillfully integrating exploration and exploitation tactics (O'Reilly & Tushman, 2008; Smith & Umans, 2013). According to this paper, ambidexterity is a crucial mediating factor, therefore NGO administrators need to cultivate a culture that prioritizes both stability and creativity.

The distribution of resources and strategic planning have another important influence in this study. The findings demonstrate that resource management, including restructuring and leveraging competencies, has a direct impact on sustainable outcomes. This corroborates Teece et al. (1997) findings that firms with significant reconfiguration capabilities are better able to react to market shifts and external disturbances.

5.1. Contribution of the Study

This paper provides an important understanding of how NGOs might continue to operate in areas vulnerable to crises, as it also contributes to the ongoing discussion about theories, methods, and practical applications. The reached findings cover a research gap about how NGOs might accomplish long-term, sustainable achievements by combining Dynamic Capabilities Theory (Teece et al., 1997) with Organizational Ambidexterity Theory (O'Reilly & Tushman, 2008). The contribution of this study is an extension and context-specific test rather than a complete departure from existing work.

Dynamic capabilities and ambidexterity have been studied at the corporate level and increasingly discussed in sustainability research. This paper advances that literature by empirically testing the integrated model in an NGO setting characterized by volatility and resource constraints. The study provides evidence that some capability effects, particularly sensing capabilities, operate primarily through ambidexterity rather than directly, clarifying the pathway from capability to performance in crisis-based environments.

At a practical level, the study involves a significant input with detailed suggestions for international leaders, donors, and policymakers. Given that environmental uncertainty might impede effective strategies prepared by management for the long-term success of organizations, it recommends that leaders focus on developing flexible resource management strategies and enhance the organization's dynamic capabilities. The study also emphasizes how secure and long-term financial sources play a major role in the sustainability of NGOs, highlighting the importance of management in guaranteeing funding sources. Donors' short-term funding models pose challenges for many NGOs in Lebanon, limiting their ability to carry out long-term development and sustainability (Anholt & Sinatti, 2020). International donors are urged by the study to create financing structures that facilitate both short-term relief operations and long-term capacity building.

5.2. Contribution to Theory

This article studies how NGOs operating in Lebanon use sensing, seizing, and reconfiguring capabilities to improve their sustainability performance, empirically validating relevance in unstable environments marked by crisis and limited resources. The findings suggest that ambidexterity is a key mechanism that catalyzes the effect of dynamic capabilities on achieving sustainability performance at the NGO level, with sensing capabilities showing a predominantly indirect effect. Despite prior research suggesting that ambidexterity benefits corporate firms endeavoring to balance exploration and exploitation, this research studies the framework in NGOs (Tarba, Jansen, Mom, Raisch, & Lawton, 2020). This work further advances knowledge of sustainable management by establishing a

connection between dynamic capacities and sustainability performance, which has been examined in corporate settings (Starik & Rands, 1995) but not yet explored in the context of NGOs.

It demonstrates that seizing and reconfiguring capabilities have a direct effect on sustainability performance, supporting the notion that organizations operating in times of crisis must constantly modify their strategic models to maintain long-term effectiveness. Furthermore, by showing how intricate connections between sustainability, ambidexterity, and capabilities may be statistically assessed, this study advances the methodological development of structural equation modeling (PLS-SEM) in the context of non-governmental organizations. A robust quantitative model that may be replicated and improved upon in subsequent research is presented in this work.

6. LIMITATIONS AND AREA FOR FURTHER RESEARCH

To better understand NGO sustainability strategies, future research can build on these findings by examining other areas, such as how technology adoption and digital transformation might enhance dynamic capabilities and assist managers in strategic formulation and execution. Teece et al. (1997) and Helfat and Raubitschek (2018) also emphasize the importance of digital competency in an organization's ability to sense, seize, and adapt to changes.

Another critical issue is the long-term evaluation of sustainability performance in relation to dynamic capacities of organizations. Although the current study offers a narrow viewpoint at this aspect, Ambrosini and Bowman (2009) observed that dynamic capacities would change based on experience, education, and external factors. Moreover, this research didn't investigate how leadership and management cognition would play a role in affecting NGOs' dynamic capacities. The institutional theory of DiMaggio and Powell (1983) states that normative, mimetic, and coercive factors also impact organizational behavior, which shows another limitation for this research. Suggesting future research to make use of organizational entrepreneurship frameworks to better understand how NGOs interact and change contexts (Battilana, Leca, & Boxenbaum, 2009).

Another insight that can be elaborated is the role of financing mechanisms in maintaining sustainability of NGOs, in which the risk of relying on donors are emphasized by Batti (2014) and Ebrahim (2005). Financing diversity, including hybrid models and impact investments, creates room for potential studies. The latter would play a critical role in affecting the long-term sustainability of organizations despite existing dynamic capabilities.

Although the study's focus is Lebanon, generalizability could be improved with a more thorough examination. Opportunities to learn how NGOs might use strategic capability building to create a long-lasting impact during crises are presented in this article.

7. CONCLUSION

The findings of this study show that NGOs with strong dynamic capabilities are better at facing challenges in unstable environments. However, this research also sheds light on the fact that although dynamic capacities are crucial for the survival of NGOs, their impacts are automatic. This situation was presented in the relationship between sensing capability and sustainability performance. Despite strong theoretical expectations, sensing capabilities did not have a significant direct effect on sustainability performance. Sensing, which is defined as the capacity to sense risks, opportunities, and environmental changes, may not be enough to produce sustainable results. NGOs may identify new requirements and risks in unstable and resource-constrained environments like Lebanon but often lack the structural adaptability or decision-making skills necessary to convert this information into long-term performance improvements. Instead, the significance of the effect was intensified by the organizational ambidexterity mechanism in utilizing resources effectively. This finding implies that supplementary organizational procedures and interpreting environmental change improve sustainability outcomes only when translated into a balanced mix of exploration and exploitation. This result is consistent with earlier studies that contend dynamic skills are dormant and only produce benefits when triggered by managerial activity and organizational procedures (Ambrosini & Bowman, 2009; Teece, 2007).

The study also shows that the transformation of dynamic skills into sustainability performance is significantly mediated by organizational ambidexterity, which lies in balancing exploration with exploitation of resources. Instead of portraying this outcome as wholly original, the research's contribution is to expand and contextualize current dynamic capacities and ambidexterity frameworks to the NGO sector functioning under protracted crisis situations. This research offers empirical evidence from a humanitarian context, which refines rather than redefines existing theory, even if previous studies have validated the same correlations in corporate and public-sector settings.

The findings from this research provide valuable input for international donors and NGO leaders worldwide. They emphasize that investing in NGOs' capacity-building initiatives would enhance their ability to identify emerging crises, capitalize on opportunities, and restructure internally for better adaptability. This requires developing organizations and improving their data-driven strategic planning and decision-making processes. The paper also highlights that financial diversification helps NGOs sustain themselves rather than depend on a single funding source. Impact investing, social enterprises, and stakeholder partnerships are suggested funding approaches NGOs can explore to achieve financial stability. Strengthening collaboration among sectors, including NGOs, government agencies, and private companies, creates new opportunities for NGOs to improve coordination, share information, and mobilize resources effectively during crisis management initiatives.

Additionally, NGOs should leverage technologies to improve sustainability and strategic adaptability by increasing the use of digital platforms, extensive data analysis, and artificial intelligence in humanitarian efforts. Governments and international donors could also support the long-term capacity building of organizations instead of providing only short-term, project-specific funding. Their efforts should focus on strategic training in crisis preparedness and adaptive strategic management. Besides, streamlining legal frameworks and minimizing bureaucratic hurdles would assist NGOs in operating more effectively in crisis-based regions. This research provides valuable insights for NGOs and governments addressing sustainability challenges in uncertain environments, in addition to enriching academic and literature discussions.

Overall, the results provide a theoretical and practical synthesis by demonstrating that sustainability in NGOs is attained through the strategic integration of sensing, seizing, and reconfiguring skills made possible by ambidextrous organizational practices, rather than just environmental awareness. Practically, this implies that funders and policymakers should complement short-term project financing with support for capability-building, such as providing flexible funding, embedding learning and evaluation systems, staff training, and encouraging partnership infrastructure. Accordingly, NGOs can sense change, reallocate resources, and scale effective interventions without sacrificing innovation. For NGO managers, the findings recommend prioritizing governance and systems that support ambidextrous decision-making, thus converting adaptive capabilities into sustainability outcomes.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

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