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The immediate impact of an integrated resilient development project on a coastal city in the Global South

The case of Accra, Ghana

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The Immediate Impact of an Integrated Resilient Development Project on a Coastal City in the Global South: The Case of Accra, Ghana

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Abstract

Urban projects featuring resilient development have become popular, whereas limited studies have been invested in evaluating the impacts of these projects, especially regarding those that rely on bilateral/multilateral partnerships to enable their implementation. This paper addresses this research need by conducting an assessment regarding the impacts that the Greater Accra Resilient and Integrated Development Project (GARID), supported by the World Bank, has led. Two surveys were conducted in 2022 and 2024, respectively, to capture the baseline and midline of GARID's implementation. The paper proposes an assessment centring on resilience enhancement and inclusive growth with a Difference in Difference (DiD) design to demonstrate the changes occurring in the intervened neighbourhoods in contrast to the comparative counterparts. The findings suggest that, since the initiation of GARID's interventions on the ground, it has significantly facilitated project transparency and stimulated notable bottom-up commitments to neighbourhood improvements. Unexpected results have also emerged, such as learning that the residents' living satisfaction has declined during the assessing period; yet, these results are understandable, considering that the actual interventions have been delayed and the implementation is still in progress. GARID is found conditionally enhancing Greater Accra's regional resilience based on its immediate impacts thus far, and an optimistic view is promising regarding the upward outcomes that GARID will result in later. The project will benefit from expediting certain interventions to avoid temporal contestations, maintaining its extensive participatory activities, and initiating early discussion around sustainable operations and maintenance mechanisms. Experiences of GARID could provide fruitful lessons for other cities to advance their resilience investments.

Keywords

Global South, Resilience, Assessment Framework, Case Study, Difference-in-Difference Estimation, International Development

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1. Introduction

Resilience has been extensively explored theoretically and pragmatically, making its pursuit a shared value among different disciplines. Understanding resilience in the scope of development and adaptation, projects built upon this concept have spread worldwide, bringing changes that can transform human well-being through livelihood stress reduction and climate adaptation enhancement (Jha et al., 2013; Schipper & Pelling, 2006). Its popularity has consequences, to the extent that it worries actors that resilience is deemed a vague buzzword that is hard to be credited (Keating & Hanger-Kopp, 2020), and the concept lacks an implementation vision connecting resilience to transformations (Carr, 2019).

It is worth noting that documenting the material outcomes achieved in projects is durable, capturing the transformation while showing the alleviation of shocks and stresses. However, it may be challenging (Keating & Hanger-Kopp, 2020). Searching for better ways to measure resilience remains an understandable research need (Béné, 2013; Davoudi et al., 2012), intertwined with relevant inquiries about whose resilience is measured, by whom, and for whom (Gaillard & Jigyasu, 2016). Configuring the funding sources that have enabled the implementation of the above projects adds another complexity to this discussion, partly regarding the ones relying on foreign aid to proceed (Stren, 2014). Conducting resilient development projects is complicated, and so is understanding the outcomes that they have.

Some earlier assessment works have paved the way forward. For example, the novel work by Béné and Haque (2022) establishes a quantitative evaluation of resilience interventions based on a Difference in Difference (DiD) design. Béné and Haque measure the impact of the ECOFISH (Enhanced Coastal Fisheries) project, supported by the Government of Bangladesh, the WorldFish Center, and USAID, to strengthen the resilience of the targeted communities in southern Bangladesh. They notice that the households involved in ECOFISH display a higher propensity to adopt positive responses during shocks than those that do not participate. In other words, by applying DiD, Béné and Haque can validate ECOFISH's impact on enhancing resilience. Another work, also by Béné and colleagues (Béné, et al., 2020), evaluates the effects of resilience intervention (the SUR1M project) in Niger, which, however, suggests that the higher level of resilience of the beneficiaries has not translated into a clear positive impact on

their well-being. Despite the progress, studies developed to enhance this discussion with evidence are still limited.

More work is needed to understand the impacts that resilient development projects could result in, and this paper is an effect of such. In accordance with the motivation that the above literature has landed, this paper aims to extend the field by exploring the impacts of the Greater Accra Resilient and Integrated Development Project (GARID) for two reasons. First, the literature has suggested exploring further resilience efforts in African cities because of their unique approaches to achieving climate resilience (Kareem et al., 2020; Satterthwaite et al., 2020). The second concerns the methodological framework the paper could draw from the scholarships. Based on several references, an assessment framework is proposed to assemble relatable indicators – supported by robust local context – to specify the improvements (Samuels & Kim, 2023) and contextualize the impact of projects on people's well-being (Béné & Haque, 2022). These notions structure the knowledge base for this study.

The paper asks if GARID has improved Greater Accra's regional resilience; if so, in what aspects has the project affected the most? An assessment framework involving eight dimensions and 19 indicators is proposed. Accordingly, two separate surveys were conducted in 2022 and 2024 to capture pre- and post-intervention conditions. A DiD approach is utilized to differentiate changes in the intervened neighbourhoods (where GARID has major interventions) in contrast to the comparative ones with statistical results. In this vein, the following sections are arranged as follows: Section 2 engages further with the context of GARID. The assessment framework, data collection process, and the DiD design are explained in section 3. Section 4 presents the results of both descriptive findings and statistical analyses, while section 5 relates the findings to the literature and provides more discussion. Policy Implications and Conclusion are provided in sections 5 and 6, respectively.

2. Assessment Experiences of Greater Accra Resilient and Integrated Development Project

GARID is a five-year investment loaned by the World Bank in 2019 to conduct resilient development (World Bank, 2019). As an international project that aims to improve flood risk management and access to basic infrastructure and services in the targeted informal settlements, GARID is currently one of the most up-to-date resilience plans. This research uses household surveys, field observation, and unstructured interviews to collect its materials and contextualize the different impacts activated by GARID.

GARID focuses on a series of projects to build up both flood mitigation and the capacity of drainage channels; ultimately, the goal is to change the flood return period from the current frequency at once-every-year to once-every-ten-years (World Bank, 2019). It lays out five components (see Figure 1 and Table I-1 in Appendix I). The project first maps out its climate-resilient drainage and flood mitigation measures (component 1). It consists of structural measures, such as the construction of flood retention basins, to mitigate flood impacts, and nonstructural measures, like installing flood early warning systems, to improve flood preparedness.

The project secondarily turns to solid waste capacity management improvement (component 2). Its goal is to reduce solid waste volumes in the Great Accra Region (GAR), involving disposed and uncollected waste. The third piece of GARID engages with the residents downstream of Nima Stream about their needs and conducts upgrading intervention – as participatory upgrading – in Nima, Nima, Alogboshie, and Akweteyman (component 3). Component 4 (project management) supports project management activities of the implementing entities and preparatory studies for the subsequent phases. Component 5 (contingent emergency response) foresees the need to enable rapid funding reallocations between the above components under emergency conditions.

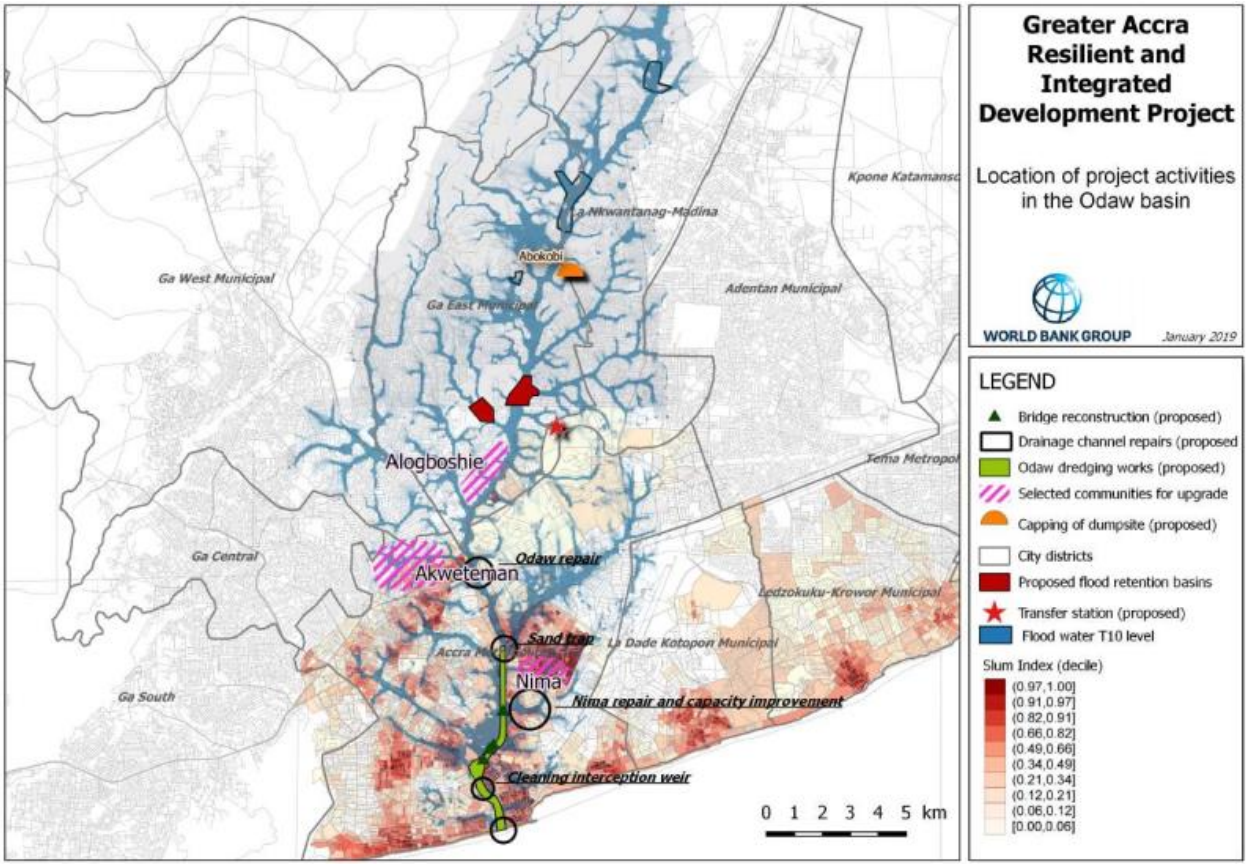

Figure 1. Greater Accra Resilient and Integrated Development Project – Project Activities
Source: World Bank (2019)

3. Methods

3.1 Impact Assessment and Data Collection

This research focuses on components 1 to 3. It reviews GARID's progress toward resilience building by comparing selected measurements upon considering pre- and post-interventions. Crucial assessment experiences have emerged during the research process.

First, given that the World Bank utilizes designated objective indicators to monitor the outcomes associated with the above three components, the research can thus review secondhand indicators to reveal GARID's progress from a physical aspect. Furthermore, to understand the content that the World Bank might not cover, the research uses field observation and unstructured interviews to capture relevant processes, difficulties, and impacts.

Second, to address the social aspect of resilience building, indicating the community transformation concept (Carr, 2019) that the World Bank has yet to cover, the research conducts interviews and household surveys to determine the social impacts the interventions have led to. For this purpose, an impact assessment framework tied to GARID shall be developed based on the literature, partly via engaging with three groups: Local Officials (G1), Local Residents before Interventions (G2), and Local Residents after Interventions (G3). Appendix I further how these groups are engaged.

Based on the literature (Accra Metropolitan Assembly, 2019; Asian Development Bank, 2011), the research's impact assessment framework was proposed with two independent investigations, pre-and post-GARID interventions, covering both qualitative and quantitative measures. Given that GARID centres on the three components illustrated above, two assessment dimensions are identified in the framework, considering their relevance to Accra: (1) resilience enhancement and (2) inclusive growth. Two key references are reviewed to articulate the underlying concepts and selected indicators.

1. Resilience enhancement: This research uses *Accra Resilience Strategy (ARS)*, released by Accra Metropolitan Assembly and 100 Resilient Cities (2019), to select the related indicators. The report identified three pillars, eight goals, and 27 initiatives for enhancing Accra's resilience. This research uses ARS as a fundamental resilience enhancement framework and identifies its overlapped goals with GARID.

2. Inclusive growth: This research also defines inclusive growth as economic growth with equal opportunity. It engages with the Framework of Inclusive Growth Indicators (FIGI) developed by the Asian Development Bank (2011) because of its depth and clarity of indicators. FIGI suggests three action-oriented policy pillars to anchor inclusive growth and 26 indicators to evaluate the progress. This research selects the relevant indicators in the assessment while adding the ad hoc pillar for GARID under Inclusive Growth. This ad hoc pillar follows the literature's suggestion on enabling a way to observe long-term transformation toward the communities' well-being (Béné & Haque, 2022; Carr, 2019). Pillars with the goals above are interrelated to GARID's components in Figure 2.

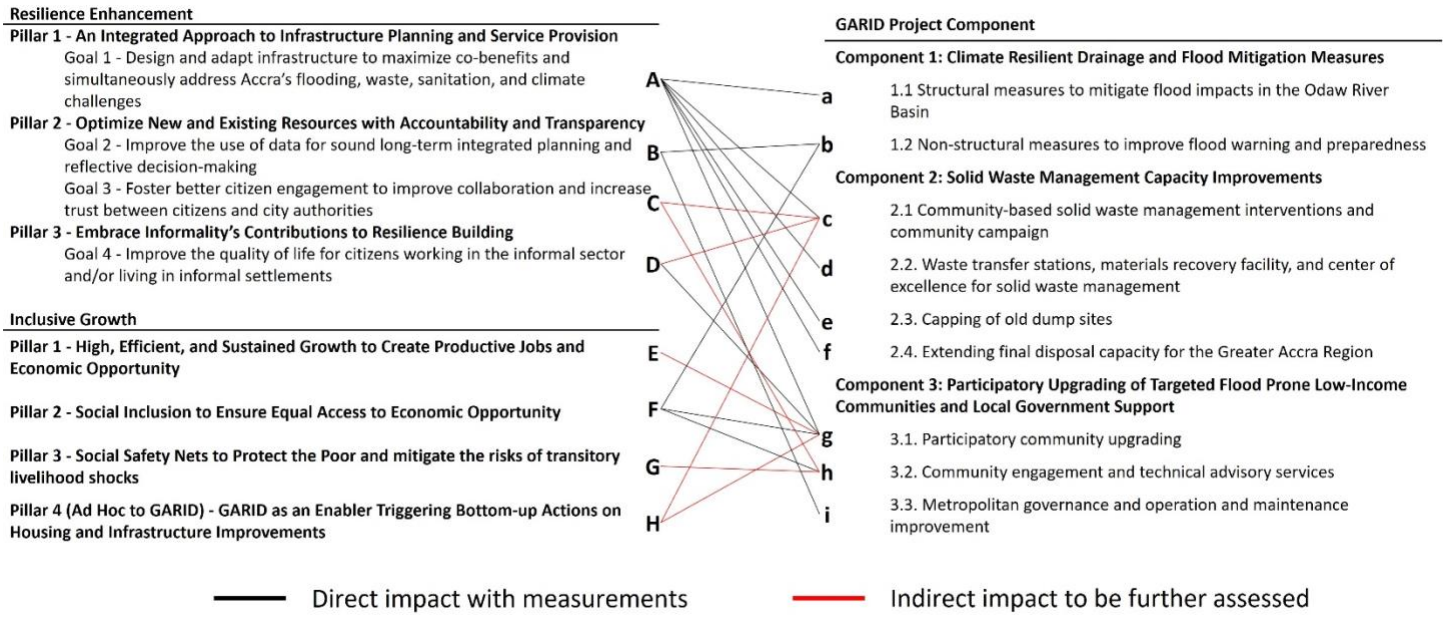

Figure 2. Interrelating Assessment with GARID Components

The third piece of experience sharing is tied to the research's analytical procedure. Upon summarizing Figure 2's indicators (further specified in Appendix II), linking the indicators with pillars/goals (A to H), GARID components (a to i), and data sources (from the World Bank, interviews, or surveys), a further task is to decide the appropriate statistical tool for analysis. With qualitative and quantitative measures collected, the research hence captures Accra's urban conditions as pre-and post-interventions, hypothesizing that the indicators from the midline will improve compared to those from the baseline assessment (see Table 1).

For its qualitative measures, the research uses content analysis to illustrate the changes. For example, with a question asking if the participant has any concerns about GARID, the researcher evaluates if the response improves, partly expressing his/her appreciation of GARID rather than showing the worrisome. For the quantitative measures, this research utilizes a DiD approach to estimate the effects of GARID. DiD can be applied when certain groups are exposed to treatment and others are not (Bradley & Green, 2020). In this research, DiD is employed to compare the changes in indicators (pre- and post-interventions) between the neighbourhoods intervened by GARID (GN) and the comparative neighbourhoods not intervened by GARID (CN, the control group). An example could be whether the introduction of GARID leads to a significant increase in satisfaction with living when comparing GN to CN (see Table I-2 and Figure I-1 in Appendix I for more details). Table 1 illustrates the complete items the research will deliver under the proposed assessment framework.

Table 1 Methods for Presenting the Baseline and Impact Assessment

Baseline Assessment – Before Interventions • Review the World Bank report for the monitored indicators • Document the critical structural interventions (i.e., detention basins and flood early warning system) with narratives and photos from on-site visits • Perform descriptive analysis on household survey results of CN and GN (with G2) • Provide descriptive analysis and narrative of interview results from interviews (with G1)
Impact Assessment – After Interventions • Review the World Bank report for the updated indicators • Revisit and document the critical structural interventions with narratives and photos • Perform a difference-in-differences analysis of CN and GN considering before and after GARID interventions (comparing G3 to G2)

It should be noted that the pre-and post-interventions of this research are set at the baseline in 2022 and the midline in 2024. At the same time, secondary sources, such as the World Bank reports, are yet to be further released by organizations to enable a comprehensive assessment that the research has proposed. This paper, which is developed parallel to the research while GARID intervention is still in progress, intentionally utilizes the survey results to conduct the DiD estimation and demonstrate the immediate impacts of GARID. In other words, the qualitative materials from the interviews and the secondary sources from the World Bank are not explicitly utilized in this paper's analytical scope.

3.2 Empirical Estimation

To identify the causal impact of the introduction of GARID using a DiD design, the paper estimates the following equation:

$$y_{hnt} = \alpha + \beta_1 treat_n + \beta_2 midline_t + \beta_3 (treat_n * midline_t) + \sum_{k=1}^{K} \vartheta_k X_{hnt} + \varepsilon_{hnt} \qquad (1)$$

Where h denotes household, n denotes the neighbourhood in which the household resides (GN or CN) and t denotes time of measurement (baseline or midline). y denotes the outcome variable, $midline$ is a dummy variable for measurements taken at the end line, X is a vector of k covariates, including demographic characteristics of the respondents (age and sex), socioeconomic background (level of education and household wealth), property ownership, and sector of employment. ε is the error term.

The paper considers eight dimensions enlisted in the assessment framework, with 19 different outcome indicators. These indicators are: (1-1) indicator assessing if the household has experienced flooding in the past 12 months, (1-2) indicator assessing the numbers of flooding in the household in the past 12 months, (1-3) indicator assessing the household's perception of flooding severity in the household, (1-4) indicator assessing the household's perception of reduced physical and financial losses in the past 12 months, (1-5) indicator assessing the household's flooding concern, (1-6) indicator assessing the household's perception of environmental influences after rains, (1-7) indicator assessing the numbers of flooding in the neighborhood in the past 12 months, (1-8) indicator assessing the household's perception of flooding severity in the neighborhood, (2-1) indicator assessing if the household has heard of GARID, (2-2) indicator assessing if the household has heard of governmental intervention, (3-1) indicator assessing the household's trust in local government to improve living conditions, (3-2) indicator assessing the household's trust in national government to improve living conditions, (4-1) indicator assessing the household's living satisfaction in the neighborhood, (5-1) indicator assessing the household's satisfaction on current occupation, (6-1) indicator assessing the household's perception that women are equal in employment opportunities, (6-2) indicator assessing the household's perception that women are equal in neighborhood decision-making, (7-1) indicator assessing the household's perception of neighborhood protection to reduce poverty, (7-2) indicator assessing the household's perception of organizations to help with financial

difficulties, and (8-1) indicator assessing the household's commitment to improving the neighborhood.

This paper runs ordinary least square regressions in all cases. Thus, for the dummy variable outcomes, the paper reports results from linear probability models.

4. Results

4.1 Descriptive Statistics

Table 2 illustrates the descriptive findings drawn from the surveys, which include information on baseline and midline assessments based on 451 households assembled in different periods. 300 of the 451 households were in GN, and the remaining in CN.

Table 2 Descriptive Statistics

	Baseline in 2022			Midline in 2024		
	GN	CN	Diff. (p-value)	GN	CN	Diff. (p-value)
Basic Information						
Number of households	300	151		300	151	
Household Size	4.3	4.2	0.1	4.8	4.6	0.2
Age (in years)	40.8	39.5	1.3	41.5	40.2	1.3
Sex = male	40.3%	37.7%	2.6%	32.0%	40.4%	-8.4%*
Years in the community	18.4	16.3	2.1	21.3	17.9	3.4**
Property ownership = owner	37.7%	38.4%	-0.7%	49.7%	40.4%	9.3%*
Education						
No formal education	11.0%	9.3%	1.7%	14.3%	7.3%	7.0%
Primary	9.7%	9.9%	-0.2%	8.0%	9.3%	-1.3%
JSS/Middle School	27.0%	27.8%	-0.8%	28.0%	21.2%	6.8%
SHS	38.0%	39.1%	-1.1%	38.0%	41.7%	-3.7%
Degree and higher	14.0%	13.9%	0.1%	11.0%	20.5%	-9.5%
Other	0.3%	0%	0%	0.7%	0%	0.7%
Household monthly income (GHS)						
Poorer	96	68		16	22	
Middle	592	576		588	639	
Richer	1,698	1,753		2,089	2,411	
Sector of employment						
Full-time Worker	62.3%	51.0%	11.3%	64.7%	72.8%	-8.1%
Casual Worker	18.0%	18.5%	-0.5%	8.7%	4.0%	4.7%
Unemployed	16.3%	25.8%	-9.5%	19.0%	18.5%	0.5%
Pensioner	3.4%	4.7%	-1.3%	7.7%	4.6%	3.1%
Dimension 1 - Flood intervention						
Household Scale						
Experienced flooding – past 12 months	26.3%	15.2%	11.1%***	30%	16.6%	13.4%***
Numbers of flooding – past 12 months	1.2	0.4	0.8***	1.1	0.5	0.6***
Flooding severity	1.5	1.2	0.3***	1.6	1.3	0.3***
Experienced less losses – past 12 months	2.7	2.8	-0.1	2.7	2.6	0.1
Flooding concern	2.5	2.2	0.3***	2.8	2.3	0.5***
Flooding-related environmental influence	2.7	2.3	0.4***	3.1	2.5	0.6***
Neighbourhood Scale						
Numbers of flooding – past 12 months	2.2	0.8	1.4***	1.9	0.9	1.0***
Flooding severity	1.9	1.4	0.5***	2.0	1.5	0.5***
Dimension 2 – Data usage and information sharing						
Has heard of GARID	18.0%	7.9%	10.1%***	29.3%	9.9%	19.4%***
Has heard of governmental intervention	30.7%	21.9%	8.8%**	22%	15.2%	6.8%*
Dimension 3 – Trust enhancement						
Trust in local gov't to improve living conditions	1.9	2.1	-0.2	2.2	2.1	0.1
Trust in national gov't to improve living conditions	1.8	1.7	0.1	1.8	1.9	-0.1
Dimension 4 – Living quality improvement						

Living satisfaction in the neighbourhood	2.6	2.9	-0.3**	2.9	3.3	-0.4***
Dimension 5 – Sustained growth and job opportunity						
Current occupation satisfaction	2.8	2.6	0.2	2.7	2.8	-0.1
Dimension 6 – Social Inclusion						
Women are equal in employment opportunities	3.0	3.1	-0.1	2.8	2.9	-0.1
Women are equal in neighbourhood decision-making	3.0	3.0	0	2.9	2.8	0.1
Dimension 7 – Social Safety Net						
Neighbourhood protection to reduce poverty	2.1	2.1	0	2.0	2.1	-0.1
Organizations to help with financial difficulties	1.6	1.5	0.1	1.3	1.4	-0.1
Dimension 8 – Bottom-up Action						
Commitment to improving the neighbourhood	3.3	3.4	-0.1	3.2	3.1	0.1
***, **, and * denote statistical significance at 1%, 5% and 10% levels respectively						

Source: Constructed by authors based on field data

At baseline, GN and CN are found to be similar in many characteristics. The characteristics include household size (4.3 vs. 4.2), age (40.8 vs. 39.5), gender (both consist of 40% male), years in the community (18.4 vs. 16.3), and property ownership (both come with about 38% owner). Respondents' education levels are also similar in both GN and CN. Half the respondents state that they have a senior high school education or higher in both neighbourhoods (52% in GN and 53% in CN). The average income is found to have clear gaps among the three differentiated groups (poorer, middle, and richer), but the differences between GN and CN are not much. The majority of the respondents are employed as full-time workers (62.3% in GN and 51% in CN). About one-fourth of the respondents report that they are unemployed in CN; by contrast, 16.3% are unemployed in GN.

At midline, some of the characteristics remain similar between GN and CN, and some do not. Household size (4.8 vs. 4.6) and age (41.5 vs. 40.2) are found to be similar between GN and CN. By contrast, the research has recruited more males (40.4%) in CN but more property owners in GN (49.7%) as the respondents. The majority of the respondents, again, address have a senior high school education or higher (49.7% in GN and 62.2% in CN). In terms of the average income, the richer groups in both GN and CN have increased between baseline and midline (from 1,698 to 2,089 in GN and from 1,753 to 2,411 in CN); there are no dramatic changes in the middle groups. Most respondents are full-time employees in both GN and CN (64.7% vs. 72.8%), yet the employed respondents have decreased in CN (from 25.8% at baseline to 18.5% at midline).

The paper uses various indicators to implicate the eight dimensions it aims to measure. Some indicators show significant differences between GN and CN at both baseline and midline. Seven out of eight indicators under Dimension 1 (flood intervention) are found to have significant differences between GN and CN at both baseline and midline, generally with GN having more flooding challenges. Compared with those in CN, at baseline, households in GN come with a higher percentage of flooding experiences (26.3% vs. 15.2%), report more flooding numbers (1.2 vs. 0.4), feel more severe flooding challenges (1.5 vs. 1.2), address stronger flooding concerns (2.5 vs. 2.2), observe more flooding-related environmental influence (2.7 vs. 2.3). When thinking about Dimension 1 from a neighbourhood scale, respondents from GN believe that about 2.2 floods have occurred (vs. 0.8 in CN); they also feel that flooding was rather severe (1.9 in GN vs. 1.4 in CN). Similar differences between GN and CN have remained in the midline.

Dimension 2 (data usage and information sharing) explores the extent to which GARID (or governmental intervention, considering that the respondents might have noticed the activities but could not name them) is known among the neighbourhoods to reflect its transparency. The households in GN express a higher awareness of GARID (18% vs. 7.9%) or any governmental interventions (30.7% vs. 21.9%) than those in CN. More respondents state that they have learned about GARID at the midline in GN (increased to 29.3%).

Most indicators among the other dimensions do not present significant differences between GN and CN, nor do they show drastic changes between the baseline and midline. The respondents indicate that they are “somewhat distrust” (around 2) of local and national governments to improve living conditions, “somewhat satisfied” (2.6 to 2.8) with their current occupations, “somewhat agree” (2.8 to 3.1) that women are equal in employment opportunities and neighbourhood decision-making, “somewhat disagree” (2.0 to 2.1) that there is neighbourhood protection reducing their risks of becoming poor, rather “disagree” (1.3 to 1.6) that there are organizations that people can reach for help with financial difficulties, and “committed” (3.1 to 3.4) to making their neighbourhoods better places. However, the residents in GN are significantly less satisfied with their living in the neighbourhoods at baseline (2.6 vs. 2.9). Though the satisfaction level has increased at the midline in both GN (to 2.9) and CN (to 3.3), their difference persisted.

4.2 Immediate Effect of GARID on Resilience Enhancement (Dimensions 1 to 4)

This section discusses the effects of the introduction of GARID on resilience enhancement, captured through the 13 indicators among Dimensions 1 to 4. The paper presents separate regression results for each indicator, respectively. Suppose the outcome variables are dummy variables (like "heard of GARID" with responses as yes or no); linear probability models would be applied to present the results. However, if the outcome variables are continuous variables (like the numbers of flooding that the responding households have reported), the results of OLS regressions would be utilized. Table 3 presents the six indicators under Dimension 1 at the household scale. Table 4 displays the last two indicators under Dimension 1 at the neighbourhood scale. The five indicators covering Dimensions 2 to 4 are presented in Table 5.

The results in Table 3 indicate that the introduction of GARID did not affect flooding conditions at the household scale. The DiD estimates imply the decreasing flooding numbers and the positive view of fewer flood-related losses. Yet, they also highlight increasing flooding concerns and awareness of flood-related influence. However, these estimates are not statistically significant. Table 2 also reveals the factors associated with the indicators, and some of them are opposite to the expectations. Compared to those in CN, the households in GN express a higher probability of flooding experience, that they have faced more floods over the past 12 months, and a stronger feeling among flooding severity, concern, and flood-related influence. In other words, the flooding conditions have worsened in GN rather than improved. The main predictors of these indicators are sex, age, and household wealth. Male are more likely to stress their concerns about flooding. Older people can better express their flooding experience, the flooding numbers, the extent of flooding severity, and their observation of flood-related influences. Wealthier respondents are more likely to express their awareness of reduced loss due to flooding intervention.

Table 3 Effect of GARID on Dimension 1 – Household Scale

	(1-1)	(1-2)	(1-3)	(1-4)	(1-5)	(1-6)
VARIABLES	Household Experienced Flooding	Household Numbers of Flooding	Household Flooding Severity	Household Experienced Less Losses	Household Flooding Concern	Flooding Related Influence
Midline in 2024	0.03	0.16	0.07	-0.14	0.17	0.23
	(0.04)	(0.18)	(0.08)	(0.15)	(0.16)	(0.16)
GN	0.12***	0.83***	0.24***	-0.06	0.35***	0.47***
	(0.04)	(0.21)	(0.08)	(0.13)	(0.13)	(0.13)

Midline in 2024 * GN	0.01	-0.17	0.04	0.15	0.16	0.16
	(0.06)	(0.30)	(0.12)	(0.19)	(0.19)	(0.19)
Highest level of education is Primary	0.04	-0.27	-0.03	0.24	0.10	0.17
	(0.07)	(0.54)	(0.16)	(0.19)	(0.20)	(0.19)
Highest level of education is JHS/Middle school	0.01	-0.72*	-0.20	0.16	-0.11	0.18
	(0.05)	(0.44)	(0.13)	(0.16)	(0.15)	(0.14)
Highest level of education is SHS	-0.002	-0.74*	-0.18	0.11	-0.24	-0.01
	(0.05)	(0.43)	(0.13)	(0.16)	(0.16)	(0.15)
Highest level of education is Tertiary	0.02	-0.69	-0.20	0.08	-0.03	0.03
	(0.06)	(0.45)	(0.15)	(0.20)	(0.19)	(0.18)
Highest level of education is "Other"	-0.23***	-1.54***	-0.61***	-1.57***	-1.03**	-0.28
	(0.06)	(0.47)	(0.15)	(0.17)	(0.51)	(0.69)
Sex = Male	-0.04	0.24	0.01	0.05	0.21**	0.12
	(0.03)	(0.19)	(0.07)	(0.10)	(0.10)	(0.10)
Property ownership = Owner	0.02	0.21	0.07	0.10	-0.05	0.07
	(0.03)	(0.18)	(0.07)	(0.09)	(0.10)	(0.09)
Age group: 20-29 years	0.07	0.47**	0.26***	0.49	0.41	0.55*
	(0.07)	(0.21)	(0.09)	(0.33)	(0.28)	(0.29)
Age group: 30-39 years	0.20**	1.08***	0.47***	0.49	0.53*	0.57*
	(0.08)	(0.25)	(0.10)	(0.33)	(0.29)	(0.30)
Age group: 40-49 years	0.17**	1.11***	0.48***	0.29	0.42	0.57*
	(0.08)	(0.29)	(0.12)	(0.34)	(0.29)	(0.30)
Age group: 50+ years	0.11	0.72***	0.29***	0.36	0.35	0.34
	(0.08)	(0.27)	(0.11)	(0.34)	(0.30)	(0.30)
Household wealth quintile: Middle	0.07	0.26	0.07	0.46***	0.15	-0.05
	(0.05)	(0.30)	(0.11)	(0.14)	(0.15)	(0.14)
Household wealth quintile: Richer	-0.02	-0.20	-0.13	0.36**	0.01	-0.09
	(0.05)	(0.27)	(0.11)	(0.15)	(0.15)	(0.15)
Sector of employment: Full-time worker	-0.05	-0.25	-0.04	-0.16	-0.13	0.15
	(0.05)	(0.29)	(0.12)	(0.17)	(0.17)	(0.16)
Sector of employment: Casual worker	-0.06	-0.06	-0.07	0.21	0.05	-0.03
	(0.06)	(0.40)	(0.13)	(0.19)	(0.20)	(0.19)
Sector of employment: Pensioner	-0.01	-0.73	-0.08	-0.65**	0.14	0.60**
	(0.10)	(0.49)	(0.19)	(0.27)	(0.28)	(0.25)
Constant	0.03	0.13	1.04***	2.02***	1.78***	1.55***
	(0.08)	(0.43)	(0.14)	(0.36)	(0.31)	(0.32)
Observations	902	902	902	902	902	902
F-Statistic	2.38	2.39	2.35	2.20	2.53	3.90
Adjusted R^2	0.03	0.03	0.03	0.02	0.03	0.06

Notes: Each column reports a different regression. The dependent variable for columns (1-1)-(1-6) are: (1) indicator of the household has experienced flooding in the past 12 months, (2) indicator of the number of floods the household has encountered, (3) indicator of the household's perception toward flooding severity, (4) indicator of the household's perception of reduced physical and financial losses in the past 12 months, (5) indicator of the household's flooding concern, and (6) indicator of the household's perception of environmental influences after rains. The omitted category for sector of employment is "Unemployed." Omitted category for household wealth quintile is "poorer." Omitted variable for highest level of education is "no formal education." Omitted category for age group is "under 20 years." Robust standard errors in parenthesis. Standard errors are clustered at the household level. ***, **, and * denote statistical significance at 1%, 5% and 10% levels respectively.

Table 4 is based on the neighbourhood scale and reveals results similar to those in Table 3. The introduction of GARID also did not affect flooding conditions at the neighbourhood scale since the DiD estimates are both not statistically significant. A similar surprise is also the fact that the

flooding conditions have worsened in GN at midline. The respondents' perceptions of GN, in contrast to CN, reveal that they have experienced more floods and felt a more severe flooding challenge. Not many predictors are found significant; one exception is the finding that male respondents would have actively addressed flooding numbers.

Table 4 Effect of GARID on Dimension 1 – Neighborhood Scale

	(1-7)	(1-8)
VARIABLES	Neighborhood Numbers of Flooding	Neighborhood Flooding Severity
Midline in 2024	0.19	0.09
	(0.23)	(0.10)
GN	1.44***	0.46***
	(0.27)	(0.10)
Midline in 2024 * GN	-0.46	0.02
	(0.37)	(0.14)
Highest level of education is Primary	-0.35	0.03
	(0.55)	(0.17)
Highest level of education is JHS/Middle school	-0.50	-0.05
	(0.46)	(0.14)
Highest level of education is SHS	-0.64	-0.06
	(0.45)	(0.14)
Highest level of education is Tertiary	-0.49	-0.05
	(0.50)	(0.16)
Highest level of education is "Other"	-1.44**	-0.55*
	(0.64)	(0.29)
Sex = Male	0.44*	0.01
	(0.23)	(0.08)
Property ownership = Owner	-0.01	-0.01
	(0.21)	(0.08)
Age group: 20-29 years	0.13	0.10
	(0.56)	(0.22)
Age group: 30-39 years	0.56	0.20
	(0.59)	(0.23)
Age group: 40-49 years	0.93	0.35
	(0.60)	(0.23)
Age group: 50+ years	0.21	0.14
	(0.59)	(0.23)
Household wealth quintile: Middle	0.42	0.12
	(0.32)	(0.12)
Household wealth quintile: Richer	0.15	-0.10
	(0.31)	(0.13)
Sector of employment: Full-time worker	-0.48	0.10
	(0.34)	(0.14)
Sector of employment: Casual worker	-0.39	0.09
	(0.45)	(0.16)
Sector of employment: Pensioner	-0.64	0.12
	(0.57)	(0.22)
Constant	0.78	1.18***

	(0.68)	(0.26)
Observations	902	902
F-Statistic	2.80	2.93
Adjusted R^2	0.04	0.04

Notes: Each column reports a different regression. The dependent variable for columns (1-7)-(1-8) are: (1) indicator of the number of floods the neighbourhood has encountered and (2) indicator of the household's perception toward flooding severity in the neighbourhood. The omitted category for sector of employment is "Unemployed." Omitted category for household wealth quintile is "poorer." Omitted variable for highest level of education is "no formal education." Omitted category for age group is "under 20 years." Robust standard errors in parenthesis. Standard errors are clustered at the household level. ***, **, and * denote statistical significance at 1%, 5% and 10% levels respectively.

Table 5 implies that the introduction of GARID has significantly affected some indicators measured among Dimensions 2 to 4. Column 2-1 of Table 5 shows that the introduction of GARID leads to a statistically significant awareness of GARID. The coefficient indicates that those in GN are 10% points more likely to hear about GARID than those in CN between baseline and midline. During the same period, Column 4-1 surprisingly indicates less living satisfaction (-0.24) in GN in contrast to the households in CN. Combining these two findings - and the fact that GARID has been delayed for its physical interventions - indicates that the high-profiled GAIRD in GN could result in greater disappointment when the residents' patience is tested over a long haul. Such a hypothesis could be verified further.

The predictors in Table 5 additionally provide the following findings. Between baseline and midline, most respondents have gained their trust in the national government to improve living conditions (0.22); they also state higher living satisfaction (0.43). Male respondents are more aware of GARID (0.07) and governmental interventions (0.08) in neighbourhoods. Owners are more satisfied with their lives (0.17), and the wealthier are more likely to hear about GARID (0.09 for Middle; 0.08 for Richer).

Table 5 Effect of GARID on Dimensions 2 to 4

	(2-1)	(2-2)	(3-1)	(3-2)	(4-1)
VARIABLES	Heard of GARID	Heard of Gov't Intervention	Trust in Local Gov't	Trust in National Gov't	Living Satisfaction
Midline in 2024	0.01	-0.06	0.12	0.22*	0.43***
	(0.03)	(0.05)	(0.14)	(0.12)	(0.11)
GN	0.10***	0.08*	-0.12	0.00	-0.27***
	(0.03)	(0.04)	(0.11)	(0.11)	(0.10)
Midline in 2024 * GN	0.10**	-0.01	0.15	-0.13	-0.24*
	(0.05)	(0.06)	(0.16)	(0.15)	(0.14)
Highest level of education is Primary	0.03	0.03	-0.17	-0.08	0.01

	(0.05)	(0.06)	(0.16)	(0.16)	(0.14)
Highest level of education is JHS/Middle school	0.05	0.01	-0.05	-0.07	-0.11
	(0.04)	(0.05)	(0.14)	(0.14)	(0.12)
Highest level of education is SHS	0.05	-0.01	-0.08	-0.19	-0.26**
	(0.04)	(0.05)	(0.14)	(0.13)	(0.13)
Highest level of education is Tertiary	0.07	-0.01	-0.13	-0.26*	-0.24
	(0.05)	(0.06)	(0.17)	(0.15)	(0.15)
Highest level of education is "Other"	0.13	0.10	0.21	-0.17	-0.31
	(0.28)	(0.28)	(0.62)	(0.60)	(0.66)
Sex = Male	0.07**	0.08***	-0.02	-0.03	-0.01
	(0.03)	(0.03)	(0.09)	(0.08)	(0.08)
Property ownership = Owner	0.03	-0.07**	-0.10	-0.01	0.17**
	(0.03)	(0.03)	(0.08)	(0.08)	(0.07)
Age group: 20-29 years	-0.02	-0.004	0.21	-0.11	0.08
	(0.09)	(0.09)	(0.28)	(0.26)	(0.29)
Age group: 30-39 years	0.03	0.01	0.21	0.01	0.35
	(0.09)	(0.10)	(0.29)	(0.26)	(0.30)
Age group: 40-49 years	-0.01	-0.04	0.06	-0.11	0.28
	(0.09)	(0.10)	(0.29)	(0.26)	(0.30)
Age group: 50+ years	-0.04	-0.01	0.30	0.05	0.51*
	(0.09)	(0.10)	(0.29)	(0.27)	(0.30)
Household wealth quintile: Middle	0.09**	0.07	0.21*	0.12	0.06
	(0.04)	(0.05)	(0.13)	(0.13)	(0.11)
Household wealth quintile: Richer	0.08*	0.02	0.02	-0.11	0.15
	(0.04)	(0.05)	(0.13)	(0.13)	(0.12)
Sector of employment: Full-time worker	-0.04	0.02	-0.10	0.08	0.00
	(0.04)	(0.05)	(0.14)	(0.14)	(0.13)
Sector of employment: Casual worker	-0.05	0.05	-0.09	0.33**	0.11
	(0.05)	(0.06)	(0.17)	(0.16)	(0.15)
Sector of employment: Pensioner	-0.07	-0.04	-0.10	0.11	0.15
	(0.08)	(0.09)	(0.24)	(0.23)	(0.20)
Constant	-0.02	0.17*	1.98***	1.81***	2.60***
	(0.09)	(0.10)	(0.30)	(0.27)	(0.31)
Observations	902	902	902	902	902
F-Statistic	3.63	1.95	1.27	1.80	5.49
Adjusted R^2	0.05	0.02	0.01	0.02	0.09

Notes: Each column reports a different regression. The dependent variable for columns (2-1)-(4-1) are: (1) indicator of the household has heard of GARID, (2) indicator of the household has heard of governmental intervention, (3) indicator of the household's trust in local government to improve living conditions, (4) indicator of the household's trust in national government to improve living conditions, and (5) indicator of the household's living satisfaction in the neighbourhood. The omitted category for sector of employment is "Unemployed." Omitted category for household wealth quintile is "poorer." Omitted variable for highest level of education is "no formal education." Omitted category for age group is "under 20 years." Robust standard errors in parenthesis. Standard errors are clustered at the household level. ***, **, and * denote statistical significance at 1%, 5% and 10% levels respectively.

4.3 Immediate Effect of GARID on Inclusive Growth (Dimensions 5 to 8)

The indicators assessing Dimensions 5 to 8 are presented in Table 6. Column 7-2 of Table 6 displays that introducing GARID leads to a significantly negative view of available organizational support to overcome financial difficulties. The households in GN have become less confident (-0.22) about having the above organizational support than those in CN between

baseline and midline. On the bright side, Column 8-1 suggests that GN's residents manifest a stronger and growing commitment (0.16) to conduct neighbourhood improvements from a bottom-up approach over the same period. Seeing these findings together implies that the residents in GN could face frustration about the conditions in the neighbourhoods, with fewer resources available to them; yet, they are prospective about what is coming with GARID.

The other predictors in Table 5 show some other findings. The surveyed households generally feel that women have become unequal in employment (-0.23) and are less willing to support neighbourhood improvements (-0.22) as time passes to the midline. Male respondents are less satisfied with their current occupations (-0.12), are more confident that women are equal in neighbourhood decision-making (0.20), and are more committed to neighbourhood improvements (0.12). Owners, as expected, could be more satisfied with their current occupations (0.19). Older people, with more years of experience in the neighbourhoods, stress their awareness of organizational support in the neighbourhoods. Richer tend to be more satisfied with their occupations (0.19), and wealthier are more resourceful when locating neighbourhood protection to avoid poverty (0.38 for Middle; 0.29 for Richer). Lastly, the respondents are generally more satisfied with their occupations as long as they are not unemployed.

Table 6 Effect of GARID on Dimensions 5 to 8

	(5-1)	(6-1)	(6-2)	(7-1)	(7-2)	(8-1)
VARIABLES	Occupational Satisfaction	Women are Equal in Employment	Women are Equal in Decision-making	Neighbor-hood Protection	Organiza-tional Support	Commitment to Improvement
Midline in 2024	-0.04	-0.23*	-0.15	-0.003	-0.01	-0.22***
	(0.09)	(0.12)	(0.13)	(0.13)	(0.10)	(0.07)
GN	-0.06	-0.09	0.01	-0.06	0.15	0.07
	(0.08)	(0.10)	(0.11)	(0.12)	(0.10)	(0.06)
Midline in 2024 * GN	-0.12	0.03	0.05	-0.01	-0.22*	0.16*
	(0.11)	(0.16)	(0.16)	(0.16)	(0.12)	(0.08)
Highest level of education is Primary	-0.09	-0.10	-0.24	0.37**	0.19	0.005
	(0.12)	(0.16)	(0.16)	(0.17)	(0.14)	(0.08)
Highest level of education is JHS/Middle school	0.03	-0.06	-0.11	0.34**	0.07	0.04
	(0.10)	(0.13)	(0.12)	(0.14)	(0.11)	(0.07)
Highest level of education is SHS	0.03	-0.21	-0.18	0.25*	0.06	0.10
	(0.10)	(0.13)	(0.13)	(0.14)	(0.11)	(0.07)
Highest level of education is Tertiary	0.14	-0.27*	-0.20	0.25	0.14	0.14
	(0.12)	(0.16)	(0.15)	(0.16)	(0.13)	(0.09)
Highest level of education is "Other"	0.84***	-1.11**	-1.17***	-0.12	0.34	-0.14
	(0.13)	(0.51)	(0.12)	(0.20)	(0.35)	(0.08)
Sex = Male	-0.12*	0.03	0.20**	-0.12	-0.10	0.12***
	(0.06)	(0.08)	(0.08)	(0.09)	(0.06)	(0.04)

Property ownership = Owner	0.19***	-0.09	0.01	-0.17**	-0.04	-0.005
	(0.06)	(0.08)	(0.08)	(0.08)	(0.07)	(0.04)
Age group: 20-29 years	-0.12	-0.12	0.34	0.01	0.32***	-0.24**
	(0.13)	(0.28)	(0.30)	(0.27)	(0.10)	(0.12)
Age group: 30-39 years	0.05	-0.20	0.23	-0.13	0.32***	-0.27**
	(0.14)	(0.28)	(0.31)	(0.27)	(0.10)	(0.12)
Age group: 40-49 years	-0.07	-0.42	-0.07	-0.16	0.32***	-0.15
	(0.14)	(0.29)	(0.31)	(0.28)	(0.11)	(0.12)
Age group: 50+ years	0.13	-0.39	0.08	0.14	0.41***	-0.17
	(0.14)	(0.29)	(0.31)	(0.28)	(0.12)	(0.12)
Household wealth quintile: Middle	-0.09	0.04	0.13	0.38***	0.07	0.13**
	(0.10)	(0.12)	(0.12)	(0.13)	(0.11)	(0.06)
Household wealth quintile: Richer	0.19*	0.08	-0.07	0.29**	-0.002	0.005
	(0.10)	(0.12)	(0.13)	(0.12)	(0.10)	(0.06)
Sector of employment: Full-time worker	2.04***	0.15	0.17	0.12	0.03	0.10
	(0.09)	(0.14)	(0.14)	(0.14)	(0.12)	(0.07)
Sector of employment: Casual worker	1.76***	-0.16	-0.15	0.23	0.33**	0.08
	(0.12)	(0.17)	(0.17)	(0.16)	(0.13)	(0.08)
Sector of employment: Pensioner	2.89***	0.04	-0.15	-0.27	-0.28*	-0.18
	(0.12)	(0.25)	(0.24)	(0.24)	(0.17)	(0.13)
Constant	1.06***	3.42***	2.81***	1.69***	1.01***	3.32***
	(0.15)	(0.30)	(0.32)	(0.30)	(0.15)	(0.13)
Observations	902	902	902	902	902	902
F-Statistic	56.46	1.65	2.06	2.39	2.25	2.73
Adjusted R^2	0.54	0.01	0.02	0.03	0.03	0.04

Notes: Each column reports a different regression. The dependent variable for columns (5-1)-(8-1) are: (1) indicator of the household's satisfaction on current occupation, (2) indicator of the household's perception that women are equal in employment opportunities, (3) indicator of the household's perception that women are equal in neighbourhood decision-making, (4) indicator of the household's perception of neighbourhood protection to reduce poverty, (5) indicator of the household's perception of organizations to help with financial difficulties, (6) indicator of the household's commitment to improving the neighbourhood. The omitted category for sector of employment is "Unemployed." Omitted category for household wealth quintile is "poorer." Omitted variable for highest level of education is "no formal education." Omitted category for age group is "under 20 years." Robust standard errors in parenthesis. Standard errors are clustered at the household level. ***, **, and * denote statistical significance at 1%, 5% and 10% levels respectively.

5. Discussion of Findings

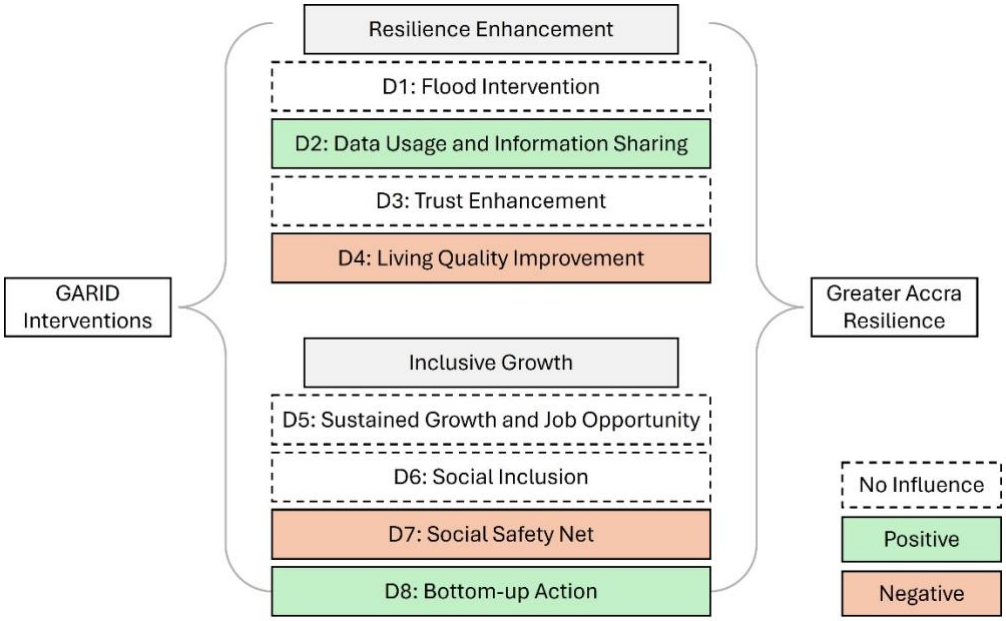

Figure 3. Intermediate Influences of GARID on Greater Accra Resilience

Studies assessing the empirical impacts that resilience development projects could lead to have been modest in the literature (Béné et al., 2020), partly because resilience is a latent variable difficult to measure (Béné, 2013). Because of this challenge, this paper's assessment framework has limitations toward generalizability. Yet, the scarcity of similar works also manifests this paper's contribution to the literature. The researcher is aware of this notion while relating its findings to other works.

This paper uses a DiD approach to understand the influences of an integrated resilient development project, known as GARID in Accra, on resilience enhancement and inclusive growth. Eight dimensions and 19 indicators, ranging from flooding experience to living satisfaction, capture these influences. The descriptive findings suggest that the basic information (household size, age, wealth, etc.) of the surveyed households is similar between GN and CN. However, examining the dimensions reveals that GN and CN are significantly different regarding flooding intervention (Dimension 1), data usage and information sharing (Dimension 2), and living quality improvement (Dimension 4). GN appears to have more severe (or even worsening) flooding challenges than CN in both baseline and midline. However, more GN residents are becoming more aware of GARID, with all households surveyed specifying a higher

living satisfaction during the same period. The indicators among the other dimensions (3, 5, 6, 7, 8) have remained similar between GN and CN and between baseline and midline. The paper further conducts regression analyses for the indicators, with the representing dimensions summarized in Figure 3. The results suggest that the introduction of GARID has significantly affected GN, in contrast to CN, among Dimensions 2, 4, 7, and 8 (see Figure 3) during the transition from the baseline to the midline. GARID does not result in obvious differences in GN from CN between the assessed timeframe across the other dimensions.

Knowing that the introduction of GARID has stressed its transparency (Dimension 2) and stimulated committed bottom-up action (Dimension 8) among focus neighbourhoods is an exciting empirical finding. It is, however, worth mentioning that the commitments to neighbourhood improvement between baseline and midline have decreased in both GN (from 3.3 to 3.2) and CN (3.4 to 3.1). In other words, both neighbourhoods have experienced a decline in this indicator, potentially as a regional trend. The comparative "better off" in GN is because of its rather moderate decline compared to CN. The advantage of DiD utilization hence displays its methodological advantage here.

Scholars have stressed enhancing projects' transparency (Ophiyandri et al., 2013) and emphasized bottom-up activities' crucial role in strengthening community resilience (Yi et al., 2020). Our findings engage with the literature through respective interpretations. On the one hand, achieving a project's transparency is often based on the degree of stakeholders' involvement, relying heavily on intentional strategy-making, visioning, and empowerment in a top-down manner (Sharifi & Yamagata, 2018) to format responsible governance (Mitchell et al., 2015). On the other hand, GARID's influence on stimulating a growing local commitment in GN implies not only how the residents are accumulatively and positively responding to the changing urban scape but also the possibility of driving a positive impact on community resilience via the bottom-up actions (Kirby et al., 2024). In other words, our findings echo Yi and colleagues' argument (2020) that collaborative efforts from both top-down and bottom-up are needed for successful resilience development.

Finding that GARID is resulting in negative impacts on living quality (Dimension 4) and social safety net (Dimension 7) is unexpected but understandable, partly by hearing words from the ground like "the pace of work is slow" or "the project has kept long." Scholars have explored

discourses around delayed urban interventions (Anand et al., 2018) and the potential "temporal contestation" (Koppelman, 2018), which features merging collective action to demand acceleration from the state. The findings here are similar to those of the scholarships and can be interpreted in two ways. The negative impacts might just reflect the fact that the GN have been challenging environments with environmental, economic, and social vulnerability, which was the exact reason that they were chosen under GARID. The conditions in GN have been deteriorating while waiting for GARID to really hit the ground. Another explanation is attached to the delay itself. When the waiting has exceeded the residents' expectations, doubts could start to occur (Koppelman, 2018), negatively influencing the respondents' living satisfaction and their awareness of trustworthy organizations to enhance the neighbourhoods' safety net.

The indifferent influences of GARID among Dimensions 1, 3, 5, and 6 come with many reasons. First, we might not successfully capture the most appropriate indicators to assess GARID impacts. The indicators selected in the paper are based on the reference centring on resilience enhancement and inclusive growth. GARID might have impacts on other dimensions that we have yet to address. Another factor is tied to the fact that the interventions are not reaching their completion. The latter could be more of a solid reason for some indicators to be indifferent in the assessment, particularly considering how the completed structural interventions (like works of dredging and upgrading) could significantly reduce flooding incidents and enhance livelihoods yet with limited influence before they are in effect.

This paper contributes to the literature by adding an evident piece of work capturing the impact of resilient development in the Global South, which has been a desirable research direction (Béné & Haque, 2022) but is hard to address considering data availability and measurement development (Béné, et al. 2020). In this exercise, a series of multi-dimensional and independently built objective and subjective indicators are proposed and measured to perform a DiD estimation, enabling this paper to methodically justify its argument that GARID has conditionally led to immediate regional resilience enhancement and inclusive growth since its introduction in 2019.

The paper lands on the above argument with a recognition of some limitations worth addressing in future work. First, the assessment framework is built on relevant works tied to Accra's conditions. Many indicators, such as a heavy emphasis on flooding intervention with up to eight

indicators, are selected accordingly and might not be the most relevant ones in the other areas. Twisting the indicators to fit the needs of others (such as looking at the severity of drought in some cases) will be essential to replicate our work. Second, the literature has suggested measuring resilience in a multi-scale manner (Béné, 2013), hinting at a shortage that this work has not addressed. A feasible direction would be engaging with the monitoring reports released by the World Bank to expand the aspects and depth of impact assessment. Third, this work is built solely to emphasize the interventions in GN with less data collection regarding the other components that GARID has invested in, such as strengthening local governments' operation and maintenance capacity and emphasizing regional collaboration. These project components have not been incorporated into the scope of this paper and could be further considered via different research perspectives. Lastly, monitoring resilience could be developed into a long-term effort to thoroughly fulfil the assessment's completeness. This work thus far is only capable of capturing the intermediate impacts that GARID has led while acknowledging that many ongoing project components come with the potential to lead to impressive neighbourhood transformation. The work has paved the way for conducting another round of assessment when GARID is fully fulfilled.

6. Policy Implications

The results, assessing from baseline to midline, reveal the findings that (1) most indicators do not have significant differences for now, (2) two immediate reactions are found negative (living satisfaction and organizational support), potentially because of the long wait for GARID's actual interventions, and (3) two positive perspectives (heard of GARID and the commitment to improve the neighbourhoods) that hint on the residents' forward-looking aspects. The immediate impacts driven by GARID come with the potential to convert into substantial positive outcomes once the project is fully developed.

Based on the findings that this paper can draw thus far, certain policy implications are worth sharing. First, flood interventions that come with a greater influence on disaster risk reduction among neighbourhoods beyond GN can be expedited if no extensive engagement activities are needed. Scholars studying urban interventions have elaborated on the potential challenges and contestations that might emerge if the promised interventions are delayed. The findings from this paper suggest that the portion of residents experiencing flooding has increased from 26.3% in the baseline to 30% in the midline, with perceptional flooding concern concurrently growing from 2.5 to 2.8 during the same period (both have worsened than CN in comparison). Suppose this downward trend is a general phenomenon across Greater Accra; timely interventions are urgently needed to prevent future damage at large, partly regarding the project items that could be effectively implemented without further ground-level consultations.

Second, on the bright side of the study, the findings reveal the effective and extensive engagements that GARID has led since its beginning, which are encouraged to continue. The portion of residents who are aware of GN has grown from 18% to 29.3%, suggesting that disseminating GARID has received notable awareness among the stakeholders. It also triggers positive feedback from GN. The study has seen a growing bottom-up commitment to improving GN (see Column 8-1 of Table 6, compared to CN), implying that the introduction of GARID is consolidating the sense of belonging in the neighbourhoods, which will reinforce community resilience. Maintaining the momentum of engagement, partly regarding upgrading activities, should later affect other indicators like trust in local and national governments or living satisfaction.

The third point stresses the early discussion around infrastructure maintenance. Scholars studying infrastructure development (Alabi et al., 2021; Mold, 2012) have reflected that a lack of maintenance culture and unstable funds for infrastructure maintenance continue to be crucial hindrances upon the completion of interventions. Based on the engagement activities the GARID has developed, a desirable next step could be establishing and investigating the localized maintenance mechanisms that could allow local governments to self-support and maintain the functionalities of the completed infrastructure. Ensuring the project items' sustainability will be a crucial issue for projects like GARID to overcome in the future.

Fourth, when looking at GARID as a whole, the immediate results show an optimistic view regarding the long-term outcomes. Much of such a view was based not solely on the surveys but more on the interviews with local governments, with many officials suggesting that it is because of GARID that intergovernmental collaborations are able to be pragmatized (personal interviews with many local officials in 2024). In other words, GARID's impact on capacity building among different levels of government, which this paper has yet to address, has been influential, aligning itself with the vision of a replicable development model (personal interview with GARID team in 2022) for the other challenging environments in Ghana. Projects similar to GARID might have the potential to further enhance regional resilience when a more thorough review of GARID's implementation process is conducted. Some notable discussions could be looking at securing successful leadership and giving sufficient mobilization authorization among government agencies.

Lastly, from a scholarly perspective, the study has established a foundation for long-term monitoring regarding the impacts that GARID will have. It is encouraged that other similar surveys be further conducted periodically in the future to trace the progress that GARID will make, including a survey at the endline.

7. Conclusion

Numerous countries in the Global South are experiencing regional resilience development, with many of them receiving Official Development Assistance (OECD, 2022) to support these interventions. In other words, understanding the impacts of these projects matters, considering that many of these projects are only durable via bilateral/multilateral partnerships. More studies are needed to explore the actual impacts the projects would lead to (Béné, 2013; Béné & Haque, 2022; Gertler et al., 2016; Janvry et al., 2011).

This paper addresses this research direction by capturing the impacts of GARID, a crucial regional resilience development project affecting many neighbourhoods in Greater Accra. Two stages of surveys were conducted in 2022 and 2024, respectively, with a DiD approach to understand if the introduction of GARID actually led to resilience enhancement and inclusive growth among the intervened neighbourhoods. The findings suggest that GARID's immediate impacts (rather than the ultimate ones because GARID is still implementing) have significantly resulted in notable project transparency and stimulated committed bottom-up actions among the intervened neighbourhoods compared with the comparative ones. Although unexpected results have also occurred, such as finding that living satisfaction has worsened and many indicators indifferent, many of these outcomes are still indefinite, considering that GARID is still in progress. In this vein, our findings suggest that GARID has conditionally achieved resilience enhancement and inclusive growth in Greater Accra, with a prospective view regarding future outcomes. Such a notion concurrently paves the way for future surveys to monitor the long-term impacts of GARID, in part referencing the materials that this paper has established.

The broader implications that the paper has drawn suggest the expedition of GARID components that require less stakeholder engagement since delaying the interventions could result in temporal contestations. At the same time, the extensive participatory activities that GARID has led should continue, considering the growing bottom-up commitments are substantializing community resilience. A caveat worth noting is initiating early discussion around sustainable operations and maintenance mechanisms that will lead to a smooth transfer of project responsibilities and ownership to local stakeholders. Finally, an optimistic view is acknowledged regarding the outcomes that GARID will result in, as well as being open to replicating GARID's approach in other projects to enhance regional resilience.

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