Sustainable Development and Economic Equity: Balancing Growth, Environmental Transition and Social Justice

Aleesha Fazal [1], Xinyuan Yan [2], Muhammad Haneef[3*]

[1] Department of International Education, Henan Medical University, China

[2] Department of Health Management, North Henan Medical University, China

[3] Department of Science and Technology, Kohat university, Malaysia

hanifkust350@gmail.com (Corresponding author)

Received date: Oct. 21, 2025, revision date: Nov. 18, 2025, Accepted: Nov. 29, 2025

ABSTRACT

Show that economic equity fosters sustainable development through three interrelated dimensions of balanced development, social transformation, and social justice. This study aims to answer the research question of whether economic equity promotes sustainable development through growth balance, transition, and social justice, addressing the practical problem that growth, greenhouse gas emissions, and justice are often pursued as separate policy agendas. The study used a cross-sectional sampling design to obtain data from 384 potential responses. The survey questions consisted of 13 items organized on a 5-point Likert scale. Items were grouped into four constructions; the three predictors were balance growth, institutional change, and institutional justice, and the outcome construct was sustainable development. The study examined the measurement model by assessing internal consistency, item-to-item loadings, joint reliability, extracted mean variance, and exploration variance analysis. On the other hand, the study estimated the structural model using partial least squares structural equation modeling and 5000 bootstrap resamples. All three of these indicators have a positive relationship between evaluation effectiveness and sustainable development. Of these three dimensions, institutional justice has the largest effect on the principle ($\beta = .298$; $p < .001$), followed by increasing balance ($\beta = .230$; $p < .001$) and institutional turnover ($\beta = .208$; $p < .001$). Thus, reliability coefficients ranged from .846 to .885, and joint reliability ranged between .881 and .909. Meanwhile, the difference produced was between .650 and .770. Finally, model fit indices were acceptable (SRMR = .055; NFI = .850). In conclusion, institutional transformation alone is not enough, and therefore sustainable development can be more assured if accessibility, participation, and social awareness are considered during implementation. The study provides an integrated economic-equity model and shows that sustainability can be evaluated as a negotiated outcome through which social justice, environmental transition, and the quality of growth are considered, rather than being characterized as an environmental objective.

Keywords: sustainable development; economic equity; inclusive growth; environmental transition; social justice

1. Introduction

While niche interests dominated issues of economic governance, sustainable development has since been incorporated. Governments are now tasked with growing economies, creating jobs, alleviating poverty, decarbonizing systems, protecting biodiversity, and promoting equity. Each of these objectives is independently related to the others, but neither of them can provide a good insight into the others. Increasing productivity can compensate for important public goods and technologies, but it can also

exacerbate inequality and waste of resources. Carbon reduction measures may reduce emissions, but they are likely to impose specific costs on population groups, vulnerable sectors, sectors, and regions. Social protection policy contracts may dampen the effects of change for the most vulnerable, but they will remain distributional costs if investment and production conditions remain marginal. The challenge for governance is to design mechanisms through which all three dimensions can evolve in a balanced way over time (Tuyen et al.,2026).

The concept of sustainable development as it is understood today is informed by the view that modern consumption should not compromise the ability of future generations to satisfy their needs (Mensah, 2019). While this principle emphasizes intergenerational equality, it argues that sustainability requires addressing distributional inequalities among contemporary generations. Indeed, as Purvis et al. (2019) pointed out, the three dimensions of sustainable development are related but have been theorized in various intellectual traditions. A policy that promotes one area of development may have negative or positive effects on others, and the consequences are difficult to predict in advance. Measures of GDP growth often mask the fact that growth is not evenly distributed among various population groups and may not correspond to broader social targets. Similarly, a particular high-emissions project can create winners and losers in the environment. The economic assessment must be complemented by an assessment of the distribution potential.

In this paper, economic equity will be conceptualized as organizing – the mechanism through which institutions and change mechanisms allocate opportunities, benefits, risks, and responsibilities in a way that enables people to participate in sustainable development and reap benefits. While income equality goes beyond uniform income distribution, it ensures people have equitable access to economic resources, jobs, education, public services, energy, and social infrastructure throughout their lives. Development is examined in terms of concrete opportunities and fair relations. Legitimate resource allocations cannot be combined with questions of equity and sustainable development. In sustainability science, these issues are often associated with climate justice analyses, in which distributional, process and cognitive aspects are considered separately but interrelatedly (Schlosberg, 2007).

The paper describes economic equity in three dimensions. Environmental sustainability is achieved when economic growth, income, service delivery, and long-term investments with control of diversity and environmental footprints are made. Transition means the transition of a country or economy from using capital to clean technology, production methods, consumption, and infrastructure. Social justice involves equitable distribution, recognition of diverse access and needs, universal participation, and protection against asymmetrical challenges. Sustainable development is a multidimensional phenomenon that reflects the balance between economic, environmental, and social life. The argument of the paper is that higher levels of sustainability will be expected if three key equations are vigorously implemented.

The research is important because the process of globalization leads to industrialization, improving services, infrastructure, and energy security with emissions and imbalances. Industrialization and related processes provide benefits and create costs for individuals, firms, and communities. A change may make some industries more productive, but less safe for workers. Improvement in one area, e.g., the environment, may make others, e.g., the economy, unsustainable. The database used for the analysis contains 384 respondents. It provides statistical information on the economic benefits, environmental impact, and environmental impact of sustainability and transition. The data were aggregated according to the new criteria but placed as before with the same numbers.

Study fills three gaps in existing literature. First, although previous research considers economic development, social, and environmental aspects as independent variables, it does not emphasize their role as key equations. Second, the migration process has not been adequately defined as most studies have focused on technology and emissions rather than classification and identification. Third, many manuscripts are unable to interpret all the results obtained. Sustainability studies often report regression coefficients, which require explanation to interpret the role of each factor. This paper develops a conceptual model,

considers three research questions, and reports all findings with critical interpretation.

The study questions are: To what extent does growth balance affect sustainable development? How does environmental change affect sustainable development? What is the impact of environmental justice on sustainable development? The objectives are to establish economics and equity, assess measurement efficiency, evaluate the three structural options, compare their strengths, and formulate policy recommendations. Its contribution is limited to individual evidence and should not be interpreted more as an overview of the nation's economy.

The effectiveness of the study lies in the fact that it views reconciliation as part of the development planning process, not as part of the corrective process. Policies on infrastructure, energy, agriculture, taxation, employment, and public administration affect distribution from the beginning. Once distributional implications are finally considered, it is possible that many policy areas will reward certain groups but not the mechanisms that make them vulnerable. Instead, the framework developed by researchers asks whether economic benefits, environmental change, and environmental justice contribute positively to sustainable development. This approach allows policy makers and managers to make informed decisions about potential trade-offs in advance.

Studying is also important because of measurement. Sustainable development is often summarized in a single report that includes a variety of unrelated indicators that therefore say little about performance. However, separate indicators for the three directions corresponding to development, institutional change, and institutional justice allow for an integrated analysis of contributions. The model is thus more predictable and flexible: a good overall effect cannot hide a weakness in a particular area that may need attention. For example, an environmental indicator cannot be rewarded with inclusivity or economic performance if benefits are not shared or individuals are not involved in decision-making.

2. Literature Review and Theoretical Foundation

2.1 Sustainable development as an integrated outcome

Sustainable development is usually expressed as a harmonious balance of economic growth, environmental protection, and social welfare (Hopwood et al., 2005; Mensah, 2019; Purvis et al., 2019). Such a picture can be misleading if the three components are treated as unrelated checklists. Indeed, the economy is embedded in ecological and biophysical systems; it cannot grow indefinitely at the sacrifice of capital value or at the expense of the conditions of social cooperation. The Sustainable Development Goals ensure that interdependencies are visible through the goals of poverty, inequality, quality of work, responsible agriculture, climate action, institutions, and partnerships (Gupta & Vegelin, 2016; Le Blanc, 2015). Nilsson et al. (2016, 2018) highlight the importance of understanding the relationships between goals as a mapping function, given that progress in one area may enable or hinder progress in other areas. Pradhan et al. (2017) find multiple correlations as well as fundamental inconsistencies between the SDGs, highlighting the need for shared governance. Sachs et al. (2019) similarly frame SDG delivery around transformational processes rather than discrete sectors.

The strong assumption of order leads to at least four tests. It seeks to maintain or improve the subsistence economic base; respecting environmental limits and tolerance; expanding current capabilities without excluding vulnerable organizations; and preserving options for future generations (Daly, 1990; Rockström et al., 2009; Steffen et al., 2015). Nationwide evidence suggests that both sides of the test are important: greater social prosperity often corresponds to excess environmental impact, while reduced resource use often corresponds to unmet human needs (Fanning et al., 2022; O'Neill et al., 2018). Strong interpretations allow gains in output capital to compensate for losses in natural capital or the environment. Strong interpretations imply that certain social functions, cultural relations, and fundamental rights cannot be easily replaced. Such a distinction involves attention. One cannot judge a project solely by its financial merit if it causes irreversible loss of ecosystems, nor can one judge solely by carbon emissions if participation is

coerced or interests captured by a small group.

Therefore, what is relevant in this study is not a single social theory. This is towards sustainable, responsible, productive development while maintaining the environmental and social code. Outcome factors capture continuity, counseling, participation, and willingness to contribute to optimal treatment. These behaviors are interpreted as indicators of sustainable support for a particular development plan. They do not directly measure a country's SDG attainment but indicate whether the plan is seen as worthy of continuity, support, participation, and additional resource investment: four sustainability-related behavioral indicators.

2.2 Economic equity

Equity is about fairness in outcomes and the processes that produce those outcomes. Being equal may require being treated the same, but equity is about how different people may need to be treated depending on where they start or the risks, they face. Economic equity can then be seen as having a vertical dimension (in terms of different income and wealth groups), a horizontal dimension (in terms of how people in similar groups may be treated differently), a spatial component (between regions) and an intergenerational element. Voice is another key aspect of equity, particularly in the context of the environment, as all citizens who are affected by investment or conservation, tax or transfer policies have a legitimate right to participate in their design. Environmental justice scholarship focuses on the distributional, procedural, and identity aspects of a given distribution of impacts and benefits, showing that these are rarely consistent across different social groups (Agyeman et al., 2002; Menton et al., 2020).

Economic equity contributes to sustainability in several important ways. At the basic level, it enables access to a wider range of opportunities, such as education, credit, infrastructure, and markets, which have positive implications for the exchange capacities of different income groups and across firms. Broader participation and equity in benefits increase social acceptance and reduce the likelihood of conflict. Social protection can reduce adjustment costs, facilitating transitions for households and workers. Friendly institutions of a quasi-constitutional economy emerge when there is equity in decision-making processes, as it allows for more information to be taken into account in collective decision-making. On the other hand, large equity gaps lead to short-sighted behavior at both the individual and institutional levels, with implications for the ability to invest in long-term, risky, socially just transitions. Overall, equity is a prerequisite for pro-sustainability institutional change that cannot be ignored, it is not a distributive side-issue, but a fundamental element of how a sustainable investment system can emerge.

2.3 Balancing growth

The balance of growth does not represent constraint, but a combination of growth mix, capacity, allocation, and consideration of resource intensity with its quantity. General development metrics aim to combine both income and poverty reduction as well as resource efficiency and pollution reduction (Aslam & Ghouse, 2023). The World Bank (2012) argues that environmental protection should not be postponed until countries become wealthier, once market failures, environmental vulnerabilities, and adjustment costs have been addressed. Bowen and Hepburn (2014) similarly argue that innovation, cheap energy, appropriate infrastructure, and credible long-term policies are required for an integrated development model to emerge. The question is not just whether output rises, but what is produced, how, who owns it, and whether it retains capacity for future production capacity.

In the manufacturing and service sectors, balanced growth is reflected in the relationships among investment, enterprise cooperation, efficiency, infrastructure capabilities, price equity, and local finance. An economy can claim growth while households witness a fluctuation in their income, congestion, social pressure, or loss of health. Instead, balanced development is about building sustainable supply chains, developing skills, adopting reasonable prices, reinvesting in public goods and the environment, and meeting demand in a limited way. Equilibrium-growth indicators respond to inputs, value creation, and the price-quality or innovation relationship, all of which combine to ask whether economic activity is generating

reliable and fair returns, rather than quantity.

Empirical studies typically associate inclusive and green expressions of growth with more sustainability, with enablers. Grossman and Krueger (1995) noted that environmental pressures may vary with income, but their findings fail to show that size independently shapes environment. The papers that follow focus on the role of policy, technology, institutions, and consumption. Hickel and Kallis (2020) question whether full global competition is possible at the level required with ongoing integrated development, while Kallis et al. (2018) argue that the growth of literature raises a number of questions about functionality, transparency, distribution, and democracy. Arguments suggest that positive and sustainable development aid depends on the balance of financial, distributional, and environmental constraints, not on GDP growth per se.

H1: Balancing growth has a positive and significant effect on sustainable development.

2.4 Environmental transition

Environmental change refers to environmental changes toward more sustainable use, conservation of resources, pollution reduction, and adaptation to lifestyles. This includes renewable energy, efficient use of buildings and transportation, circular mobility, conservation, climate adaptation, and organizational behavior changes. Transition theory emphasizes that these changes occur among technological, regulatory, market, cultural, infrastructure, and user practices (Geels, 2002; Markard et al., 2012). Thus, deep carbonation requires coordinated changes across multiple sociotechnical systems, as well as the diffusion of a single mechanism (Geels et al., 2017). Because of the resources, habits, and political closure of dominant institutions, transition is not a simple substitution for one method for another, but one of conflict, experimentation, time mismatches, and the rest of old skills.

Environmental awareness is an important antecedent of behavior but is incompatible with environmental fluctuations. Indicators measure the perceived importance of environmental protection, the impact of environmental quality on experience, and personal environmental awareness. As such, they measure micro-level preparedness for environmental change. This estimate is lower than direct indicators such as renewable energy adoption, carbon intensity, or economic viability. Nevertheless, public awareness of environmental quality and responsibility can influence research, compliance, policy support, and organizational incentives. Transition policies last longer when people understand the social problem and connect it to the quality of their own experiences.

Transitions can advance sustainable development by reducing environmental risks, improving natural resources, spurring innovation, and protecting the natural resources from which food comes. Activities also lead to synergies and trade-offs in terms of the SDGs, so sector improvements cannot be considered to lead to equitable total outcomes (Fuso Nerini et al., 2018). Still, poorly designed strategies can backfire. Energy price reforms can place a burden on low-income households; grazing restrictions may exclude nutrients in the absence of alternatives; new infrastructure can trigger land conflicts; and integrated jobs may not arise in the same locations or require the same skills as derivative jobs. Transition processes are spatially embedded and ensure that regional capacities and burdens are materially distinct (Coenen et al., 2012; Truffer & Coenen, 2012). Sovacool and others. (2017) therefore advocate an analysis of power-justice across distribution, knowledge, and processes. Thus, environmental change must be considered along with environmental protection, employment policies, regional development, and decision-making capacity.

H2: Environmental transition has a positive and significant effect on sustainable development.

2.5 Social justice

Social justice is "the question of how benefits and burdens are shared, whose needs and interests are recognized, and who can participate in decisions" (Dempsey et al., 2011, p. 333). raise who gains or losses in terms of access to "clean" infrastructure, services, revenues, costs, or damages the second raises issues

of access to data or communication channels, whose consent is needed, who participates in decisions, and how their views are weighted. lifestyles, knowledge, and how they respond to disparate vulnerabilities While Fraser (2005) identifies links between redistribution and recognition in political representation, social justice scholars such as Schlosberg (2007) describe many ways in which struggles for social justice simultaneously capture aspects of distribution, process, and recognition the above structure incorporates inclusiveness, access to and appreciation of cultural and cultural heritage and the importance of development work in the community Each represents the concepts of knowledge and well-being as outcomes of the sustainable development process for the individuals and groups concerned distribution (benefit sharing), access, participation, efficiency, non-discrimination, recognition, and aspects of group protection The evidence presented here is intended to test the hypothesis that socially based and rewarding sustainable development contributes positively to multilateral political economy.

Just transition scholarship prioritizes justice aspects of decarbonization transitions. Newell and Mulvaney (2013) examine low-carbon growth opportunities in terms of their political-economic implications for transition countries. Heffron and McCauley (2018), for their part, define horizontal continuity as evolution with greater attention to distributional aspects. Meanwhile, McCauley and Heffron (2018) suggest climate justice, energy justice, and environmental justice as the three transitional policies of sustainability. Finally, Jenkins et al. (2016) proposed a theory of energy transformation that explicitly seeks to integrate distribution, recognition, and procedural justice. Overall, this body of work suggests that social justice plays a significant role in shaping legal and climate change. Put another way, a transformational vision of sufficient magnitude is likely to meet resistance if citizens do not feel that they are benefiting from the transformation process or that their interests have been carefully considered in its design. To develop the capacity for acceptance and transformation, policy decision makers need to shift toward inclusiveness, consider alternatives, and strive for greater outcomes for all.

H3: Social justice has a positive and significant effect on sustainable development.

2.6 Integrated conceptual model

The model conceptualizes economic justice as a higher principle of planning expressed through balanced development, ecological evolution, and social harmony. Each of the constituent factors affects the sustainable development of a country, region, industry, or organization. The distinction between the three is appropriate, given that any community can exhibit varying degrees of competence in each of these areas. However, their combination is also appropriate, as sustainability is an overarching principle, and progress not based on ecology is regressive, environmentalism not based on social justice is unsustainable, and redistribution without income is parasitic

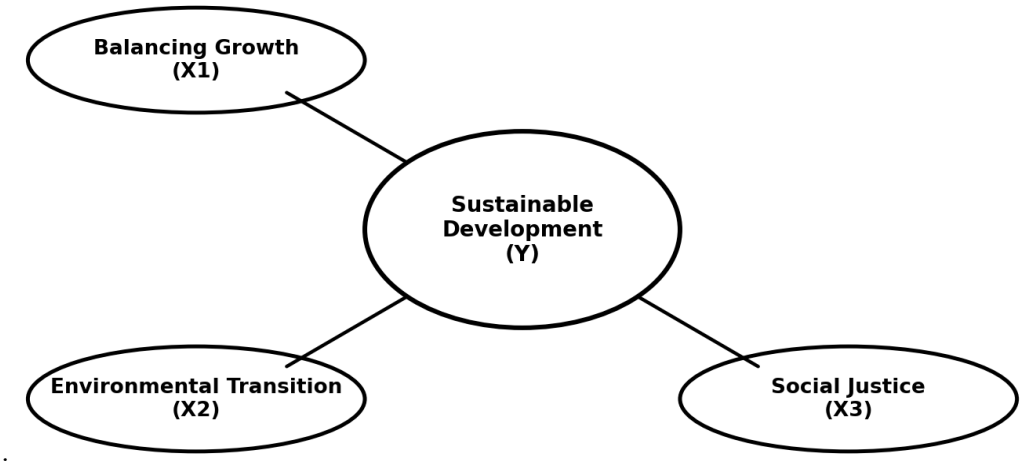


Figure 1. Economic Equity Framework

Figure 1 presents three distinct parallel approaches for how economic equity might contribute to sustainable development. The figure does not suggest that these dimensions are interchangeable but rather allows for comparison of their individual standardized effects while upholding the theoretical position that durable sustainability requires integration across all three.

3. Research Methodology

3.1 Research design and analytical status

The study adopted quantitative, cross-sectional, descriptive research design. Of the total number of questionnaires distributed (400), 384 were returned and correctly completed, representing a 96.0% response rate. The unit of analysis was the individual, and a 5-point Likert scale was used ranging from strongly disagree to strongly agree. In the pilot study, 100 questionnaires were distributed, and 94 were retrieved, correctly completed, and analyzed.

The study model includes four constructs and 13 indicators, with balanced growth, environmental transition, and social justice defining exogenous variables, and sustainable development as an endogenous factor. The results of the analysis show how these clusters affect the ability to achieve sustainability in the proposed model. However, to generalize macroeconomic equity findings, a probability sample must be selected from a population of households, workers, firms, institutions, and communities.

3.2 Population, sampling, and data collection.

Data collection took place over 3 sites during 2024 to cover 3 sites to reduce single-site bias. The questionnaire was distributed by trained facilitators in 3 languages. Multi-site respondent sampling was used to increase the range of observations and reduce location-specific biases. Respondents were invited to participate on a voluntary basis. All procedures were anonymous.

Incomplete or non-transparent questionnaires were excluded according to the exclusion criteria. The final sample size of 384 was sufficient to assess the parsimony of the three-predictor PLS model. In fact, the volume exceeds the traditional 10-fold rule of thumb for the number of indicators (13 items). More importantly, the model adequacy is assessed by loadings, internal consistency, convergent validity, discriminant evidence, bootstrapped confidence intervals, and global estimated fit statistics rather than sample size. The analysis was ethically informed by voluntary participation, the right to withdraw, and confidentiality. Anonymity was preserved by excluding any potentially identifying respondent variables.

3.3 Operationalization of constructs

Table1. presents the structure of the indicators

Construct	Code	Operational meaning in this study	Measurement foundation
Balancing Growth	BG1–BG3	Adequacy of facilities; value created by services; fairness between price and quality/innovation	Value perception (VP1–VP3)
Environmental Transition	ET1–ET3	Importance of protection; environmental quality; personal environmental responsibility	Environmental awareness (EA1–EA3)
Social Justice	SJ1–SJ3	Inclusive wellbeing; connection with nature and culture; socially meaningful experience	Emotional experience (EE1–EE3)
Sustainable Development	SD1–SD4	Continuity, endorsement, participation, and willingness to support higher-quality provision	Willingness to participate (WP1–WP4)

Table 1 were determined by focusing on the mechanisms that influence the processes. Thus, an individual's perception of quality and justice of an economic value determines its growth. Transition to sustainability is determined by an individual's awareness and orientation towards environment-quality. Recognition and wellbeing-related value determine the process of social justice. Finally, continuous improvement and support of development by individuals defines sustainable development. It should be noted that the structure presented above is relevant to analyses on an individual level, but not on a national level. Each indicator was sorted out according to the constructs proposed by the previous literature review.

3.4 Data-analysis procedure.

The research was conducted in two phases. First, the measurement model was assessed by examining the indicator loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) for each construct. Although loadings of .70 or higher are usually recommended, values of .50 or higher may be acceptable if construct reliability and content coverage are achieved. In addition, alpha and CR values of .70 and above and AVEs of .50 or above indicate good consistency, reliability, and internal consistency. Sample means were appropriate for the analysis of variance using the Kaiser–Meyer–Olkin statistic, Bartlett's slope test, and the amount of variance explained.

The structural model was then estimated using partial least squares structural equation modelling. The method of partial least squares structural equation modeling (PLS-SEM) is appropriate for prediction-oriented and theory-driven analyzes of latent variables, and the results should report measurement- and structural-model criteria (Hair et al., 2019). The reliability and validity of the measurement model were assessed according to the guidelines of Cheung et al. (2024), whereas the statistical model used 5,000 bootstrap resamples. Standardized path coefficients reflect the direction and magnitude of relationships between variables, and their standard errors reflect the sampling distribution of the coefficients. Thus, the t statistics and p -values test whether the coefficients can be assumed to be different from zero, and the confidence intervals represent the range of population significance. Finally, goodness of fit was assessed using SRMR, d_ULS, d_G, and NFI. The values of these indices were interpreted with caution because distances should be compared to relevant reference quantiles calculated using bootstrap sampling

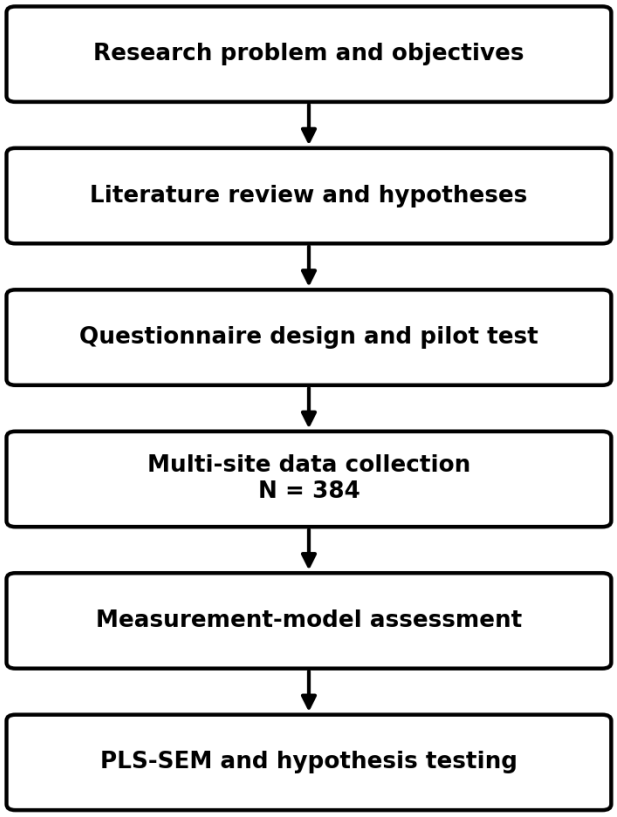


Figure 2. Research methodology process.

Figure 2 below represents the research process, which started with defining research objectives and conducting a literature search, designing a questionnaire, and a pilot study followed by collecting data from several sites. In the next stage, the process separated assessment of measurement model from structural model. From the diagram, one can see that decisions about hypotheses were made after their reliability and validity were evaluated.

4. Results

4.1 Respondent profile

This study conducted an analysis of the research subjects, and the results are as follows

Table 2. Sample Feature Table

Characteristic	Category	Frequency	Percentage
Gender	Male	233	60.7
	Female	151	39.3
Age	18 or below	25	6.5
	19–30	87	22.7
	31–50	198	51.6
	51 or above	74	19.3
Nationality	China	97	25.3
	Singapore	87	22.7
	India	64	16.7
	Thailand	48	12.5
	Indonesia	21	5.5
	Malaysia	67	17.4
Prior activity frequency	0–5 times	193	50.3
	6–10 times	94	24.5

	11–15 times	59	15.4
	More than 15	38	9.9

As seen in Table 2, 60.7% of the sample were men, and 39.3% were women. The most common age group was 31-50, with 51.6%, followed by 19-30, with 22.7%. The six reported nationalities comprised 25.3% China, 22.7% Singapore, 17.4% Malaysia, 16.7% India, 12.5% Thailand, and 5.5% Indonesia. Half of the participants said they could provide more than five examples of activities before. Thus, the profile suggests multinationalism of the participants, yet the sample was localized in its scope and attracted considerable middle-aged and inexperienced respondents. The distribution is descriptive; no claim for its representativeness for the larger population groups is provided because the relevant group-test outputs are missing.

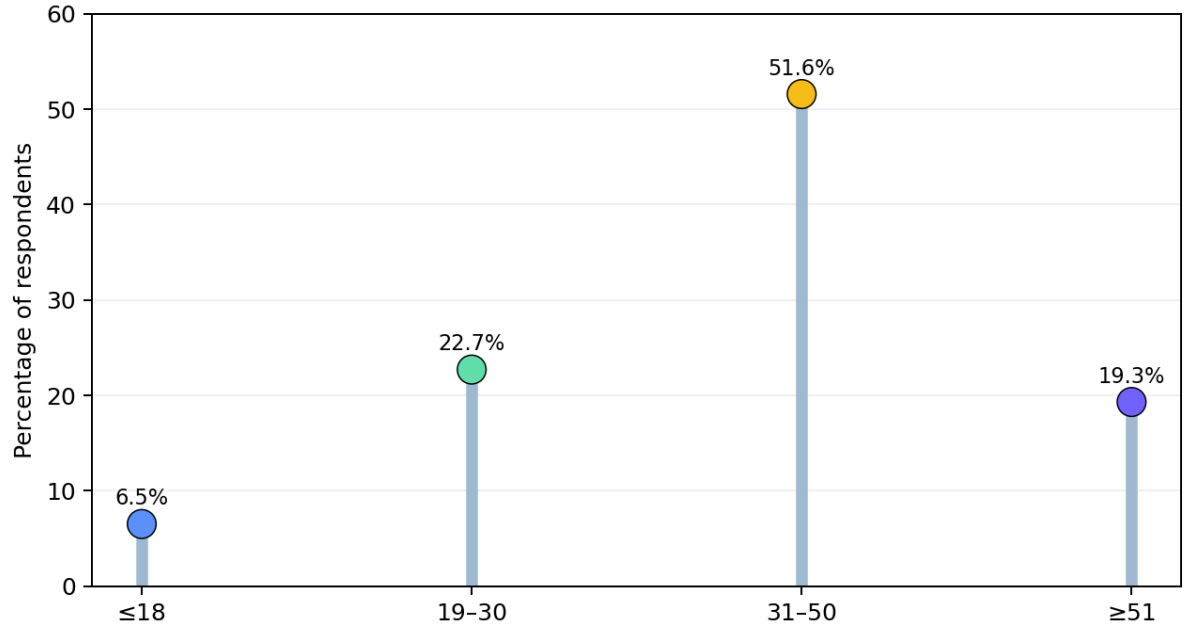


Figure 3. Age Profile of Respondents (N = 384)

Figure 3 allows us to see the concentration of the sample. Thus, the respondents who are aged 31–50 account for slightly more than half of all cases, meaning that the model primarily reflects the assessments of economically active adults but not adolescents or elderly. Therefore, one should be careful about the interpretation of equity because diverse age cohorts can experience differences in employment, opportunities for mobility, affordability, and climate risks

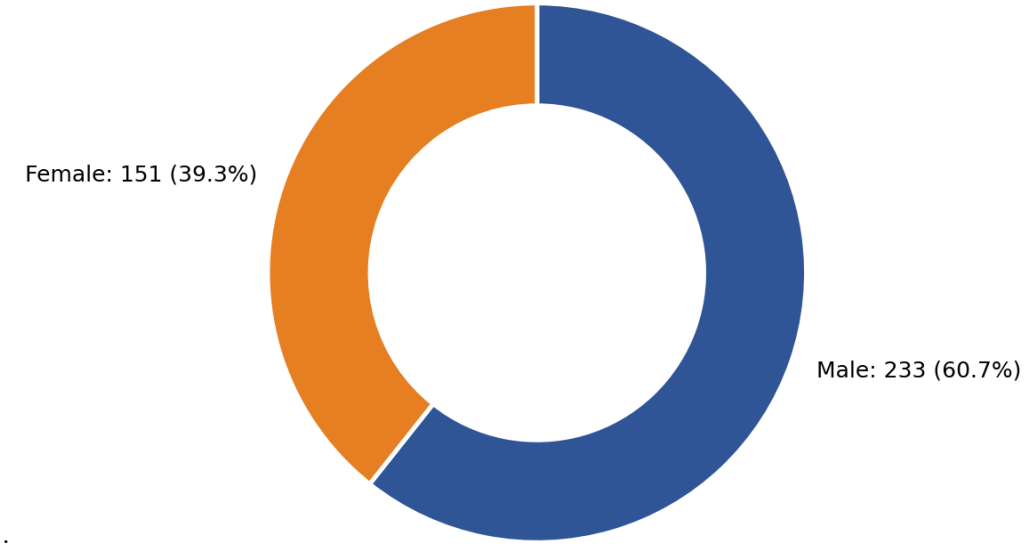


Figure 4. Gender composition of the sample

Figure 4 below represents the gender structure as a composition chart. Thus, the given structure demonstrates that most of the participants are male at 60.7% (N=233). At the same time, 39.3% are female (N=151). It may be concluded that the structure is imbalanced. Since the analysis does not involve the analysis of measurement-invariance and group-difference tests, the descriptive composition is reported; however, it does not claim that the structural relationships are different due to gender.

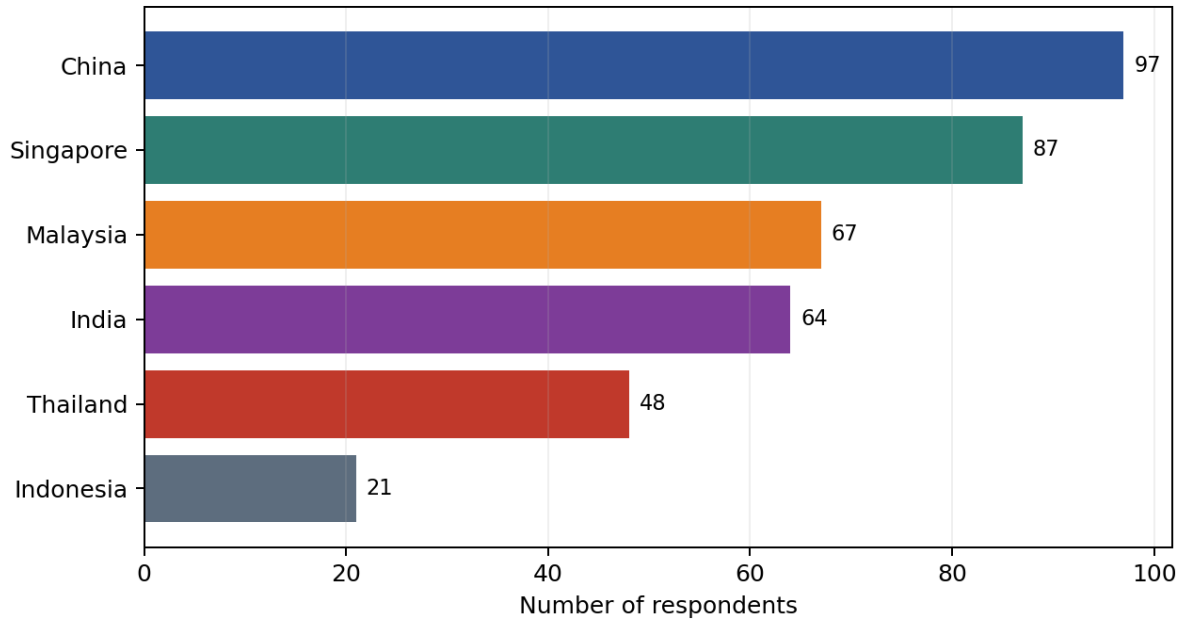


Figure 5. Pivot chart of respondents by nationality

Figure 5 reorganizes the nationality frequencies as a pivot chart. China constitutes the largest group (n = 97; 25.3%), followed by Singapore (n = 87; 22.7%), Malaysia (n = 67; 17.4%), India (n = 64; 16.7%), Thailand (n = 48; 12.5%) and Indonesia (n = 21; 5.5%). The figure retains the precise categories and counts reported in the dataset. It enhances the comparison across nationalities but does not infer national population distribution, since the sample was selected at specific sites rather than based on population proportionate national allocations.

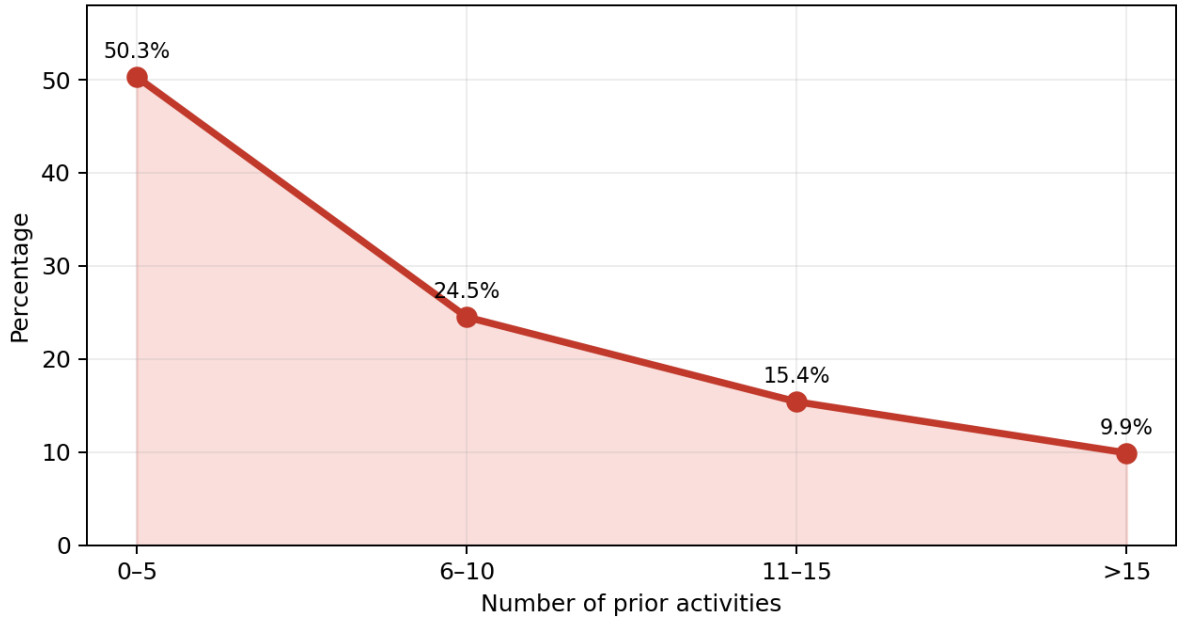


Figure 6. Profile graph of prior activity frequency.

Figure 6 shows an apparent downward trend as the number of previous activities increases. Half of the sample falls into the zero-to-five category, while less than one respondent in ten has had more than 15 of them previously. This is therefore a high proportion of respondents with limited prior exposure. Their views on value, as well as those of the environment, inclusion, and future support, may be particularly sensitive to factors such as accessibility and early experience.

4.2 Measurement-model assessment

Table 3. Factor Analysis

Construct / item		Loading	Cronbach's α	CR	AVE
Balancing Growth	:BG1	0.84	0.868	0.89	0.729
	BG2	0.829			
	BG3	0.891			
Environmental Transition	:ET1	0.867	0.885	0.909	0.77
	ET2	0.831			
	ET3	0.931			
Social Justice	:SJ1	0.862	0.846	0.907	0.765
	SJ2	0.861			
	SJ3	0.901			
Sustainable Development	SD1	0.79	0.86	0.881	0.65
	SD2	0.811			
	SD3	0.811			
	SD4	0.813			

Table 3 below shows that all indicators have satisfactory reliability and convergent validity. Each item has a loading above .790, which means that there is a strong relationship between the indicator and the construct.

At the same time, Cronbach's alpha is above .7 (it is between .846 (social justice) and .885 (environmental transition)), and composite reliability is between .881 and .909, which also suggests that all items are consistent in measuring the same constructs. AVE is between .650 and .770, meaning that the constructs explain at least 65% of variance in the indicators. Thus, all the values are sufficient, and all items should be retained and used for further analysis. Therefore, the measurement model with four constructs is valid since the four constructs have acceptable reliability and validity.

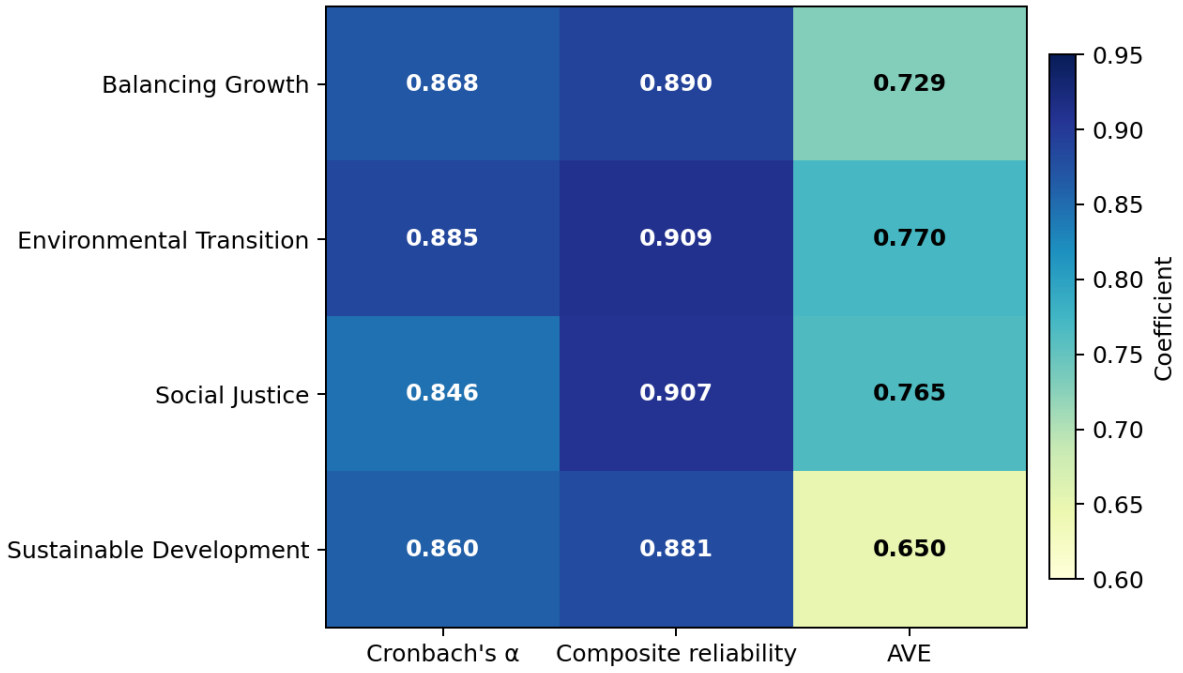


Figure 7. Heatmap of construct reliability and convergent validity

Figure 7 below presents Cronbach's alpha, composite reliability, and average variance extracted as a heat map instead of another bar graph. Environmental transition has the highest alpha and composite reliability, while social justice has a marginally lower composite reliability, but a high AVE. Sustainable development has the lowest AVE (.650), but it is still comfortably above the minimum of .50. The cells' annotation preserves every detail in the exact value, and the colors' contrast allows the human eye to identify the pattern effortlessly but not replacing the statistical table. Reliability alone cannot confirm the content validity of a scale, but it certifies all items in the indicated clusters consistently work.

The Kaiser–Meyer–Olkin value was .808, and Bartlett's test was significant, χ^2 (78) = 2,785.069, $p < .001$. Four factors extracted together explained 77.20% of the variance. The KMO result confirms that common variance across the 13 items is good enough to proceed with factor analysis. Bartlett's outcome rejects the idea of the given correlation matrix being an identity matrix. And finally, the variance explained demonstrates that the four-factor solution holds a considerable amount of information from the original items.

4.3 Correlation evidence

Table 4. Factor relationship

Relationship	Pearson r	Significance	Interpretation
Balancing Growth ↔ Sustainable Development	.438	$p < .01$	Moderate positive association
Environmental Transition ↔ Sustainable	.406	$p < .01$	Moderate positive

Development			association
Social Justice ↔ Sustainable Development	.398	p < .01	Moderate positive association

Table 4 displays positive bivariate relationships among all economic-equity dimensions and sustainable development. The greatest correlation is with balancing growth (r = .438), followed by environmental transition (r = .406) and social justice (r = .398). Thus, the coefficients suggest a moderate association, not that any of these dimensions are redundant substitutes for the others. Finally, note that the order of the variables differs from their arrangement in the structural model because, in this table, we examine zero-order correlations, not standardized path coefficients that represent unique variance explained by each construct in the presence of controls.

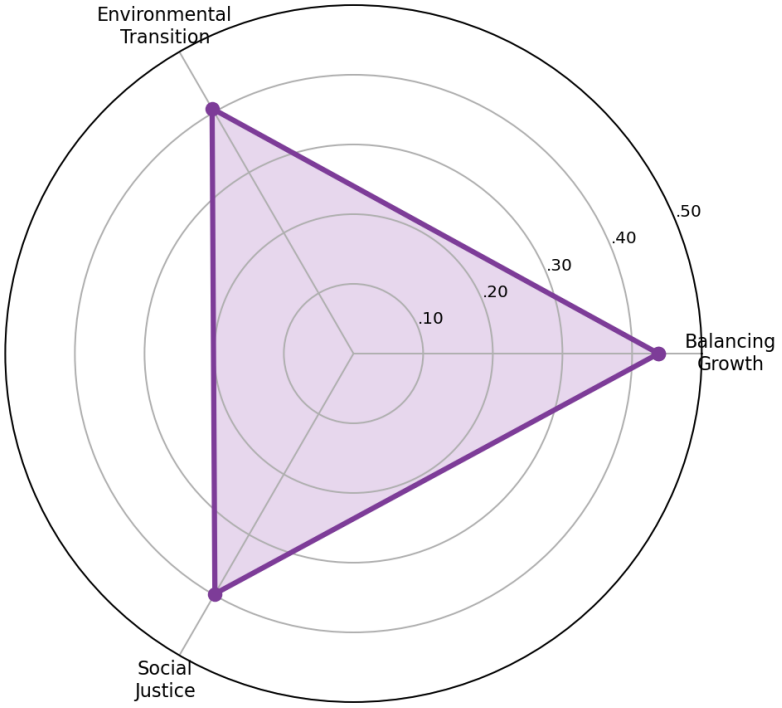


Figure 8. Radar profile of correlations with sustainable development

Figure 8. Bivariate Relations Compared Using Common Radial Metric. The compactness of the figure suggests that the degree of associations is confined to a narrow range between .398 and .438. Balanced integration achieved the highest score, next is environmental transition, and the third is social justice. This figure is for the purpose of comparison; therefore, the exact values should be referred to in Table 4.

4.4 Structural-model assessment and hypothesis testing.

Table 5. Acceptable Approximate Fit

Fit indicator	Reported value	Reference criterion	Assessment
Chi-square	382.085	Descriptive	Reported only
SRMR	.055	< .080	Acceptable
d_ULS	.273	< .950	Acceptable with caution
d_G	.150	< .950	Acceptable with caution
NFI	.850	> .800	Acceptable

Table 5 shows an acceptable approximate fit. The SRMR is .055 which is smaller than .08 so the average difference between the observed and model-predicted correlation is small. The NFI is .850 which means that the fit has improved compared to a model where no relationships are present, as required by the given criterion. The d_ULS and d_G values are small, however, we should compare these values with the appropriate percentiles from a bootstrapped distribution (which are not available in this paper), and we are being conservative here. The model fit is thus sufficient to interpret the paths, but it does not establish causality.

Table 6. Statistical Table of Established Hypotheses

Hypothesis And Path	β	SE	t	p	95% CI	Decision
H1: BG → SD	.230	.049	4.687	< .001	[.132, .327]	Supported
H2: ET → SD	.208	.050	4.155	< .001	[.110, .305]	Supported
H3: SJ → SD	.298	.050	5.978	< .001	[.199, .393]	Supported

Table 6 presents partial support for all three hypotheses. Balanced growth positively predicts sustainable development (β = .230, SE = .049, t = 4.687, p < .001), and its confidence interval excludes zero. Environmental transition also has a positive effect (β = .208, SE = .050, t = 4.155, p < .001). Social justice has the strongest unique effect (β = .298, SE = .050, t = 5.978, p < .001). The coefficients mean that a one-standard-deviation increase in the relevant predictor is associated with an increase of .230, .208, or .298 standard deviations in sustainable development, holding the other predictors in the model constant.

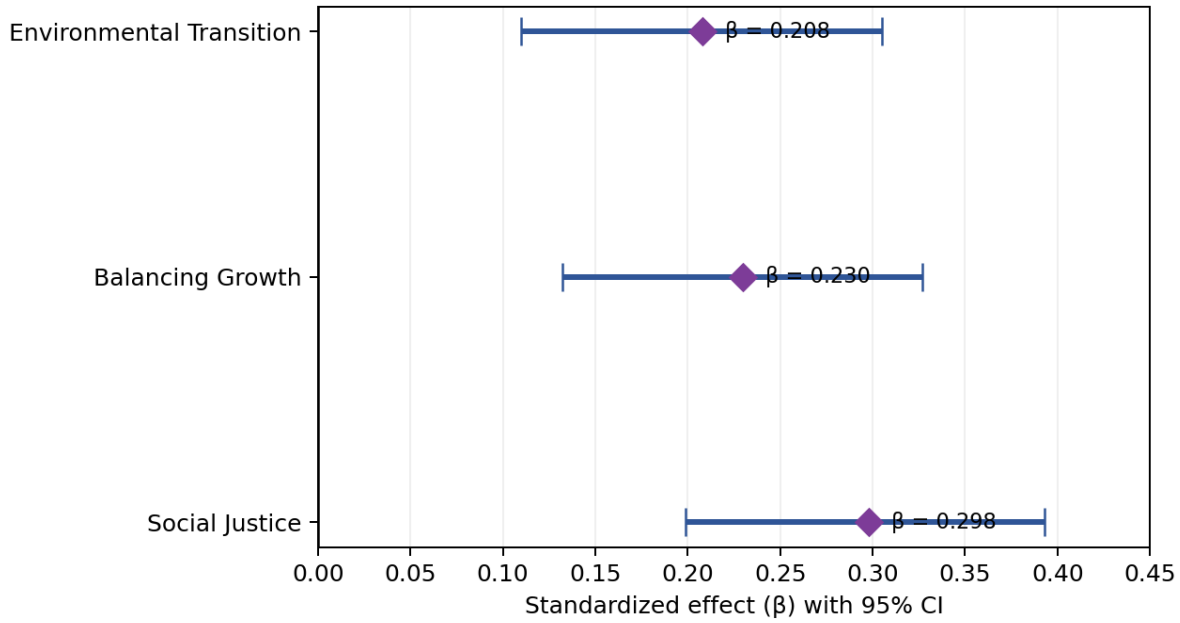


Figure 9. Forest plot of standardized structural effects and 95% confidence intervals

Figure 9 shows the standardized coefficients as the forest area with their 95% confidence intervals. Social justice is the strongest path (β = .298, 95% CI [.199, .393]), followed by balanced growth (β = .230, 95% CI [.132, .327]) and institutional turnover (β = .208, 95% CI [.110, .305]). None of these intervals exceed zero, visually reinforcing the theoretical decisions. Social justice has a strong unique direction despite its low pairwise correlation, suggesting that it provides distinct explanatory information when other predictors are considered. The differences should not be exaggerated because the intervals overlap; the larger effect supports cooperation rather than replacing growth or evolution with fairness.

5. Discussion

5.1 Balancing growth and sustainable development

The contribution of H1 indicates that individuals who perceive a strong fit between product, service value, price, and quality are more likely to indicate support for the development process in travel behavior. In other words, people are willing to accept a development offer that provides them with expected benefits and perceive it as a fair exchange for the trait. This finding is consistent with the inclusive-growth hypothesis because sustainability-minded strategies require ongoing economic gains to cover costs and not just limit them. By focusing solely on community, conservation-focused programs risk creating only a transient community of donors, while development-oriented and quality-oriented policies may provide a lasting foundation for building a community that supports sustainability.

Although the .230 coefficient is not significant, the concept of balanced growth is not a panacea for creating a sustainability-oriented system. The fact that economic efficiency is a significant predictor does not mean that it is the only pillar of sustainability. An area or organization that offers excellence in terms of products and services may still find its growth unsustainable due to overuse of resources. Similarly, a development plan may fail to deliver on promises and then promise a system that cannot be achieved in terms of price and experience. Thus, given the estimation in H1, economic efficiency should not be viewed as a guarantee of long-term stability.

The transition also explains how balanced development promotes sustainability by ensuring that investments in facilities and services meet cost limits. It goes beyond simply allocating costs by also considering the perceived value of costs by managers. In other words, when talking about balanced growth, software developers must ensure that sufficient capital is invested in creating and maintaining products and services at an acceptable level of quality. The investment also needs to be negotiated through increased rates, concessions, and other means to create a profitable project for companies receiving concessions. Profitability should then be determined by factors such as employment of local suppliers and workers, investment in education, job creation with living wages, infrastructure payments based on local consumption, and return of revenues to the local environment and community.

5.2 Environmental transition and sustainable development

H2 posits that environmental management has a positive effect on sustainable development; those who value conservation, those who associate social good with their experiences, and those who feel worthy are more likely to promote processes and improvements. This finding highlights a key aspect of any resource-based economy, namely that the environment is one of the primary values. Its decline through air and water pollution, land degradation, biodiversity loss, resource depletion, and poor waste management has negative impacts on ecosystems and economies.

The standardized coefficient value of .208 is the lowest of the three direct effects. This is not to say that the evolutionary process is unimportant, but it does suggest that mindfulness may be necessary but not sufficient for mediation, as people may endorse unwanted behavior. Individuals may agree that the system needs to be improved while viewing the proposed measures as unfair, ineffective, imprecise, and/or too expensive to implement. The gap between attitudes and practices is well documented in the existing literature on environmentalism, requiring policy makers to make the process simpler or more attractive to accommodate this diverging attitude. Thus, to encourage investment in transition, policymakers may wish to create institutions that facilitate further steps, regulate, ensure compliance, provide information, provide financial rewards, infrastructure constraints, and build trust.

It is useful for policymakers to frame transitions as investment-friendly options that address relevant environmental concerns. The system selected the following areas for inclusion: renewable energy, renewable energy sources and transportation, wastewater treatment, footprint design standard, sustainability auditing

and rating, environmental footprint, closed system sources, waste reduction and recycling, and refinancing and costs, among others. Each of these components seeks to consider equity, specifically which groups of employees can bear costs and benefits, who will hire and be hired, and how small employers will be hired. Awareness thus translates into practical and relevant sustainable development.

5.3 Social justice and sustainable development.

The most supported option is the one that satisfies H3 and prioritizes environmental justice as a key pillar of sustainable development credibility. Respondents indicated that healthy development, harmony with nature and culture, and rich experiences were most desirable. This result is closely related to the concept of science; development is most successful in its role as a directive when it empowers individuals and communities by acknowledging their relationships, roles, and identities rather than treating them as means to an end. Technically feasible but environmentally insensitive measures lead to failures in policies that require people's commitment, as illustrated by the just migration literature. Regions that do not recognize the symbolic value of certain communities and lifestyles risk losing public support even when new conditions offer overall improvement.

Social justice enables sustainable development by influencing the evolutionary process through trust, cooperation, and sustainability. Citizens subject to restrictions or other burdens require transparency, cost, and recognition for willing compliance. Similarly, workers need reassurance that they will undergo retraining, financial stability, and other services to provide carbon emissions with minimal disruption to their lives. The same is true for consumers, who are more likely to accept higher prices and reduce pollution when they understand what the extra costs are like and benefit from improved service. In contrast, an infectious perception of injustice often defeats the objectives of sustainable development policies, as is best illustrated by the literature on direct transition. Environmental justice can thus achieve the dual benefits of services by making sustainable development policies while also having intrinsic benefits.

It is too early to overstate the significance of this finding, as the approach used in the study primarily captures the role of science in promoting sustainable development. The indicator chosen for analysis focuses on process aspects rather than outcome-based measures such as income, wealth, ownership, poverty, gender, disability, power, and access to resources. The coefficient found in the analysis is significant but needs to be enhanced in further research. A more comprehensive approach would be to examine what distinguishes knowledge-based and distributed social justice systems and then examine their relationship to sustainable development.

5.4 Integrated interpretation.

Taken together, the results suggest that we reject the notion of a single stability role. All three pillars were found to have significant effects, meaning that each should be considered separately. A strategy based on economics, without environmental transformation, will destroy its very foundation. An environmental transformation that is not based on social justice will result in conflict and risk the rise of reactionary forces. Social justice of limited priority will distribute the scarcity of natural resources, as opposed to long-term optimism. Economic equality is the force that binds the community together.

The order of things is also important. Social justice should be built into the design, not as an afterthought to mitigate blame. The balance of growth should prioritize quality, local capacity building, and transfer rather than quantity. Environmental transformation requires awareness combined with infrastructure and resource incentives. These three pillars can reinforce each other: buying local products can create jobs, better infrastructure can reduce operating costs, community participation can raise awareness, and equitable profit sharing can encourage conservation.

6. Theoretical Contributions

The primary contribution of this study lies in the conceptualization of income equality in terms of cooperation, rather than as a specific outcome of distribution. The framework combines balanced growth, social transformation, and social justice as strategies that link art, social-justice, and transformational strategies. Interactions explain why equity assessment is simultaneously linked to developmental ends and strategic planning processes of policy and institutional change.

The second contribution is empirical in nature and depends on the construction results. The analysis showed that each component maintained a positive unique relationship with the sustainable development indicator. In particular, the dimension of social justice showed the highest level of routing, indicating that social values and recognition cannot be replaced by economic and social considerations. This outcome is particularly useful for supporting multivariate models and for predicting boundaries that use composite indices that hide trade-offs between components. The differential reporting of the paths allows to identify a balanced transition even when the overall level of stability is positive.

A third contribution comes from the different methodologies of the research. The paper distinguishes between statistical and theoretical validity and provides rationales for the measurement of each component. Indeed, item clusters were found to be internally consistent, whereas the conceptual discussion highlights measurement boundaries at the individual level. Such a strategy is necessary so that coefficients do not result from conceptual inadequacy of a construct. The study formalizes these considerations into a theoretical foundation and set recommendations for the development of a specific economic-management strategy that would be used in future studies.

7. Policy and Managerial Implications

7.1 Build an equity screen into development decisions

Any significant investment or adjustment must be evaluated based on four questions: Does it provide lasting benefits to the crop? Does this reduce environmental stress or increase adaptation? Are benefits and burdens distributed? Do the affected groups have a voice? Contract analysis should be conducted in accordance with the initial decision and should be repeated regularly throughout the lifecycle of the investment plan. Research should examine the effects of investment by subgroups of the population (by income, gender, age, location, employment status, and by asset confiscated) to ensure that aggregate effects do not obscure significantly different effects across groups.

7.2 Shift from growth volume to growth quality

Public agencies and managers should increase their revenue and attendance targets with indicators of social procurement, fair wages, small enterprise development, refinancing, natural resources, generational diversity, quality of life, and quality of life. Entrepreneurial services, such as community development, improved employment opportunities, and local sources, should be encouraged. Fees for the infrastructure must address its maintenance, safety, and environmental responsibility, and it is open to public scrutiny. By doing so, the structure of H1 is likely to establish a relationship between enhanced profitability and overall sustainability potential.

7.3 Design a just environmental transition

Environmental regulations should be gradual and predictable and should be accompanied by support for smaller operators, such as technical assistance, infrastructure, integrated infrastructure and flexible time. Activities include skills mapping, recognized training, income retention during transition, and pathways into new employment. For households, take steps to ease the transition, especially where basic services are affected. Participation in decision-making is needed before options are narrowed down and processes of inquiry are established. These measures would result in increased social norms without affecting those with less capacity to cope.

7.4 Make social justice measurable

Organizations need to report local outcomes, yes, but also distributional and process outcomes, which are things like how much revenue is kept local, wage distribution, small and medium enterprise contracting victory, participation rate planning, availability, displacement, costs, gender effects, satisfaction with complaint handling, and culture and community knowledge of knowledge. Removing these will make it easier to respond and avoid tokenistic consultation.

7.5 Use an integrated dashboard

Table 7 provides an alternative presentation of the model which takes the form of a management dashboard. This highlights the danger that growth without local value retention or affordability may cause for local communities as well as the risk to the environment posed by enhanced production with increased burdens on workers and communities, and the dangers to society posed by social programmed that may have unstable funding or foundations. In this way it encourages adaptive management rather than simply a single sustainability assessment.

Table 7. Factor Discussion

Dimension	Dimension	Dimension
Core indicators	Core indicators	Core indicators
Decision signal	Decision signal	Decision signal
Balancing Growth	Balancing Growth	Balancing Growth
Productivity: local value retained; decent jobs; affordability; infrastructure quality	Productivity: local value retained; decent jobs; affordability; infrastructure quality	Productivity: local value retained; decent jobs; affordability; infrastructure quality

8. Limitations and Future Research

There are several limitations to the study. First, the data is cross-sectional, so we cannot establish temporal order and causal relationships. Positive paths may indicate relationships with each other or with unmeasured influential factors. Extension plans should ensure that equity improvements preceded long-term sustainability achievements. Second, the entire construction is based on self-referential assumptions, so that there is the possibility of individual strategy and social biases. Future studies should use a mix of survey and governance, institutional, labor markets, and corporate brands.

Third, the sample comes from three sample sites and does not represent a demographic or an economy. Their age and geographic distribution vary. Licensing should include not only households, but also workers, businesses, politicians, civil society organizations, and groups that rise in costs. Multigroup analyzes could examine whether effects vary by income, race, sex, age, neighborhood, occupational status, or disability status.

Fourth, constructs are measured in terms of psychological and behavioral factors. The Environmental Group is a potential source of dynamics but does not capture technological and social change itself. The growth column measures perceived value but does not measure productivity and distribution. The judging panel captures progress and experience but not repetition or process. The outcome group measures behavioral support but lacks SDG achievement goals. These restrictions do not invalidate the reported associations but limit their interpretation.

A new instrument must have at least four items per construct and must go through expert review, intelligence interviews, pilot testing, exploratory and validation testing, measurement-validation testing, and predictive-validation assessment. Sustainable development should be measured against both assumptions

and achieved objectives. Researchers should also evaluate mediation (e.g., whether social justice enhances the effect of social mobility by increasing trust) and discrimination (e.g., whether the costs of moving reduce support among low-income groups). Spatial and longitudinal measures would show how disadvantages and burdens are spread across space and time.

8.1 Robustness and replication agenda.

Several additional tests would increase confidence in the model. New data should reflect explained variance in developmental stability, R2, out-of-sample predictive performance, and collinearity diagnostics. The evidence should also include effect sizes, f2, for each parameter estimate. Discriminant accuracy should be assessed by the heterotrait–monotrait ratio rather than from a number of correlations. Common-method bias should be controlled for procedurally by adding items and using anonymity and statistically by full-collinearity or marker-variable test. Competing models should also be compared – one defines income equality as a fixed variable and the other one defines it as a variable. A comparison of other systems will determine whether three direct effects are a more appropriate representation of the underlying process.

Surveys also need to be conducted at multiple levels – local surveys can survey households, employees, employees, and firms – and regional surveys can compare areas of potential comparison, including high-carbon industries, climate change, or natural resources. A national panel survey can combine households and enterprises with search items and administrative indicators. Multivariate modeling would then isolate individual responses from local and regional conditions. Such a mechanism is useful to capture the dynamics of the political system: a respondent may capture local fluctuations even when infrastructure is inadequate while a region may see a green investment gain when locals fail. These conditions can be combined in an integrated analysis, but they require different policy planning.

Similarly, qualitative evidence would help explain the processes captured by the model. Questions and brainstorming sessions could explore direct growth options, delivery costs, and unseen disability categories. Process research can show why the same types of policies have different effects in different contexts. Participatory mapping could reveal clusters of environmental degradation and capital that are not visible. Such approaches are particularly relevant for environmental assessment and decision-making (O'Faircheallaigh, 2010). They would complement the model by opening its measures and enhancing the content validity of the future research.

Finally, future studies should define decision points before beginning data collection. Statistical significance is an inadequate criterion for informing post-sample choices (Sharma, et al.,2025). Researchers and stakeholders may agree on minimum efficiency, reduced emissions, biodiversity, level of participation, cost-effectiveness, or benefit sharing to be considered economically efficient. The model can thus be part of a broader decision support system that balances statistical evidence, environmental, financial, and legal constraints. It would transform the topic from a research tool into a mathematical tool for planning sustainable development transitions.

8.2 Measurement priorities for the next empirical study.

The follow-up analysis should include a set of four constructs while expanding the breadth of direct measurements for each concept. Sustainability should include elements that reflect sustainable local employment, local savings, reasonable prices, local infrastructure, profitability, and reinvestment in the region. Environmental transformation should include elements related to the adoption of clean technologies and materials, pollution control, resource efficiency, conservation of natural environments, transformation planning, and actual improvement. The concept of social justice should be distributional and procedural and should encompass the dimensions of diversity, cultural identity, and social knowledge. Finally, sustainable development must be facilitated to reflect long-term economic sustainability, environmental sustainability, resilience, Health, adaptability, and stakeholder contributions.

The inspection must first go through a series of procedural documents before the final inspection. A panel of experts may initially assess whether the items are jargon-free, understandable, and free of other material. This step is critical so that the philosophical questions will have meaningful answers about the conceptualization of each term, such as justice, evolution, and social justice. The next phase will involve a preliminary test showing how well the instruments perform given the sample size, thus identifying items with low factor loadings and misinterpreting the results. No single factor should be excluded because of low statistical contribution to the total variance explained by a factor. Beyond the establishment of robust measures, the larger study would focus on measurement variability, including users, residents, businesses, and other researchers, rather than examining average differences and contextual relationships.

Objective indicators should be aggregated at the same level as the survey, whether by neighborhoods or by time periods, to ensure that the changes are consistent with respondents' perceptions of economic, social, and environmental indicators. Future research should report adjusted R2 and R2 estimates, effect sizes or f2, predictive value, nonmodal predictive power, covariate variables, and heterotrait–monotrait ratio. The analysis report should also provide a complete correlation matrix alongside bootstrapped confidence intervals. These data would be used to question the validity of the estimates, to identify relationships between variables, and to assess whether the model has sufficient power to predict new observations. A pre-written research plan will increase transparency in expressing opinions rather than interacting with data, thus reducing the risks of p-hacking and other conclusion biases.

9. Conclusion

Current research has applied an economic-economic framework to understand sustainable development as a balanced process of growth, institutional change, and social justice. This study used a survey questionnaire with 384 responses, and the analysis revealed positive and statistically significant coefficients for all three predictors. In particular, the social justice indicator showed the strongest unique association with outcome, followed by balance for growth and institutional turnover. The model showed good internal consistency and convergent validity and met close model-fit indices.

The main thrust of this study is that sustainable development, in general, and its dimensions of growth, transition, and equity cannot be achieved through identified drivers alone. Rather, benefits, environmental change, and distributive policies require a balance of communities to truly impact sustainable development outcomes. For example, economic development should be measured not only in quantitative terms but also in terms of its quality and distributional impact, with appropriate infrastructure and protective measures in place. Similarly, the transition cannot be successful without the necessary support systems and global participation. Social justice must be incorporated into decisions at every stage in order to be truly transformative. The research implies that governments can formulate more effective policies by focusing on the balance of processes and considering their overall impact on achieving the Sustainable Development Goals. Such an approach would also help enable civic engagement that would preserve social and social capital across generations.

References

Agyeman, J., Bullard, R. D., & Evans, B. (2002). Exploring the nexus: Bringing together sustainability, environmental justice, and equity. Space and Polity, 6(1), 77–90. https://doi.org/10.1080/13562570220137907

Aslam, A., & Ghouse, G. (2023). Targeting the new sustainable inclusive green growth: A review. Cleaner and Responsible Consumption, 11, 100140. https://doi.org/10.1016/j.clrc.2023.100140

Bowen, A., & Hepburn, C. (2014). Green growth: An assessment. Oxford Review of Economic Policy,

30(3), 407–422. https://doi.org/10.1093/oxrep/gru029

Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2024). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. Asia Pacific Journal of Management, 41(2), 745–783. https://doi.org/10.1007/s10490-023-09871-y

Coenen, L., Benneworth, P., & Truffer, B. (2012). Toward a spatial perspective on sustainability transitions. Research Policy, 41(6), 968–979. https://doi.org/10.1016/j.respol.2012.02.014

Daly, H. E. (1990). Toward some operational principles of sustainable development. Ecological Economics, 2(1), 1–6. https://doi.org/10.1016/0921-8009(90)90010-R

Dempsey, N., Bramley, G., Power, S., & Brown, C. (2011). The social dimension of sustainable development. Sustainable Development, 19(5), 289–300. https://doi.org/10.1002/sd.417

Fanning, A. L., O'Neill, D. W., Hickel, J., & Roux, N. (2022). The social shortfall and ecological overshoot of nations. Nature Sustainability, 5, 26–36. https://doi.org/10.1038/s41893-021-00799-z

Fraser, N. (2005). Reframing justice in a globalizing world. New Left Review, 36, 69–88. https://doi.org/10.64590/ys5

Fuso Nerini, F., Tomei, J., To, L. S., Bisaga, I., Parikh, P., Black, M., Borrion, A., Spataru, C., Castán Broto, V., Anandarajah, G., Milligan, B., & Mulugetta, Y. (2018). Mapping synergies and trade-offs between energy and the Sustainable Development Goals. Nature Energy, 3, 10–15. https://doi.org/10.1038/s41560-017-0036-5

Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes. Research Policy, 31(8–9), 1257–1274. https://doi.org/10.1016/S0048-7333(02)00062-8

Geels, F. W., Sovacool, B. K., Schwanen, T., & Sorrell, S. (2017). Sociotechnical transitions for deep decarbonization. Science, 357(6357), 1242–1244. https://doi.org/10.1126/science.aao3760

Grossman, G. M., & Krueger, A. B. (1995). Economic growth and the environment. The Quarterly Journal of Economics, 110(2), 353–377. https://doi.org/10.2307/2118443

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Heffron, R. J., & McCauley, D. (2018). What is the 'just transition'? Geoforum, 88, 74–77. https://doi.org/10.1016/j.geoforum.2017.11.016

Hickel, J., & Kallis, G. (2020). Is green growth possible? New Political Economy, 25(4), 469–486. https://doi.org/10.1080/13563467.2019.1598964

Hopwood, B., Mellor, M., & O'Brien, G. (2005). Sustainable development: Mapping different approaches. Sustainable Development, 13(1), 38–52. https://doi.org/10.1002/sd.244

Jenkins, K., McCauley, D., Heffron, R., Stephan, H., & Rehner, R. (2016). Energy justice: A conceptual review. Energy Research & Social Science, 11, 174–182. https://doi.org/10.1016/j.erss.2015.10.004

Kallis, G., Kostakis, V., Lange, S., Muraca, B., Paulson, S., & Schmelzer, M. (2018). Research on degrowth. Annual Review of Environment and Resources, 43, 291–316. https://doi.org/10.1146/annurev-environ-102017-025941

Le Blanc, D. (2015). Towards integration at last? The Sustainable Development Goals as a network of targets. Sustainable Development, 23(3), 176–187. https://doi.org/10.1002/sd.1582

Markard, J., Raven, R., & Truffer, B. (2012). Sustainability transitions: An emerging field of research and its prospects. Research Policy, 41(6), 955–967. https://doi.org/10.1016/j.respol.2012.02.013

McCauley, D., & Heffron, R. (2018). Just transition: Integrating climate, energy, and environmental justice. Energy Policy, 119, 1–7. https://doi.org/10.1016/j.enpol.2018.04.014

Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action. Cogent Social Sciences, 5(1), 1653531. https://doi.org/10.1080/23311886.2019.1653531

Menton, M., Larrea, C., Latorre, S., Martinez-Alier, J., Peck, M., Temper, L., & Walter, M. (2020). Environmental justice and SDGs: From synergies to gaps and contradictions. Sustainability Science, 15, 1621–1636. https://doi.org/10.1007/s11625-020-00789-8

Newell, P., & Mulvaney, D. (2013). The political economy of the 'just transition.' The Geographical Journal, 179(2), 132–140. https://doi.org/10.1111/geoj.12008

Newell, P., Srivastava, S., Naess, L. O., Torres Contreras, G. A., & Price, R. (2021). Toward transformative climate justice: An emerging research agenda. WIREs Climate Change, 12(6), e733. https://doi.org/10.1002/wcc.733

Nilsson, M., Chisholm, E., Griggs, D., Howden-Chapman, P., McCollum, D., Messerli, P., Neumann, B., Stevance, A.-S., Visbeck, M., & Stafford-Smith, M. (2018). Mapping interactions between the Sustainable Development Goals: Lessons learned and ways forward. Sustainability Science, 13, 1489–1503. https://doi.org/10.1007/s11625-018-0604-z

Nilsson, M., Griggs, D., & Visbeck, M. (2016). Map the interactions between Sustainable Development Goals. Nature, 534, 320–322. https://doi.org/10.1038/534320a

O'Faircheallaigh, C. (2010). Public participation and environmental impact assessment. Environmental Impact Assessment Review, 30(1), 19–27. https://doi.org/10.1016/j.eiar.2009.05.001

O'Neill, D. W., Fanning, A. L., Lamb, W. F., & Steinberger, J. K. (2018). A good life for all within planetary boundaries. Nature Sustainability, 1, 88–95. https://doi.org/10.1038/s41893-018-0021-4

Piketty, T. (2014). Capital in the twenty-first century. Harvard University Press. https://doi.org/10.4159/9780674369542

Pradhan, P., Costa, L., Rybski, D., Lucht, W., & Kropp, J. P. (2017). A systematic study of Sustainable Development Goal interactions. Earth's Future, 5(11), 1169–1179. https://doi.org/10.1002/2017EF000632

Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: In search of conceptual origins. Sustainability Science, 14, 681–695. https://doi.org/10.1007/s11625-018-0627-5

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., III, Lambin, E. F., et al. (2009). A safe operating space for humanity. Nature, 461, 472–475. https://doi.org/10.1038/461472a

Sachs, J. D., Schmidt-Traub, G., Mazzucato, M., Messner, D., Nakicenovic, N., & Rockström, J. (2019). Six transformations to achieve the Sustainable Development Goals. Nature Sustainability, 2, 805–814. https://doi.org/10.1038/s41893-019-0352-9

Schlosberg, D. (2007). Defining environmental justice. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199286294.001.0001

Sharma, P., & Karki, D. (2025). Blockchain technology in the digital era: global research trends and financial innovation. Journal of Management Changes in Digital Era, 2(1):93-109. .https://doi.org/10.33168/JMCDE. 2025.0107

Sovacool, B. K., Burke, M., Baker, L., Kotikalapudi, C. K., & Wlokas, H. (2017). New frontiers and conceptual frameworks for energy justice. Energy Policy, 105, 677–691. https://doi.org/10.1016/j.enpol.2017.03.005

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., et al. (2015). Planetary boundaries: Guiding human development on a changing planet. Science, 347(6223), 1259855. https://doi.org/10.1126/science.1259855

Truffer, B., & Coenen, L. (2012). Environmental innovation and sustainability transitions in regional studies. Regional Studies, 46(1), 1–21. https://doi.org/10.1080/00343404.2012.646164

Tuyen, P. T. A., Trong, T. D., & Nhung, N. T. T. (2026). Management Power, Open Strategy, and Organizational Structural Agility: A Dual-Mediation Framework for Digital Transformation Performance. Journal of Management Changes in Digital Era, 3(1):1-11.10.33168/JMCDE. 2026.0105

World Bank. (2012). Inclusive green growth: The pathway to sustainable development. World Bank. https://doi.org/10.1596/978-0-8213-9551-6