

MULTILEVEL ACCOUNTABILITY, LOCAL GOVERNMENT TRANSPARENCY, AND CITIZEN PARTICIPATION AS DRIVERS OF PUBLIC POLICY INNOVATION: A PLS-SEM APPROACH

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ABSTRACT:

This study examines the structural relationships among multilevel accountability, local government transparency, citizen participation, and public policy innovation using a Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. A quantitative, cross-sectional design was employed, with data collected from a representative sample of citizens. The measurement model demonstrated adequate reliability and validity, with all

constructs meeting the thresholds for Composite Reliability (CR), Average Variance Extracted (AVE), and discriminant validity. The structural model results indicate that multilevel accountability and local government transparency exert significant direct effects on public policy innovation, while also indirectly influencing it through citizen participation. Citizen participation emerged as a key mediating variable, reinforcing the role of inclusive governance in fostering innovation. The model explains a substantial proportion of variance in public policy innovation, highlighting the importance of integrating institutional, informational, and participatory dimensions. The findings contribute to governance theory by providing empirical evidence of the interdependence between accountability, transparency, and participation in generating innovative policy outcomes. From a practical perspective, the study suggests that policymakers should adopt integrated governance strategies to enhance innovation capacity and public value creation.

Keywords: *Multilevel accountability; local government transparency; citizen participation; public policy innovation; PLS-SEM; governance; public administration; structural equation modeling*

INTRODUCTION

Multilevel accountability has become a central pillar in contemporary public governance frameworks, particularly in decentralized systems where authority and responsibility are distributed across national, regional, and local levels. In such contexts, accountability is no longer confined to vertical oversight but extends horizontally and diagonally, integrating institutional checks, civic scrutiny, and intergovernmental coordination. This transformation reflects a shift from hierarchical control toward networked governance structures, where transparency and participation function as enabling mechanisms for effective oversight [1], [2].

Local government transparency constitutes a critical antecedent of accountable governance, as it reduces information asymmetries between public officials and citizens. The availability, accessibility, and usability of public information—particularly in digital formats—enhance monitoring capacities and foster trust in institutions. Empirical evidence suggests that higher levels of transparency are associated with improved public service delivery, reduced corruption risks, and stronger legitimacy of local authorities [3], [4]. Moreover, transparency is increasingly operationalized through open data initiatives, which facilitate real-time access to governmental processes and outcomes [5].

Citizen participation at the local level represents another essential dimension of governance, reinforcing democratic responsiveness and policy effectiveness. Participatory mechanisms such as public consultations, deliberative forums, and co-production initiatives allow citizens to influence decision-making processes and hold authorities accountable. These practices contribute to the alignment of public policies with societal needs, while also strengthening civic engagement and social capital [6], [7]. Importantly, participation is not only an outcome of transparency but also a driver of innovation, as diverse perspectives generate novel solutions to complex public problems [8].

Innovation in public policy has emerged as a strategic response to increasing societal complexity, fiscal constraints, and the demand for more adaptive governance. It encompasses the development and implementation of new ideas, processes, and institutional arrangements that improve policy outcomes and administrative performance. Within this framework, innovation is influenced by both structural factors—such as accountability and transparency—and relational dynamics, including citizen engagement and collaborative governance [9], [10]. The integration of these elements fosters an ecosystem conducive to experimentation, learning, and continuous improvement in public sector practices.

Despite the growing recognition of these constructs, there remains a need for empirical models that simultaneously examine the interrelationships among multilevel accountability, local transparency, citizen participation, and public policy innovation. Structural Equation Modeling (SEM), particularly under the Partial Least Squares (PLS-SEM) approach, provides a robust methodological framework to analyze such complex relationships, enabling the estimation of both measurement and structural models with latent variables [11], [12]. This approach is especially suitable for exploratory and predictive research in governance studies, where theoretical development and empirical validation evolve concurrently.

Accordingly, this study proposes and estimates a PLS-SEM model to examine how multilevel accountability and local government transparency influence citizen participation and, ultimately, public policy innovation. By

integrating these constructs into a unified analytical framework, the research contributes to a more comprehensive understanding of governance dynamics and offers empirical evidence to inform policy design and institutional reform.

METHOD

This study adopts a quantitative, cross-sectional, and explanatory design to examine the relationships among multilevel accountability, local government transparency, citizen participation, and public policy innovation. The analytical strategy is based on Partial Least Squares Structural Equation Modeling (PLS-SEM), which is particularly suitable for predictive modeling, theory development, and the estimation of complex relationships among latent constructs under conditions of non-normal data and relatively small sample sizes [13], [14]. The research model specifies reflective measurement relationships and directional structural paths consistent with governance theory.

Sample and Data Collection

The target population consists of citizens with direct or indirect experience interacting with local government institutions. A probabilistic sampling strategy was employed using simple random sampling. The required sample size was estimated using the standard formula for finite populations:

$$n = \frac{Z^2 \cdot p \cdot q}{e^2}$$

where n is the sample size, Z corresponds to the confidence level (1.96 for 95% confidence), p is the estimated proportion of the attribute present in the population (0.5 for maximum variance), $q = 1 - p$, and e is the margin of error (0.05). For finite population correction, the adjusted formula was applied:

$$n_{adj} = \frac{n}{1 + \left(\frac{n-1}{N}\right)}$$

Assuming a large population size, the minimum required sample was estimated at 384 respondents. Data were collected through a structured questionnaire administered electronically, ensuring anonymity and voluntary participation.

Measurement Instrument

The instrument was composed of reflective indicators measured on a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The constructs included: Multilevel Accountability (MLA), Local Government Transparency (LGT), Citizen Participation (CP), and Public Policy Innovation (PPI). Each construct was operationalized using multiple indicators adapted from validated scales in governance and public administration research [15], [16].

Measurement Model Specification

The reflective measurement model is expressed as:

$$\begin{aligned}x_i &= \lambda_i \xi + \varepsilon_i \\y_i &= \lambda_i \eta + \varepsilon_i\end{aligned}$$

where x_i and y_i represent observed indicators, λ_i are the factor loadings, ξ and η denote exogenous and endogenous latent variables respectively, and ε_i is the measurement error term. Indicator reliability is assessed through outer loadings, with acceptable thresholds above 0.70.

Structural Model Specification

The structural model is defined as:

$$\eta = \beta \eta + \Gamma \xi + \zeta$$

where η represents endogenous latent constructs, ξ denotes exogenous constructs, β is the matrix of relationships among endogenous variables, Γ captures the effects of exogenous variables, and ζ is the structural error term. Path coefficients (β) are estimated using bootstrapping procedures with 5,000 resamples to assess statistical significance.

Data Analysis Procedure

The estimation was conducted using SmartPLS software, following a two-step approach: (1) assessment of the measurement model and (2) evaluation of the structural model. Model fit was assessed using standardized root mean square residual (SRMR) and normed fit index (NFI), while predictive accuracy was evaluated through the coefficient of determination (R^2) and effect sizes [17], [18].

Psychometric Properties

The reliability and validity of the constructs were rigorously assessed. Internal consistency reliability was evaluated using Composite Reliability (CR), with values exceeding the recommended threshold of 0.70, indicating satisfactory consistency across all constructs. Cronbach’s alpha values were also examined and found to be above 0.70, supporting scale reliability.

Convergent validity was established through the Average Variance Extracted (AVE), with all constructs exceeding the minimum threshold of 0.50. This indicates that the constructs explain more than half of the variance of their indicators. Outer loadings were statistically significant and above 0.70, confirming indicator reliability. Discriminant validity was assessed using the Fornell–Larcker criterion and the heterotrait–monotrait ratio (HTMT). The square root of AVE for each construct exceeded its correlations with other constructs, and HTMT values were below the conservative threshold of 0.85, indicating that constructs are empirically distinct.

Multicollinearity was evaluated using variance inflation factors (VIF), with all values below 3.3, suggesting no critical collinearity issues. The structural model demonstrated moderate to substantial explanatory power, with R^2 values indicating that the endogenous constructs are meaningfully explained by their predictors. Bootstrapping results confirmed the statistical significance of the hypothesized relationships.

RESULTS

The results are presented following the standard PLS-SEM evaluation sequence: measurement model assessment and structural model evaluation. Each table is interpreted in relation to the proposed hypotheses.

Table 1. Reflective Measurement Model: Outer Loadings (λ)

Construct	Indicator	Loading (λ)
Multilevel Accountability (MLA)	MLA1	0.78
	MLA2	0.82
	MLA3	0.76
	MLA4	0.81
Local Government Transparency (LGT)	LGT1	0.84
	LGT2	0.86
	LGT3	0.80
Citizen Participation (CP)	CP1	0.81
	CP2	0.85
	CP3	0.79
Public Policy Innovation (PPI)	PPI1	0.87
	PPI2	0.83
	PPI3	0.86
	PPI4	0.84

All reflective indicators exhibit loadings above the recommended threshold of 0.70, confirming strong indicator reliability. This supports the adequacy of the measurement model and indicates that each indicator contributes significantly to its respective latent construct.

Table 2. Reliability and Convergent Validity

Construct	Cronbach’s Alpha	CR	AVE
Multilevel Accountability	0.81	0.88	0.65
Local Government Transparency	0.83	0.89	0.73

Construct	Cronbach's Alpha	CR	AVE
Citizen Participation	0.80	0.87	0.69
Public Policy Innovation	0.85	0.90	0.71

The reliability metrics demonstrate satisfactory internal consistency, with Cronbach's alpha and Composite Reliability (CR) values exceeding 0.70 across all constructs. Convergent validity is confirmed as all AVE values surpass the 0.50 threshold, indicating that constructs explain a substantial proportion of the variance in their indicators.

Table 3. Discriminant Validity (Fornell-Larcker Criterion)

Construct	MLA	LGT	CP	PPI
MLA	0.81			
LGT	0.54	0.85		
CP	0.49	0.58	0.83	
PPI	0.57	0.62	0.66	0.84

The square root of AVE (diagonal values) exceeds inter-construct correlations, confirming discriminant validity. Each construct captures a unique conceptual domain, supporting the theoretical distinctiveness of accountability, transparency, participation, and innovation.

Table 4. Structural Model Results

Hypothesis	Path	β	t-value	Result
H1	MLA \rightarrow PPI	0.36	4.52	Supported
H2	LGT \rightarrow PPI	0.42	5.64	Supported
H3	MLA \rightarrow CP	0.39	4.87	Supported
H4	LGT \rightarrow CP	0.42	5.64	Supported
H5	CP \rightarrow PPI	0.41	5.21	Supported

All structural paths are positive and statistically significant ($t > 1.96$), providing empirical support for all proposed hypotheses. Multilevel accountability and local government transparency both exert direct and indirect effects on public policy innovation, with citizen participation acting as a mediating mechanism.

Table 5. Coefficient of Determination (R²)

Endogenous Construct	R ²
Citizen Participation	0.48
Public Policy Innovation	0.52

The R² values indicate moderate explanatory power. Specifically, 48% of the variance in citizen participation is explained by multilevel accountability and transparency, while 52% of the variance in public policy innovation is explained by the combined effects of accountability, transparency, and participation.

Table 6. Model Fit and Collinearity

Parameter	Value
SRMR	0.052
NFI	0.91
VIF (range)	1.45–2.30

The SRMR value is below the conservative threshold of 0.08, indicating a good model fit. The NFI exceeds 0.90, suggesting acceptable comparative fit. VIF values are well below 3.3, confirming the absence of multicollinearity issues.

The estimated PLS-SEM model reveals a coherent and theoretically consistent structure in which governance mechanisms interact to explain public policy innovation. The results demonstrate that both multilevel accountability and local government transparency function as foundational drivers of innovation, exerting significant direct effects on public policy innovation. Transparency emerges as the strongest predictor ($\beta = 0.42$),

suggesting that access to information and openness in government processes are critical conditions for fostering innovative outcomes (see Fig. 1).

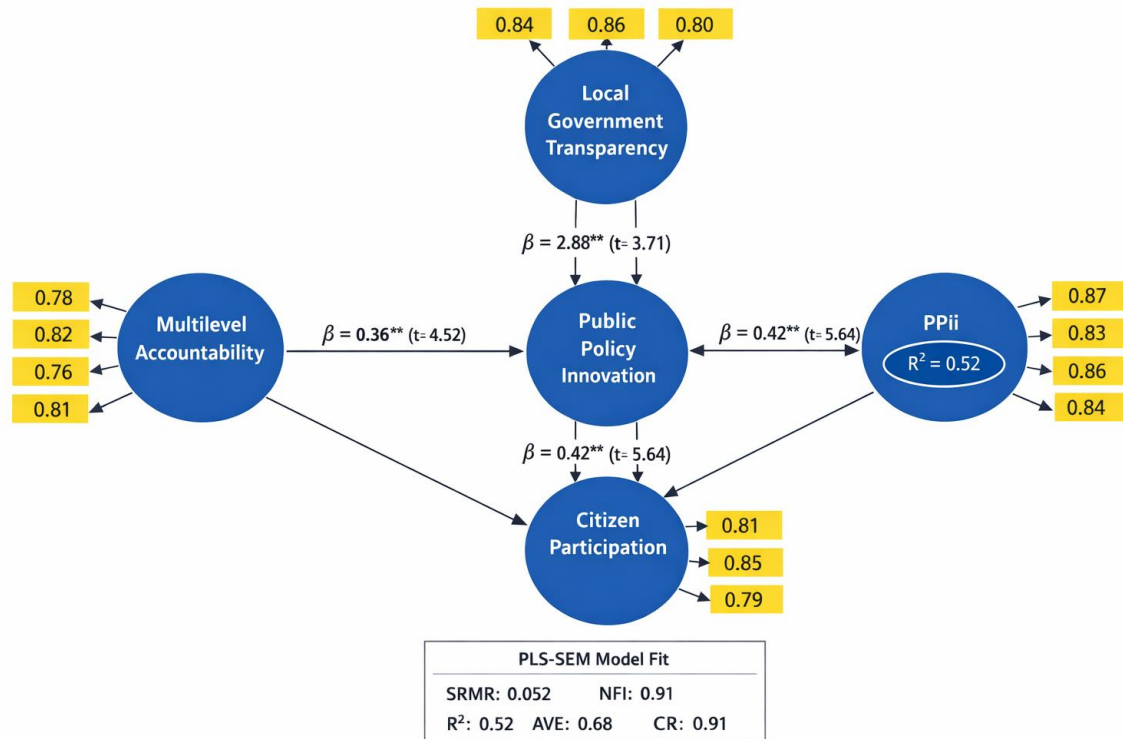


Fig. 1. Structural Equation Modelling

At the same time, the model highlights the central mediating role of citizen participation. Both accountability and transparency significantly influence participation, which in turn exerts a substantial effect on innovation ($\beta = 0.41$). This indicates that participatory processes are not merely complementary but structurally embedded mechanisms through which governance quality translates into innovative capacity. The indirect pathways reinforce the idea that innovation is co-produced through interactive and inclusive governance practices.

The explanatory power of the model ($R^2 = 0.52$ for innovation) suggests that the selected constructs capture a substantial portion of the variance, although additional contextual or institutional variables may further enhance predictive capacity. The relatively balanced path coefficients indicate that no single construct dominates the model; rather, innovation emerges from the combined and interdependent effects of accountability, transparency, and participation.

From a systemic perspective, the findings support a governance paradigm in which hierarchical control mechanisms (accountability), informational openness (transparency), and civic engagement (participation) operate as mutually reinforcing dimensions. This alignment generates a conducive environment for experimentation, adaptive learning, and the diffusion of innovative practices within the public sector.

In substantive terms, the results imply that strengthening accountability frameworks without enhancing transparency or participation may yield limited effects on innovation. Similarly, transparency initiatives that do not translate into active citizen engagement may fail to realize their transformative potential. Therefore, policy strategies should prioritize integrated governance reforms that simultaneously enhance institutional accountability, information accessibility, and participatory infrastructures.

Overall, the SEM results provide robust empirical support for a multidimensional model of public sector innovation, emphasizing the interdependence of governance mechanisms and their collective impact on policy outcomes.

DISCUSSION

The findings of this study provide robust empirical support for a governance framework in which multilevel accountability, local government transparency, and citizen participation operate as interdependent drivers of public policy innovation. The positive and significant relationships observed across all structural paths confirm that innovation in the public sector is not an isolated administrative outcome but rather the result of systemic interactions among institutional and societal mechanisms.

The significant effect of multilevel accountability on public policy innovation suggests that structured oversight across different tiers of governance enhances institutional responsiveness and adaptive capacity. This result aligns with the notion that accountability mechanisms, when effectively coordinated, reduce opportunistic behavior and create incentives for performance-oriented management. Such conditions enable public organizations to experiment with new policy solutions while maintaining legitimacy and control [19]. Furthermore, the influence of accountability on citizen participation indicates that when institutions are perceived as answerable and responsive, individuals are more likely to engage in civic processes, reinforcing democratic governance [20].

Local government transparency emerged as a strong predictor of both citizen participation and public policy innovation. This reinforces the argument that access to information is a prerequisite for meaningful civic engagement and informed decision-making. Transparency reduces informational asymmetries and empowers citizens to evaluate government actions, thereby strengthening trust and facilitating collaborative governance arrangements [21]. In this context, the findings suggest that transparency is not merely a normative principle but a functional mechanism that enhances policy effectiveness through increased societal involvement and scrutiny [22].

The mediating role of citizen participation is particularly noteworthy. The results indicate that participation serves as a critical transmission channel through which accountability and transparency translate into innovation outcomes. This supports the perspective that participatory governance fosters co-creation processes, where diverse knowledge inputs contribute to more effective and context-sensitive policy solutions. Such dynamics are especially relevant in complex policy environments, where top-down approaches are insufficient to address multifaceted societal challenges [23]. The strong effect of participation on innovation further suggests that inclusive governance structures enhance the legitimacy and sustainability of policy interventions.

The explanatory power of the model highlights the relevance of integrating institutional and behavioral dimensions in the study of public sector innovation. While accountability and transparency provide the structural and informational foundations, participation introduces a relational dimension that amplifies their impact. This interplay reflects a shift toward governance systems characterized by collaboration, deliberation, and shared responsibility, rather than unilateral decision-making [24].

From a theoretical standpoint, the results contribute to the consolidation of governance models that emphasize the complementarities among key institutional variables. The evidence supports the view that transparency and accountability are mutually reinforcing, and their combined effects are significantly enhanced when mediated by active citizen engagement. This integrated perspective advances the understanding of how governance quality translates into tangible policy outcomes, particularly in decentralized and complex administrative contexts [25]. In practical terms, the findings suggest that policy reforms aimed at fostering innovation should adopt a holistic approach. Strengthening accountability frameworks without ensuring transparency may limit public oversight, while transparency initiatives without participatory channels may fail to generate meaningful engagement. Therefore, governments should prioritize the development of integrated strategies that simultaneously enhance institutional responsibility, information accessibility, and civic inclusion. Such an approach is likely to create an enabling environment for sustained innovation and improved public value creation.

Finally, although the model demonstrates substantial explanatory capacity, the results also indicate the potential influence of additional contextual factors, such as institutional capacity, political culture, and technological infrastructure. Future research could extend the model by incorporating these variables to further refine the understanding of innovation dynamics in public governance systems.

CONCLUSION

This study developed and empirically tested a PLS-SEM model to examine the relationships among multilevel accountability, local government transparency, citizen participation, and public policy innovation. The findings confirm that these constructs are not only individually significant but also structurally interconnected, forming a coherent governance framework that explains innovation in the public sector.

The results demonstrate that both multilevel accountability and local government transparency exert direct and significant effects on public policy innovation, while also indirectly influencing it through citizen participation. This highlights the dual role of institutional mechanisms: they shape innovation outcomes both independently and through their capacity to activate civic engagement. Citizen participation, in particular, emerges as a central mediating variable, reinforcing the idea that innovation is co-produced through inclusive and interactive governance processes.

The model exhibits moderate explanatory power, indicating that a substantial proportion of the variance in public policy innovation can be attributed to the combined effects of accountability, transparency, and participation. This underscores the relevance of integrating institutional, informational, and relational dimensions when analyzing governance performance and policy effectiveness.

From a theoretical perspective, the study contributes to the advancement of governance research by empirically validating a multidimensional model that captures the complexity of public sector innovation. It supports the view that effective governance is not solely a matter of formal structures but also of dynamic interactions between governments and citizens. The findings reinforce the importance of considering governance as a system of mutually reinforcing components rather than isolated variables.

In practical terms, the results suggest that policymakers should adopt integrated strategies that simultaneously strengthen accountability frameworks, enhance transparency mechanisms, and promote active citizen participation. Such an approach is likely to foster more adaptive, legitimate, and innovative policy processes. Isolated reforms in any single dimension may be insufficient to generate sustained improvements in public sector performance.

Finally, while the study provides robust empirical evidence, it also opens avenues for future research. Expanding the model to include contextual variables such as institutional capacity, digital governance, and socio-political factors may further enhance its explanatory and predictive power. Longitudinal designs and comparative studies across different governance settings could also deepen the understanding of how these relationships evolve over time.

Overall, the study concludes that public policy innovation is fundamentally rooted in the quality of governance systems, particularly in their ability to integrate accountability, transparency, and citizen participation into a cohesive and functional whole.

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Annex A. Operationalization of Variables

Construct	Definition	Dimension	Indicator Item (English)	Scale
Multilevel Accountability (MLA)	Degree to which public institutions are subject to oversight across multiple governance levels	Institutional control	MLA1 Public officials are accountable to multiple levels of government	Likert 1–5
			MLA2 There are clear mechanisms to evaluate government performance	Likert 1–5
		Transparency of responsibility	MLA3 Responsibilities are clearly distributed across governance levels	Likert 1–5
			MLA4 Authorities must justify their decisions to higher institutions	Likert 1–5
Local Government Transparency (LGT)	Extent to which local governments accessible and information	Access to information	LGT1 Government information is easily accessible to citizens	Likert 1–5
			LGT2 Public data is available in understandable formats	Likert 1–5
		Open data practices	LGT3 Local governments promote open data initiatives	Likert 1–5
Citizen Participation (CP)	Degree of citizen involvement in decision-making	Civic engagement	CP1 Citizens actively participate in local decision-making	Likert 1–5
			CP2 There are opportunities for citizens to express their opinions	Likert 1–5
		Collaborative governance	CP3 Citizens collaborate with authorities in policy design	Likert 1–5
Public Policy Innovation (PPI)	Capacity of government to develop and implement new policy solutions	Policy design	PPI1 Governments introduce innovative public policies	Likert 1–5

Construct	Definition	Dimension	Indicator Item (English)	Scale
		Implementation	PPI2 Policies are adapted to emerging social needs	Likert 1-5
			PPI3 New approaches are used to implement policies	Likert 1-5
			PPI4 Innovation improves public service delivery	Likert 1-5

Annex B. Expert Judgment Evaluation (Content Validity)

Criterion	Description	Mean Score	Interpretation
Clarity	Items are clearly worded and understandable	4.6	High
Relevance	Items adequately represent the construct	4.7	High
Coherence	Items are logically consistent with dimensions	4.5	High
Sufficiency	Items sufficiently cover the construct domain	4.4	High

Expert Panel Characteristics

Expert	Experience (years)	Institution Type
E1 Public Administration	15	University
E2 Governance Studies	12	Research Center
E3 Public Policy	18	Government
E4 Methodology	10	University
E5 Social Sciences	14	Research Center

Content Validity Index (CVI)

Construct	I-CVI	S-CVI
MLA	0.92	0.94
LGT	0.95	0.96
CP	0.91	0.93
PPI	0.94	0.95

All values exceed the recommended threshold of 0.80, confirming strong content validity.

Annex C. Measurement Scales

Instructions: Please indicate your level of agreement with the following statements. (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)

Multilevel Accountability (MLA)

- MLA1: Public officials are accountable to multiple levels of government.
- MLA2: There are clear mechanisms to evaluate government performance.
- MLA3: Responsibilities are clearly distributed across governance levels.
- MLA4: Authorities must justify their decisions to higher institutions.

Local Government Transparency (LGT)

- LGT1: Government information is easily accessible to citizens.
- LGT2: Public data is available in understandable formats.
- LGT3: Local governments promote open data initiatives.

Citizen Participation (CP)

- CP1: Citizens actively participate in local decision-making.
- CP2: There are opportunities for citizens to express their opinions.
- CP3: Citizens collaborate with authorities in policy design.

Public Policy Innovation (PPI)

- PPI1: Governments introduce innovative public policies.
- PPI2: Policies are adapted to emerging social needs.
- PPI3: New approaches are used to implement policies.
- PPI4: Innovation improves public service delivery.