

From Basic Independence to Inclusive Participation: Using Adapted Katz Adl and Lawton–Brody Iadl to Diagnose Disability Policy Implementation in Rural Indonesia

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Abstract

This study examines whether functional independence among persons with disabilities can be used as micro-level evidence for analysing disability policy implementation in rural Indonesia. Drawing on a case context in Karangpatihan Village, Ponorogo Regency, the study integrates adapted Katz Activities of Daily Living (ADL) and Lawton–Brody Instrumental Activities of Daily Living (IADL) measures with a public policy implementation perspective. The dataset contains 226 complete observations. Because the original instruments were operationalised using three ordered response categories (1–3), the study treats them as adapted measures rather than standard clinical versions. Descriptive analysis shows a clear distinction between basic and instrumental functioning. The adapted Katz ADL mean was 16.67/18, with 87.6% of respondents in the 16–18 descriptive range, whereas the IADL mean was 12.62/18, with 55.8% scoring 13 or above. In the IADL domains, financial management (2.65/3) and medication management (2.58/3) were strongest, while mobile-phone use (1.41/3) and public transportation (1.54/3) were weakest. Robust ordinal psychometric analysis further showed high ordinal internal consistency (IADL $\alpha_{ordinal} = 0.934$, $\omega = 0.949$; Katz $\alpha_{ordinal} = 0.962$, $\omega = 0.971$) and predominantly unidimensional factor structures. However, Katz ADL exhibited a substantial ceiling effect (63.7% at the maximum total score), limiting discrimination among respondents with high basic functioning. The findings suggest that disability inclusion should be assessed not only through individual functioning but also through the accessibility of digital, transportation, market, and public-service environments. The study contributes a policy-oriented framework in which ADL/IADL measures serve as outcome evidence for diagnosing the gap between formal disability rights and actual opportunities for participation.

Keywords: persons with disabilities; rural governance; policy implementation; Katz ADL; Lawton–Brody IADL; accessibility; capability approach; Indonesia

1. Introduction

Disability policy has increasingly moved from a welfare-oriented understanding of persons with disabilities as recipients of protection and assistance toward a rights-based approach in which persons with disabilities are recognized as rights holders, citizens, and participants in social and economic life. The

United Nations Convention on the Rights of Persons with Disabilities (CRPD) explicitly connects independent living and participation with accessibility to the physical environment, transportation, information and communication technologies, and community services, including in rural areas (United Nations, 2006). Article 9 is therefore not limited to physical access: it also encompasses transportation, information, communications, and accessible services. Article 19 further recognizes the right to live in the community and to access community services on an equal basis.

Indonesia has adopted a corresponding rights-based policy architecture. Law No. 8 of 2016 on Persons with Disabilities remains in force and establishes a legal basis for the respect, protection, and fulfilment of disability rights. The national planning framework has subsequently been operationalized through Government Regulation No. 70 of 2019 and Minister of National Development Planning/Head of Bappenas Regulation No. 3 of 2021, which regulates planning, implementation, evaluation, and participation in disability-rights fulfilment. The policy architecture therefore contains strong normative commitments. The analytical problem is how to determine whether these commitments are translated into meaningful opportunities for persons with disabilities in everyday community life.

Policy implementation theory provides a useful entry point to this problem. Van Meter and Van Horn (1975) conceptualize implementation as a process shaped by policy standards and objectives, resources, inter-organizational communication, characteristics of implementing agencies, implementer dispositions, and the social, economic, and political environment. Mazmanian and Sabatier (1980) similarly emphasize the interaction between policy tractability, the capacity of statutory arrangements to structure implementation, and environmental variables. Lipsky (1980) adds that citizens experience public policy through frontline service encounters in which public workers exercise discretion under organizational constraints. These perspectives imply that formal rights cannot be assumed to produce equivalent outcomes at the point of service delivery.

Functional measures of daily living can contribute to this implementation analysis because they provide evidence about what people are actually able to do. The Katz Index of Activities of Daily Living was originally designed to assess basic functions such as bathing, dressing, toileting, transferring, continence, and feeding (Katz et al., 1963). Lawton and Brody (1969) developed the IADL framework to assess more complex activities needed for relatively independent community living. In conventional applications, ADL is closer to basic self-care, whereas IADL captures activities that require greater interaction with the social and economic environment.

However, functional assessment should not be reduced to an individual-deficit perspective. The distinction between activity capacity and participation is especially important in disability policy. A person may possess substantial capacity for eating, bathing, dressing, or managing money, yet encounter barriers when attempting to use public transportation, access digital services, reach markets, communicate with public institutions, or participate in economic activity. Sen's (1999) capability approach provides a complementary conceptual lens: resources and individual characteristics do not automatically translate into substantive freedoms or valued functionings. Conversion depends on social, institutional, and environmental conditions.

This issue is particularly relevant to rural governance. Rural residents with disabilities may face longer distances, fewer transport options, limited accessible infrastructure, weaker digital connectivity, and more constrained service availability. In such settings, an apparently low score on an instrumental activity may reflect an interaction between individual capability and environmental accessibility rather than an individual impairment alone. This interpretation is consistent with the CRPD's emphasis on identifying

and eliminating environmental barriers and with recent evidence that the meaning of several classic IADL items has changed as technologies and social practices have evolved.

A recent re-examination of the Lawton–Brody scale using 3,552 participants found that shopping, food preparation, and transportation were sensitive to functional differences, while telephone and financial items were affected by technological change and changing norms. The authors argued that the scale remains foundational but requires contemporary revision to maintain relevance (Benge et al., 2026). This observation is particularly pertinent to the present study because mobile-phone use is one of the lowest-scoring domains in the Karangpatihan dataset.

The central research problem is therefore not simply whether persons with disabilities are independent. Rather, it is whether their existing functional capacities can be converted into instrumental capability and meaningful participation through an enabling local policy environment. This study addresses the problem by integrating adapted Katz ADL and Lawton–Brody IADL measurements with a public policy implementation perspective.

The study has three objectives. First, it describes the level and distribution of basic and instrumental functional independence among 226 respondents. Second, it evaluates the empirical quality of the adapted ADL and IADL measures using internal consistency, item analysis, polychoric correlations, ordinal reliability, and exploratory factor analysis. Third, it interprets the difference between basic and instrumental functioning as evidence for diagnosing environmental and service-delivery barriers relevant to disability-inclusive rural governance.

Three research questions guide the analysis: (1) What patterns of basic and instrumental functional independence are observed among respondents? (2) Do the adapted Katz ADL and Lawton–Brody IADL measures demonstrate satisfactory empirical reliability and construct-structure evidence? and (3) What does the gap between basic and instrumental functioning imply for disability policy implementation and inclusive rural governance?

2. Literature Review and Analytical Framework

2.1 From rights to implementation outcomes

Rights-based disability policy changes the evaluative question from whether government provides assistance to whether public institutions enable equal participation. The CRPD is explicit that accessibility is a prerequisite for independent living and participation, while the Indonesian policy framework embeds disability inclusion within development planning and evaluation. This means that implementation should be evaluated at more than the input or programme-output level. Numbers of programmes, beneficiaries, training sessions, or facilities do not by themselves demonstrate that people can use those opportunities in daily life.

Implementation theory helps explain why a gap can arise between formal commitments and lived outcomes. Policy standards may be clear while resources remain limited; communication may be fragmented across administrative levels; implementing organizations may have different priorities; and frontline actors may interpret policy requirements through existing routines. At the local level, these mechanisms can shape whether accessibility becomes an operational feature of transportation, digital services, markets, health services, and village administration.

2.2 Katz ADL and Lawton–Brody IADL as complementary measures

The Katz Index captures fundamental self-care activities. Its conceptual strength lies in identifying the extent to which a person can perform basic bodily and personal-care activities. The Lawton–Brody IADL

framework moves to a higher level of everyday functioning by assessing activities necessary for independent community living, such as communication, shopping, food preparation, transportation, medication management, and financial management (Lawton & Brody, 1969).

The present study uses adapted versions of both frameworks. The Katz dataset includes bathing, dressing, oral hygiene, walking, toileting, and eating/drinking. The IADL dataset includes mobile-phone use, shopping/market activity, cooking, public transportation, medication management, and financial management. Each item is scored from 1 to 3. This operationalization differs from the original scoring systems and therefore cannot be interpreted using official clinical cut-offs from the original instruments. The distinction is analytically valuable. Basic ADL primarily indicates whether an individual can manage essential self-care. IADL additionally reflects whether the individual can operate within a wider social, economic, technological, and transportation environment. A difference between the two measures can therefore be treated as a diagnostic signal of the point at which individual capacity encounters environmental constraints.

2.3 Capability approach and person–environment interaction

Sen's capability approach distinguishes between resources, capabilities, and achieved functionings. In the present context, functional capacity can be understood as an individual-level resource, while capability refers to the real opportunity to convert that capacity into activities and participation. This distinction prevents an overly individualistic interpretation of disability. If a respondent can manage money but cannot reach a market because transportation is inaccessible, the observed participation constraint is not adequately described as a personal incapacity.

Accordingly, this study proposes an analytical chain: disability rights and policy standards → policy implementation → environmental conditions → functional capacity → instrumental capability → participation outcomes. ADL is positioned mainly as evidence of basic functional capacity; IADL is positioned as evidence of instrumental capability at the interface between the person and the community environment. The framework does not assume that IADL causes participation or that low IADL scores prove policy failure. Instead, the scores identify domains requiring policy diagnosis and contextual investigation.

Figure 1. Analytical framework linking functional capacity with disability-inclusive rural governance

Analytical level	Core construct
1. Normative policy	CRPD; Law No. 8/2016; inclusive development planning
↓	Policy standards, rights, accessibility obligations
2. Implementation	Resources; communication; implementing actors; local governance
↓	Actual delivery of services and enabling conditions
3. Environment	Transport; digital access; public services; market access; infrastructure
↓	Conversion conditions for individual capability
4. Functional capacity	Adapted Katz ADL: basic self-care independence
↓	Capacity available to the person
5. Instrumental capability	Adapted Lawton–Brody IADL: community-oriented functioning
↓	Opportunity to participate

6. Outcomes	Economic participation; social participation; service access; autonomy
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2.4 Research gap and contribution

Existing ADL/IADL research predominantly treats these measures as functional or clinical indicators, while disability-policy research often focuses on rights, accessibility, service provision, institutional arrangements, or participation. These streams are rarely integrated at the rural governance level. The resulting gap concerns the conversion of individual functional capacity into actual opportunities for participation. The present study addresses this gap by treating ADL/IADL evidence as a bridge between individual functioning and policy implementation. Its empirical contribution is the paired analysis of 226 respondents; its conceptual contribution is the capacity–capability–environment linkage; and its policy contribution is a diagnostic framework for identifying where local implementation may need to remove barriers rather than simply increase assistance.

3. Methods

3.1 Study context and design

This study uses a quantitative cross-sectional descriptive and psychometric design embedded in a rural disability-policy case context in Karangpatihan Village, Balong District, Ponorogo Regency, East Java, Indonesia. The unit of analysis is the respondent-level functional assessment. A total sampling approach was employed, whereby all eligible persons with disabilities identified within the study population and meeting the predefined inclusion criteria were invited to participate. After data screening and exclusion of incomplete observations, 226 respondents were included in the final analysis. The analytic dataset contains 226 observations with complete scores for both the adapted Katz ADL and adapted Lawton–Brody IADL measures. The source material does not document the sampling frame, recruitment procedure, response rate, or probability-sampling design; accordingly, the analysis is descriptive and should not be interpreted as statistically representative of all persons with disabilities in Ponorogo or Indonesia.

3.2 Instrument adaptation and operationalization

The study uses adapted and operationalized versions of Katz ADL and Lawton–Brody IADL. Adaptation was necessary because the research concerns persons with disabilities in a contemporary rural setting, where digital communication, transportation, market access, and community services are important components of everyday independence. The adaptation is substantive rather than merely linguistic: item content and scoring were operationalized for the study context.

Instrument	Operational domains in this study	Score per item	Total score
Adapted Katz ADL	Bathing; dressing; oral hygiene; walking; toileting; eating/drinking	1–3	6–18
Adapted Lawton–Brody IADL	Mobile phone; shopping/market; cooking; public transportation; medication; financial management	1–3	6–18

Important: the 1–3 scoring scheme is the operationalization used in the dataset. It is not the original scoring format of the classic Katz or Lawton–Brody instruments. The descriptive categories used below are study-specific and are not clinical cut-offs.

3.3 Statistical analysis

Descriptive statistics included the minimum, maximum, mean, median, quartiles, standard deviation, domain means, and descriptive score distributions. Domain performance was expressed as $\text{mean}/3 \times 100$ to facilitate interpretation relative to the adapted maximum; this percentage is a descriptive index, not a standardized Lawton–Brody or Katz score.

Item-level analysis examined corrected item–total correlations and floor/ceiling proportions. Floor effect was defined as the proportion of respondents receiving the minimum item score (1), while ceiling effect was the proportion receiving the maximum item score (3). Total-scale floor and ceiling proportions were also examined.

Internal consistency was assessed using conventional Cronbach's alpha and McDonald's omega and then re-examined using ordinal alpha and ordinal omega based on polychoric correlations. Because the items have three ordered categories, the ordinal analysis was treated as the primary robustness analysis. Ordinal reliability is useful when few response categories and skewed distributions make Pearson-based assumptions less appropriate (Gadermann et al., 2012).

Factorability was assessed using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity. Exploratory factor analysis was then conducted on the polychoric correlation matrix using a principal-axis approach. The final factor solution was determined primarily from the eigenvalue structure and substantive interpretability. Item loadings, communalities, polychoric corrected item–total correlations, and alpha-if-item-deleted values were examined to determine whether items should be retained, revised, or removed. Content validity indices (I-CVI and S-CVI) were not calculated because the available dataset contained no expert-judgment ratings. This is important because content validity cannot be reconstructed from respondent data alone. Consistent with COSMIN principles, the article therefore distinguishes content validity from empirical reliability and construct-structure evidence (Terwee et al., 2018).

4. Results

4.1 Descriptive profile of basic and instrumental functioning

The two measures reveal a clear descriptive difference between basic and instrumental functioning. The adapted Katz ADL mean was 16.67 out of 18 (92.6% of the adapted maximum), with a median of 18 and 87.6% of respondents in the 16–18 range. By contrast, the adapted IADL mean was 12.62 out of 18 (70.1% of the adapted maximum), with a median of 13. Thus, the dataset indicates substantially greater basic self-care capacity than instrumental capacity. This difference is descriptive rather than a causal estimate.

Table 1. Overall descriptive statistics for adapted Katz ADL and Lawton–Brody IADL

Statistic	Katz ADL	IADL
Valid respondents	226	226
Minimum	6	6
Maximum	18	18
Mean	16.67	12.62
Median	18	13
Q1	16	10
Q3	18	15
Standard deviation	2.58	3.52
Percentage of adapted maximum	92.6%	70.1%

Table 2. Descriptive distribution of adapted Katz ADL

Total score	n	%
6–9	8	3.5%
10–12	13	5.8%
13–15	7	3.1%
16–18	198	87.6%
Total	226	100%

The 16–18 range is a descriptive grouping constructed for this dataset; it is not an official Katz clinical category.

Table 3. Descriptive distribution of adapted IADL

Total score	Interpretation used in this study	n	%
6–9	Lower descriptive range	48	21.2%
10–12	Middle descriptive range	52	23.0%
13–15	Moderately high descriptive range	82	36.3%
16–18	Higher descriptive range	44	19.5%
Total		226	100%

Overall, 55.8% of respondents scored 13–18 on the adapted IADL total, while 44.2% scored 6–12. The wider spread of IADL scores, compared with Katz ADL, suggests greater heterogeneity in instrumental functioning. This is analytically important because IADL activities require greater interaction with external systems and are therefore potentially more sensitive to differences in accessibility.

4.2 Domain-level patterns in adapted IADL

Table 4. Mean scores and descriptive performance indices for adapted IADL

IADL domain	Mean	Maximum	Mean/3 × 100
Financial management	2.65	3	88.3%
Medication management	2.58	3	86.1%
Shopping/market	2.24	3	74.8%
Cooking	2.19	3	73.0%
Public transportation	1.54	3	51.2%
Mobile-phone use	1.41	3	47.1%

Financial management was the strongest IADL domain (2.65/3), followed by medication management (2.58/3). Shopping/market activity and cooking were intermediate (2.24 and 2.19). Public transportation (1.54) and mobile-phone use (1.41) were the two weakest domains. The pattern is therefore not one of uniformly low functioning. Rather, respondents appear relatively capable in selected domestic, health self-management, and financial activities while experiencing greater difficulty in domains that depend on external mobility and digital connectivity.

4.3 Domain-level patterns in adapted Katz ADL

Table 5. Mean scores and descriptive performance indices for adapted Katz ADL

ADL domain	Mean	Maximum	Mean/3 × 100
Eating/drinking	2.92	3	97.3%
Bathing	2.86	3	95.3%
Dressing	2.84	3	94.7%
Toileting	2.80	3	93.4%
Walking	2.72	3	90.7%
Oral hygiene	2.53	3	84.4%

Eating/drinking had the highest mean score (2.92/3), followed by bathing (2.86), dressing (2.84), toileting (2.80), walking (2.72), and oral hygiene (2.53). Even the lowest domain remained relatively high relative to the adapted maximum. The pattern indicates that basic self-care is concentrated near the upper end of the response scale, while oral hygiene and walking provide somewhat more differentiation.

4.4 Item-level reliability and floor/ceiling effects

Table 6. Item-level corrected item–total correlations and floor/ceiling proportions

Instrument	Item	Mean	Corrected item–total	Floor %	Ceiling %
IADL	Mobile phone	1.41	0.461	76.1	17.3
IADL	Shopping/market	2.24	0.741	30.1	54.4
IADL	Cooking	2.19	0.641	31.9	50.9
IADL	Public transportation	1.54	0.579	67.7	21.2
IADL	Medication	2.58	0.632	10.6	69.0
IADL	Financial management	2.65	0.643	11.1	76.1
Katz	Bathing	2.86	0.859	4.4	90.3
Katz	Dressing	2.84	0.859	4.9	88.9
Katz	Oral hygiene	2.53	0.356	21.2	74.3
Katz	Walking	2.72	0.706	10.2	82.3
Katz	Toileting	2.80	0.840	7.1	87.2
Katz	Eating/drinking	2.92	0.849	2.7	94.7

All IADL corrected item–total correlations exceeded 0.40, indicating coherent item functioning. In Katz ADL, oral hygiene had the lowest corrected item–total correlation (0.356), although it remained conceptually relevant to basic self-care. The item-level floor/ceiling results show a contrasting measurement pattern: mobile-phone use and public transportation have high floor proportions, while most Katz items have very high ceiling proportions.

4.5 Internal consistency and factorability

Table 7. Conventional empirical reliability and factorability

Indicator	IADL	Katz ADL
Number of items	6	6
Valid respondents	226	226

Cronbach's alpha	0.836	0.847
McDonald's omega	0.840	0.903
KMO	0.777	0.886
Bartlett's χ^2	612.201	964.757
df	15	15
Bartlett p-value	<0.001	<0.001

The conventional reliability estimates were satisfactory for both measures. IADL showed Cronbach's alpha of 0.836 and omega of 0.840, while Katz ADL showed alpha of 0.847 and omega of 0.903. KMO values of 0.777 and 0.886 and significant Bartlett tests indicate that the correlation matrices were suitable for factor analysis.

4.6 Robust ordinal psychometric analysis

Because every item was measured on a three-category ordered scale, the dataset was further analysed using polychoric correlations and ordinal reliability estimates. This reanalysis provides a more appropriate robustness check than relying exclusively on Pearson correlations for highly ordinal indicators.

Table 8. Polychoric correlations and ordinal reliability

Indicator	IADL	Katz ADL
Ordinal alpha	0.934	0.962
Ordinal omega	0.949	0.971
KMO	0.771	0.886*
Bartlett's test	$\chi^2(15)=1,483.26$; $p<0.001$	$\chi^2(15)=2,660.22$; $p<0.001$
First eigenvalue	4.536	5.115
Second eigenvalue	0.735	0.687
Dominant solution	1 factor	1 factor

**The polychoric Katz matrix was close to singular because several item correlations were extremely high; the Pearson-based KMO is retained as a robustness reference and should be interpreted cautiously.*

The ordinal reliability coefficients were high: $\alpha_{\text{ordinal}} = 0.934$ and $\omega = 0.949$ for IADL, and $\alpha_{\text{ordinal}} = 0.962$ and $\omega = 0.971$ for Katz ADL. The polychoric IADL correlations ranged from 0.462 to 0.875, with particularly strong relationships between financial management and shopping (0.875), financial management and medication management (0.859), and shopping and cooking (0.820). Katz polychoric correlations were generally higher, ranging from 0.344 to 0.976; bathing and dressing were especially strongly associated (0.976).

Table 9. Robust ordinal EFA: factor loadings, communalities, and item-deletion evidence

Instrument/item	Factor loading	Communality	Polychoric item-total	α if deleted	Decision
IADL – Mobile phone	0.675	0.455	0.657	0.940	Retain–revise
IADL – Shopping/market	0.934	0.872	0.890	0.911	Retain

IADL – Cooking	0.798	0.636	0.765	0.927	Retain
IADL – Public transportation	0.858	0.736	0.836	0.918	Retain
IADL – Medication	0.878	0.772	0.843	0.917	Retain
IADL – Financial management	0.894	0.798	0.848	0.917	Retain
Katz – Bathing	≈1.00	≈1.00	0.991	0.943	Retain
Katz – Dressing	≈0.99	≈0.98	0.984	0.950	Retain
Katz – Oral hygiene	0.619	0.383	0.607	0.983	Retain–revise
Katz – Walking	0.950	0.903	0.928	0.947	Retain
Katz – Toileting	0.990	0.980	0.981	0.946	Retain
Katz – Eating/drinking	0.990	0.981	0.987	0.944	Retain

The robust ordinal EFA supports a predominantly unidimensional structure for both instruments. The first IADL eigenvalue was 4.536 and the second was 0.735; for Katz ADL the corresponding values were 5.115 and 0.687. Thus, a second factor was not retained. Importantly, this does not eliminate the substantive distinction between mobile-phone use and transportation and the other IADL activities. Rather, these items can be interpreted as context-sensitive manifestations of a broader instrumental-functioning construct. Item deletion did not provide a compelling reason to remove any indicator. Deleting mobile-phone use would increase IADL ordinal alpha from 0.934 to 0.940, a small numerical gain that would remove an analytically important indicator of digital participation. Similarly, deleting oral hygiene would increase Katz alpha to 0.983, but the item remains conceptually relevant to basic self-care. The defensible decision is therefore to retain both items while revising their operational definitions in future applications.

4.7 Ceiling effects and measurement discrimination

Table 10. Total-scale floor and ceiling effects

Scale	Floor	Ceiling
IADL total	7.96%	12.39%
Katz ADL total	2.21%	63.72%

The total IADL scale has relatively limited floor and ceiling effects, supporting broader discrimination across respondents. By contrast, 63.72% of respondents achieved the maximum Katz ADL score of 18. This substantial ceiling effect indicates that the adapted Katz measure has limited capacity to distinguish among respondents who already display high levels of basic self-care functioning. The result should not be interpreted as evidence that Katz ADL is a poor measure; rather, it indicates that its discriminatory value is constrained in this particular population and operationalization.

5. Discussion

5.1 The central finding: basic independence exceeds instrumental independence

The central empirical finding is the descriptive gap between basic and instrumental independence. Respondents recorded a mean Katz score of 16.67/18 and a mean IADL score of 12.62/18. This difference

suggests that the capacity to perform basic self-care does not automatically translate into equivalent independence in activities that require interaction with the external environment.

This distinction matters for disability policy because a narrow focus on basic self-care can produce an incomplete picture of inclusion. A person may eat, bathe, dress, and manage toileting with relatively little assistance while still being constrained in reaching markets, using public transportation, communicating through a mobile phone, or accessing digital and public services. From a capability perspective, the relevant policy question is therefore not only whether capacity exists, but whether institutions and environments enable people to convert that capacity into valued functionings and participation.

5.2 Digital connectivity as a policy-relevant dimension of functioning

Mobile-phone use was the lowest IADL domain, with a mean of 1.41/3 and a 76.1% floor proportion. This finding is especially relevant because contemporary communication technologies mediate access to information, health services, financial transactions, market opportunities, social networks, and government communication. The result should not be read as a simple deficit in individual technological competence. It may also reflect device availability, affordability, accessibility features, digital literacy, communication barriers, interface design, and the extent to which public services are digitally accessible. This interpretation is consistent with Benge et al. (2026), who found that the telephone and financial components of the original Lawton–Brody framework have become less straightforward because technologies and everyday practices have changed. In a rural Indonesian setting, therefore, the relevant policy indicator may be broader than 'telephone use'. Future instruments should specify whether the item concerns making calls, receiving messages, navigating applications, accessing information, conducting transactions, or using assistive accessibility features.

5.3 Mobility as an interaction between individual capacity and infrastructure

Public transportation was the second-lowest IADL domain (1.54/3), while walking remained relatively high on the adapted Katz measure (2.72/3). This juxtaposition is analytically important. It suggests that the capacity to move physically is not equivalent to the capacity to travel independently through the community. Public transportation requires not only bodily mobility but also accessible vehicles, roads, information, schedules, payment systems, affordability, communication, and sometimes assistance from other people.

The CRPD explicitly places transportation and information and communication technologies within the scope of accessibility, including in rural areas. The present findings therefore support a policy interpretation in which mobility outcomes are partly environmental. A low transportation score should trigger assessment of the transport system and surrounding barriers rather than being attributed automatically to individual impairment.

5.4 Economic capability is a potential asset rather than merely a welfare target

Financial management was the strongest IADL domain (2.65/3), while shopping/market activity was also relatively high (2.24/3). These findings indicate that a substantial part of the sample retains capacity for everyday economic transactions. From a policy perspective, this suggests that disability inclusion can be framed not only in terms of protection and dependency but also in terms of capability expansion, economic participation, and access to productive opportunities.

However, the evidence should not be overstated. A high financial-management score does not prove successful entrepreneurship, income growth, access to banking, or employment. It indicates a functional capacity that could potentially be converted into such outcomes if markets, finance, digital tools,

transportation, and institutional support are accessible. This distinction is central to Sen's capability approach.

5.5 Why the psychometric findings matter for policy research

The psychometric analysis strengthens the policy interpretation because the observed patterns are not merely the result of an internally incoherent measurement instrument. Both adapted scales show strong ordinal internal consistency, and the robust EFA indicates predominantly one-dimensional structures. At the same time, the analysis reveals different discriminatory properties. IADL provides more variation across respondents and domains, while Katz ADL is strongly concentrated at the upper end.

The ceiling effect is particularly important. If 63.7% of respondents receive the maximum Katz total score, the measure is less informative for distinguishing people who are already relatively independent in basic self-care. This makes IADL especially valuable for policy diagnosis because it captures domains where independence becomes contingent on interactions with external systems. The finding also cautions against using a single composite 'independence' indicator without examining the domain structure.

5.6 Implications for policy implementation theory

The findings can be interpreted through implementation theory as evidence of a possible conversion gap between policy standards and lived outcomes. Van Meter and Van Horn's framework directs attention to standards, resources, communication, implementing organizations, implementer dispositions, and the environment. The low scores for digital and transportation activities are consistent with the possibility that formal rights are not yet fully translated into accessible systems. Lipsky's perspective adds that frontline implementation may shape how accessible services become in practice. The data do not identify which mechanism is responsible, so qualitative investigation of village officials, service providers, families, and persons with disabilities remains necessary.

Thus, the ADL/IADL findings should be treated as diagnostic evidence rather than as direct measures of implementation performance. They identify outcome domains that can be investigated against policy inputs, budgets, service standards, infrastructure, institutional routines, and participation mechanisms. This approach can strengthen policy evaluation by moving beyond program counts toward observable changes in people's everyday opportunities.

5.7 Policy implications for disability-inclusive rural governance

Table 11. Translating empirical findings into policy diagnostic areas

Empirical signal	Policy interpretation	Illustrative local policy response
Mobile-phone use: 1.41/3; high floor	Digital inclusion/accessibility gap	Accessible devices; digital-literacy support; assistive features; accessible village information and services
Public transportation: 1.54/3	Mobility and accessibility gap	Accessible village transport; transport assistance; route/information accessibility; mobility support
Shopping/market: 2.24/3	Existing economic participation capacity	Market access; inclusive marketplaces; entrepreneurship support; accessible payment systems
Cooking: 2.19/3	Domestic capability remains available	Home-based productive skills; adapted tools; assistive technology

Medication: 2.58/3	Relatively strong self-management	Link self-management capacity with inclusive primary-health services
Financial management: 2.65/3	Relatively strong economic capability	Financial inclusion; productive finance; accessible banking and digital transactions
Katz total ceiling: 63.7%	Basic ADL has limited discrimination at high functioning	Use ADL as baseline; complement it with IADL, accessibility, and participation indicators

These implications support a shift from a predominantly care-oriented model toward an autonomy–capability–participation framework. The policy objective is not to eliminate assistance, which remains necessary for some individuals, but to ensure that assistance and public systems expand rather than substitute for agency wherever possible.

6. Limitations

First, the study is based on 226 complete observations in a single rural case context. The sampling design is not documented in the source material, so external generalization should be avoided. Second, the adapted instruments use a 1–3 scoring system rather than the original scoring formats. Consequently, the reported means, categories, and ceiling effects apply to this operationalization and should not be compared mechanically with standard clinical cut-offs.

Third, content validity evidence is incomplete. No expert-rating dataset was available, so I-CVI, S-CVI/Ave, S-CVI/UA, and Aiken's V could not be calculated. The manuscript therefore makes no claim of full instrument validation. Fourth, the design is cross-sectional and descriptive. The ADL–IADL gap cannot be interpreted as a causal effect of policy implementation, infrastructure, digital access, or transport. Fifth, the current analysis does not directly measure participation outcomes, such as employment, income, civic participation, or service utilization. The proposed capability and implementation mechanisms should therefore be tested in future mixed-method or longitudinal research. Finally, several adapted items are context-sensitive. Mobile-phone use and transportation may reflect environmental accessibility as well as individual functioning. This is a substantive advantage for policy diagnosis, but it also means that future research should collect parallel measures of infrastructure, device access, affordability, service accessibility, and environmental barriers.

7. Conclusion

This study demonstrates the value of integrating functional assessment with public policy implementation analysis in a rural disability context. Among 226 respondents, basic self-care functioning was relatively high, while instrumental functioning was more heterogeneous and substantially lower. The strongest IADL domains were financial management and medication management; the weakest were mobile-phone use and public transportation. Robust ordinal analysis showed high internal consistency and predominantly unidimensional structures for both adapted measures, while the strong Katz ceiling effect indicated limited discrimination among respondents already functioning at a high basic level.

The substantive implication is that disability inclusion cannot be evaluated solely by asking whether a person can perform basic activities. Policy must also be assessed in terms of whether the village environment enables people to use their capabilities in wider social and economic life. The findings

therefore support a policy diagnostic framework linking functional capacity, instrumental capability, environmental accessibility, implementation conditions, and participation outcomes.

For rural disability governance, the practical priority is to complement social protection with measures that reduce mobility and digital barriers, strengthen accessible public services and market access, and expand opportunities for economic participation. In this framework, Katz ADL provides a baseline of basic functional capacity, while IADL offers a more sensitive window into the interaction between persons with disabilities and the systems through which rural citizenship is exercised.

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