Third Meeting

Statistical and Technical Advisory Group on the Productive Capacities Index

Banco de Portugal, Lisbon, Portugal

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Report of the Third Meeting of the Statistical and Technical Advisory Group (STAG) on the Productive Capacities Index (PCI)
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Table of Contents

Introduction

This outcome document captures the key discussion points and summarizes the main recommendations of the Third Meeting of the Statistical and Technical Advisory Group (STAG) on the Productive Capacities Index (PCI), held at Banco de Portugal in Lisbon, Portugal on 23 June 2025. Organized by the United Nations Conference on Trade and Development (UNCTAD) and hosted by the Banco de Portugal, the STAG meeting brought together statisticians, technical experts and academic specialists to support the continued refinement of the PCI and to ensure its methodological soundness. Mr. Steve MacFeely, Chief Statistician of the Organization for Economic Cooperation and Development (OECD), chaired the meeting.

The STAG provides technical guidance to UNCTAD as per its Terms of Reference (ToRs) in the development and periodic revision of the PCI and supports the work of the High-level Advisory Board (HLAB) and UNCTAD on productive capacities. The Third Meeting focused on advancing concrete proposals raised by the HLAB, particularly regarding the PCI's role in informing National Productive Capacities Gap Assessments and guiding the formulation and implementation of Holistic Productive Capacities Development Programmes. These initiatives aim to support countries in achieving structural economic transformation and pursuing their national development objectives. Particular emphasis was placed on enhancing the quality of the PCI for Small Island Developing States (SIDS) and laying the groundwork for developing a satellite PCI tailored to their unique development challenges.

Discussions were centred on key issues including:

1) Data input and methodological updates introduced in PCI 3.0, including statistical enhancements and extensions of existing PCI categories;
2) Robustness tests for the PCI regarding index construction methods and the relationship of the index with macroeconomic performance;
3) Development of a preliminary, satellite "Green PCI" to capture environmental, finance and gender dimensions;
4) A conceptual framework for a satellite PCI tailored to SIDS; and
5) Strategies to enhance the visibility and use of the PCI via fostering inter-agency synergies.

Members of the STAG warmly welcomed UNCTAD's continued work on the PCI, recognizing its growing relevance for evidence-based policymaking and the challenges outlined in the background report.

In his opening remarks, Mr. Paul Akiwumi, Director of UNCTAD's Division for Africa, Least Developed Countries and Special Programmes, highlighted several major achievements of the PCI since the previous STAG meeting. These include the finalization of statistical and methodological guidelines discussed during the 56th session of the United Nations Statistical Commission (UNSC), deeper engagement with UN processes, growing country demand for capacity-building support, and increasing uptake of the PCI in academic and policy research. He underscored the vital role of the STAG in enhancing the PCI's credibility, policy relevance and governance, and expressed sincere gratitude for members' sustained contributions. Mr. Akiwumi invited participants to offer expert guidance on methodological decisions, the development of satellite indices, capacity-building, and ways to further strengthen the PCI's role in policymaking.

Overall appreciation from the STAG

Members of the Advisory Group, both in their oral remarks and written submissions, welcomed the growing institutional relevance and statistical quality of the PCI. They noted with encouragement that the PCI is increasingly becoming a standard tool for assessing productive capacities, with a number of international and regional organizations, including regional commissions and UNDP, actively integrating the index into their analytical and operational work, particularly in the context of LDCs, LLDCs and SIDS. ESCAP, for instance, applied the PCI's overall score and structural change component in its *2024 Asia-Pacific Biennial Review of the Doha Programme of Action for LDCs* to assess progress on structural transformation commitments. Members commended UNCTAD's efforts to ensure methodological robustness and statistical accuracy, while maintaining broad country coverage, including in structurally vulnerable economies where data availability is often limited.

Several members praised the PCI's inclusive design, which brings visibility to under-resourced and data-scarce domains, and its potential as a diagnostic and capacity-building tool. They also acknowledged the concrete steps taken by UNCTAD to engage with national statistical offices (NSOs) and international statistical bodies, notably through consultations with NSOs and evidenced by UN Statistical Commission' s acknowledgment of the PCI Guidelines. Members further welcomed the deepening collaboration between UNCTAD and UNDP, including through the latter's Resident Representative Network and Global Policy Network, which offer significant opportunities to enhance the visibility, field-level application, and policy relevance of the PCI. In sum, the STAG participants appreciated both the technical rigor and the pragmatic utility of the PCI and encouraged its continued refinement and institutional embedding across the UN system and beyond.

Annex 1 presents the summary of action points to be implemented by UNCTAD secretariat, STAG and other stakeholders.

Summary and outcomes of discussions

1. Review of the new PCI update (PCI 3.0)

Presentation 1: Overview of updates and data input challenges

Previous STAG meetings acknowledged that all 47 PCI input indicators – including both recent and historical data – must be updated in each cycle to maintain consistency, due to frequent and sometimes significant revisions by data providers. In this section, the UNCTAD secretariat presented key findings from the ongoing work to produce the next generation index (PCI 3.0). The secretariat provided an update on input data, highlighting general improvements in data coverage, quality and consistency, despite persistent challenges related to weak statistical capacity in several developing countries and issues related to data access.

The UNCTAD secretariat found that the update reduced data missingness and enhanced overall robustness, as evidenced by the high correlations of both the individual (category and/ or input) data series and the composite PCI with previous versions. Continued challenges related to data

availability and inconsistency which often lead to data missingness, particularly in developing countries and recent periods, highlight the need to strengthen and build national statistical capacities and improving reporting systems.

The UNCTAD secretariat also reported progress in automating data retrieval processes using API-based methods, though many indicators are still only available via manual processes that remain vulnerable to inefficiencies and errors. Crucially, the secretariat identified rising data access barriers, including paywalls and restrictive licensing, particularly in the Transport and Energy categories, which posed significant challenges for the current update. The STAG called for more open, standardized data systems and closer collaboration with data providers to ensure the transparency, usability and policy relevance of the PCI, which requires direct discussions at senior management level with the custodians of relevant data.

In response to UNCTAD's presentation, STAG members welcomed progress in data automation and improvements in coverage and consistency, while raising key concerns about data access, quality and methodology. The Chair emphasized the growing threat posed by paywalls, which undermine transparency and limit the public utility of the PCI at its underlying data. He recommended examining the relationship between missing rates in PCI input data and national statistical capacity, in order to better understand how data missingness may reflect broader weaknesses in statistical infrastructure. Other members raised concerns about potential inconsistencies stemming from secondary data sources, particularly the risks of overreliance on the World Bank APIs, which may not consistently capture metadata revisions from primary sources. Members also underscored the importance of properly attributing original data sources and safeguarding metadata integrity within automated systems.

Participants further proposed technical improvements to the PCI data collection process, including setting thresholds for acceptable missing data rates, creating a pipeline of alternative indicators for potential substitution, and leveraging GIS-based solutions to address persistent data gaps, particularly in transport and land use. Collaboration with initiatives such as UN-GGIM (Committee of Experts on Global Geospatial Information Management) was encouraged to enhance data availability and quality. Further concerns were raised about indicator redundancy, political sensitivities (e.g. regarding fertility rates), and the challenge of accurately capturing digital infrastructure, particularly the difference between mobile and fixed internet access in collaboration with the ITU.

The secretariat confirmed that statistical capacity at the national level is a key factor in assessing data quality, noting that PCI implementation often reveals technical gaps across various statistical domains, and has the potential to generate spillover benefits for broader statistical development.

Presentation 2: Enhancement of the PCI statistical pipeline

The UNCTAD secretariat presented methodological refinements undertaken to produce PCI 3.0 that aim to improve the accuracy and stability of country-level scores, particularly for diagnostic use. In this session, the STAG was invited to review and approve the proposed enhancements to the PCI statistical pipeline, with a particular focus on the refined imputation strategy.

A key enhancement proposed in PCI 3.0 is the introduction of a two-step transformation process, which applies basic adjustments before imputation and delays derived indicator construction until after imputation. This approach reduces "missingness" and improves statistical properties, supporting more accurate, up to date and consistent imputation techniques.

Improvements were also made to the imputation strategy. PCI 3.0 introduced a new longitudinal random forest imputation method (*longitudinalRFI*), which augments the previous *missForest* approach by incorporating time-series features to better capture trends over time. In comparative simulations where known data were masked and then imputed, *longitudinalRFI* performed similarly to *missForest* and *missRanger* in terms of normalized root median squared error (*NRMedSE*). This method shows lower normalized root mean squared error (*NRMSE*), indicating greater accuracy and stability. Multiple Imputation by Chained Equations (*MICE*) was also tested, but this exhibited significantly higher error rates.

Following the presentation, STAG members expressed broad support for the proposed methodological enhancements to the PCI statistical pipeline, particularly the introduction of longitudinal random forest imputation and the revised transformation sequence. The improved handling of outliers and better preservation of time series characteristics were seen as important strengths, and the overall statistical robustness of PCI 3.0 compared with PCI 2.0 was positively received.

Several technical considerations were raised during the discussion. Members recommended further empirical analysis to determine the thresholds of acceptable missingness for reliable imputation, and encouraged systematic comparisons of methods, including newer approaches, such as transformer-based imputation. One member suggested revisiting geographic proximity-based imputation; however, the secretariat clarified that this approach had been used in the first PCI version, but was later abandoned following advice and consensus from the STAG, as it neglects country-specific characteristics and produced unrealistic results. The poor performance of MICE imputation was also discussed. A STAG member noted that its reliance on linear regression may reduce its effectiveness when variables are not highly correlated, in contrast to random forest-based methods that better accommodate complex, non-linear patterns.

Another member suggested disaggregating the effects of transformation and imputation refinements to clarify their individual contributions, or alternatively, illustrating specific country-level examples where *longitudinalRFI* improves stability over *missForest*t.

Members further highlighted the importance of engaging directly with countries to validate imputed data. The secretariat noted that, while due to resource constraints, such consultations are currently limited to training missions, ongoing initiatives such as national data availability dashboards and correspondence with country focal points are helping to identify gaps and incorporate national inputs where available.

Presentation 3: Extension of existing PCI categories

The UNCTAD secretariat presented preliminary findings on the potential extension of three existing PCI categories – namely Transport, Human Capital and Institutions – based on recommendations from previous STAG and HLAB meetings.

Transport

To address the absence of maritime data in previous PCI versions – an issue first raised at the first meeting of the STAG – the UNCTAD secretariat examined three new indicators published by UNCTAD: the Liner Shipping Connectivity Index (LSCI) and two seaborne trade variables, total goods loaded (exports by sea) and total goods discharged (imports by sea). A preliminary PCA found that *seaborne goods discharged* aligns most closely with existing Transport indicators and the PCI Transport score. This suggests that it could be integrated without distorting the category's existing structure. Given the high correlation between *loaded* and *discharged goods*, only one is considered necessary; ultimately, *discharged* goods was preferred due to its stronger statistical fit with the existing framework. In contrast, the LSCI loaded heavily on a second principal component, distinct from the main transport dimension, and showed weaker correlations with core transport indicators. It also suffers from limited coverage, particularly for landlocked developing countries. Moreover, as a derived index, rather than a directly measurable variable, it does not align with PCI methodological principles. The secretariat, therefore, recommended including only *seaborne goods discharged* and excluding the use of the LSCI.

STAG members broadly supported the inclusion of *seaborne goods discharged* and the exclusion of the LSCI in the Transport category. Members welcomed the effort to address the long-standing maritime transport gap identified since the first STAG meeting, though several raised concerns about conceptual clarity and data reliability. One member noted key limitations of the LSCI, pointing out that it primarily captures container shipping – often used for manufactured goods and skewed by transshipment activity – rather than overall maritime trade capacity. By contrast, *seaborne goods discharged*, a UN SDG indicator derived from national trade data, was seen as more methodologically robust and better aligned with the PCI framework. Some members suggested combining seaborne import and export volumes or normalizing them by GDP to improve interpretability and reduce redundancy. Others questioned the conceptual grounding of the indicator, highlighting potential ambiguity in the interpretation of the role of discharge volumes within the productive capacities' context. One member stated the view that low correlation with existing variables need not be a major concern if the objective is to incorporate indicators that reflect distinct, policy-relevant aspects of transport capacities.

Overall, there was a clear consensus on the importance of capturing maritime transport in the index. There is also recognition that *seaborne goods discharged* remains a pragmatic, albeit imperfect, proxy given current data constraints. As a result, the STAG offered tentative approval of its inclusion, while encouraging further work to identify more suitable maritime transport indicators.

Human Capital

The possible inclusion of labour force indicators in the Human Capital category was first discussed at the first meeting of the STAG and supported by the discussions at the March 2024 meeting of the HLAB. Board members previously highlighted the limitations of existing education-based indicators, noting that schooling may not reflect actual workforce skills due to brain drain, mismatches with labour market demand, or undervalued forms of vocational and on-the-job training. Additional concerns included the growing influence of artificial intelligence on productivity and the impact of market concentration on the labour share.

The UNCTAD secretariat reviewed a wide range of potential indicators using data from ILOSTAT, EIU, and LSEG, and assessed their quality based on the Tier Classification of SDG indicators. Many indicators suffered from poor country coverage and low frequency, confirming concerns raised by the STAG. Only three indicators met minimum standards for further analysis: the *employment-to-population ratio*, time spent on unpaid work, and informal employment as a share of total employment. Among these, only the employment-to-population ratio showed adequate coverage for preliminary testing. While there was interest in including informal employment due to its relevance for capturing the labour market structure in developing economies, data availability remains too limited for use at this stage. The secretariat also clarified that gender disaggregation was not applied to this set of indicators, as this is being pursued separately under the "Green PCI framework" (see Section 3).

PCA results showed that the *employment-to-population ratio* is weakly correlated with existing Human Capital indicators and loads primarily on a separate component, accounting for 17.4% of the total variance. This component raised conceptual concerns, as it may reflect labour market outcomes rather than human capital productive capacities. As a result, the secretariat recommended not including the employment-to-population ratio at this stage. STAG members were invited to support the identification of additional labour force-related indicators with better coverage and conceptual alignment.

While some STAG members saw value in including a labour force measure to complement existing education indicators, others expressed concern that employment ratios reflect labour market outcomes rather than productive potential, particularly in countries with large informal sectors or structural underemployment. The ILO representative highlighted that global modelling efforts (beyond SDG-based indicators) could provide broader coverage and more accurate estimates, particularly for informality. Alternative indicators were suggested such as labour productivity, social protection coverage and the NEET rate (youth not in education, employment or training) as conceptually stronger and more policy relevant.

Several members echoed these suggestions, encouraging the secretariat to test total labour force, productivity per worker, and potentially explore International Standard Classification of Occupations (ISCO) data linked to artificial intelligence (AI) exposure in future iterations. There was also interest in revisiting the role of education-related indicators, particularly in assessing whether education metrics, such as educational attainment or expected years of schooling, are conceptually aligned with the measurement of productive capacities. Given these diverse perspectives, STAG members agreed that further work is needed to assess the empirical and conceptual fit of various labour-related indicators before reaching a final decision.

Institutions

The secretariat revisited the role of governance in the Institutions category, reflecting various suggestions from the HLAB. Some members proposed giving greater prominence to institutional capacity within the PCI, including the idea of recognizing it as a fourth pillar alongside productive resources, entrepreneurial capabilities and production linkages. Others noted that while the current category includes indicators on regulatory quality, government effectiveness, rule of law, anti-corruption and civil liberties, these tend to reflect the investment climate and may not capture broader governance dynamics. Previous HLAB suggestions included exploring indicators linked to

the "developmental state" and disaggregating governance into public sector, private sector and civil society dimensions. In response, the secretariat reviewed potential data sources, including the V-Dem dataset, but did not identify any input indicators with sufficient coverage and methodological quality for PCI inclusion. STAG members were invited to propose viable governance-related indicators for further consideration in future updates.

Discussion on institutional indicators remained exploratory, with no conclusive recommendations on additional inclusions. The ILO representative strongly recommended exploring SDG indicator 8.8.2, i.e. the level of national compliance with labour rights (freedom of association and collective bargaining). The ILO has recently released a high-coverage dataset on this indicator, supported by a sound and consistent methodology. One participant proposed revisiting corporate governance data, though members noted that its relevance and availability often depend on the relative role of state versus private enterprise in the economy. Other possible sources were mentioned, including the OECD, OHCHR and the World Bank. However, data coverage and methodological alignment with the PCI framework require further examination.

One STAG member observed that the current PCI already captures key aspects of public sector and civil society governance, and suggested exploring dimensions not yet represented, such as private sector governance. However, it was noted that available data in this area may be skewed towards countries with more developed capital markets, and it remains unclear whether such indicators would best fit under the Institutions or Private Sector dimension of the PCI.

Members broadly acknowledged the need for further analysis and proposed revisiting the discussion at a later stage.

2. Robustness tests for PCI

Presentation 1: Exploring methodological choices in PCI construction

The UNCTAD secretariat presented a detailed assessment of the weighting scheme used in PCI construction, comparing the current use of principal component analysis (PCA) with a simple average aggregation method, focusing on implications for consistency, robustness and interpretability.

The presentation distinguished between two conceptual approaches to constructing PCI categories: *latent constructs*, where indicators are proxies for an underlying unobservable variable; and *formative constructs*, where indicators are complementary and define the construct itself. While PCA is better suited to the latent interpretation, a simple average may offer clearer interpretation under the formative approach.

To assess the proposed options, the UNCTAD secretariat compared PCA-based scores with simple averages of standardized indicators. Results showed very high correlations (over 0.99) for six of the eight categories. However, notable discrepancies were found in Energy and Natural Capital, potentially explained by factors such as the need for multiple principal components to capture variation in those categories, and the assignment of negative weights to some indicators, such as renewable energy share and forest area.

The secretariat noted that a simple average of standardized indicators could serve as a more transparent and replicable alternative to PCA, particularly for country-level implementation. This approach would simplify computation and enhance interpretability, especially in contexts with limited statistical capacity, but it may not fully capture the underlying statistical structure of the data and could introduce a discontinuity relative to previous PCI versions. In light of these findings, the STAG was invited to provide a recommendation on whether to continue exploring the use of a simple average as an alternative to PCA for aggregating PCI input indicators.

While many STAG members acknowledged the importance of interpretability and ease of use, they also emphasized that the simple average method presents significant limitations. Participants noted that PCA remains a valuable tool for uncovering latent structures, especially when indicators are not highly correlated, whereas simple averages may obscure such complexity. Others pointed out that equal weighting may not reflect the relative economic importance or conceptual relevance of indicators within the category. Additional concerns included indicator redundancy, complementary or opposing effects between indicators, and the need for manual intervention for inverted variables under a mean-based approach.

Several members reaffirmed support for the current hybrid model, which uses PCA within categories to preserve statistical coherence and applies a simple average across categories to reflect their conceptual parity in defining productive capacities. Some suggested improving temporal stability by deriving PCA-based weights and fixing them over a multi-year reference period, enabling more consistent extrapolation and easier national replication. Other proposals, such as using moving-window PCA and randomized weights to produce confidence intervals, were acknowledged but not prioritized. Participants also cautioned against adopting arbitrary fixed weights without empirical or theoretical justification, which could undermine transparency and credibility.

The secretariat welcomed these reflections, reaffirming the value of PCA in grounding the PCI in both statistical evidence and economic reasoning. The Chair concluded that the current PCA-based methodology should be retained for now, while encouraging further experimentation to balance rigor, simplicity and policy relevance.

Presentation 2: PCI and macroeconomic performance: econometric analysis

The UNCTAD secretariat presented an econometric assessment of the PCI's relationship with macroeconomic performance to test the index's robustness. While GDP growth remains the most common proxy for economic outcomes, the secretariat emphasized that the PCI is explicitly designed to go *beyond GDP*, aiming to reflect the structural, inclusive and long-term drivers and enablers of development that GDP alone does not capture. Alternative outcome variables – such as employment rates and industrial production indices – were explored, but these suffer from limited coverage, poor comparability, and weak alignment with the PCI's long-term development framework. As such, GDP was retained as the dependent variable for this illustrative analysis, despite its limitations.

A bivariate vector error correction model (VECM) was estimated using PCI and GDP. However, several modelling challenges emerged, including endogeneity, the bounded nature of the PCI (0-100), the short time series (2000-2024), and significant heterogeneity across countries. Standard cointegration and causality tests yielded inconclusive results, reflecting the absence of a clear

theoretical lag structure and the difficulty of capturing the complex dynamics of the multidimensional PCI.

The secretariat concluded that further methodological work is needed to identify more appropriate outcome variables and modelling strategies. The STAG was invited to provide guidance on: (i) whether GDP remains an appropriate benchmark; (ii) how to address the PCI's bounded distribution; and (iii) which econometric approaches are best suited to the PCI's low-frequency, non-linear development data.

The Chair acknowledged the complexity of the modelling challenges and recommended pursuing further investigation into this topic. Due to time constraints, STAG members were invited to share written feedback after the meeting to help guide future analysis.

One STAG member suggested that if VECM or VAR-based approaches are used to explore the relationship between the PCI and macroeconomic indicators, the analysis should focus more on impulse response functions (IRFs) and variance decompositions (VDs), which offer clearer insights than model coefficients alone. Alternative methods such as Autoregressive Distributed Lag (ARDL), Structural Vector Autoregression (SVAR) or panel regression models were also proposed. They recommended focusing more on summary statistics, data visualizations and relevant theoretical frameworks to help identify appropriate outcome variables before proceeding to more complex regression analysis.

Another member recommended considering a dynamic panel data approach to better take advantage of the dataset's panel structure, which includes multiple countries with observations over time. It was also advised that the documentation of this analysis clearly explain the rationale behind the choice of econometric models to support transparency and understanding.

3.   Preliminary satellite "Green PCI"

The UNCTAD secretariat presented the conceptual framework and preliminary results for a satellite Green PCI, designed to capture dimensions of sustainability, inclusivity and resilience that are not fully addressed by the current PCI. Building on previous recommendations from the STAG and HLAB, the proposed satellite Green PCI introduces three dimensions: environment, financial vulnerability and gender equality. Although partially covered in the existing index, these themes merit separate treatment to better reflect the PCI's evolving development framework. Drawing on HLAB background and outcome reports and UN statistical guidelines, the secretariat applied standard PCI revision methods, utilizing tools such as correlation analysis and PCA, in an exploratory analysis of the feasibility of this new framework.

Due to time constraints, STAG members were invited to share written feedback after the meeting for the presentation made under this heading,

Environment

The secretariat reviewed a range of global indices, such as ND-GAIN, MVI, EVI and the World Risk Index, to identify indicators relevant to environmental sustainability. The candidate indicators were crosschecked against existing PCI inputs. While some indicators, like forest area and renewable

energy, are already included in the PCI, others related to pollution, waste and climate resilience were sourced from the *Beyond GDP* literature and the IAEG-SDG indicator list. Ten indicators were shortlisted, of which seven were retained for the preliminary Environment index based on data availability and conceptual alignment.

The preliminary PCA retained two components: the first captures environmental pressure, with strong loadings on higher per capita domestic material consumption and greenhouse gas (GHG) emissions, and negative loadings on renewable energy use, whereas the second reflects mitigation efforts, with high loadings on forest area, protected land and recycling rates. The resulting composite score incorporates both environmental pressure and policy response. Country patterns showed that developed countries tend to combine high emissions with strong mitigation, while developing and least developed countries displayed more varied profiles. Notably, forest area and renewable energy aligned more closely with this new environmental dimension than with their current placement in the Natural Capital and Energy categories, presenting a possible solution to the previously mentioned classification issues.

Finance

The secretariat outlined the conceptual basis and initial findings for the Finance category in the satellite Green PCI, aimed at capturing macro-financial vulnerabilities that constrain the development of productive capacities. While some financial aspects are already partially reflected in the PCI's Private Sector category, the satellite Green PCI approach responds to the HLAB's recommendations to assess broader risks such as debt distress and external financial reliance. Selected indicators focused on how financial pressures, such as public debt, external debt, and elevated borrowing costs, constrain investments in productive capacities.

Preliminary PCA results suggested two components. The first, interpreted as debt distress, showed high loadings on government interest payments and public debt, and a negative loading on the current account balance, indicating fiscal pressure linked to external debt burdens. The second, reliance on external finance, was associated with higher FDI inflows and current account deficits, suggesting heightened exposure to external shocks and capital flow volatility. The analysis revealed significant variation across countries, underscoring the need for context-specific assessment that accounts for differing levels of debt tolerance and external financing needs.

Given the ambiguity in statistical and conceptual interpretation, the secretariat recommended further work to identify a more consistent set of indicators that can precisely reflect the core concept of financial vulnerability. A written remark by a STAG member echoed this suggestion, emphasizing the importance of carefully defining how the components are interpreted, such as whether the component score should be inverted, before producing the index.

Gender

The UNCTAD secretariat presented the conceptual foundation and preliminary results for a gender-focused dimension of the satellite Green PCI, with a particular emphasis on the care economy. Building on the HLAB's recommendations and the framework by Braunstein, Bouhia and Seguino (2020), the analysis underscores how unequal care responsibilities limit women's opportunities and suppress long-term productive capacities. While care-related elements are partially reflected in the

existing PCI – such as through health spending and access to electricity – the proposed Gender category introduces three new indicators: the female-to-male age at first marriage ratio (proxy for relative contribution to social reproduction), the female-to-male ratio of waged employment (proxy for wage gap), and women's employment in services adjusted by income inequality (proxy for extent of care sector).

The PCA only retained one component, with high positive loadings across all included indicators, suggesting a unified dimension of gender equity in care infrastructure, economic opportunity and social reproduction. Country patterns showed a clear gradient, with developed economies scoring higher and LDCs clustering at the lower end of the distribution.

Aggregation

The UNCTAD secretariat concluded the presentation by outlining possible approaches for integrating the three new satellite Green PCI dimensions into the broader PCI framework. One option is to incorporate them into the overall PCI using a geometric mean, in line with existing aggregation methods. However, this would require further conceptual justification regarding the relevance of the new dimensions to productive capacities, as well as their intersections with the current PCI categories. The secretariat also shared preliminary results from an experimental Green PCI based solely on the average of the three new components. These results pointed to a potential trade-off between Finance and Environment dimensions.

STAG members were invited to provide guidance on how to interpret these findings, advise on appropriate aggregation strategies, and suggest clear and inclusive naming conventions for the Green PCI and its components. Regarding the conceptual positioning and aggregation of the proposed new dimensions, one member noted that some of the indicators considered may be better classified as outcomes rather than inputs into productive capacities, and recommended grounding their inclusion, if appropriate, in established economic models of productive capacities.

4. Conceptual framework for a satellite "SIDS PCI"

Presentation 1: Background and mandate overview

The UNCTAD secretariat presented the conceptual basis for developing a satellite PCI tailored to Small Island Developing States (SIDS), supported by mandates from the Antigua and Barbuda Agenda for SIDS (ABAS), UNCTAD's Strategy for SIDS and other global sustainable development frameworks. This initiative aims to strengthen and green productive capacities in pilot Caribbean SIDS (Antigua and Barbuda, the Dominican Republic, Jamaica, and Trinidad and Tobago) boosting just transitions that align with the unique needs of SIDS and advancing economic transformation, with broader spillover benefits for other SIDS. The outcomes of the project in those four pilot countries will serve as a foundation across all SIDS.

The project is motivated by the need to address structural challenges in SIDS that the core PCI does not fully capture, including limited data availability, distortions from per capita scaling due to small populations, non-traditional growth paths (e.g. high reliance on services and tourism) and high climate vulnerability. The proposed satellite SIDS PCI would adapt key dimensions such as Transport,

Energy and Structural Change to better reflect SIDS development needs, and incorporate indicators on debt, external vulnerability and disaster risk.

The UNCTAD secretariat outlined the project timeline, which began with data diagnostics, national indicator mapping and conceptual development from March to May 2025. A draft framework was presented to the STAG in the current meeting (June 2025), which will be followed by initial calculations, stakeholder consultations and regional validation activities scheduled throughout the second half of 2025. In 2026, the focus will shift to statistical training and National Productive Capacities Gap Assessment (NPCGA) workshops in the four beneficiary countries.

Presentation 2: Preliminary framework presentation

The UNCTAD secretariat presented the preliminary framework for the satellite SIDS PCI, outlining its rationale, core components and methodological steps. The rationale focused on addressing structural gaps in the global PCI that overlook SIDS-specific features such as small size, remoteness, concentrated economic structures and vulnerability to climate shocks. The satellite SIDS PCI aims to complement the core PCI by reflecting these unique conditions, supporting more tailored policy design and global advocacy.

The satellite SIDS PCI methodology consists of five steps: (1) developing a conceptual base informed by productive capacities literature and SIDS critiques; (2) conducting a data availability assessment to address data gaps and inconsistencies; (3) evaluating indicator feasibility, with a focus on relevance to SIDS vulnerabilities; (4) finalizing indicator selection and identifying proxies where needed; and (5) ensuring iterative refinement through stakeholder consultation and adaptation to emerging challenges.

The presentation introduced a tailored set of indicators for a SIDS-specific PCI, adapting existing categories (e.g. Natural Capital, Energy, and Institutions) and adding new ones on Climate Resilience and Financial Vulnerability.

Following the presentation, STAG members welcomed the ambition to develop a satellite PCI tailored to the structural characteristics of Small Island Developing States (SIDS), while raising important conceptual and operational considerations.

In the discussion, a representative from the UNCTAD secretariat reaffirmed that the objective is to develop a satellite PCI for SIDS grounded in the existing PCI methodology, while allowing for appropriate adaptations to reflect the specific characteristics of SIDS. The importance of clearly identifying all outputs as part of a "satellite PCI" to ensure conceptual coherence, was emphasized to avoid any confusion. The initiative should be viewed as a complementary extension of the global PCI, providing a context-specific lens that captures the comparative advantages and structural constraints of SIDS. The inclusion of indicators related to inequality were also encouraged, given the diversity of income levels among SIDS, and the need for methodological consistency across regional and national applications was underscored.

The representative from ECLAC expressed support for the initiative and underscored the statistical capacity challenges facing Caribbean SIDS. He offered ECLAC's collaboration and noted that some relevant data sources already exist at the country-level, albeit not always openly available.

One STAG member raised initial concerns about the risk of duplication and noted that a similar approach might be requested by other country groupings, such as LDCs or LLDCs. Nonetheless, the member acknowledged the unique data availability challenges in SIDS and supported a pragmatic approach: recommending the listing of core indicators, identifying data gaps, and utilizing local sources or proxy indicators where appropriate. The discussion also stressed the importance of maintaining the PCI's core focus on productive capacities, cautioning against expanding its scope in ways that could dilute its purpose and comparability.

Another member noted the importance of conceptual clarity and political neutrality. He cautioned against entangling the SIDS PCI with politically sensitive frameworks, which could hinder its uptake and detract from its core focus.

STAG Chair concluded this section by noting that SIDS are a highly heterogeneous group, for example between the Caribbean and Pacific regions, and advised caution in generalizing indicators across diverse economic contexts. He also noted that defining SIDS membership can be complex, with potential political implications for the scope of the satellite PCI. Emphasizing the importance of methodological consistency, clear communication and avoiding duplication, he encouraged continued refinement and looked forward to updates to be presented in future meetings.

5. Fostering synergies, visibility and use of the PCI

Ms. Yanchun Zhang, Chief Statistician of the United Nations Development Programme (UNDP), provided an overview of recent discussions between UNCTAD and the UNDP Executive Office on opportunities to promote the PCI within UNDP's programme and research networks. She outlined three key channels for collaboration:

1. Resident Representative Network: UNDP country offices could support dissemination of the PCI and its satellite indices, such as the Green PCI, while also relaying field-level feedback.
2. Global Policy Network: UNDP specialists in economic and development issues across headquarters, regions and country teams could be engaged to integrate the PCI into broader analytical and operational work.
3. Chief Economists Group: UNCTAD would be invited to present the PCI to Chief Economists of UNDP Regional Bureaus, offering an opportunity to deepen technical dialogue on productive capacities and structural transformation.

From the UNCTAD secretariat, Mr. Paul Akiwumi welcomed UNDP's collaboration and affirmed the complementarity between the two institutions' mandates. He pointed out that UNCTAD would present the PCI project and NPCGA for Zimbabwe to UNDP Resident Representatives that same week, illustrating concrete applications of the index and ongoing partnerships with UNDP country teams. He expressed appreciation for the opportunity to leverage UNDP platforms to increase visibility and policy uptake of the PCI.

In a written remark, Mr. Yusuke Tateno (Economic Affairs Officer of ESCAP) noted that the PCI is increasingly used by ESCAP as a standard tool for measuring productive capacities, particularly in research on LDCs, LLDCs and SIDS. He highlighted its application in ESCAP's *2024 Asia-Pacific Biennial Review of the Doha Programme of Action for LDCs*, where both the overall PCI score and the

structural change component were used to assess progress on structural transformation. He also commended the PCI's inclusive approach, offering wide global coverage including many SIDS in the Asia-Pacific region.

Ms. Anu Peltola, Director of UNCTAD Statistics, briefed the group on recent developments following the 56th Session of the UN Statistical Commission, where the PCI Guidelines were acknowledged in the official report and welcomed for further discussion by the Commission Bureau. She noted that several national statistical offices (NSOs) had expressed interest in peer reviewing the PCI, including France's INSEE and Statistics Finland, and reiterated that the index had already benefited from consultations with NSOs in countries such as Botswana, Lao PDR, Namibia and Rwanda.

Ms. Peltola emphasized that the PCI is not only an index, but also a practical tool for identifying data gaps and supporting statistical capacity development in areas directly linked to national development priorities. Drawing on official statistics, the PCI is designed to be adaptable to country contexts, offering guidance on indicator selection, aggregation methods and data availability. She noted that by spotlighting under-resourced domains, the PCI can support more targeted investment in national data systems. She noted the importance of systematic engagement with NSOs and the UN Statistical Commission, and invited STAG members to share suggestions on how to raise awareness and strengthen the PCI's integration into broader UN efforts to build statistical capacity.

The Chair of the STAG welcomed the presentation and suggested that visibility efforts can extend beyond the Statistical Commission to include venues such as the UN World Data Forum, which offers an additional platform to engage with statistical and policy audiences. He also noted that the timing and location of the next STAG meeting could be strategically aligned with other statistical meetings to encourage participation from national chief statisticians.

Closing and way forward

To conclude the meeting, the Chair of the STAG thanked all participants for their active engagement and reaffirmed the value of the STAG in reinforcing the methodological rigor and policy relevance of the PCI. He commended the UNCTAD team for the depth and quality of their analytical work and noted that the meeting reflected the growing maturity of the PCI, with discussions increasingly focused on practical refinements and strategic positioning. He summarized the STAG's key recommendations, including support for the improved imputation method, tentative endorsement of the new maritime transport indicator, and the need for further work on human capital and institutions. On robustness testing, the STAG advised continued experimentation while retaining the current aggregation approach. The Chair also noted valuable proposals for expanding communication, visibility and outreach, particularly through upcoming statistical events.

Mr. Carlos Coimbra, on behalf of the Banco de Portugal as the host institution, expressed his appreciation for the rich and productive discussions. While acknowledging time constraints towards the end of the agenda, he welcomed the opportunity to support the PCI process and looked forward to future engagement, noting that the discussions raised important points to revisit in the next meeting.

Representing the UNCTAD secretariat, Mr. Paul Akiwumi closed the meeting by expressing deep appreciation to all participants, including the STAG members, presenters and UNCTAD colleagues. He reiterated the central role of the STAG in ensuring the credibility and methodological soundness of the PCI. He outlined several forward-looking priorities, including efforts to address data access challenges through higher-level engagement with relevant entities, opportunities for wider engagement with national statistical offices, and ongoing efforts to strengthen the index's role in global capacity-building and sustainable development. He announced that the next STAG meeting is expected to be hosted by the OECD, and shared plans for a possible academic symposium to expand the PCI's research community and enhance its visibility. He warmly thanked the Banco de Portugal for their generous hospitality and support and looked forward to continued collaboration in the next phase of PCI development.

Annex 1 - Summary of Action Points from the 3rd STAG on the PCI

1. **PCI 3.0 Methodological Updates and Data Challenges**
   1.1. **Investigate links** between data missingness and national statistical capacity.
   1.2. **Consider the feasibility of developing criteria** for acceptable missing rates.
   1.3. **Document alternative indicators** or proxies for key indicators.
   1.4. **Higher-level engagement with data providers** to address data access challenges mitigate paywall/restriction issues.

2. **Improvements to the Statistical Pipeline**
   2.1. **Adopt longitudinal random forest imputation (longitudinalRFI)** over previous methods.
   2.2. **Continue testing imputation performance** and compare with other methods, such as transformers.
   2.3. **Continue to engage countries** to validate imputed data, e.g. through dashboards and focal point consultations, if resources allow

3. **Extension of Existing PCI Categories**
   3.1. **Transport**: Tentatively approve **inclusion of seaborne goods discharged**; exclude LSCI. Further refinement encouraged.
   3.2. **Human Capital**: Further explore **labor-related indicators** (e.g., informality, productivity, NEET rate). No additions approved yet.
   3.3. **Institutions**: Consider SDG indicator 8.8.2

4. **Robustness Testing**
   4.1. **Retain current approach (PCA-based aggregation)** for now; simple average found too limited despite interpretability benefits.
   4.2. **Investigate fixed PCA weights** over time or moving-window PCA for greater stability over time.
   4.3. Further assessment of the **relationship between PCI and macroeconomic outcomes**, including exploration of **alternative econometric models**.

5. **Satellite "Green PCI" Development**
   5.1. **Further conceptual and statistical refinement needed**, especially for Finance indicators.
   5.2. Feedback invited on:
      5.2.1. Aggregation within satellite Green PCI and/or integration with main PCI
      5.2.2. Naming conventions for the satellite index and its components
      5.2.3. Clarifying input vs. outcome indicators.

6. **Satellite "SIDS PCI" Development**
   6.1. Continued support for the development of a **satellite SIDS PCI**, grounded in core PCI methodology.
   6.2. Next steps:
      6.2.1. Finalize theoretical framework
      6.2.2. Finalize indicator set and produce preliminary results
      6.2.3. Conduct stakeholder consultations

      6.2.4.   Prepare for statistical trainings and NPCGA workshops in 2026.

7. **Enhancing Visibility and Use of PCI**
   7.1. **Strengthen collaboration** with UNDP networks (e.g. Resident Representatives, Chief Economists).
   7.2. **Leverage platforms** such as the UN World Data Forum for broader outreach.
   7.3. **Continue engaging NSOs** for peer review, feedback and indicator adaptation.

8. **General Recommendations**
   8.1. Continue developing and refining **satellite indices** while preserving PCI's coherence and clarity.
   8.2. Ensure **conceptual alignment and methodological consistency** across country groups.
   8.3. Align STAG meetings and other PCI activities with major statistical events to **enhance visibility and participation**.

Annex 2 - List of participants at the Third Meeting of the Statistical and Technical Advisory Group on the Productive Capacities Index (PCI)

	Participant	Title	Organization	Country
1	Prof. Xiaowen Fu	Associate Dean and Professor	Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University	China, Hong Kong SAR
2	Mr. Rafael Diez de Medina	Director and Chief Statistician	Department of Statistics, International Labor Organization (ILO)	Switzerland
3	Mr. Steve MacFeely	Chief Statistician	The Organization for Economic Cooperation and Development (OECD)	France
4	Prof. Dr. Jan-Egbert Sturm	Professor of Applied Macroeconomics; Director of the KOF Swiss Economic Institute	Department of Management, Technology and Economics (D-MTEC)	Switzerland
5	Mr. Oliver Chen	Tenure-Track Assistant Professor	University of Lausanne (UNIL-CHUV)	Switzerland
6	Mr. Rolando Ocampo	Director, Statistics Division	Economic Commission for Latin America and the Caribbean (ECLAC)	Chile
7	Mr. Afolabi Olowookere	Alternate Executive Director	International Monetary Fund	USA
8	Mr. Carlos Coimbra	Adviser to the Board of Banco de Portugal	Associated Professor at ISCTE	Portugal
9	Mr. João Amador	Deputy Head, Economics and Research Department	Banco de Portugal	Portugal
10	Mr. Paul Akiwumi	Director	UNCTAD-ALDC	Switzerland
11	Mr. Mussie Delelegn	Head a.i.	UNCTAD-ALDC	Switzerland
12	Mr. Rachid Bouhia	Economic Affairs Officer	UNCTAD-ALDC	Switzerland
13	Mr. Benny Salo	Statistician	UNCTAD-STAT	Switzerland
14	Ms. Anu Peltola	Director	UNCTAD-STAT	Switzerland
15	Mr. Robert Ndugwa	Head Global Urban Observatory Unit	United Nations Human Settlements Programme (UN-Habitat)	Kenya

16	Ms. Yanchun Zhang	Chief of Statistics	Human Development Report Office, United Nations Development Programme (UNDP)	USA
17	Mr. Joseph Ilboudou	Officer-in-Charge	African Center for Statistics -United Nations Economic Commission for Africa	Ethiopia
18	Mr. Taffere Tesfachew	Senior Advisor	Tony Blair Institute	United Kingdom
19	Mr. David Boko	Statistician	African Center for Statistics -United Nations Economic Commission for Africa	Ethiopia
20	Mr. Yusuke Tateno	Economic Affairs Officer	UN Economic and Social Commission for Asia and the Pacific (ESCAP)	Thailand
21	Mr. Matt Bishop	Senior Lecturer	UNCTAD-ALDC/University of Sheffield	United Kingdom
22	Ms. Preeya Mohan	Senior Fellow	UNCTAD-ALDC/University of the West indies	Trinidad and Tobago
23	Ms. Denyse Dookie	Research Fellow	UNCTAD ALDC/London School of Economics	United Kingdom
24	Mr. Duy-Cat Can	Data scientist	UNCTAD-ALDC/ University of Lausanne	Switzerland
25	Ms. Lisa Borgatti	Economic Affairs Officer	UNCTAD-ALDC	Switzerland
26	Ms. Stefanie Garry	Economic Affairs Officer	UNCTAD-ALDC	Switzerland
27	Mr. Giovanni Valensisi	Economic Affairs Officer	UNCTAD-ALDC	Switzerland
28	Mr. Alexander Blackburn	Statistician	UNCTAD-STAT	Switzerland
29	Mr. Corey To	Intern	UNCTAD-ALDC	Switzerland
30	Ms. Nadine Nyamangirazi	Intern	UNCTAD-ALDC	Switzerland
31	Mr. Oumarou Djelbeogo	Intern	UNCTAD-ALDC	Switzerland
32	Ms. Petra Kynclova	Statistician	UNCTAD-STAT	Switzerland