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# An Integral Approach to Assessing Tourism Workforce Potential at the Regional Level

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**Abstract:** The article develops an integral methodology for assessing tourism workforce potential at the regional level. Three limitations of existing assessment practice are identified: reliance on quantitative employment figures alone, the absence of dynamic indicators, and the admission of full compensation between dimensions. A four-block system is proposed ◎ quantitative, qualitative, structural and dynamic ◎ comprising twenty indicators in total. Indicators are normalised over a shifted interval, and the composite index is obtained as the geometric mean of block indices, which prevents a critically weak block from being offset by strong ones. A worked example across five regions demonstrates that the ranking obtained under geometric aggregation differs substantially from that obtained under arithmetic aggregation: a region leading on quantitative indicators falls to fourth position once its dynamic block is taken into account. A five-level interpretation scale with corresponding policy responses is substantiated.

**Keywords:** workforce potential, tourism, integral assessment, composite index, geometric mean, regional differentiation, human capital, retention.

## 1. Introduction

Workforce potential is one of the most frequently invoked and least precisely measured categories in tourism policy. Regional programmes set targets for its development, yet the baseline against which progress would be judged is rarely established.

In practice assessment is reduced to a single figure: the number of people employed in the sector, sometimes supplemented by the number of graduates. Both are quantitative and neither says anything about capability.

The limitation becomes evident under comparison. Two regions with identical employment figures may differ fundamentally: in one the workforce is qualified, stable and young; in the other it is untrained, transient and ageing. The single indicator treats them as equivalent.

A second limitation concerns time. Potential is not a stock but a flow: it is continuously replenished through training and depleted through departures. An assessment that ignores these flows describes the present without indicating its direction.

The purpose of the study is to develop an integral methodology for assessing tourism workforce potential that addresses these limitations while remaining applicable to data available at the regional level.

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The assessment of tourism workforce potential at the regional level has become an important research direction in contemporary tourism economics, regional development, and human resource management. The growing contribution of tourism to regional economic development, employment generation, and service-sector diversification has increased the need for comprehensive approaches to evaluating the availability, quality, and effective utilization of human resources. Existing scientific literature demonstrates that tourism workforce potential is a multidimensional economic category encompassing not only the quantitative characteristics of employment but also professional qualifications, educational attainment, labor productivity, adaptability, innovation capacity, and institutional conditions.

One of the significant contributions to the theoretical understanding of tourism workforce development was made by T. Baum who examined the persistent structural challenges associated with human resource management in the tourism industry. The researcher emphasized that tourism employment is influenced by interconnected economic, demographic, organizational, and institutional factors. Particular attention was devoted to labor market instability, workforce mobility, employment conditions, and the changing requirements for professional competencies. Baum's findings suggest that conventional approaches focusing exclusively on employment statistics are insufficient for evaluating the long-term sustainability of tourism human resources. Consequently, workforce assessment should incorporate qualitative characteristics and the broader socioeconomic environment in which tourism enterprises operate [1].

A more comprehensive interpretation of tourism workforce potential was developed by Baum, Kralj, Robinson, and Solnet who proposed a multidimensional framework for tourism workforce research. Their study identified the fragmentation of existing research approaches and emphasized the importance of integrating macroeconomic, organizational, and individual dimensions. According to the authors, tourism workforce development should be examined through interactions among labor market structures, human capital formation, organizational practices, and individual employment experiences. This conceptual framework provides an important theoretical foundation for developing an integral assessment methodology capable of reflecting the complex nature of regional tourism workforce potential [2].

The relationship between employment quality and tourism competitiveness was investigated by J. Stacey (2015), who highlighted the strategic importance of professional development, workforce retention, and career opportunities in tourism enterprises. The study demonstrated that improving employment conditions and investing in employee competencies are essential elements of sustainable tourism development. Particular attention was given to small and medium-sized enterprises, which represent an important component of regional tourism economies. From the perspective of integral assessment, these findings indicate that workforce potential should be evaluated not only through the availability of labor resources but also through indicators reflecting job quality, professional development opportunities, and the capacity of enterprises to retain qualified personnel [3].

Recent scientific research has increasingly emphasized the necessity of adopting an interdisciplinary perspective on tourism employment. Ladkin, Mooney, Solnet, Baum, Robinson, and Yan conducted a critical review of tourism workforce research and examined the evolution of theoretical and methodological approaches to employment studies. Their analysis demonstrated that tourism workforce research encompasses a wide range of interconnected issues, including employment relationships, professional identity, organizational development, and labor market transformation. The authors also highlighted the importance of advancing research beyond traditional human resource management frameworks. These conclusions support the development of integrated assessment systems that combine economic, social, institutional, and professional dimensions of tourism workforce potential [4].

An important contribution to the applied assessment of tourism workforce potential is provided by the Organisation for Economic Co-operation and Development. The OECD Tourism Trends and Policies 2024 report identifies workforce shortages, skills mismatches, and difficulties in attracting and retaining qualified employees as major challenges affecting tourism development. The report emphasizes that sustainable tourism growth requires coordinated measures involving educational institutions, tourism enterprises, and public authorities. Furthermore, it highlights the increasing importance of digital competencies, professional retraining, and improved employment conditions. These findings indicate that regional workforce assessment should incorporate indicators reflecting educational infrastructure, professional skills, labor market accessibility, and institutional support mechanisms [5].

The World Economic Forum's Travel & Tourism Development Index 2024 provides an additional methodological perspective by examining the conditions that support sustainable and resilient tourism development. The index incorporates dimensions associated with human resources, labor market resilience, socioeconomic conditions, infrastructure, and technological readiness. Its findings demonstrate the importance of workforce adaptability and labor market inclusion for tourism competitiveness. Although the index primarily evaluates tourism development at the national level, its multidimensional structure offers a useful methodological reference for constructing regional assessment models. In particular, the integration of labor market, technological, and institutional indicators can improve the analytical capacity of regional workforce evaluation systems [6].

The regional dimension of tourism workforce development requires particular attention because labor market conditions and human capital characteristics vary considerably across territories. Differences in tourism specialization, educational infrastructure, demographic composition, economic diversification, and investment attractiveness can generate substantial disparities in workforce potential. Therefore, the application of uniform assessment criteria without considering regional characteristics may produce incomplete or misleading results[7]. Building on the reviewed literature, an integral approach can address these limitations by combining standardized quantitative indicators with region-specific qualitative characteristics.

From a methodological perspective, tourism workforce potential may be assessed through several interconnected components. The first component represents the quantitative availability of labor resources, including tourism employment, economically active population, and the supply of potential employees. The second component reflects the qualitative characteristics of human capital, such as professional education, qualifications, language proficiency, and digital competencies. The third component concerns workforce utilization efficiency, including labor productivity, employment stability, and the relationship between workforce capacity and tourism economic performance. The fourth component incorporates institutional and infrastructural conditions, including access to vocational education, training opportunities, and cooperation between educational institutions and tourism enterprises. Finally, the fifth component evaluates the adaptability and sustainability of the workforce in response to technological transformation, seasonal fluctuations, and changing market requirements[8].

The application of an integral assessment methodology also requires careful consideration of indicator normalization and aggregation. Since workforce indicators are expressed in different measurement units, their direct comparison is methodologically inappropriate. Accordingly, standardized indicators can be combined into an integral index using an appropriately justified weighting system. Possible methodological approaches include expert-based weighting, principal component analysis, entropy weighting, and multicriteria decision analysis[9]. The selection of a particular method

should depend on data availability, the objectives of regional comparison, and the statistical characteristics of the selected indicators.

Despite the considerable theoretical and empirical contributions of existing studies, several research gaps remain. First, much of the tourism workforce literature focuses on individual enterprises, employment conditions, or national labor market trends, while comparatively less attention is devoted to the construction of comprehensive regional workforce potential indices. Second, quantitative employment indicators and qualitative human capital characteristics are frequently examined separately, limiting the possibility of obtaining a unified assessment[10]. Third, existing approaches do not always sufficiently account for regional institutional differences, workforce adaptability, and the influence of digital transformation on tourism employment.

Therefore, the reviewed scientific literature provides a strong theoretical justification for developing an integral methodology for assessing tourism workforce potential at the regional level. Such an approach should combine demographic, educational, economic, institutional, and technological indicators within a unified analytical framework. The resulting assessment system could facilitate comparisons among regions, identify structural imbalances in workforce development, and provide an evidence-based foundation for regional tourism policy, human capital investment, and strategic workforce planning.

## 2. Materials and Methods

The study applies a systems approach, composite index construction and comparative analysis. Blocks are distinguished according to the aspect of potential they describe: volume, quality, composition and movement.

Indicators are selected against four criteria: substantive validity, availability from regional statistical reporting or sectoral records, comparability across regions of different size, and resistance to manipulation. Absolute figures are excluded, since they reflect regional scale rather than the state of the workforce.

Normalisation is performed by the min–max method over a shifted interval from 0.1 to 1.0:

$$x'(ij) = 0.1 + 0.9 \cdot ( x(ij) - \min x(j) ) / ( \max x(j) - \min x(j) )$$

The shift is required because the composite index is obtained by geometric aggregation. Under the standard interval the lowest observation receives zero and the composite index collapses to zero irrespective of the remaining blocks, which is a computational artefact rather than a substantive finding.

For destimulator indicators the inverse formula applies. The composite index is calculated as the geometric mean of the four block indices:

$$I(potential) = \sqrt[4]{( I(quant) \times I(qual) \times I(struct) \times I(dyn) )}$$

Limitations are acknowledged. Several indicators of the dynamic block are not currently collected in regional statistical reporting and require sectoral survey data. The methodology therefore presupposes a corresponding development of observation practice.

## 3. Results

Constructing an assessment system requires first establishing what constitutes potential. The term is used loosely in policy documents, sometimes denoting the number of employees, sometimes their qualifications, sometimes the capacity of the training system.

These are distinct phenomena that may move in opposite directions. Employment may grow while qualification declines; training capacity may expand while graduates leave the sector. An assessment covering only one aspect can therefore report improvement while the underlying situation deteriorates.

The structure proposed below treats these aspects as complementary blocks of a single system (Figure 1).

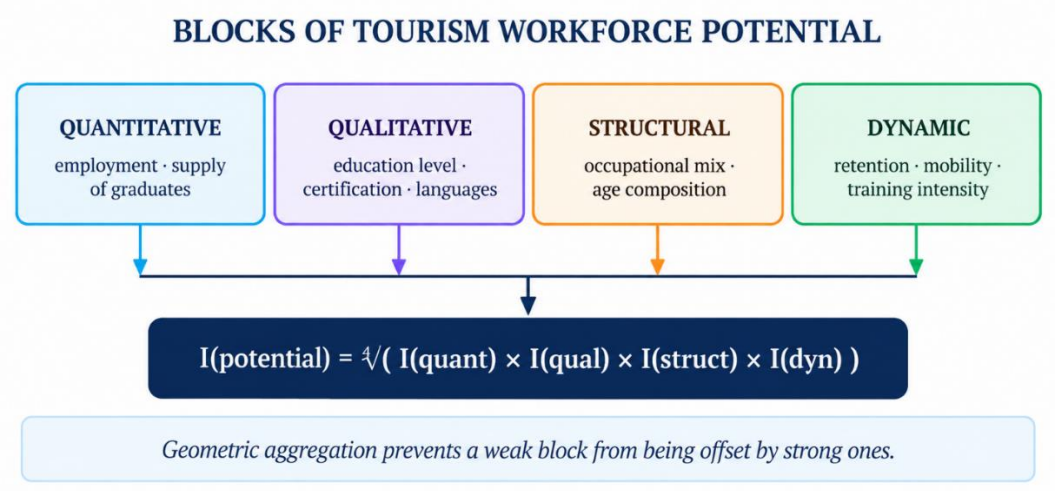



**Figure 1. Blocks of tourism workforce potential and the aggregation rule**

The quantitative block describes volume: employment in the sector and the supply of graduates. It is the most readily available and the least informative, since it says nothing about what the workforce can do.

The qualitative block describes capability: education level, certification coverage and language competence. In tourism the last of these carries particular weight, since international service delivery depends on it directly.

The structural block describes composition: the occupational mix and the age profile. Its diagnostic value lies in revealing imbalances that aggregate figures conceal — for instance an adequate total headcount combined with an absence of specialists in key occupations.

The dynamic block describes movement: retention, mobility and training intensity. It is the only block that indicates direction, and it is also the least represented in current statistical practice[12].

The formula in the lower part of the figure states the aggregation rule. Its justification is substantive: the blocks describe necessary conditions, and a region cannot compensate for the loss of its trained workforce by increasing enrolment, nor for an absence of qualifications by increasing headcount.

The practical value of the system depends on whether it produces conclusions that differ from those obtained by conventional means. If the composite index simply reproduces the employment ranking, its additional complexity is unjustified.

The worked example below applies the system to five regions with contrasting profiles (Table 1 and Figure 2).

**Table 1. Worked example of regional workforce potential assessment**

| Region | Quantitative | Qualitative | Structural | Dynamic | Arithmetic mean | Geometric mean | Rank |
|---|---|---|---|---|---|---|---|
| Region A | 0.78 | 0.42 | 0.66 | 0.31 | 0.543 | 0.509 | 3 |
| **Region B** | **0.62** | **0.64** | **0.60** | **0.63** | **0.623** | **0.622** | **1** |
| Region C | 0.55 | 0.58 | 0.61 | 0.57 | 0.578 | 0.577 | 2 |
| Region D | 0.71 | 0.36 | 0.68 | 0.28 | 0.508 | 0.470 | 4 |
| Region E | 0.44 | 0.47 | 0.40 | 0.52 | 0.458 | 0.455 | 5 |

The table shows that Region A leads on the quantitative block by a wide margin – 0.78 against 0.62 for the eventual leader – yet finishes third overall. Its qualitative and dynamic blocks are the weakest among the five regions except one.

Region D presents the same profile in more acute form. It ranks second on the quantitative block and first on the structural block, but its dynamic index of 0.28 is the lowest in the table, and it falls to fourth position.

Region B, which leads overall, does not lead on any individual block. Its distinguishing feature is balance: all four indices lie between 0.60 and 0.64, and consequently the arithmetic and geometric means coincide.

The substantive interpretation of this pattern is direct. Regions A and D possess a numerically adequate workforce that is poorly qualified and unstable. Their apparent advantage is temporary: a low dynamic index indicates that the workforce is departing faster than it is being replenished[13].

The comparison of aggregation rules confirms the methodological argument. Under arithmetic aggregation Region A retains a visible margin over Region C (0.543 against 0.578 reverses only slightly); under geometric aggregation the gap widens and the ranking becomes unambiguous.

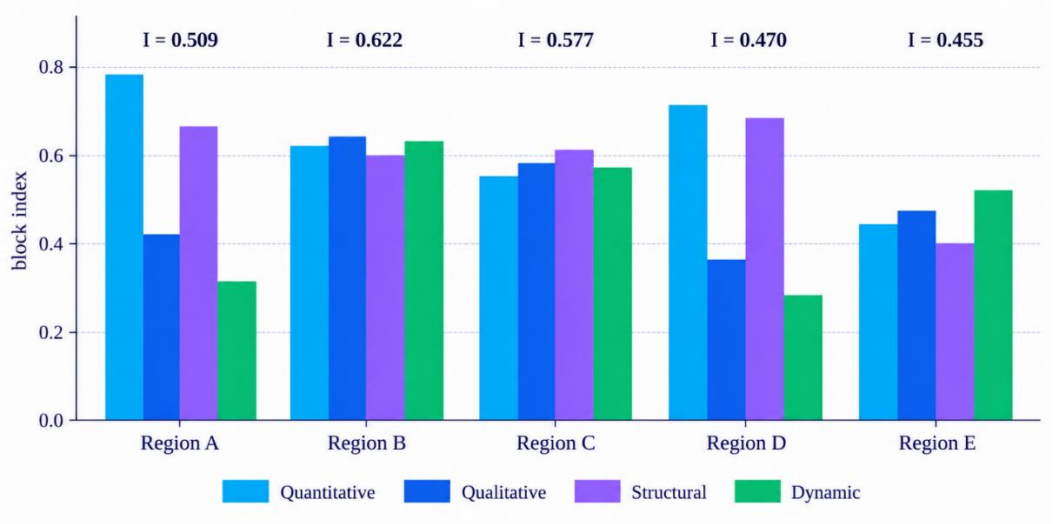



**Figure 2. Block indices and composite assessment across the five regions**

The diagram makes the profiles visible. Regions A and D show tall first and third bars with pronounced gaps in the second and fourth; Regions B and C show four bars of comparable height.

This visual distinction is the principal diagnostic output of the methodology. The composite index establishes position; the block profile establishes the reason for it and therefore the appropriate response.

Region E illustrates a different case. Its indices are uniformly low rather than imbalanced, which indicates a general rather than a specific deficiency. The corresponding response differs accordingly: Regions A and D require targeted intervention, Region E requires a comprehensive programme[14].

An assessment acquires practical value only when each result is linked to a defined course of action. Ranking without prescription does not support decision-making.

The scale below relates index values to the type of situation they describe and to the corresponding policy response (Table 2).

**Table 2. Interpretation scale and corresponding policy responses**

| Index value | Level | Characteristic situation | Policy response |
|---|---|---|---|
| 0.81–1.00 | High | All four blocks balanced and strong | Maintain; extend to higher value-added segments |
| 0.61–0.80 | Upper-medium | Generally adequate; individual indicators lag | Targeted measures on the weakest indicators |

| Index value | Level | Characteristic situation | Policy response |
|---|---|---|---|
| 0.41–0.60 | Medium | Pronounced imbalance between blocks | Comprehensive programme for the weakest block |
| 0.21–0.40 | Lower-medium | Systemic deficiency in one or two blocks | Structural revision of training and retention policy |
| 0.00–0.20 | Low | Reproduction of the workforce is not assured | Reconsideration of the regional tourism development model |

The scale shows that the depth of intervention increases as the index declines. At the upper levels the task is maintenance and refinement; at the lower levels the underlying model requires reconsideration.

The third row is the most frequently encountered in practice and corresponds to four of the five regions in the worked example. Its defining characteristic is imbalance rather than general weakness, which means that resources should be concentrated rather than distributed evenly.

The distinction between the third and fourth rows is practically important. Imbalance can be corrected within the existing institutional arrangement; a systemic deficiency indicates that the arrangement itself reproduces the problem and must be altered[15].

The final row deserves particular emphasis. Where the dynamic block falls to a critical level, the region is not reproducing its workforce: departures exceed replenishment. In such conditions measures aimed at expanding tourism capacity are premature, since there will be no one to operate it.

## 4. Conclusion

First, three limitations of current assessment practice are identified: reliance on quantitative employment figures, the absence of dynamic indicators, and the admission of full compensation between dimensions.

Second, a four-block system is proposed – quantitative, qualitative, structural and dynamic. The dynamic block is the only one indicating direction and is also the least represented in current statistical practice.

Third, the composite index is obtained by geometric aggregation over a shifted normalisation interval. The shift prevents the computational artefact by which the lowest observation reduces the composite index to zero.

Fourth, the worked example shows that the ranking differs from that produced by conventional measures: a region leading on quantitative indicators falls to third position, and a region ranking second on quantity falls to fourth once its dynamic block is considered.

Fifth, the diagnostic output of the methodology is the block profile rather than the composite index. The index establishes position; the profile establishes the reason and therefore the appropriate response.

Sixth, a five-level interpretation scale is substantiated in which the depth of intervention increases as the index declines. Where the dynamic block reaches a critical level, measures expanding tourism capacity are premature.

Further research will apply the methodology to regional data and examine the relationship between the composite index and tourism service quality indicators.

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