



## **Territorial Diagnosis and Sectoral Valorisation for Sustainable Development in Tamanrasset, Algerian Sahara**

**Lynda Hamadene<sup>1\*</sup>, Fateh Benalia<sup>2</sup>**

<sup>1</sup>Department of Geography and Spatial Planning, Faculty of Earth Sciences, Geography and Spatial Planning, USTHB Laboratory of Geography and Regional Planning (LGAR), Algiers, Algeria

\* **Corresponding Author Email:** [hamadenelynda@gmail.com](mailto:hamadenelynda@gmail.com) - **ORCID:** 0009-0003-8606-1997

<sup>2</sup>Department of Geography and Spatial Planning, Faculty of Earth Sciences, Geography and Spatial Planning, USTHB Laboratory of Geography and Regional Planning (LGAR), Algiers, Algeria

**Email:** [Fateh16@yahoo.fr](mailto:Fateh16@yahoo.fr) - **ORCID:** 0009-0003-8606-6374

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### **Abstract:**

Sustainable development policies require territorially differentiated approaches, particularly in arid and peripheral regions where socio-economic dynamics and access to services are highly uneven. In Algeria, the sharp contrast between the urbanised northern regions and the sparsely populated Sahara raises critical questions regarding the territorial anchoring of development strategies. This article develops an integrated territorial diagnosis of the wilaya of Tamanrasset, located in the Algerian Sahara, by combining municipal-level socio-economic, environmental, and infrastructure indicators with a SWOT-based analytical framework and stakeholder-informed assessment. The findings reveal strong spatial polarisation centred on the city of Tamanrasset, accompanied by pronounced intra-regional disparities in access to services, employment opportunities, and connectivity infrastructure. At the same time, the diagnosis identifies strategic pathways for sectoral valorisation through sustainable tourism, traditional handicrafts, and renewable energy, provided that development interventions recognise functional complementarities and spatial continuity across Saharan systems. A comparative reading with other Saharan wilayas (Adrar, Illizi, and Ouargla) further supports the argument that territorial diagnosis constitutes a decisive tool for place-based policy design and for overcoming the limitations of fragmented governance in low-density arid regions. The paper concludes by positioning Tamanrasset as a Saharan laboratory for sustainable development and by highlighting transferable lessons for peripheral territories across the Global South.

## **1. Introduction**

Sustainable development has become a central reference framework for contemporary public policies, aiming to reconcile economic growth, social equity, and environmental protection. However, its effective implementation remains highly dependent on territorial contexts. In Algeria, the pronounced spatial heterogeneity between the urbanised coastal regions, the High Plateaus, and the vast Saharan areas renders uniform development strategies largely ineffective. This diversity calls for a territorially differentiated approach grounded in a detailed understanding of local dynamics. Within this perspective, territorial diagnosis emerges as a strategic decision-support tool. It goes beyond the

mere identification of territorial dysfunctions and seeks to reveal latent potential, spatial complementarities, and the margins of action available to local actors within an endogenous development framework. By integrating quantitative indicators, qualitative analysis, and stakeholder participation, territorial diagnosis facilitates the formulation of development strategies adapted to the socio-economic, cultural, and environmental specificities of territories. Territorial diagnosis has also been mobilised in educational, planning and governance contexts to support participatory and place-based approaches (Barthes, 2022; Bonnet, 2024; University of Tours – UMR CITERES, 2016). The wilaya of Tamanrasset, located in the far south of Algeria, represents a particularly emblematic case

study. Prior to the administrative reorganisation of 2019, it covered approximately 557,900 km<sup>2</sup>—nearly one quarter of the national territory—and encompassed several Saharan spaces with complementary dynamics, notably Tamanrasset, In Salah, and In Guezzam. This territorial ensemble was characterised by strong functional coherence, structured around trans-Saharan routes, long-standing mobility patterns, economic networks, and shared socio-cultural systems. Although sparsely populated, the region exhibited significant demographic potential, with a high proportion of young people of working age. The administrative reform of 2019, which led to the creation of the wilaya of In Salah, profoundly altered this territorial organisation. While the reform aimed to enhance administrative proximity and local governance, it also fragmented a historically integrated space by separating territories with deeply interdependent economic, infrastructural, and social dynamics. The absence of an integrated territorial diagnosis prior to this decision raises questions regarding the relevance of such fragmentation in light of sustainable development objectives and long-term economic valorisation. Territorial analysis shows that Tamanrasset and In Salah share complementary assets, including agro-pastoral and energy potential, abundant solar resources, a strategic position along north–south corridors, and rich natural and cultural heritage. Their administrative separation tends to weaken economic synergies, disperse public investment, and complicate the planning of strategic infrastructure. Conversely, an integrated territorial diagnosis at the scale of the Saharan ensemble would have enabled the identification of these complementarities and the formulation of a coherent development strategy extending beyond strict administrative boundaries.

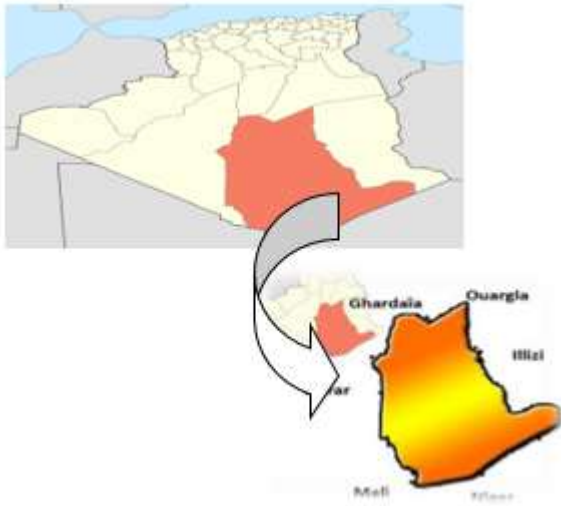
## 2. Literature Review

Research on sustainable development in Algeria has primarily focused on coastal and urban regions. Tedjani (2021) highlights the country's environmental and social challenges, yet his analysis remains general and insufficiently adapted to Saharan specificities. Similarly, Hadjslimane and Bentayeb (2009) address territorial planning from a national perspective without examining the local dynamics of southern wilayas in depth. With regard to the Sahara, some studies—such as those by Kebaili (Ouargla) or Gherbi et al. (Oued Souf) shed light on urban transformations and intervention strategies, but they focus on case studies other than Tamanrasset. Research by (Lahouazi and Khouildat.,2021) on marginalised areas of Tamanrasset or by (Bouaoud et al.,2021) on

wastewater management provides valuable sectoral insights but does not offer an integrated territorial reading. The originality of this article lies in the application of a comprehensive territorial diagnosis to the region of Tamanrasset, mobilising sustainability indicators, a SWOT analysis, and a participatory approach. Unlike existing studies, this approach integrates economic, social, environmental, and cultural dimensions to identify sectors capable of supporting sustainable development. This positioning allows Tamanrasset to be considered not as a peripheral space, but as a Saharan laboratory of sustainable development, where geographical constraints may be transformed into strategic opportunities. At the international level, territorial diagnosis is widely recognised as a key tool for implementing sustainable development. The International Guidelines on Urban and Territorial Planning (UN-Habitat, 2015) stress the need to adapt public policies to local specificities by integrating social, economic, and environmental dimensions. Likewise, the (OECD,2022), in its report *A Territorial Approach to the Sustainable Development Goals*, emphasises that territorialising the SDGs enhances the relevance and effectiveness of sustainability strategies. Recent studies by GIZ (2023) highlight the importance of local actor participation and multi-level governance, while ActionAid's (Guidebook.,2015) provides practical tools for participatory territorial diagnostics. Academic research (Rhazzane et al., 2022) further argues for conceptual integration between territorial development and sustainability, viewing territories as spaces of innovation and resilience. However, few studies apply these frameworks to Saharan territories characterised by climatic constraints, geographic isolation, and distinctive cultural wealth. This article addresses this gap by adapting international frameworks to the Saharan context of Tamanrasset.

### 3.1 Geographical Context

The wilaya of Tamanrasset is located in the extreme south of Algeria and forms part of the central Algerian Sahara. It occupies a strategic position at the crossroads of trans-Saharan routes linking northern Algeria to the countries of the African Sahel and, more broadly, Europe to sub-Saharan Africa via the Trans-Saharan Highway (National Road No. 1). The wilaya is bounded by Ghardaïa to the north, Ouargla to the northeast, Illizi to the east, Adrar to the west, Mali to the southwest, and Niger to the southeast (Figure 1). Tamanrasset, the capital of the Ahaggar region, has held wilaya status since 1974 and is located approximately 1,800 km from Algiers. The territory is characterised by a distinctive desert landscape dominated



**Figure 1:** Geographical situation( Source Monograph of wilaya)

by the Ahaggar massif, composed of mountain formations of diverse geological origins and complex tectonic structures. This mountainous environment contrasts with surrounding reg and erg formations, giving the region significant geomorphological diversity. Climatically, the region is classified as arid, with an average annual temperature of approximately 22°C. Annual precipitation generally does not exceed 50 mm at elevations around 1,400 meters but may reach up to 380 mm at higher altitudes. Water resources are predominantly groundwater-based. Underflow aquifers provide relatively good-quality water; however, their spatial extent is limited and they remain highly vulnerable. Population distribution within the wilaya is markedly uneven. A strong concentration of inhabitants is observed in the city of Tamanrasset due to the availability of infrastructure, public services, and employment opportunities. This concentration has reinforced demographic and functional polarisation, as residents of dispersed settlements increasingly migrate towards the urban centre.

**3.2 Methodological Framework**

The methodological framework is based on a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats), applied at the municipal and wilaya scales. This approach integrates internal territorial characteristics with external contextual dynamics in order to support strategic development planning. The diagnostic process involved several stages: identification of territorial identity through the analysis of resources and constraints; construction of an analytical grid distinguishing strengths, weaknesses, opportunities, and threats; assessment

of interactions between internal and external factors; spatial analysis based on statistical data, planning documents, satellite imagery, and field surveys; participatory consultation with local stakeholders; development of prospective scenarios; and validation of results through stakeholder feedback.

**3.3. Methodological Limitations**

While the territorial diagnosis provides a comprehensive and multidimensional assessment, several limitations should be acknowledged. First, the SWOT framework, although useful for structuring internal and external factors, remains partly interpretative and dependent on the selection of indicators. Second, data availability at the municipal level in Saharan contexts is often limited, which may constrain the precision of intra-regional comparisons. Third, the participatory component, although valuable, reflects the perspectives of selected local stakeholders and may not fully capture all social groups. These limitations do not undermine the relevance of the findings but highlight the need for further empirical refinement and longitudinal research in Saharan territories.

**4. Results**

The territorial diagnosis is based on a set of multidimensional indicators covering socio-economic conditions, environmental factors, infrastructure, natural resources, and governance (Table 1). The analysis reveals significant disparities between municipalities, with strong demographic and functional polarisation centred on the city of Tamanrasset. The SWOT synthesis highlights high levels of both opportunities and risks. While the wilaya possesses considerable natural, cultural, and strategic assets, these are threatened by environmental vulnerability, limited infrastructure, and persistent socio-economic imbalances. Sustainable tourism emerges as the most promising sector, given the region’s exceptional landscapes, biodiversity, and cultural heritage. Renewable energy and traditional handicrafts also represent key opportunities for economic diversification.

*Table 1: Selection categories*

Indicator category	Concrete examples	Potential data sources
Socio-economic	Unemployment rate, sectoral distribution of employment, access to basic services (education, health)	National Office of Statistics (ONS), local surveys, ministerial reports

Indicator category	Concrete examples	Potential data sources
<b>Environmental</b>	Water availability and quality, air and soil pollution, biodiversity, climate vulnerability (drought, desertification)	National Agency for Water Resources, Ministry of the Environment, local NGOs
<b>Infrastructure and spatial planning</b>	Road accessibility, condition of public facilities, energy coverage, urbanisation and planning instruments (PDAU)	Ministry of Public Works, local authorities, urban planning documents
<b>Natural resources</b>	Historical sites, handicrafts, Saharan tourism, community-based initiatives	Ministry of Culture, UNESCO, local associations
<b>Governance and participation</b>	Coordination among stakeholders, civil society involvement, policy transparency, local initiative capacity	Institutional reports, participatory surveys, NGOs and civic associations

**3.1.1. Demographic analysis**

The population of the wilaya of Tamanrasset is unevenly distributed among its municipalities, with a strong concentration in the city of Tamanrasset, which serves as the administrative and functional capital of the region. As of 31 December 2020, the municipality of Tamanrasset had a population of 118,851 inhabitants (Figure 2), representing approximately 47.5% of the total population of the wilaya. In contrast, peripheral municipalities such as Tazrouk remain sparsely populated, with only 5,571 inhabitants, reflecting significant intra-regional demographic disparities.

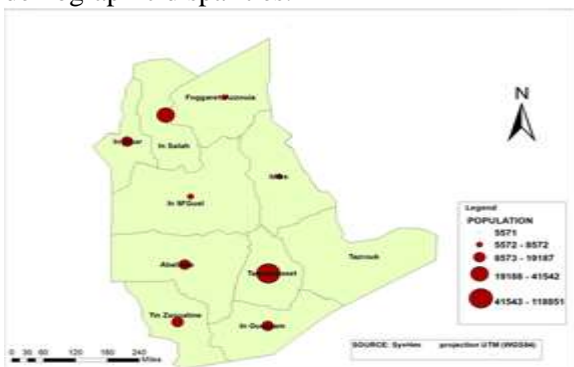
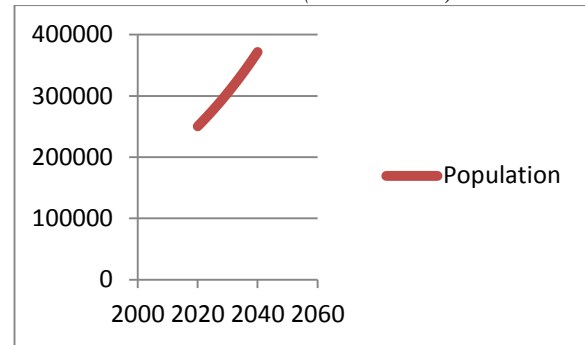


Figure 2. Distribution of the population across the municipalities of Tamanrasset Source ONS (2023)

Population projections for the period 2020–2040 indicate a substantial demographic increase, with the total population of the wilaya expected to reach approximately 371,726 inhabitants by 2040 (Figure 3). This demographic growth may represent a major asset for the territory if accompanied by improvements in socio-economic conditions, employment opportunities, and access to infrastructure and services, thereby strengthening human capital and supporting local development dynamics. Conversely, if current structural constraints persist particularly limited economic diversification, insufficient valorisation of natural resources, and spatial marginalization, the projected population increase could exacerbate socio-economic pressures and territorial imbalances.

Figure 3. Population projection for the wilaya of Tamanrasset (2020–2040).

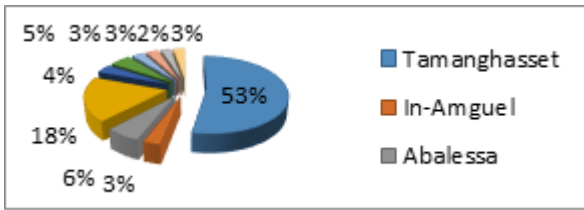


Source: Authors' elaboration

**3.1.2. Access to education**

The spatial distribution of middle school enrolment across the municipalities of the wilaya of Tamanrasset reveals pronounced disparities. The municipality of Tamanrasset alone accounts for approximately 53% of total enrolments, reflecting its role as the primary educational centre due to the concentration of facilities and services. Ain Salah follows with around 18% of enrolled students (Figure 4), while the remaining municipalities display significantly lower enrolment rates. These disparities highlight unequal access to educational infrastructure and contribute to reinforcing demographic and functional polarisation within the wilaya, as households tend to migrate towards municipalities offering better educational opportunities.

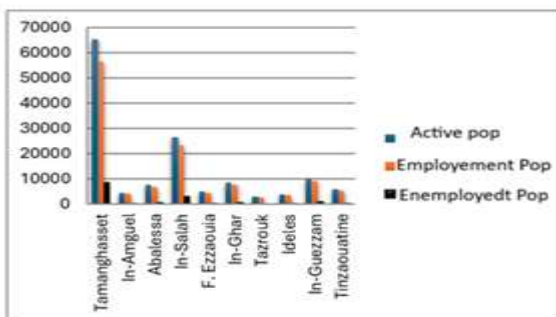
**3.1.3. Infrastructure network:** The wilaya of Tamanrasset possesses important assets in terms of economic infrastructure and structuring facilities, placing it in a favourable position for future economic development. These assets include several major national roads, notably the Trans-Saharan



**Figure 4.** Distribution of middle school enrolment across the municipalities of Tamanrasset  
Source: ONS (2023).

Highway (RN1), which constitutes the backbone of the wilaya and a key axis linking Algeria to sub-Saharan Africa. Additional connections include National Road No. 03 at the border with the wilaya of Illizi and Niger, National Road No. 52 linking the wilaya to Adrar and In Salah, National Road No. 54 connecting Illizi to In Eker, and National Road No. 55 linking In Amguel, Tit, and the Malian border. Despite these assets, disparities in road quality and accessibility persist, particularly in peripheral areas.

**3.1.4 Employment:** According to data from the National Office of Statistics (ONS, 2023), employment opportunities within the wilaya of Tamanrasset are highly concentrated in the municipal capital. The municipality of Tamanrasset accounts for 56,597 employed persons, reflecting both its demographic weight and its role as the main economic and administrative hub of the region. This concentration is largely attributable to the presence of public services, administrative institutions, and economic activities clustered in the urban centre. Ain Salah represents the second most important employment area, with approximately 23,262 employed individuals, while the number of unemployed persons is estimated at 3,291. In contrast, Tazrouk records the lowest employment figures, with 2,633 individuals engaged in the labour market and 201 unemployed persons (Figure 5). These patterns underline significant territorial inequalities in access to employment and confirm the strong polarisation of economic activities within the wilaya.



**Figure 5.** Employed population and unemployment by municipality in the wilaya of Tamanrasset (2020)  
Source: ONS (2023)

### 3.1.5 Tourism landscape and territorial zones

The tourism offer of the wilaya of Tamanrasset is closely linked to its territorial landscapes and remarkable sites. Landscapes are defined as portions of space perceived by the observer and shaped by the interaction of natural and human factors. The identification of landscape areas within the wilaya takes into account geographical features (relief, soils, hydrography), historical and cultural evolution (intangible heritage, land use, activities), dominant landscape forms (regs, ergs, gueltas, cultural parks), urban forms (location in relation to relief, modes of urbanisation, integration into the landscape), and architectural characteristics (heritage, building types, materials, and colours). Based on field surveys, cartographic documents, and satellite imagery, three major landscape zones characterising the territory of Tamanrasset were identified: the Hoggar area, the Tidikelt area (Figure 6), and the border strip area. These zones are distinguished by the presence of remarkable natural and cultural sites that contribute to the specificity and tourism potential of the wilaya.



**Figure 6.** Mount Tahat Source : Site web 360Algeria

## 3.2. Matrix summary

### 3.2.1. Natural resources

Based on the analytical matrix and the summary of the criteria used (Table 2), risk and hazard factors appear to be predominant. This situation indicates that the natural resources of the wilaya require enhanced protection and valorisation within a sustainable resource management framework.

**3.2.2. Societal system**

The matrix analysis of the societal system (Table 3) shows that risk and hazard factors outweigh positive factors. This finding suggests the need for improved valorisation of human capital, more effective labour force integration, and targeted policies to protect young people from unemployment

*Table 2. Analytical grid for natural resources*

	Internal factors		External factors	
	Strengths	Weaknesses	Opportunities	Threats
Luck Factors	+13		+09	
Sum	+22			
Challenge Factors	+13			-12
sum	+1			
Conflict Factors		-13	+09	
sum	-4			
Hazard Factors		-13		-12
sum	-25			

*Table 3. Analytical grid for the societal system*

	Internal factors		External factors	
	Strengths	Weaknesses	Opportunities	Threats
Luck Factors	+06		+09	
Sum	+11			
Challenge Factors	+06			-5
sum	+1			
Conflict Factors		-03	+05	
sum	-02			
Hazard Factors		-03		-5
sum	-08			

**3.2.3. Urban system and infrastructure**

The matrix relating to the urban system and infrastructure (Table 4) indicates the coexistence of significant opportunities and substantial risks. This situation highlights the need for rational land use, improved spatial structuring, and the provision of

adequate facilities and services to meet citizens' needs.

*Table 4. Analytical grid for the urban system and infrastructure*

	Internal factors		External factors	
	Strengths	Weaknesses	Opportunities	Threats
Luck Factors	+04		+03	
Sum	+07			
Challenge Factors	+04			-2
sum	+02			
Conflict Factors		-05	+03	
sum	-02			
Hazard Factors		-05		-2
sum	-07			

**3.2.4. Territorial economy**

The analysis of the territorial economy (Table 5) reveals high levels of both opportunities and risks. This finding underscores the need for optimal exploitation and protection of the region's resources and economic assets in order to promote sustainable development and prevent economic vulnerability.

*Table 5. Analytical grid for the territorial economy*

	Internal factors		External factors	
	Strengths	Weaknesses	Opportunities	Threats
Luck Factors	+19		+18	
Sum	+37			
Challenge Factors	+19			-16
sum	+03			
Conflict Factors		-19	+18	
sum	-01			
Hazard Factors		-19		-16
sum	-35			

**3.3. Synthesis of results**

Overall, the results of the territorial diagnosis highlight a highly polarised territorial structure characterised by a strong concentration of population, services, and economic activities in the city of Tamanrasset, alongside the marginalisation of peripheral municipalities. While the wilaya possesses considerable assets in terms of natural resources, cultural heritage, and strategic positioning, these advantages remain unevenly valorised. The SWOT analysis reveals that opportunities and risks coexist at high levels, indicating both significant development potential and substantial vulnerability. Sustainable tourism, renewable energy, and traditional handicrafts emerge as priority sectors capable of supporting economic diversification, provided that development strategies are grounded in territorial coherence and supported by effective governance mechanisms.

### 3.4. Theoretical Implications

Beyond its empirical contribution, this study contributes to debates on place-based development and territorial governance in peripheral and arid regions. It supports the argument that sustainable development cannot be dissociated from spatial coherence and functional interdependencies. In low-density territories such as the Algerian Sahara, institutional fragmentation may produce unintended effects by disrupting historically integrated territorial systems. The findings therefore reinforce theoretical perspectives that emphasise territorial continuity, multi-level governance, and spatial justice as essential conditions for sustainable development.

## 4. Discussion – Territorial Diagnosis, Spatial Coherence and Institutional Choices

The results of the territorial diagnosis applied to the wilaya of Tamanrasset highlight a fundamental reality: sustainable development in Saharan environments cannot be adequately addressed through rigid administrative boundaries that are disconnected from actual territorial dynamics. The cross-analysis of socio-economic, environmental, infrastructural, and cultural indicators reveals strong functional interdependence between the territories of Tamanrasset, In Salah, and In Guezzam, which have historically been structured around trans-Saharan routes, human mobility, and economic complementarities. The demographic and functional polarisation observed around the city of Tamanrasset, combined with the relative weakness of secondary infrastructure, points to a hierarchical yet coherent territorial organisation at the scale of

the former wilaya perimeter. In this context, the administrative separation of In Salah in 2019 can be interpreted as an institutional break introduced without a prior integrated territorial assessment. Yet the diagnostic results show that major economic potential—particularly in the agro-pastoral, energy, tourism, and logistics sectors—is precisely rooted in the complementarity of these territories and their integration within wider territorial systems. The Saharan economy is not structured through isolated municipal or wilaya-based logics; rather, it operates through networks, flows, and spatial continuities. Administrative fragmentation therefore tends to dilute agglomeration effects, disperse public investment, and complicate the planning of strategic infrastructure, especially in territories characterised by low population densities and long distances. Conversely, a comprehensive territorial diagnosis would have enabled the identification of complementary poles of specialisation—In Salah for energy and agro-pastoral functions, Tamanrasset for tourism, cultural and service-related functions, and In Guezzam for cross-border activities—and would have supported the design of an integrated economic strategy at the scale of the Greater South. A comparison with other Saharan wilayas, such as Adrar, Illizi, and Ouargla, reinforces this interpretation (Table 6). In Adrar, coherence between oasis agriculture and energy potential has enabled the emergence of targeted sectoral strategies. In Illizi, the valorisation of the Tassili n'Ajjer World Heritage site relies on strong territorial continuity. In Ouargla, dependence on hydrocarbons highlights the limitations of excessive sectoral specialisation. These differentiated trajectories confirm that territorial diagnosis is a decisive instrument for adapting public policies to local specificities and for avoiding the adverse effects of fragmented governance. Thus, the case of Tamanrasset highlights a central issue: the need to align institutional decisions with an in-depth territorial reading. Territorial diagnosis should not be mobilised solely as an ex post analytical tool; rather, it should be considered a structuring prerequisite for any administrative reform or development strategy. In Saharan contexts more than in any other, sustainability depends on recognising spatial continuities, functional interdependencies, and shared socio-cultural systems.

## 5. Scenarios and Prospects for Sustainable Development in Economic Sector

Following the research process and the field surveys conducted with local authorities and stakeholders in the wilaya, several scenarios for local and sustainable development were formulated. These

scenarios aim to address individual and societal needs in the medium and long term (2030 horizon), while promoting sectoral development and ensuring a balanced relationship between resource use and investment requirements. The objective is to foster interdependence and equilibrium among economic sectors in order to enhance economic growth and improve living conditions, with particular attention given to the environmental dimension, in accordance with the principles of sustainable development. Emphasis is also placed on the importance of preserving natural resources and protecting them from depletion through rational and sustainable management practices.

**5.1. Development Prospects for the Agro-Pastoral Sector**

These strategic orientations were defined on the basis of the following principles, objectives, and standards (Figure 7):

- Completion of new irrigated perimeters within the framework of land concession schemes and other agricultural development policies;
- Adoption of modern, water-saving irrigation techniques;
- Intensification of agricultural activities in newly developed perimeters in line with rural renewal policies, through the mobilisation of various funding mechanisms (PNDA, PPDRI, DGF, Southern Development Fund, etc.) and the diversification of activities and crops, including state-supported initiatives such as poultry farming, beekeeping, arboriculture, vegetable production, and the valorisation of local know-how;
- Promotion of crops adapted to regional conditions, particularly date palms and other arboricultural species.



Figure 7. Hydro-agricultural management plan

Wilaya	Main assets	Major constraints	Key sectors identified by the diagnosis
Tamanrasset	Cultural heritage, Saharan tourism, renewable energy potential, handicrafts	Geographic isolation, fragile infrastructure, climatic vulnerability	Sustainable tourism, local handicrafts, renewable energy
Adrar	Energy potential (solar, gas), oasis agriculture	Water management issues, demographic pressure	Renewable energy, irrigated agriculture
Illizi	World heritage (Tassili n'Ajjer), cultural tourism	Low population density, lack of infrastructure	Heritage tourism, cultural valorisation
Ouargla	Oil-producing region, more developed infrastructure	Strong dependence on hydrocarbons, vulnerability to energy transition	Economic diversification, renewable energy, urban services

**5.3. Development Prospects for the Industrial Sector**

In the long term, the establishment of a genuine industrial framework is envisaged. Within the perspective of implementing a coherent industrial development strategy in the wilaya of Tamanrasset, the main actions to be undertaken (Figure 8) include:

- Encouraging investment, particularly in small and medium-sized enterprises (SMEs), through appropriate policies and incentive measures;
- Promoting opportunities for the creation of off-site SMEs that rely on raw materials sourced from outside the region;
- Rehabilitating the existing industrial fabric through upgrading, recapitalisation, new investments, and, where appropriate, privatisation;
- Developing construction materials and agri-food industries by capitalising on their comparative advantages, such as the availability of raw materials, a trained workforce, secure markets, and access to relatively low-cost energy;
- Launching a structured industrial investment programme;
- Implementing incentive measures to support SME development in order to boost employment creation and generate added

value, particularly by fostering competitive territories through the establishment of industries that do not depend on local raw materials;

Rehabilitating existing industrial and activity zones and creating new ones in order to expand the supply of industrial land

**5.4. Tourism Development Prospects**

In line with the orientations of the National Tourism Development Scheme (SDAT), there is a need to move towards a genuine tourism renewal policy, given the considerable and legitimate ambitions associated with this sector. This policy should primarily focus on the following actions:

- Formulating a coherent tourism development strategy, including the establishment of tourist circuits and the.

- promotion of activities such as visits to historical monuments, participation in local festivals, and attendance at conferences and congresses;
- Expanding accommodation capacity through the development of hotels, restaurants, motels, youth hostels, and traditional guesthouses;
- Diversifying tourism offerings by promoting various forms of tourism, including domestic tourism, international tourism, ecotourism, cultural and scientific tourism, conference and business tourism, as well as mountain, Saharan, and oasis tourism;
- Developing, preserving, and enhancing tourist sites, such as archaeological remains, historical monuments, museums, oases, and religious or cultural sites;
- Strengthening tourism communication and promotion through tourism offices, brochures, postcards, and advertising across different media platforms;
- Promoting the labelling and certification of local products, including livestock products and handicrafts;
- Ensuring that the wilaya regains its role as a major tourist destination, as it historically has been;
- Establishing designated Tourism Development Zones (TDZs) to support structured and sustainable tourism growth.

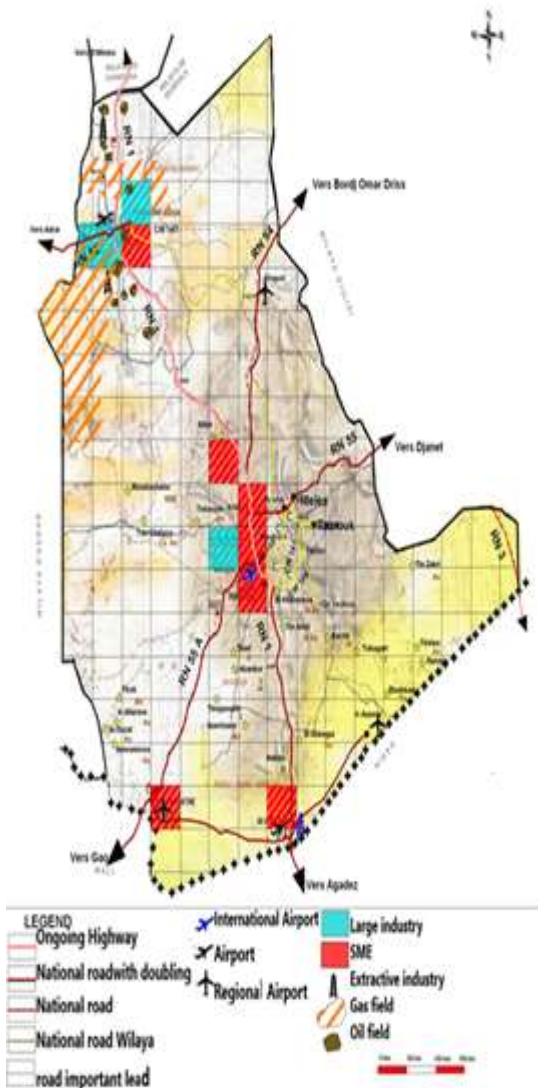


Figure 8. Industrial development scenario

**5.5. Prospects for the Development of Transport and Connectivity Infrastructure**

The main development objectives aim to provide comprehensive territorial coverage through an improved network of transport links, with the goal of enhancing accessibility and service provision for the population of the wilaya (Figure 9). The principal actions to be undertaken include:

- Implementing de-enclavement projects across the entire wilaya in order to reduce the isolation of certain segments of the population;
- Upgrading selected wilaya and municipal roads (CW, CC) whose poor state of repair is well documented;
- Strengthening National Road No. 1 (RN1) along its stretch between the boundary with the wilaya of Ghardaïa and the border with Niger;
- Upgrading National Roads RN55, RN55A, RN54, and RN52;

- Doubling the carriageway of RN52 along the In Salah–In Ghar and In Salah–Foggaret Ez Zoua sections;
- Completing the Silet–Tin Zaouatine road, a section of the Trans-Saharan corridor leading to Mali;
- Doubling the carriageway of RN55 between RN1 and Ideles;
- Constructing a road linking Tin Zaouatine, In Guezzam, and In Azaoua along the border with Niger and Mali;
- Launching a feasibility study for a future north–south motorway parallel to RN1.



Figure 9. Road network development scenario

## 6. Conclusion: Territorial Diagnosis as a Strategic Alternative to Administrative Fragmentation

This research demonstrates that territorial diagnosis constitutes far more than a descriptive instrument; it emerges as a fundamental strategic tool for guiding sustainable development choices and informing institutional decision-making. Applied to the wilaya of Tamanrasset, it has made it possible to identify both the territory's major assets—natural and

cultural heritage, tourism potential, solar resources, and geostrategic position—and its structural constraints related to geographic isolation, environmental vulnerability, and socio-spatial imbalances. Unlike conventional sectoral or administrative approaches, the integrated territorial diagnosis highlights the functional coherence of the Saharan space under study, encompassing Tamanrasset, In Salah, and In Guezzam. The findings suggest that the administrative separation implemented in 2019 did not sufficiently account for existing economic complementarities, mobility networks, and socio-territorial dynamics. Such institutional fragmentation may, in the long term, hinder the economic valorisation of the Greater South by weakening territorial synergies and complicating development governance. Conversely, an approach grounded in territorial diagnosis would have enabled the design of a sustainable development strategy at the scale of a coherent Saharan ensemble, capable of articulating sectoral specialisation, territorial equity, and environmental resilience. The case of Tamanrasset thus demonstrates that the multiplication of administrative entities does not necessarily constitute an effective response to development challenges in arid environments. Rather, the success of public policies depends on recognising territorial logics, spatial continuities, and local identities. Rather than questioning administrative reform per se, this study argues that institutional restructuring in arid regions should be preceded by rigorous territorial diagnosis to ensure that development strategies remain aligned with spatial realities and functional complementarities. Ultimately, this study advocates the rehabilitation of territorial diagnosis as an essential prerequisite for any administrative reform and for any strategy aimed at economic valorisation in Saharan regions. By considering Tamanrasset as a Saharan laboratory for sustainable development, the article opens up transferable perspectives for other arid territories in Algeria and beyond, where sustainability can only be achieved through integrated territorial governance based on a detailed understanding of local realities and effective coordination among stakeholders.

### Author Statements:

- **Ethical approval:** The conducted research is not related to either human or animal use.
- **Conflict of interest:** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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