Revue Française d'Economie et de Gestion
ISSN : 2728- 0128
Volume 6 : Numéro 4

Building a Sustainability Balanced Scorecard for Desalination Plants : Literature Review and a Performance Assessment Conceptual Framework

La conception d'un Sustainability Balanced Scorecard pour les stations de dessalement : Revue de la littérature et cadre conceptuel

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Date de soumission : 07/03/2025

Date d'acceptation : 06/04/2025

Pour citer cet article :

Lachheb. Y. & Al. (2025) « Building a Sustainability Balanced Scorecard for Desalination Plants : Literature Review and a Performance Assessment Conceptual Framework », Revue Française d'Economie et de Gestion « Volume 6 : Numéro 4 » pp : 566- 582.

Abstract

The demand for non-conventional water resources has been intensified by a multifaceted set of factors, including water stress, drought, population growth, and rapid urbanization. This demand has escalated notably, particularly within the MENA region, which is home to 14 of the 17 most water-stressed nations worldwide. This issue is of pressing concern for different stakeholders. Seawater desalination is regarded as a resilient freshwater solution, yet challenges persist, including elevated energy consumption, environmental impacts, capital and operational cost constraints, and quality issues concerns. Current studies rarely address these multifaceted performance challenges. The objective of this study is twofold. Firstly, it will provide a comprehensive performance assessment tool by developing a Sustainability Balanced Scorecard (SBSC) that incorporates both traditional BSC and sustainability dimensions. Secondly, it will propose a conceptual framework suggesting the assessment of the impact of SBSC non-financial perspectives on the financial performance of desalination plants.

Keywords : Sustainability ; Balanced Scorecard; desalination plants; performance; key performance indicators (KPIs).

Résumé

La demande de ressources en eau non conventionnelles a été intensifiée par un ensemble de facteurs à multiples facettes, notamment le stress hydrique, la sécheresse, la croissance démographique et l'urbanisation rapide. Cette demande s'est considérablement accrue, en particulier dans la région MENA, qui abrite 14 des 17 nations les plus touchées par le stress hydrique dans le monde. A cet égard, le dessalement de l'eau de mer est considéré comme une solution résiliente pour s'approvisionner en eau douce, mais des défis persistent, notamment la consommation élevée d'énergie, les impacts environnementaux, les contraintes liées aux coûts d'investissement et d'exploitation, et les problèmes de qualité. Les études actuelles abordent rarement ces problèmes de performance aux multiples facettes. L'objectif de cette étude est double. Premièrement, elle fournira un outil exhaustif d'évaluation des performances des stations de dessalement en élaborant un Sustainability Balanced Scorecard (SBSC) qui intègre à la fois les dimensions traditionnelles du BSC et celles du développement durable. Deuxièmement, elle proposera un cadre conceptuel suggérant l'évaluation de l'impact des perspectives non financières du SBSC sur les performances financières des usines de dessalement.

Mots-clés : Développement durable, Balanced Scorecard, station de dessalement, performance, indicateurs clés de performance (KPI).

Introduction

The escalating water stress, protracted drought, demographic expansion, and accelerated urbanization have collectively augmented the demand for non-conventional resources. The demand for water reuse and seawater desalination has increased, particularly in regions approaching critical water scarcity thresholds. The MENA region (Middle East and North Africa) faces the most acute challenges, with the FAO (Food and Agriculture Organization) (2022) identifying it as the globe's most water-stressed area. Findings from 2018 revealed that 14 of the world's 17 highest-risk nations related to water shortage, including the top six, are located in the MENA region. Projections indicate that available water per capita in the MENA region will fall below absolute scarcity thresholds by 2030, reaching 500 cubic meters annually as populations surge. The World Bank (2023) has confirmed that this will intensify. Given these pressures, desalination emerges as a viable and resilient solution for freshwater security.

In this context, the valuation of the global water desalination sector reached $20.32 billion in 2023. Industry analysts anticipate a 9.12% Compound Annual Growth Rate (CAGR) by 2032, which would potentially elevate the market value to $44.57 billion (Straitsresearch, 2024).

Regarding the production costs for desalinated seawater, they currently range between $0.5 and $1 per m^3, influenced by variables like membrane technology, energy sourcing, and ambient water conditions. These costs include energy inputs, operating expenses, maintenance protocols, and infrastructure depreciation, which together account for 70-85% of total expenses (Smartwater magazine, 2024).

While desalination enables climate change mitigation and strategic resource diversification across agricultural, industrial, and domestic uses, operational challenges persist. Significant energy demands, environmental concerns from hypersaline discharge, and elevated capital requirements remain critical barriers (Almasoudi & Jamoussi, 2024).

Furthermore, ensuring water quality necessitates meticulous monitoring, a prerequisite for public health compliance. This is a complex equation, indeed, balancing hydrological necessity against ecological standards.

Given these multifaceted challenges, evaluating desalination plant effectiveness requires consideration of diverse operational aspects. Existing research efforts to establish multidimensional assessment frameworks remain limited in scope, fragmented, and, with predominant focus restricted to technical, operational, and economic parameters. Balfaqih et al. (2016) pioneered a conceptual supply chain evaluation model utilizing balanced scorecard (BSC) methodology, while Al-Mutaz (2022) established country-specific key performance

indicators (KPIs) for Saudi Arabian desalination facilities. Natixis (2020) subsequently introduced environmental and social metrics through a sustainability-focused BSC adaptation. Despite the notable advances in the field, to the best of our knowledge, no comprehensive multidimensional assessment framework exists within academic literature—a critical gap that our research aims to address. Additionally, while studies assessing the impact of non-financial perspectives on financial performance are extant in numerous industries, to the best of our knowledge, no study has hitherto examined this impact in the desalination plant industry, particularly employing both traditional BSC perspectives and sustainability aspects.

Hence our paper attempts to respond to the follwowing questions: **"What are the most critical Key Performance Indicators (KPIs) for conducting a comprehensive performance assessment of desalination plants, and how do these indicators collectively contribute to evaluating efficiency, sustainability, and operational reliability?"**

The objective of this paper is twofold. Firstly, through a systematic analysis of existing desalination performance literature review, we propose an enhanced BSC model integrating conventional dimensions (financial, customer, internal processes, organizational learning) with sustainability metrics addressing socioeconomic and environmental impacts. This dual approach directly responds to evolving stakeholder demands while maintaining strategic alignment with operational constraints. Secondly, our study suggests a conceptual framework assessing the impact of SBSC's non-financial perspective on desalination plants' financial performance.

Our analysis proceeds through two structured sections : Section one examines foundational literature on desalination technologies and BSC applications and Section two introduces the proposed sustainability BSC framework as well as the assessment conceptual framework. Finally, the conclusion highlights theoretical and managerial implications, followed by an acknowledgment of limitations and prospective research trajectories.

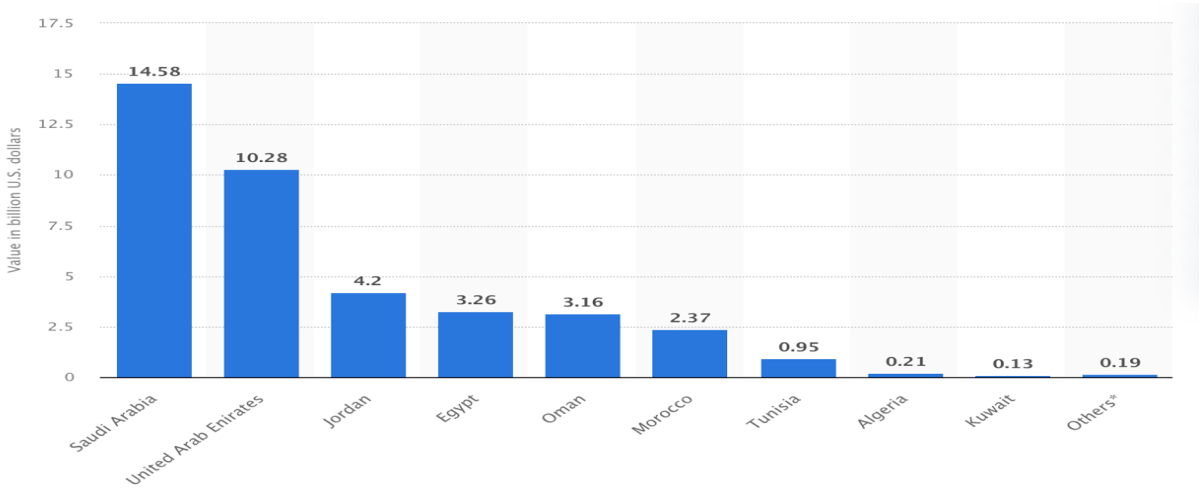
1. Literature review

1.1. Desalination plant

The emergence of industrial-scale seawater desalination first arose in the 1930s, an era marked by exponential technological progression and sustained R&D investments. Current estimates reveal a daily output of 110 million m³ across 22,800 global facilities, reflecting a 6–12% annual expansion (Le Monde, 2024). Within the MENA region, which constitutes 47.5% of global capacity, residential demand represents 62.3% of usage compared to 35% for industrial applications (Sayed et al., 2023). National dependency metrics remain striking: Kuwait at 90%,

Oman at 86%, and Saudi Arabia at 70% (Sayed et al., 2023). These patterns are further contextualized through Figure 1's spatial valuation analysis.

Figure N°1: Value of active water desalination plant projects in the Middle East and North Africa region in 2022, by country *(in billion U.S. dollars)*



Source: Statista 2022

Such statistics highlight the indispensable function of desalination in hydrologically vulnerable zones. Desalination is an electrochemical separation process where salts and contaminants are extracted from saline sources to yield potable or industrial water, a procedure characterized by significant energy demands. While high infrastructure costs generally restrict implementation to regions with extreme freshwater deficits, particularly climate-sensitive MENA states, ecological compromises endure. For every cubic meter of treated water, 1.5 m³ of chemical brine effluent is discharged (Seawards, 2024), an unavoidable consequence of current desalination technologies.

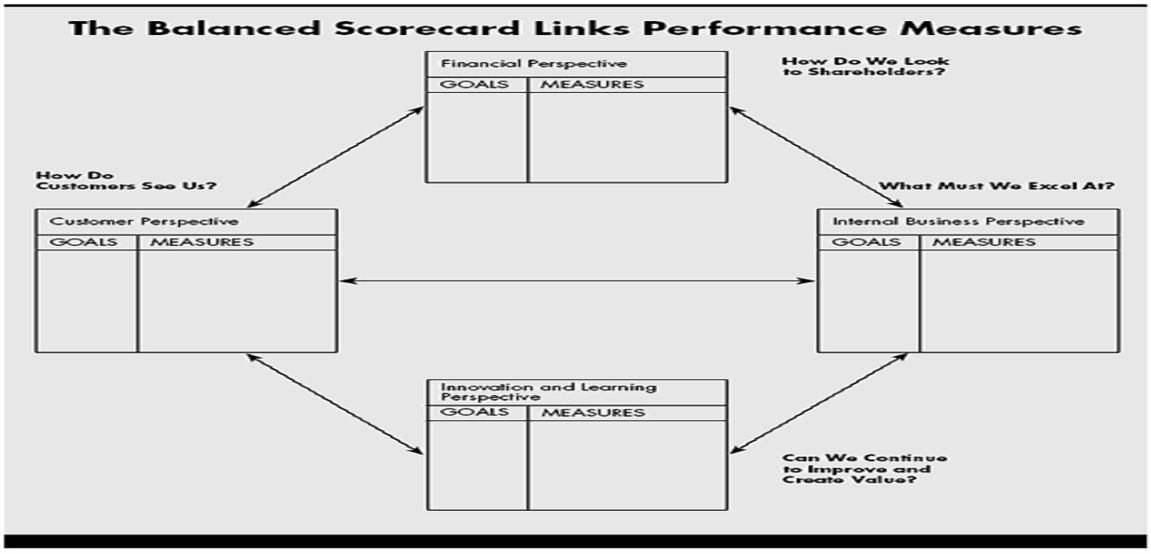
Consequently, performance evaluation frameworks must reconcile technical efficacy with ecological accountability and societal implications. The integration of a BSC methodology proposed herein addresses this equilibrium through multilayered KPIs encompassing operational, economic, and sustainability benchmarks. Such a paradigm facilitates a nuanced appraisal of stakeholder value while maintaining methodological rigor.

1.2. The Balanced Scorecard

First conceptualized by Kaplan and Norton in 1992, the Balanced Scorecard (BSC) framework was designed as a multidimensional performance measurement system. Its foundational premise lies in harmonizing financial and non-financial metrics, short-term objectives with long-term aspirations, and process-oriented indicators with outcome-based evaluations. These metrics, categorized into four perspectives—financial, customer, internal business, and

innovation and learning- are interlinked through causal relationships that operationalize strategic intent. Through dynamic simulations, the model seeks to align initiatives across individual, departmental, and organizational levels, thereby identifying processes capable of meeting stakeholder expectations (Kaplan and Norton, 1992). A visual representation of this structure is provided in Figure 2.

Figure N°2 : The Balanced Scorecard framework



Source : Kaplan and Norton (1992)

The adaptability of the BSC framework has been extensively examined. As Figge et al. (2002) posited, it serves as "a promising starting point" for embedding environmental and social considerations into corporate governance. Consequently, scholarly efforts have focused on extending the model into a Sustainability Balanced Scorecard (SBSC), which integrates ecological and societal dimensions. Three methodological approaches dominate this adaptation: the first one suggests embedding sustainability metrics within existing perspectives, the second proposes appending dedicated sustainability perspectives, and the third approach suggests deriving an entirely distinct SBSC structure (Dağıdır and Özkan, 2024; Hansen and Schaltegger, 2016; Schaltegger and Freund, 2011; Figge et al., 2002). Such diversification reflects the framework's capacity for contextual customization.

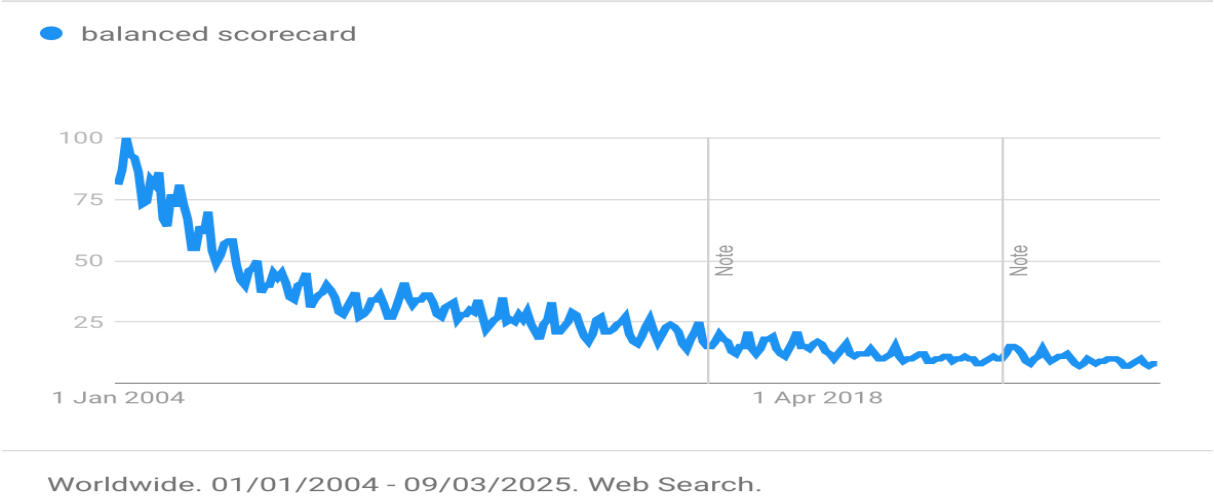
Debates persist regarding optimal SBSC configurations (Al-Mawali, 2023). A critical consideration, one often overshadowed by theoretical discussions, is the alignment between organizational priorities and structural design choices. Firms typically select architectures that reconcile stakeholder pressures with operational challenges, emphasizing either strategic environmental linkages or socio-economic imperatives. For industries with pronounced

ecological footprints, such as desalination, this necessitates explicit incorporation of sustainability aspects.

Furthermore, a study of Google Trends data from January 2004 to March 2025 reveals a surge in interest for the SBSC starting in 2010, while there was a decline in interest for the traditional BSC over the years.

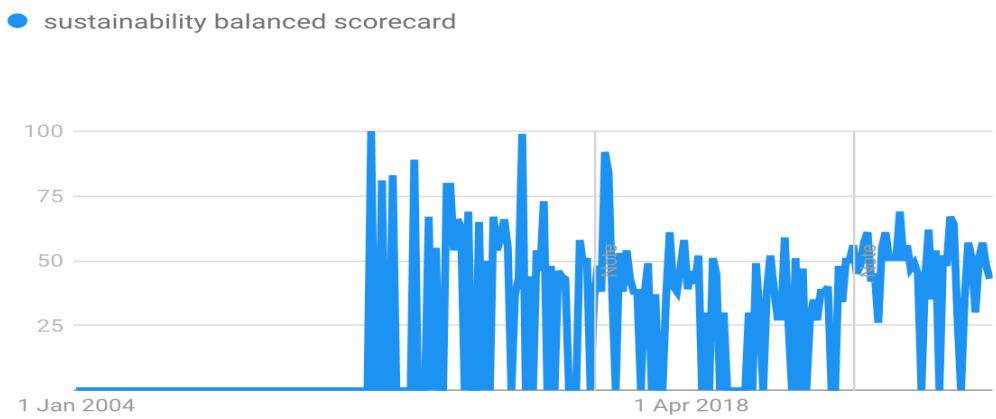
The trends in research interest for the terms 'BSC' and 'SBSC' are illustrated in Figures 3 and Numerical values denote search interest relative to the highest chart point globally, where 100 signifies peak popularity, 50 represents half that magnitude, and 0 corresponds to insufficient data availability.

Figure N°3: BSC interest over time



Source : Google Trends

Figure N°4 : SBSC interest over time



Source : Goolge Trends

In light of the imperative to reconcile stakeholder satisfaction in seawater desalination with alignment to the Sustainable Development Goals (SDGs) outlined in the United Nations' 2030 Agenda, the present analysis extends the traditional BSC framework with two dimensions :

socioeconomic and environmental perspectives. This traditional BSC extension is a deliberate choice, grounded in requirements specific to the desalination sector.

2. Sustainability Balanced Scorecard and desalination plants performance

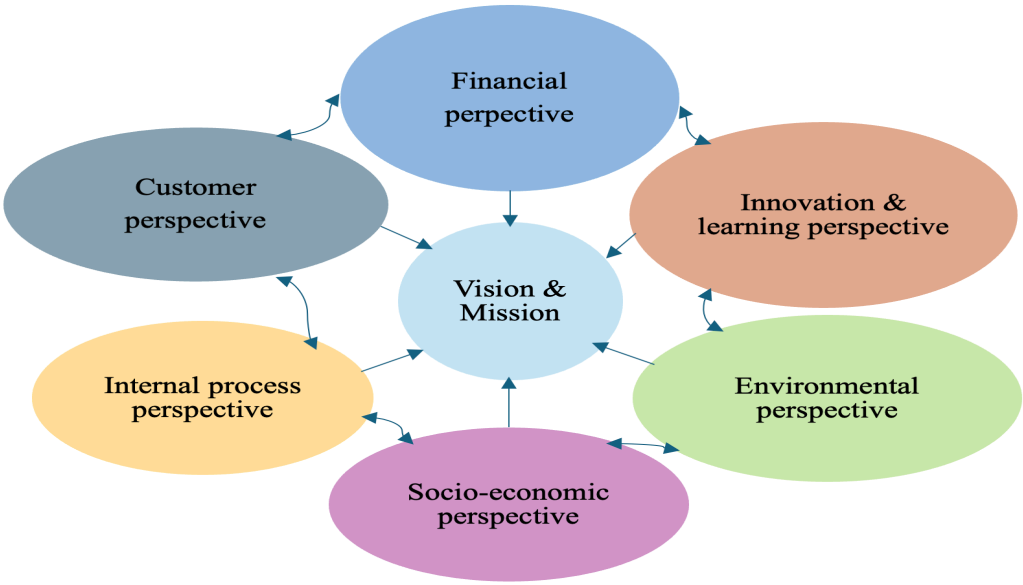
2.1. Building a SBSC for desalination plants

Scarce are the studies that attempted to provide a comprehensive performance assessment of desalination plants. An in-depth review of the literature revealed a fragmented assessment, with a focus on either technical, operational, or economic Key Performance Indicators (KPIs).

Few studies have attempted to build a comprehensive assessment system either through KPI development or BSC implementation. In this regard, Balfaqih et al. (2016) pioneered a novel supply chain evaluation model that utilized the BSC methodology. Building upon this foundation, Balfaqih (2020) subsequently incorporated, later on, an environmental perspective to address the environmental drawbacks associated with desalination plants. In a similar vein, Al-Mutaz (2022) developed a set of country-specific key performance indicators (KPIs) for Saudi Arabian desalination plants. Subsequently, Natixis (2020) introduced environmental and social metrics through a sustainability-focused BSC adaptation.

This paper presents a SBSC framework constructed through rigorous analysis of Moroccan desalination plants. Two novel dimensions, socio-economic and environmental, were integrated into the traditional BSC structure to address sector-specific priorities. A critical insight. One that bridges operational and sustainability metrics. Figure 5 exhibits the developed model of SBSC containing six dimensions.

Figure N°5 : The six perspectives of the SBSC



Source : Own elaboration

The KPIs for each SBSC perspective were systematically compiled from global desalination studies and then subjected to rigorous validation via semi-structured interviews with Moroccan desalination experts. To ensure methodological rigor, Table 1 details the provenance of KPIs across all six perspectives. As shown below, each perspective provides a set of targets to reach using a number of KPIs. For instance, the environmental perspective strives for achieving good health and well-being, responsible consumption and production, climate change risk mitigation, and optimal wastewater management to protect life below water. In view of the considerable number of KPIs associated with each goal, we have decided against disclosing the KPIs relevant to the different SBSC perspectives; however, we have provided the sources for each set of KPIs.

Table N°1 : Sources of different KPIs

Perspective	**Sources**	**Goals**
Financial Perspective	Balfaqih et al, 2016 El Belkasmi and Boutti, 2023 Gunnar Herber, 2024	• Long-term financial performance • Short-term financial performance
Internal process perspective	Al-Mutaz, 2022 Balfaqih et al, 2016 Gunnar Herber, 2024	• Recovery rate • Water storage capacity • Pumping infrastructure • Transmission and distribution network • Inspection and control of physical assets • Operational water loss • Service connection efficiency
Customer perspective	Balfaqih et al, 2016 Gunnar Herber, 2024	• Service coverage • Customer complaints • Continuity of supply • Customer satisfaction • Perceived advantages • Perceived disadvantages
Innovation and learning perspective	Balfaqih et al, 2016 Gunnar Herber, 2024	• HR performance • Automation and control • Innovation
Socioeconomic perspective	Naxitis, 2020 UN DESA. 2024	• Climate change adaptation and risk mitigation (Resilience) • Political stability • Access to clean water and sanitation • Clean energy use

		• Sustainable cities and communities • Decent work and economic growth • Industry, innovation, and infrastructure • Zero hunger • Gender equality
Environmental perspective	Naxitis, 2020 UN DESA. 2024	• Good health and well-being • Responsible consumption and production • Climate action (Greenhouse emission) • Life below water (brine discharge and chemicals)

Source : Own elaboration

2.2. The impact of SBSC non-financial perspectives on the financial performance of desalination plants: Conceptual framework

The broad scope of the BSC's application has been exemplified through its integration across academic disciplines, industrial sectors, and heterogeneous organizational frameworks. Such extensive adoption highlights its methodological rigor in optimizing financial performance, as evidenced by multidisciplinary scholarly inquiries (Al-Hosaini et al., 2023).

Over recent decades, a significant corpus of research has focused on individual BSC perspectives to assess corporate financial outcomes. In contrast, an equally substantial body of work has examined the holistic effects of its implementation on organizational efficacy. This dichotomy underscores the need for nuanced theoretical frameworks.

In this regard, Davis and Albright's (2004) quasi-experimental analysis within the banking sector demonstrated that BSC adoption correlates with superior financial outcomes relative to non-adopting counterparts. Parallel findings by Feroze et al. (2022) further substantiate this relationship, particularly within SME contexts.

A separate evaluation was conducted by Al-Hosaini et al. (2023), isolating the three non-financial perspectives of the BSC in private university settings. Results revealed statistically significant positive correlations between financial performance and customer, innovation/learning, and internal process dimensions.

Although literature used the different perspectives of the BSC either independently or as a whole to assess the organization's financial performance, studies addressing the SBSC have placed greater emphasis on the repercussions of its implementation on the corporations' financial performance.

In this regard, a positive correlation between Sustainable Balanced Scorecard implementation and corporate financial performance has been consistently demonstrated through empirical research. Figge et al. (2002) identified that organizations integrating sustainability indicators within performance measurement frameworks frequently outperform peers in profitability metrics.

Furthermore, SBSC utilization has been shown to facilitate enhanced resource optimization and innovation capacity, as documented by Hansen & Schaltegger (2016). Conversely, sector-specific outcome disparities necessitate cautious interpretation. Strategic alignment with industry dynamics therefore emerges as critical, a prerequisite for maximizing return on investment from sustainability initiatives (Gandini et al., 2024). This imperative holds particular relevance for desalination plant facilities, given their complex environmental-socioeconomic tradeoffs and substantial capital/operational expenditures.

Therefore, while the role of the SBSC in enhancing firms' financial performance has been explored across multiple industries, literature gaps persist regarding its application within desalination plant financial assessments. A critical gap that is requiring targeted research. Opportunities exist for enhancing understanding by evaluating the individual contributions of non-financial SBSC perspectives to desalination facilities' financial performance.

Hence our study suggests exploring the contribution of each non-financial component of the SBSC, namely, customer perspective, internal process, learning and innovation, environmental perspective, and socioeconomic perspective, to desalination plants' financial performance. In this regard, five hypotheses were formulated, namely:

H1: Customer perspective has a significant positive effect on desalination plants' financial performance.

H2: Internal process perspective has a significant positive effect on desalination plants' financial performance.

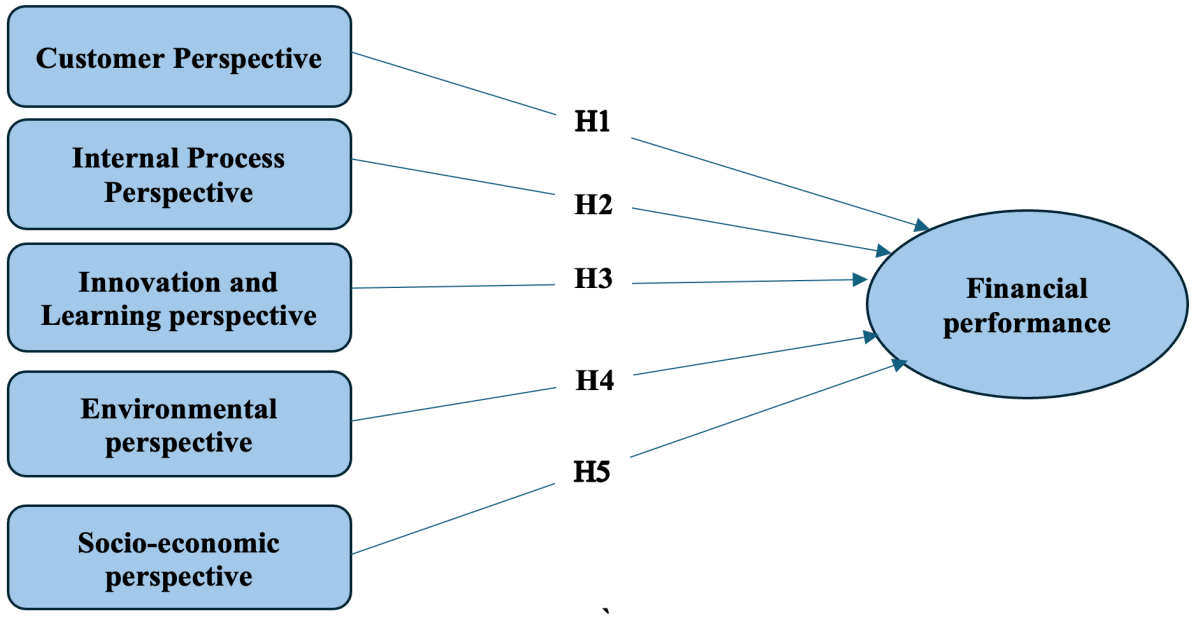
H3: Innovation and learning perspective has a significant positive effect on desalination plants' financial performance.

H4: Environmental perspective has a significant positive effect on desalination plants' financial performance;

H5: Socio-economic perspective has a significant positive effect on desalination plants' financial performance.

Figure 6 shows the conceptual framework we have developed, which allows us to quantify the correlations between the non-financial SBSC perspectives and the financial performance of the desalination plants.

Figure N°6 : A conceptual framework of non-financial perspectives impact on the financial performance of desalination plants



Source : Own elaboration

Conclusion

This study introduces a comprehensive Sustainability Balanced Scorecard (SBSC) framework designed to enable a holistic evaluation of desalination facility performance. The framework systematically assesses the interdependencies between non-financial sustainability dimensions—such as environmental impact, social responsibility, and operational efficiency—and the financial outcomes of desalination plants. By integrating sustainability considerations with traditional performance indicators, this methodological advancement provides a structured approach to managing and improving the long-term viability of desalination operations.

A key contribution of this framework is its ability to address the critical gap in desalination performance management by linking sustainability metrics with financial viability. As climate regulations tighten and resource scarcity escalates, desalination plants must navigate a complex landscape where environmental stewardship and business sustainability are interconnected. While sustainability investments may not yield immediate financial returns, as Wagner (2007) highlights, they frequently generate indirect economic benefits, such as risk mitigation,

regulatory compliance, and enhanced corporate reputation. This underscores the necessity of incorporating sustainability-driven strategies into financial decision-making.

The proposed conceptual model serves as a foundation for empirical validation, encouraging researchers to quantify and test the relationships between non-financial SBSC dimensions and financial performance outcomes. From a practical standpoint, managers and industry practitioners must carefully consider how sustainability dimensions—such as energy efficiency, carbon footprint reduction, and responsible water management—can be embedded into operational strategies. Doing so will not only enhance compliance with environmental regulations but also bolster the long-term resilience and competitiveness of desalination plants. As freshwater scarcity intensifies globally, desalination operators face growing pressure to align environmental sustainability with business objectives. The SBSC model provides a comprehensive toolkit for facilitating this transition, offering data-driven insights that balance ecological responsibility with economic performance. By adopting this approach, desalination facilities can move toward more sustainable, resilient, and financially sound operations, ensuring their long-term contribution to global water security.

REFERENCES

Almasoudi, S., & Jamoussi, B. (2024). Desalination technologies and their environmental impacts: A review. *Deleted Journal*, *1*, 100002. https://doi.org/10.1016/j.scowo.2024.100002

Al-Hosaini, F., Ali, B., Baadhem, A., Jawabreh, O., Atta, A., & Ali, A. (2023). The impact of the Balanced Scorecard (BSC) Non-Financial Perspectives on the financial performance of private Universities. Information Sciences Letters, 12(9), 2903–2913. https://doi.org/10.18576/isl/120901

Al-Mawali,H., (2023). "Proposing a strategy map based on sustainability balanced scorecard and DEMATEL for manufacturing companies," Sustainability Accounting, Management and Policy Journal, Emerald Group Publishing Limited, vol. 14(3), pages 565-590, May.

Amer, M., Hilmi, Y., & El Kezazy, H. (2024, April). Big Data and Artificial Intelligence at the Heart of Management Control: Towards an Era of Renewed Strategic Steering. In The International Workshop on Big Data and Business Intelligence (pp. 303-316). Cham: Springer Nature Switzerland.

Amer, M., & Hilmi, Y. (2024). ERP and the Metamorphosis of Management Control: An Innovative Bibliometric Exploration. Salud, Ciencia y Tecnología-Serie de Conferencias, 3.

Balfaqih, H. (2020). Closed-loop Supply Chain for Seawater Desalination: A Performance Measurement Model. Proceedings of the International Conference on Industrial Engineering

and Operations Management Dubai, UAE, March 10-12, 2020. https://www.ieomsociety.org/ieom2020/papers/350.pdf

Balfaqih, H., Nopiah, Z., Al Nory, M. & Saibani, N. (2016). Performance Measurement of Water Desalination Supply Chain Using Balanced Scorecard Model. International Journal of Engineering and Technology. 8. 55-63.

Dağıdır, B. D., & Özkan, B. (2023). A comprehensive evaluation of a company performance using sustainability balanced scorecard based on picture fuzzy AHP. Journal of Cleaner Production, 435, 140519. https://doi.org/10.1016/j.jclepro.2023.140519

Davis, S., & Albright, T. (2004). An investigation of the effect of Balanced Scorecard implementation on financial performance. Management Accounting Research, 15(2), 135–153. https://doi.org/10.1016/j.mar.2003.11.001

Eifert, A., & Julmi, C. (2022). Challenges and How to Overcome Them in the Formulation and Implementation Process of a Sustainability Balanced Scorecard (SBSC). Sustainability, 14(22), 14816. https://doi.org/10.3390/su142214816

EL BELKASMI, H., & BOUTTI, R. (2023). Evaluation of the Business Model of Seawater Desalination: A Case Study Agadir, Morocco. International Journal of Accounting, Finance, Auditing, Management and Economics, 4(6-2), 596-616. https://doi.org/10.5281/zenodo.10436979

E. K. Hamza, A. Mounia, H. Yassine and I. Z. Haj Hocine, "Literature Review on Cost Management and Profitability in E-Supply Chain: Current Trends and Future Perspectives," 2024 IEEE 15th International Colloquium on Logisticsand Supply Chain Management (LOGISTIQUA), Sousse, Tunisia, 2024, pp. 1-6, doi: 10.1109/LOGISTIQUA61063.2024.10571529.

EL KEZAZY, H., & HILMI, Y. (2024). Le contrôle de gestion territorial: levier de la bonne gouvernance. Essaie sur le cas des collectivités territoriales au Maroc. Alternatives Managériales Economiques, 6(4), 287-305.

El Kezazy, H., & Hilmi, Y. (2023). The use of new technologies in management control systems and their impact on managerial innovation. Ouvrage collectif: Innovation Managériale et Changement Organisationnel.

el Kezazy, H., Hilmi, Y., Ezzahra, E. F., & Hocine, I. Z. H. (2024). Conceptual Model of The Role of Territorial Management Controller and Good Governance. Revista de Gestão Sociale Ambiental, 18(7), e05457-e05457.

El Kezazy, H., & Hilmi, Y. (2023). Improving Good Governance Through Management Control in Local Authorities. International Review of Management And Computer, 7(3).

EL KEZAZY, H., & HILMI, Y. (2023). L'Intégration des Systèmes d'Information dans le Contrôle de Gestion Logistique: Une Revue de Littérature. Agence Francophone.

EL KEZAZY, H., & HILMI, Y. (2022). Towards More Agile Management: Literature Review of Information Systemsas the Pillar of Management Control. Revue Internationale du Chercheur, 3(4).

EL KEZAZY, H., & HILMI, Y. (2024). Le contrôle de gestion territorial: levier de la bonne gouvernance. Essaie sur le cas des collectivités territoriales au Maroc. Alternatives Managériales Economiques, 6(4), 287-305.

Figge, F., Hahn, T., Schaltegger, S. & Wagner, M. (2002). The Sustainability Balanced Scorecard - Theory and Application of a Tool for Value-Based Sustainability Management.

Figge, F., Hahn, T., Schaltegger, S., & Wagner, M. (2002). The Sustainability Balanced Scorecard – linking sustainability management to business strategy. Business Strategy and the Environment, 11(5), 269–284. https://doi.org/10.1002/bse.339

Gandini, A., Suhartini, D., Susilowati, E. (2024). Sustainability Balanced Scorecard: Enhancing Financial Performance. https://ic-ebgc.upnjatim.ac.id/index.php/ic-ebgc/article/view/122

Gunnar, H., (2024). https://medium.com/@desalter/plant-prices-the-costs-of-constructing-a-desalination-facility-2c31f7fcb690

Hamza, E. K., HIJAB, Z., Oumaima, E. B., Amal, M. E. L. L. O. U. L. I., & Ezzahra, E. F. (2024). Strategic Innovation: Integrating System Dynamics into Management Control. Journal of Ecohumanism, 3(8), 1012-1028.Hansen, E. G., & Schaltegger, S. (2016). The sustainability balanced scorecard: A systematicreview of architectures. Journal of Business Ethics, 133(2), 193-221.

HILMI, Y. (2024). L'intégration des systèmes de contrôle de gestion via les plateformes numériques. Revue Economie & Kapital, (25).

Hilmi, Y. (2024). Cloud computing-based banking and management control. International Journal Of Automation And Digital Transformation, 3, 1-92.

HILMI, Y. (2024). Contrôle de gestion dans les banques islamiques: Une revue de littérature. Recherches et Applications en Finance Islamique (RAFI), 8(1), 23-40.

HILMI, Y., & HELMI, D. (2024). Impact du big data sur le métier de contrôleur de gestion: Analyse bibliométrique et lexicométrique de la littérature. Journal of Academic Finance, 15(1), 74-91.

HILMI, Y., & KAIZAR, C. (2023). Le contrôle de gestion à l'ère des nouvelles technologies et de la transformation digitale. Revue Française d'Economie et de Gestion, 4(4).

HILMI Y. (2024). Le contrôle de gestion au niveau des clubs sportives : Approche théorique. PODIUM OF SPORT SCIENCES

FAO (2022). AQUASTAT Core Database. Food and Agriculture Organization of the United Nations. Web: http://www.fao.org/aquastat/en/ Accessed February 2022.

Le monde, (2024). https://www.lemonde.fr/sciences/article/2024/03/07/le-dessalement-de-l-eau-de-mer-une-technologie-en-plein-essor_6220612_1650684.html

Naxitis, (2020). DESALINATION: Balancing the Socioeconomic Benefits and Environmental Costs. https://gsh.cib.natixis.com/our-center-of-expertise/articles/desalination-balancing-the-socioeconomic-benefits-and-environmental-costs

Sayed, E. T., Olabi, A., Elsaid, K., Radi, M. A., Alqadi, R., & Abdelkareem, M. A. (2022). Recent progress in renewable energy based-desalination in the Middle East and North Africa MENA region. Journal of Advanced Research, 48, 125–156. https://doi.org/10.1016/j.jare.2022.08.016Feroze, B, Nafees, B, Ahmad, N, Zahid, M. (2022). IMPLEMENTATION OF BALANCED SCORECARD AND FINANCIAL PERFORMANCE OF SMES. https://mc-caddogap.com/wp-content/uploads/paper-43-of-vol-8-issue-3Reviewed.pd

Schaltegger, S., & Lüdeke-Freund, F. (2011). The sustainability balanced scorecard: Concept and the case of Hamburg airport.

Seawards, (2024). State of matters, existing technologies and their impacts. https://www.seawards.fr/en/state-of-matters/

Smartwater magazine, (2024). https://smartwatermagazine.com/news/smart-water-magazine/ten-facts-about-water-desalination

Straitsresearch, (2024). https://straitsresearch.com/report/water-desalination-market

Statista, (2024). https://www.statista.com/statistics/1376937/mena-value-of-active-water-desalination-plant-projects-by-country/

UN DESA. (2024). The Sustainable Development Goals Report 2024 – June 2024. New York, USA: UN DESA. © UN DESA. https://unstats.un.org/sdgs/report/2024/.

Wagner, M. (2007). Integration of environmental management with other managerial functions of the firm: Empirical effects on drivers of economic performance. Long Range Planning, 40(6), 611–628.

World Bank (2023). The Economics of Water Scarcity in the Middle East and North Africa. ISBN (electronic): 978-1-4648-1740-3. DOI: 10.1596/978-1-4648-1739-7

Yassine, H. I. L. M. I., Zahra, H. A. J. R. I. O. U. I., & Hamza, E. K. (2024). Systematic review of IPSAS standards: The introduction of IPSAS in public establishments. Edelweiss Applied Science and Technology, 8(5), 292-306.

Yassine, H., Houmame, A. A., Amine, A., & Driss, H. (2024). Governance Optimization through Territorial Management Control in Local Authorities. Pakistan Journal of Criminology, 16(04), 93-110.