

From a Technical Tool to Governance Function: Institutionalizing Water Accounting in Egypt through a Comparative Analysis with Australia

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Back cover photo: Irrigation Canal in Qora Kharigin, West Nubariyah/Housh Eissa region at the Beheira Governorate, Egypt (*photo:* Mohamed Samy/Waft Agency)

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List of Abbreviations

Abbreviation	Full term / Explanation
WA	Water Accounting
WA⁺	Water Accounting Plus
MWRI	Ministry of Water Resources and Irrigation (Egypt)
IWMI	International Water Management Institute
FAO	Food and Agriculture Organization of the United Nations
MENA	Middle East and North Africa
BoM	Bureau of Meteorology (Australia)
NWI	National Water Initiative (Australia)
NWA	National Water Account (Australia)
SOPs	Standard Operating Procedures
SEEA-Water	System of Environmental-Economic Accounting for Water
MoUs	Memoranda of Understanding
CAPMAS	Central Agency for Public Mobilization and Statistics (Egypt)

Summary

The growing pressure on the water resources system has increased the need for public policy tools that can quantify and track water availability, allocation, use, and productivity to address water needs and manage rising multi-sector competition. In this context, water accounting was increasingly adopted as a framework to measure water flows and uses systematically. Nevertheless, confining this framework to a solely technical exercise risks sidelining the power dynamics related to water data ownership and ministerial turf, in addition to its fragmentation across sectoral agencies with heterogeneous or incomplete reporting standards. This reality undermines coherent planning, monitoring, and accounting, and weakens transparency across users.

This study applies the principle of policy coherence, one of the water governance principles articulated by the Organization for Economic Cooperation and Development (OECD), to the study of water accounting. Therefore, this paper argues that effective institutionalization of water accounting (WA) depends on coherent policy instruments, clear institutional mandates and coordinated technical action. In particular, it requires policy attention to how water data is legally regulated, produced, owned, shared, and used across institutions. WA is thus a procedural tool that supports negotiations of trade-offs transparently and coherently across water-related agencies, policies, and data systems under conditions of scarcity. This paper proposes a five-dimensional framework for institutionalizing water accounting, which includes the public value and purpose, regulations and legal mandate, a three-layer institutional model, staged implementation, and routinization.

In Egypt, water accounting exists as an emerging technical capability inside the Ministry of Water Resources and Irrigation (MWRI), but remains vulnerable to fragmentation, weak mandates, and ad hoc data sharing. In this paper, Australia's water information system is used as a comparative case of deliberately institutionalizing water accounting to address policy incoherence and contested water allocation decisions. Australia is treated as a benchmark because its National Water Account is anchored in hard law (Water Act 2007 and its related Water Regulation 2008), produced routinely by a dedicated national institution (the Bureau of Meteorology (BoM)), supported by formal reporting. Both countries, Egypt and Australia, face severe water scarcity along with critical allocation decisions despite different political, economic, and hydrological systems.

Institutionalizing water accounting requires positioning its public value in transparency, policy coherence, and the negotiation of trade-offs under conditions of limited water supply rather than merely improving efficiency and productivity metrics. It must be clearly anchored in legal instruments superseding sectoral turf. In Egypt, this could be advanced through a regulatory instrument linked to Law No. 147 of 2021 that specifies purpose, scope, organizational ownership, political oversight, frequency of reporting, and authority to request data. Effective water accounting governance depends on the adoption of a three-layer model that leverages the capacity of the current interministerial water council for oversight, envisions the formation of a permanent technical unit under the planning and strategic management department within the premises of the Ministry of Water Resources and Irrigation, and formalizes reporting obligations across agencies. Given the intricacy of water accounts, it is recommended to proceed through a staged development process. Egypt has started water accounts in the Delta region. In this way, water accounts are scaled systematically and grounded in evidence. Routinization also requires SOPs that define methods, reporting periods, and quality assurance processes. Publication cycles should be aligned with planning, budgeting, and investment programs.

Background

Egypt faces a long-term water deficit challenge that strains national planning, allocation, and investment decisions. Per capita freshwater availability has declined over the past three decades, falling below the international water-stress threshold, and reaching an average of 585 m³ in 2018, with further decline expected (CAPMAS 2022).

This scenario is driven by Egypt's high dependence on the Nile River basin, along with upstream developments and increased hydrological variability in the basin. Moreover, water losses from aging irrigation and sanitation infrastructure, weakly monitored groundwater abstraction, particularly in newly reclaimed lands, and declining water quality further create uncertainty on actual water availability, effective water delivery, and its sustainability (Nikiel and Eltahir 2021; Rady and Omar 2018). At the same time, while farmers have gained greater autonomy in crop choices, water allocation remains centrally managed (Cassing et al. 2009). This arrangement created tensions in water demand management and complicated planning and monitoring at the local and national levels and across sectors, mainly domestic water and sanitation, agriculture, industry, energy, and environmental uses. These conditions push for early planning, scenario analysis, and coherent decision-making.

In response, the Ministry of Water Resources and Irrigation (MWRI) has shifted its strategic focus toward balancing water supply expansion in non-conventional water resources with efficient demand management of limited resources. National strategies, including the National Water Resources Plan and Water Strategy 2037, emphasize reducing system losses, improving climate-adaptive water productivity, expanding drainage and wastewater reuse, and strengthening water quality management. Achieving these objectives requires timely, reliable, and integrated information on how water is available, allocated, used, and reused across sectors and regions.

In this context, MWRI has taken concrete steps toward digitalizing water management systems. Since 2019, the Ministry has collaborated with international partners such as the Food and Agriculture Organization of the United Nations (FAO), the International Water Management Institute, and IHE Delft to strengthen analytical capacity and develop water accounting tools (Abou Taleb 2019; Hundertmark 2020). A technical water accounting team has been formed within MWRI to operationalize water accounting tools, support drought and other planning scenarios, and assess water productivity (Abou Taleb, 2019).

Water Accounting as a Decision-Support Tool

Water accounting (WA) is one of the widely applied data-driven tools informing water management. WA refers to standardized approaches to systematically identify, quantify, and report information on water resources, including water stocks, inflows, outflows, uses, and balances across defined spatial and temporal boundaries (Hundertmark 2020). Different forms of water accounting exist depending on purpose, scale, and data sources. One such approach is Water Accounting Plus (WA+), which relies on satellite-based remote sensing to generate spatially explicit estimates, maps, and accounts of water supply, water consumption, irrigation return flows, and water deficits across different land-use systems and seasons (Bassi et al. 2020). In Egypt, WA+ has been applied by MWRI as a technical tool to support assessments of water consumption, productivity, and efficiency, particularly in agriculture. Its appeal lies in its ability to generate consistent and comparable data over large areas, including locations where ground-based monitoring is limited.

Critical Perspectives on WA and WA+

Engineers and technical experts often promote water accounting tools such as WA+ as neutral and transparent mechanisms for water planning and scenario-building. However, the use of these frameworks also carries critical epistemological and socio-political limitations. Looking at satellite-based data as the sole representation of water reinforces the dichotomy between nature and society, where water is managed as a purely physical substance detached from social relations, power structures, and historical context (Zwarteveen et al. 2018).

So far, the tool has been used to generate information on water saving, productivity improvement, and efficiency metrics. While these objectives are important, they tend to frame water predominantly as an economic input, paying less attention to socio-political dimensions such as distributional fairness. Moreover, remote sensing-based accounts may inadequately represent factors such as institutional access to water, governance constraints, and some forms of water quality, all of which shape productivity outcomes on the ground.

Although water accounting serves as an essential analytical tool, it is not a practice that exists in a vacuum without limitations and biases. The relevance and impact of water accounting are determined by the institutional arrangements through which data are produced, interpreted, governed, and used. For this reason, this paper argues that institutionalizing water accounting goes beyond selecting appropriate technical tools for explicit attention to institutional structures and arrangements across governance levels and stakeholder interactions that determine how water accounting works. The outcomes of water accounting should connect science and politics by recognizing context, differences, and debate (ter Horst et al. 2023; Zwarteveen et al. 2018). Otherwise, water accounting may perpetuate existing inequalities or favor certain forms of knowledge, rather than inclusive, transparent, and accountable water governance.

Research Gap

Existing literature widely acknowledges that water-related decision-making is typically distributed across multiple public institutions holding partial and sometimes overlapping mandates over agriculture, irrigation, environment, energy, and urban agencies. These agencies often have their own data management practices, develop their own terminologies, analytical practices, and data standards based on their operational mandates and regulatory responsibilities (Vardon et al. 2023). For example, reuse already plays a critical role in closing the gap between water demand and conventional supply, yet data on volumes, quality, and trade-offs remain scattered across institutions. In addition, socio-economic and environmental data are also held by a wide range of agencies. As a result, water-related data are often dispersed across multiple institutions, heterogeneous in form, incomplete, and difficult to compare. This problem is exacerbated when formalized data-sharing arrangements or clear coordination mechanisms are absent (Tulloch and Harvey 2007).

Egypt's improvement in the e-government development index¹, from approximately 0.59 in 2022 to 0.67 in 2024 on a 0 to 1 scale, reflects growing national investment in digital infrastructure (UNESCWA 2025). However, the literature provides limited insight into how such technological readiness translates into effective data governance at lower operational levels of water management, where day-to-day allocation decisions, enforcement, and negotiations occur. Gaps in human, financial, and institutional capacity within governorate-level irrigation departments, water user associations, and field operations continue to constrain the practical use of data systems.

Consequently, while water accounting has been identified as a means to improve transparency, coherence, and evidence-based planning, it still lacks the understanding of how water accounting systems can be institutionally embedded within fragmented governance systems. In this regard, existing studies insufficiently address how governance structures, authority relations, and stakeholder interactions across scales influence the design, implementation, and use of water accounting.

The CGIAR Science Program on Policy Innovation aims to fill the gap by examining the institutionalization of water accounting in Egypt through a comparative governance-oriented analysis of Australia's experience. Australia is selected as a heuristic comparative case of full institutionalization, where water accounting has been deliberately embedded within legal, organizational, and data governance systems to support transparent allocation decisions across water users. The Australian case is used analytically to identify the institutional conditions—such as legal mandates, routinization, and clearly defined roles—under which water accounting gains authority beyond the technical domain. The research question, therefore, becomes: **what can a comparative analysis of Australia reveal about the institutional conditions required for water accounting to become an effective governance function, and how can these conditions be applied in the Egyptian context?**

Institutionalization Framework

This paper will explore water accounting through the perspective of governance, and particularly the principle of policy coherence. The assertion is that for water accounting to be effective as an instrument of public policy, it must be anchored in coherent policy instruments, clear institutional mandates, and coordinated technical action. At the core of this idea is water data governance, which includes regulation, production, management, dissemination, and use of water data.

¹ The United Nations E-Government Development Index (0–1 scale) combines online service provision, telecom infrastructure, and human capital to assess national digital government development.

This section develops a governance framework composed of five interrelated dimensions (Figure 1): 1. Purpose and Public Value, 2. Legal and Policy Mandate, 3. Institutional Arrangements (The Institutional Triangle), 4. Staged Development, 5. Routinization and operationalization.



Figure 1: Institutionalized Water Accounting Framework

1. Purpose of Institutionalizing Water Accounting

Based on the Australian model, the study explores how water accounting supports planning and coordination by making water availability, use, and trade-offs more transparent across sectors and scales. In this sense, water accounting is not assumed to resolve distributional questions or deliver equity outcomes automatically. Instead, the study examines how this institutional mechanism is anchored within public structures and produces data to inform debates on efficiency, equity, and allocation priorities (see Table 1 for a comparative study on the purpose of institutionalizing water accounting). The study frames water accounting a starting point for negotiation when it is linked to the data needs of planning and allocation and connected with multiple water uses within a shared informational network.

Table 1: Purpose of Institutionalizing Water Accounting

Australia	Egypt
- The concept of water accounting emerged in public policy spaces in response to the growing competition over strained water resources among sectors and users (Horne 2015). - As part of broader water information system reforms, National water accounts became a core component of the National Water Initiative (NWI), which is an intergovernmental framework designed to harmonize water planning, allocation, and investment across states and territories, while delineating how water is allocated across	- The rationale for institutionalizing water accounting in Egypt arises from a complex set of pressures, including increased autonomy in agricultural decision-making, drought, and a persistent gap between water demand and conventional water supply (i.e., Nile inflows, rainfall, and renewable groundwater). - While Australia's water accounting is related to water markets and explicit environmental water allocations, Egypt's national priorities place greater emphasis on supporting state-led

economic activities, human consumption, and environmental uses (Bureau of Meteorology, n.d.). • These accounts disclose, for each reporting period, information on total water resources, water availability, abstraction volumes, water entitlements and allocations, and the actual use of water (<i>Water Act 2007; Water Regulations 2008</i>). • Their public value lies in their contribution to transparency, credibility, and trust among stakeholders, including water users, investors, and the ecosystem (Bureau of Meteorology, 2013). They provide a shared, evidence-based inventory for policy decisions, regulatory oversight, and interministerial and intergovernmental coordination. In addition, they underpin the functioning of water markets and trade and environmental water allocation.	allocation within a framework that treats water as a shared public resource. It focuses on measuring climate-adaptive water productivity and water use efficiency gains. • Non-conventional flows, e.g., drainage reuse, treated wastewater, and groundwater, play an increasingly central role in closing Egypt's water balance but are often reported inconsistently across institutions. Institutionalizing these flows allows their systematic measurement, integration into national water balances, and explicit consideration in planning and policy decisions. • By providing a standardized and authoritative picture of water availability, sources, use, losses, and reuse across sectors and regions, water accounting supports anticipatory planning, improves the legitimacy of allocation decisions, and enhances coherence between national strategies and operational management. It helps to prioritize public investment and reduce dependency on project-based data systems while mitigating institutional fragmentation.
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2. Legal and Policy Mandate for Water Accounting

Across the literature, a system is considered institutionalized when it is anchored in formal rules in the form of laws, decrees, regulations, or binding strategies that define its mandate, outputs, and authority (FAO 2024; Hundertmark 2020; Saleth and Dinar 2004) (see Table 2). Mandates include four elements of water accounting:

- Purpose
- Scope
- Frequency
- Authority to request data from other agencies

Table 2: Legal and Policy Foundations of Water Accounting

Australia	Egypt
• The Australian model involved setting up the institutional foundation of water accounting in law by enacting the Water Act 2007, the Water Regulations 2008, and the National Water Account Companion Guide 2013. These legal instruments regulate water data management, including the production and dissemination of water accounts. • The statutory duty to publish the National Water Account was a foundational element in Australia's institutionalization of water accounting because it transformed it from a discretionary, short-term policy priority or individual agency leadership to a legally mandated function, creating continuity and credibility annually.	• In Egypt, the National Water Resources Plan addresses accounting functions from an operational lens of improving water supply, distribution, and calculating deliveries, abstraction, efficiency, productivity, and losses. One target goal for urban water management is to reduce system losses and unaccounted-for water in domestic supply to no more than 20 percent by 2030, with a further reduction to 15 percent by 2037. Another objective emphasizes the need for better water information in order to understand water quality challenges in different water bodies. • From a legal perspective, Law No. 147 of 2021 on Water Resources and Irrigation introduces provisions related to the measurement, reporting, and regulation of water use, including obligations on users and operators with respect to abstraction, discharges, and compliance. • However, the law does not explicitly establish a national water information system as an integrated

	institutional function, nor does it assign clear responsibility for compiling, standardizing, and publishing comprehensive water accounts at the national scale. Information-related provisions are dispersed across regulatory and enforcement articles, reflecting a focus on control and compliance rather than on coordinated data governance. The absence of an explicit legal mandate for water accounting limits the ability to systematically link these strategic goals to operational monitoring, planning, and investment decisions, and weakens coherence across irrigation, sanitation, and environmental policies.
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3. The Institutional Triangle: Three layers of institutional arrangements

Across the literature, a unit is considered institutionalized when it is embedded within formal organizational structures and processes (Bureau of Meteorology 2013; Hundertmark 2020). Institutionalization implies that the unit appears on the official organogram, with defined posts, job descriptions, internal functional teams (such as data management, methods and quality assurance, and analysis and dissemination), and a clear reporting line. Beyond organizational placement, institutionalization also requires political backing: a high-level political champion or authorizing body that supports the unit's mandate, defends its budget, and enforces cooperation across agencies. Finally, institutionalized units are characterized by the routine use of their outputs by ministers, planners, regulators, and external stakeholders in core processes such as allocation planning, investment decisions, and inter-sectoral negotiations (see Table 3).

Table 3: The Institutional Triangle for Water Accounting

Australia	Egypt
- Effective institutionalization of water accounting rests on a clear separation between three interrelated layers: - technical unit (owns the systems) - political oversight committee - inter-agency data provision - These three dimensions operate jointly and are mutually reinforcing.	In Egypt, current practice does not yet reflect this layered institutional arrangement. A water accounting team is currently located within the planning department, but it operates without a formal mandate with defined job descriptions. Staff involved in water accounting typically carry out these tasks alongside other assignments and may be rotated as part of routine promotion or administrative restructuring. As a result, water accounting activities remain vulnerable to personnel changes and shifting priorities, limiting their continuity and institutional authority.

3.1 Organizational Placement and Structure: Who Owns Water Accounting?

International practice demonstrates that water accounting units can be located in different types of institutions, including ministries responsible for water resources or environment, national planning bodies, or national statistical offices (Bureau of Meteorology, 2013; National Institute of Statistics and Geography (INEGI) 2018; Statistics Netherlands 2025; Water Stewardship Indonesia (WSI) 2024). The key determinant of effectiveness is not sectoral affiliation per se, but rather national priorities and objectives set (see Table 4).

Table 4: Organizational Placement and Ownership

Australia	Egypt
The Water Act 2007 granted the Bureau of Meteorology (BoM) specific authority and obligations over water information.	Water accounting responsibilities have been housed within the strategic management sector at MWRI since 2019. Institutionalization would

BoM is legally mandated to define the scope of water information, compile and standardize data received from multiple reporting entities, and publish annual national water accounts. This centralized compilation role has been critical in producing nationally consistent and comparable data across states, which is publicly available, comprehensive, and widely used by the government, the water sector, and industry.	require the establishment of a Water Accounting Directorate within this sector, given its role in investment planning and cross-sector coordination. Its mandate would be similar to that of Australia's Bureau of Meteorology (BoM), with responsibility for defining the scope of water information, standardizing reporting formats and timelines, and compiling data from all relevant agencies under a clear legal mandate. The directorate would be chaired by the head of the planning department.
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3.2 Political Oversight

Political oversight is essential for the legitimacy of water accounting as it guides the use of its outputs and protects the technical independence of the producing agency (see Table 5).

Table 5: Political oversight mechanisms

Australia	Egypt
The Council of Australian Governments established a National Water Account Committee in 2008 (Bureau of Meteorology, n.d.). The BoM chairs the committee, which is composed of representatives from each state, leading water agencies, and industry bodies. This arrangement provided political cover for piloting the first national water accounts, facilitated feedback and evaluation, and supported the iterative refinement of methods, coverage, and presentation.	Water-related decisions are distributed across multiple ministries and agencies with partial and overlapping mandates, including water resources, agriculture, environment, housing, and energy. A recently established interministerial water council provides a potential platform for political oversight of water accounting. If appropriately designed, such a council could legitimize common data standards and provision, coordinate priorities, and resolve disputes over the interpretation and use of water information, without assuming technical production functions.

3.3 Inter-agency data governance and reporting obligations

Effective water accounting also depends on robust inter-agency data governance arrangements. One indicator of best practice is sustained engagement between account producers and users to define the range, format, and frequency of accounts required to support decision-making (Vardon et al. 2025). This engagement is typically formalized through data-sharing agreements or reporting obligations involving water resources agencies, basin authorities, agriculture and irrigation departments, environmental and energy regulators, national statistical offices, and meteorological services (see Table 6).

Table 6: Inter-Agency data governance and reporting obligations

Australia	Egypt
- The Bureau of Meteorology collaborates with approximately thirty reporting partners. Reporting obligations are established by law, requiring jurisdictions responsible for water resource plans to submit specified information within defined timeframes following the end of each accounting period. These reports include information on water availability, permitted abstractions, and actual water use that must be submitted no later than four months after the end of a water accounting period. - The scope of reporting is designed to evolve over time in response to user needs and emerging policy priorities.	Inter-agency cooperation on water data remains largely informal. Existing practices often rely on ad hoc correspondence between ministries, without binding obligations or standardized reporting requirements. This limits data completeness, consistency, and timeliness, and constrains the ability to compile comprehensive water accounts. Institutionalizing water accounting would therefore require formalizing data-sharing arrangements and clarifying reporting responsibilities across agencies, transforming voluntary cooperation into a predictable and enforceable governance mechanism. From a political economy

	perspective, this shift would alter existing bureaucratic functions by shifting control over water information and increasing the visibility of distributional trade-offs, which may generate resistance.
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4. Staged Development for Water Accounting Implementation

International experience suggests that the institutionalization of water accounting is most effective when adopted through a phased, regionally prioritized approach rather than through immediate nationwide coverage. Australia's experience illustrates how regional prioritization can serve both technical and institutional objectives, allowing methods, governance arrangements, and data flows to be tested and refined before scaling up (see Table 7).

Table 7: Phased development approaches to implementation

Australia	Egypt
- Australia did not begin with comprehensive national water accounting across all regions. Instead, it was initially piloted in selected regions and water systems before being progressively expanded to cover additional basins and jurisdictions. - Early priority regions were chosen based on a combination of factors, including high levels of water stress, the size of the population, the presence of major irrigated and horticultural production areas, and the concentration of urban water abstractions.	- In Egypt, a similar logic of regional prioritization is already emerging in practice. The Nile Delta has been a primary focus of water accounting efforts undertaken by MWRI, reflecting its central importance for national water security. The Delta hosts a large share of the population, supports intensive agricultural production, and concentrates significant irrigation, drainage, and reuse flows. - Pilot areas have been used to develop water indicators, and efforts are ongoing to expand the system to additional regions and governorates. - Another staged development option is to establish a common reporting framework across MWRI departments at the central and governorate levels, before scaling to other water-related sectors.

5. Routinization and operationalization of water accounting: reporting cycles, standards, and use in decision-making

Institutionalization of water accounting extends beyond formal mandates to include the routinization and resourcing of core functions that are supported by dedicated budget lines, permanent staff, and standard operating procedures (SOPs) governing data production and use (FAO 2024; Horne 2015; Jackson and Kimutai 2018). Routinization, in turn, is reflected in the regular production of official, quality-assured water accounts that provide timely and reliable information for decision-making. These accounts are often aligned with the System of Environmental-Economic Accounting for Water (SEEA-Water), although approaches and levels of detail vary across countries (Vardon et al. 2025).

However, decision-makers do not always systematically use these accounts, particularly when they are complex, poorly communicated, or misaligned with the timing and needs of core decision processes. This underscores that data governance is not only a matter of technical quality, but of institutional design that effectively links data production to use (see Table 8).

Table 8: Routinization and operationalization

Australia	Egypt
National Water Accounts are produced on a fixed annual reporting cycle, covering the period from 1 July to 30 June.	Egypt has technically capable teams and significant volumes of water-related data are generated across agencies.

• Each account follows a standardized structure defined through formal SOPs, ensuring consistency across water catchment regions and over time. • The accounts are designed to address a set of core governance questions, including changes in water inflows, outflows, and storage; the nature of water access entitlements and allocations; the management plans governing water access; actual water abstraction for economic and social use; and the volume of water made available for environmental purposes. • Each water accounting report includes contextual information on geographic and hydrological conditions, land use, and water management arrangements during the reporting period, alongside water accounting statements, detailed explanatory notes, and descriptions of surface and groundwater resources.	• Water accounting has not yet been embedded within a standardized reporting cycle governed by formal SOPs. • Data production remains fragmented, with different institutions collecting and managing information according to their own mandates, formats, and timelines. • Developing SOPs that define reporting periods, account structure, analytical content, and quality assurance processes would help transform water accounting from an ad hoc analytical activity into a regular governance function. Aligning reporting cycles with national planning and policy processes would further ensure that water accounts are produced when decisions are made and in formats that decision-makers can readily use.
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Scope and Limitations

- Australia operates within a federal system characterized by water markets and legally defined entitlements, which differ significantly from Egypt's centralized allocation model and its treatment of water as a public resource.
- The framework does not resolve distributive conflicts over water allocation; rather, it clarifies the institutional conditions for improving coherence by managing trade-offs and improving coordinated action.
- The analysis is based on secondary sources and institutional assessment, rather than primary empirical assessment of system performance.

Implications for Egypt

1. Clarify the Purpose and Public Value

Institutionalizing water accounting in Egypt requires defining its public value as procedural rather than purely technical. Its role should be understood not only as improving efficiency metrics, but as providing a shared evidentiary basis for transparency, coordination, and informed negotiation. In this sense, water accounting can support planning, allocation, reuse policy, and the management of inter-sectoral trade-offs.

2. Establish a Clear Legal Mandate

Institutionalizing water accounting in Egypt would require complementing Law No. 147 of 2021 with a specific legal or executive instrument, such as a law amendment, presidential decree, or cabinet regulation, establishing water accounting as a national function, defining its purpose, scope, frequency, and spatial coverage, and assigning authority for the compilation and publication of accounts.

3. Institutionalizing the Three-Layer Institutional Arrangement

Institutionalizing water accounting in Egypt requires the adoption of a three-layer institutional arrangement that distinguishes between political oversight, technical production, and data provision:

- Political oversight: an interministerial water council or steering committee,
- Technical production: a permanent water accounting unit,
- Data provision: line ministries, utilities, governorates, and agencies with reporting obligations.

A critical condition is the designation of a single national unit responsible for defining reporting scope and standards, compiling and quality-assuring data, and publishing official water accounts. The unit should be the sole compiler and publisher, not the sole data producer. Data production should remain distributed, but compilation authority must be centralized to ensure consistency, comparability, and credibility. It is envisioned that this unit will be established under the planning and strategic management department within the premises of the Ministry of Water Resources and Irrigation

Political oversight structures, such as the existing interministerial water council, would play a key role in endorsing standards and priorities, resolving inter-agency disputes over data interpretation, and linking water accounting outputs to national planning and investment decisions.

Strengthening inter-agency data governance further requires moving beyond informal coordination toward formalized arrangements, including memoranda of understanding (MoUs) or regulatory instruments, defined reporting timelines, and standardized reporting templates. These arrangements would need to cover the full range of water-related sectors, including water resources, agriculture, irrigation, sanitation, environment, energy, statistics, and meteorology.

4. Staged Development for Implementation

Institutionalizing water accounting requires a staged implementation strategy that prioritizes high-impact regions, uses pilot applications to refine methods and governance arrangements, and sequences expansion from intra-sectoral harmonization toward cross-sectoral integration.

5. Routinization and operationalization

Moving water accounting from ad hoc analysis to a regular governance function requires SOPs, dedicated resources, and fixed reporting cycles. In Egypt, this implies developing standardized procedures that define reporting periods, account structure, core analytical questions, and quality assurance processes. Water accounts must be produced when decisions are made, not after, to align publication with national planning cycles, investment programming, and reuse and efficiency policy reviews

Conclusion

This paper has argued that water accounting needs to go beyond a technical exercise to a fully institutionalized governance tool that reshapes how strained water resources are managed and negotiated. In that way, it can expand the space for water policy choices and support more coherent water and agricultural policies that connect planning with cropping patterns, irrigation upgrading, salinity management, and investment prioritization. These outcomes align closely with the objectives of the CGIAR Policy Innovations Program: enhancing policy coherence across food, land, and water systems; strengthening evidence-based decision-making; and supporting more transparent and equitable governance under conditions of resource stress.

The Australian experience shows how authority, incentives, and accountability are structured around water accounting. The system became institutionalized once it was built into a broader water information system reform rooted in laws and regulations that defined an authoritative organ and its objectives, including water data aggregation, national water information standards, enforcement mechanisms, and reporting obligations for water-related agencies. Thus, this model transformed WA from a discretionary analysis into a stable public function that could support planning, enable coordination across jurisdictions, and sustain trust among users, regulators, and investors.

Egypt is relatively advanced within the MENA region in terms of water accounting readiness. It has a dedicated water accounting team, long-standing hydrological monitoring systems, increasing integration of remote sensing, and an emerging policy discourse that links water productivity, reuse, and climate adaptation. This places Egypt in a strong position to move from experimental and project-based accounting toward a more authoritative national system.

Institutionalizing water accounting in Egypt should therefore be understood as part of a broader process of state-building under conditions of scarcity. The comparative framework suggests that the primary public value for Egypt would be procedural: reducing information asymmetries within water-related agencies and across sectoral departments, making allocation trade-offs visible, and strengthening the legitimacy of state decisions in reallocations

and reuse. This requires aligning water accounting with Egypt's social policies, where water is treated as a public resource managed through a centralized state-led allocation.

A durable system would require a clear legal mandate that defines the purpose, scope, frequency, and authority of water accounting; a stable organizational home with dedicated staff and budget; and formal reporting obligations that convert inter-agency cooperation from voluntary exchange into enforceable practice. Equally important is political oversight that legitimizes standards and mediates disputes without capturing the technical process itself. Staged development that starts in hotspot regions such as the Nile Delta offers a pragmatic strategy to build credibility and demonstrate decision-making value, while gradually expanding coverage informed by pilot implementation.

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