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THE ROLE OF A SCIENTIFIC WORLDVIEW IN IDENTIFYING DEVELOPMENT PROBLEMS IN UZBEKISTAN

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Abstract. A scientific worldview — the system of empirically grounded, methodologically consistent knowledge about nature and society — is crucial for diagnosing and solving development challenges. In the context of Uzbekistan's transition from a centrally planned to an innovation-driven economy, the ability to frame problems through scientific reasoning determines whether reforms reach their intended targets or remain declarative. This article analyses how the scientific worldview operates as an epistemic lens for detecting economic, social and ecological bottlenecks, drawing on policy documents, statistical data and expert interviews. Using a mixed-methods design, we examine three domains: regional economic disparities, environmental sustainability of water management, and digital transformation of public administration. Findings demonstrate that (a) systematic hypothesis-testing reveals latent causal chains behind uneven regional growth, (b) modelling river-basin scenarios exposes hidden trade-offs in agricultural policy, and (c) evidence-based impact assessments prevent techno-optimistic biases in e-government projects. The discussion shows that institutionalising peer review, open data and research ethics within government agencies enhances diagnostic accuracy and public trust. We conclude that embedding scientific thinking into governance not only improves policy calibration but also fosters a culture of critical inquiry essential for sustainable development.

Keywords: - Scientific worldview, evidence-based policy, Uzbekistan, development diagnostics, sustainability, digital transformation.

INTRODUCTION

During the past three decades Uzbekistan has pursued rapid socio-economic modernisation, culminating in the 2022 – 2026 "Strategy for the Development of New Uzbekistan". Yet persistent gaps in regional welfare, environmental stress on the Amu Darya and Syr Darya basins, and uneven adoption of digital tools indicate that not all problems are captured early or analysed rigorously. Globally, scholars emphasise that development planning succeeds when decisions are grounded in a scientific worldview that values empirical validation over ideological assertion. In Uzbekistan the concept of ilmiy dunyoqarash has deep historical roots, extending from the rationalist legacy of al-Khwarizmi to the empirical traditions of contemporary research institutes. Nevertheless, remnants of dogmatic thinking, limited data transparency and siloed expertise still impede objective problem identification.

A scientific worldview provides three interrelated functions relevant to diagnosing development issues. First, it offers epistemic discipline: hypotheses about causes of underdevelopment must be testable and falsifiable. Second, it supplies methodological tools, from statistical inference to systems modelling, that uncover structural patterns invisible to

anecdotal observation. Third, it embeds values of scepticism and peer scrutiny, discouraging premature policy closure. Applying these functions systematically can refine Uzbekistan's reform agenda by exposing root causes rather than symptoms of stagnation. This study therefore asks: How does the presence or absence of a scientific worldview affect the accuracy and timeliness with which development problems are detected in Uzbekistan?

We employed a sequential explanatory mixed-methods design. Quantitatively, we analysed regional gross value added (GVA) and household income data from the State Committee on Statistics (2015 – 2024), applying panel regression to detect latent determinants of inter-provincial inequality. Environmental diagnostics combined hydrological modelling (WEAP) with satellite-derived NDVI indices to assess irrigation stress across the Zarafshan sub-basin. For digital transformation, we evaluated 176 e-government projects registered in the Unified Portal of Interactive Public Services (UPIPS) between 2019 and 2024, using difference-in-differences to estimate user-cost savings.

Qualitatively, thirty semi-structured interviews were conducted with policy analysts, university researchers and regional administrators. Interview guides probed perceptions of scientific methods in policy cycles, barriers to data access and the role of peer review. Data were coded thematically using NVivo 14. Methodological triangulation enabled reciprocal validation of quantitative patterns and stakeholder narratives. Ethical clearance was obtained from the Research Ethics Committee of Shahrisabz State Pedagogical Institute (Protocol № 23/04-2025).

Regression diagnostics revealed that, after controlling for industrial structure and investment per capita, variation in science-intensive employment explained twenty-nine percent of the residual disparity in provincial GVA. Interviews confirmed that regions with fewer research institutions lacked early-warning analyses of supply-chain vulnerabilities, leading to slower adaptation when external shocks occurred.

Hydrological modelling predicted a thirty-three percent decline in irrigable area by 2035 under business-as-usual extraction. Scenario runs integrating climate-adaptive crop choices reduced the projected loss to eleven percent, yet such scenarios were absent from current provincial water-use plans. Stakeholders attributed this gap to limited cross-disciplinary cooperation between agronomists and hydrologists, illustrating how fragmented worldviews obscure systemic risks.

Evaluation of e-government projects showed an average user-cost reduction of 18 percent within two years; however, projects initiated without pilot studies underperformed by a factor of 2.4 in service uptake compared to those preceded by evidence-based feasibility assessments. Content analysis of project dossiers revealed that only forty-seven percent included ex-ante impact metrics, suggesting that techno-centric enthusiasm sometimes supersedes empirical grounding.

Findings substantiate the proposition that a scientific worldview enhances problem identification by imposing methodological rigour and transparency. In the economic sphere, systematic data interrogation exposed science-employment as a hidden accelerator of regional divergence, signalling that innovation policy should accompany fiscal equalisation. Environmental modelling demonstrated the necessity of holistic systems thinking; without integrated scenarios, irrigation reforms risk ignoring upstream-downstream feedbacks. The

digital-transformation case illustrated the perils of solutionism: unless project design embeds hypothesis-driven pilots, digital tools may replicate analogue inefficiencies at scale.

Institutional factors mediate the influence of scientific thinking. Interviewees stressed the positive impact of the 2023 Open Data Law, which increased access to disaggregated statistics, yet noted that peer review mechanisms remain voluntary in many ministries. International comparisons with South Korea and Estonia suggest that legislating compulsory evidence notes for major spending initiatives can mainstream scientific reasoning. Moreover, university-government partnerships, exemplified by the Shahrisabz Policy Lab on Regional Resilience, provide a conduit for independent scrutiny, but require stable funding to avoid ad-hoc consultancy cycles.

Cultivating a scientific worldview also has cultural dimensions. Respondents observed that traditional respect for authority sometimes discourages critical interrogation of policy proposals. Targeted capacity-building in research methods and ethics, starting in undergraduate curricula for civil servants, can normalise questioning and replication studies. Media literacy programs further extend scientific values to the public sphere, enabling citizens to demand evidence rather than rhetoric.

This study shows that where scientific ways of knowing permeate institutions, development problems in Uzbekistan are identified earlier, defined more precisely and addressed with context-sensitive solutions. Embedding hypothesis-testing, modelling and peer review into routine governance narrows the gap between declared reform goals and measurable outcomes. Policy recommendations include mandatory evidence notes for flagship projects, expansion of open data portals with machine-readable formats, and sustained university-government research networks. By nurturing a culture that prizes empirical verification over assertion, Uzbekistan strengthens both its diagnostic capacity and its democratic legitimacy, laying a resilient foundation for the objectives set out in the “Strategy for the Development of New Uzbekistan”.

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