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HISTORICAL PROBLEMS OF NEW LAND DEVELOPMENT AND RECLAMATION IN KHOREZM AND KARAKALPAKSTAN (1950–2000)

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Abstract: This abstract examines the socio-economic and ecological consequences of large-scale new land development and soil reclamation in the Khorezm oasis and the Republic of Karakalpakstan between 1950 and 2000. During the Soviet era, particularly from the 1950s to the 1980s, the lower reaches of the Amu Darya river underwent aggressive agricultural expansion aimed at achieving cotton independence. Millions of rubles were directed toward constructing major irrigation networks, such as the Tachiatash hydro-complex and the Tuyamuyun reservoir system. However, extensive irrigation without adequate drainage infrastructure triggered rapid groundwater rise, catastrophic secondary soil salinization, and accelerated the desiccation of the Aral Sea. Following independence in 1991, the region faced the severe burden of managing these inherited systemic crises under acute water scarcity. This study evaluates archival data, statistical reports, and historical monographs to analyze the structural failures of Soviet hydrodynamic engineering and its long-term impact on the region's agricultural sustainability.

Keywords: Land reclamation, secondary salinization, Khorezm oasis, Karakalpakstan, Amu Darya, irrigation systems, Aral Sea crisis.

Introduction

In the second half of the 20th century, the lower reaches of the Amu Darya river—encompassing the Khorezm region and Karakalpakstan—became a primary zone for intensive agricultural exploitation [1, p. 45]. The geopolitical drive of the USSR to maximize raw cotton production led to ambitious state programs targeting the conversion of desert and semi-desert zones into arable land [2, p. 112]. While these initiatives initially boosted agricultural output, they ignored the fragile hydrological balance of the deltaic ecosystem. By the late 1970s, the extensive structural expansion of irrigation networks combined with inefficient water management manifested in widespread land degradation [3, p. 88]. Understanding the historical trajectory of these reclamation programs from 1950 to 2000 is critical to evaluating contemporary environmental policies and water management strategies in Uzbekistan.

Methodology

This research utilizes a historical-comparative and statistical analysis framework based on archival documents, agricultural registries, and specialized hydro-geological monographs published between 1960 and 2010. The geographical scope is confined to the Khorezm region and the Republic of Karakalpakstan, representing the terminal delivery zone of the Amu Darya basin. Quantitative data regarding irrigated land areas, salinization percentages, and collector-drainage volumes were cross-referenced with regional economic assessments to isolate the socio-economic drivers behind reclamation failures. A chronological approach is applied to distinguish the high-intensity Soviet engineering period (1950–1989) from the post-independence transition phase (1990–2000), during which regional water allocation strategies shifted.

Results

The empirical evidence indicates an unprecedented escalation of land development followed by severe environmental feedback loops:

- **Infrastructure and Land Expansion:** Between 1950 and 1980, the total irrigated territory in Karakalpakstan and Khorezm expanded dramatically, supported by the construction of the Tachiatash hydro-unit (operational in 1974) and the Tuyamuyun reservoir system (1980) [4, p. 62; 5, p. 19].
- **The Rise of Drainage Networks:** To combat waterlogging, thousands of kilometers of collector-drainage channels (such as the Main Left-Bank Collector) were dug. By 1985, the total

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discharge of highly saline drainage water back into the Amu Darya or adjacent depressions reached over 5–7 cubic kilometers annually [6, p. 104].

- **Soil Degradation:** Due to poor lining of irrigation canals, horizontal filtration losses exceeded 40–50%. This caused groundwater levels to rise to within 1–1.5 meters of the surface, triggering massive capillary action and secondary salinization. By the late 1980s, over 85% of arable lands in Karakalpakstan were classified as moderately to highly salinized [7, p. 73].

Analysis and Discussion

The historical analysis reveals that the core failure of the reclamation strategy lay in the "extensive growth model." Soviet planners prioritized expanding the physical footprint of cotton fields over improving the technical efficiency of the existing infrastructure [8, p. 142]. Irrigation networks were largely unlined earthen canals, which caused massive water losses due to seepage.

Furthermore, the construction of collector-drainage systems lagged decades behind the initial irrigation deployment [9, p. 95]. Without deep, functional drainage, the heavy leaching washes (sho'r yuvish) performed every winter merely caused the water table to rise temporarily, bringing deep-seated ancient salts back up to the root zone during the summer heat [10, p. 201]. Following 1991, independent Uzbekistan faced reduced financial capacity to maintain these capital-intensive systems. The severe droughts of 2000 exposed the vulnerability of the region, where degraded soils yielded significantly lower crop returns despite massive historical investments [11, p. 54].

Conclusion

The period of 1950–2000 highlights a profound contradiction between aggressive state engineering and ecological limits in Khorezm and Karakalpakstan. The rapid reclamation of new lands delivered short-term economic gains but exacted a catastrophic long-term price: systemic soil salinization, the collapse of deltaic ecosystems, and the structural desiccation of the Aral Sea basin [12, p. 118]. The structural mistakes of this historical era emphasize that modern land remediation in the lower Amu Darya cannot rely on simply applying more water; instead, it requires strict shift toward closed-pipe irrigation, bio-drainage, and desalting technologies.

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Innovation – SICMRI 2026**

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