



TERMS REPRESENTING HYDRAULIC ENGINEERING STRUCTURES AND THEIR LEXICAL-SEMANTIC CLASSIFICATION

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Abstract

This work is dedicated to the scientific analysis of the linguistic features of terms representing hydraulic engineering structures. It examines the etymology, structural composition, and semantic groupings of these terms, highlighting their usage in key areas such as water management, irrigation, drainage, water supply, dams, and canals. The study also analyzes the alignment of these terms with international terminology and their role within national terminological practice. The results contribute to the standardization of hydraulic engineering terminology, facilitate the work of specialists and translators in the field, and improve the quality of scientific and technical literature.

Keywords: Hydraulic engineering, structure, term, terminology, semantic group, irrigation, drainage, water management, dam, canal, term standardization.

Introduction

It is well known that in the term hydraulic engineering (hydro + technics), hydro (from Greek hydor — water, liquid, moisture) appears in many international borrowings and denotes a relation to water bodies, moisture, or hydrogen, as in hydrology, hydrogeology, and hydrologist [1, p. 498]. The term technics (Greek technike — skillful, craftsman < techne — art, craft) has two main meanings:

1. The aggregate of means serving human activity in production processes and for non-production needs — for example, advanced technology, aviation technology, cotton-picking technology, technical sciences;

2. A complex of machines, mechanisms, instruments, tools, devices, etc., used in a particular field of production — e.g., technical aid, technical measures [2, pp. 80–81].

The terminology denoting hydraulic engineering structures and their lexical-semantic groupings can be studied by dividing them into three main subgroups:

1. Terms denoting structures installed in water channels:

These include words such as band (dam), bo‘g‘ot (barrage), darak, dahana (intake structure), jon/jona (sluice), surjona, to‘g‘on (large dam), suv darvoza (water gate), suv to‘siq (water barrier), suv yopgich (stop gate), quloq (side intake), sepoya (tripod pier), chilpoya, taltay, shlyuz (sluice) and others.

2. Terms naming water-lifting structures, devices, and tools:

These include chighir (Persian-origin water wheel), charx (wheel), parrak (blade), charpalak (paddle wheel), tighir (gear wheel), vodokashka/vodokachka (Russian borrowing, water pump), nasos (pump), dor (winch post), qovga (bucket), paqir (pail), among others.

3. Terms for materials and items used to block or regulate water channels:

Examples include chim (turf sod), xos (brushwood), hashak (reed bundle), loy (clay), tosh (stone), dastak (handle), no‘g‘ala (mud plug), qamish (reed), beton (concrete), xula/g‘ula (gravel and similar aggregates).

It is well known that from the source of water to the irrigated field, water encounters and passes through many control and distribution structures. Historically and to this day, rivers like Kashkadarya, Topolondarya, Surkhandarya, and Zarafshan have been harnessed using dams, barrages, and water diversion installations. Sepoya and chorpoya (tripod piers) were placed in rivers to divert large volumes of water for human use.

In our previous paper titled “A Study of Hydraulic Engineering Terminology in English and Uzbek” [3], we focused on terms for structures installed in water channels, such as band, dam, darak, jon, surjona, quloq, dahana, sepoya, chorpoya, beldachik, taltay, etc. Therefore, in this paper, we turn to terms for water-blocking materials, water-lifting structures and devices, and the tools related to them.

To‘g‘on is a structure designed to block or control the flow of water. Variants include earth dam, head dam, to‘g‘onboshi (dam head), and large-scale platinum dams (Russ. platina) [4:1-543]. The DLT (Turkic Lexicographic Dictionary) records qir [5:1-314], with dialectal forms such as oltang (water distributor).



According to A. Muhammadjonov, head dams installed at the head of canals in the Zarafshan Valley were traditionally called varaq, varq, or band.

Bo‘g‘ot in standard Uzbek denotes the constricted part of a watercourse or a location where water splits. Regional variants include qirshov (Andijan), bag‘ot or bo‘g‘ma (Fergana) — meaning a dammed section of a canal; in Khorezm, bo‘gat or buvat is synonymous with to‘g‘on (dam) or to‘siq (barrier) [6:276; 7:121].

The second group consists of terms for water-lifting structures. These draw water from various depths using simple or mechanical means:

Chighir: An ancient and simple water-lifting device consisting of a large wheel (1.5–2 meters in diameter) with buckets or jars attached at intervals. Powered by human or animal force, it was used in Egypt, India, China, Central Asia, and other regions to lift water from streams to higher ground [8:12-565]. In Kashkadarya, forms include chighir, chiqiniq, tighir, digir, charx, charxpalak, parrak, chanqaroq. DLT mentions chighri (water wheel blade) [9:1-397], Radloff records chighir [10: vol. 3, pt. 1: 1188–2107]. Khwarazmi in the 10th century used six terms for water wheels in the Merv oasis: dolab, daliya, gharrafa, zurnuk, naura, manjunaan. According to Bartold, each term referred to a distinct type of wheel designed for irrigating elevated fields [11:26].

To‘gin: The part of the water wheel frame where water-lifting containers are attached and secured.

Qovga: A container fastened to the wheel’s frame to draw water; related terms include kavush (small pot), xumcha (small jar), paqir (bucket).

Poyga: The track along which animals walk back and forth when drawing water from a well.

Bellig‘ / Atoyil: The rope tied around animals’ waists when pulling water.

Suv qo‘nar‘ga: Local term for a pump station site or water storage location.

Vodokashka / Vodokachka: A loanword for pump houses where water-extraction pumps are installed.

The third subgroup of lexical-semantic units includes materials used for water blocking:

Chim: A sod cut with a hoe or spade from grass-covered soil, used to seal dams or embankments. Related dialect terms include lowli o‘t (grass sod), chimto‘siq (grass barrier), chimtoll, sevarguzar.



In conclusion, the analysis of hydraulic engineering terms and their lexical-semantic groupings shows that the majority of terms denoting artificial structures that block or divert river flows have varied phonetic and morphological structures (e.g., band, bo‘g‘ot, darak, dahana, to‘g‘on). Etymologically, they stem from Turkic (darak, quloq, to‘g‘on) and Iranian (band, dahana, sepoya) roots. Certain terms exhibit consistent paradigmatic and syntagmatic patterns (e.g., suvayirg‘ich, suvyopgich, suvbo‘lgich, suv taqsimlagich, suvto‘siq, suvto‘sma). Among these, band is particularly productive and stable in its derivational and combinatory use (ko‘rband, g‘ishtband, xokband, nishband, chilband). Some terms reflect deep historical continuity in Uzbek (darak, dara/tara+k/q), while others demonstrate semantic shifts (sepoya — literally “three-legged support”).

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