SMALL HYDROELECTRIC POWER PLANTS IN AGRICULTURE

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Abstract: The integration of small-scale hydroelectric power plants in the agricultural sector has significant implications for sustainable energy production and efficient water management. This study explores the potential of small hydroelectric power stations to provide renewable energy to agricultural operations while also managing water resources for irrigation and other agricultural needs. The research examines the design, implementation, and operation of small hydro plants within the context of agriculture, focusing on capacity planning, site selection, environmental considerations, and the synergy between water and energy needs. By employing case studies and quantitative analyses, the study highlights the benefits of small hydroelectric facilities, such as reduced carbon footprint, decreased reliance on fossil fuels, diversification of energy sources, and enhanced water use efficiency. It also addresses the challenges faced by these installations, including ecological impacts, initial capital costs, regulatory frameworks, and technical expertise requirements.

Keywords: Small hydroelectric plants, agriculture, renewable energy, water management, sustainable development, rural electrification.

Basing on the relevance of BMI topic based on works, decrees, decisions of the President of the Republic of Uzbekistan, decisions and orders of the Cabinet of Ministers, scientific and technical literature, internet information. Modern new Uzbekistan developed energy to the system have Central Asia countries energy systems electricity energy work 50% of its output power is located in Uzbekistan, the government by until 2030 the country electricity energy with provision strategy adopted. This strategy from 2020 to 2030 the issue of electricity supply in the country in the period up tosets medium and long-term goals. Electricity until 2030 increasing power generation from 5900 MW to 29200 MW, electricity energy work in release natural gas spending 16.5 billion reduction from cubic meters to 12.1 billion cubic meters and electricity reduce transmission losses by 2.35%, and its distribution by 6.5% planned.

In concept the following directions priority as marked:

- modernization and reconstruction of existing power plants, electricity energy

work release according to energy efficient from technologies used without new electricity stations build;

- electricity energy account conduct system improvement;

- again renewable, micro HPP, the sun energy sources development; current in the development of renewable energy sources at the time electricity energy scarce has been regions energy supply to improve separately attention directed.

Hydropower development in 2020-2030 concept within Uzbekistan Republic electricity energy with to provide planned 62 project the work according to common power 1537 MW was 35 .

In general when in Uzbekistan energy projects cost seeing when released 21 766.2 million from dollars, HPP for - 2556.6 million the dollar organizeThe list of hydropower investment projects that can be developed 1.1- in the table given

in Uzbekistan development possible has been of GES investment list of projects work release powers (01.04.2021 year state)

Table 1.1

Project name	**Amount soum million**	**Submission Time**
Pskem in the river Pskemskaya Hydroelectric power station (400 MW)	862.4	2019 2024
Mullahaki Hydroelectric power plant (140 MW)	350.0	2020 2025
Verkhnepskemskaya Hydroelectric power plant (200 MW)	200.0	2023 2028
Aqbulok Hydroelectric power plant (60.0 MW)	160.0	2024 2027
the Chotkal River Hydroelectric power station construction (76 MW)	151.7	2020 2024
Collect Hydroelectric power plant modernization to do	84.5	2019 2022
Collect in the river Zarchob Hydroelectric power stations cascade (75.6 MW)	80.4	2017 2021
"Farhad HPP" DK modernization	72.4	2017 2021
Khangaron in the river Whip HPP (26.5 MW)	27.2	2017 2020
Lameness in the river Rabat Hydroelectric	25.3	-

power station construction 6 MWPower		
It has a capacity of 8MW on Aksuv river Chappasuyskaya Construction of hydroelectric power station	25.0	-
Akdaryo - Aksuv 10 MW in the river to power haveTamshush Hydroelectric power station construction	25.0	-
The cistern water in the warehouse small HPP construction	24.1	2020 2022
"Kamolot" HPP in the Chirchik-Bozsuv tract (8.2MW)	22.6	2017 2021
Dargom "Baghishamal" No. 2 on the channel HPPconstruction (6.45 MW)	21.7	2020 2022
Modernization of Samarkand HPP cascade to do (GES-2B)	21.7	2019 2021

That's it therefore too large, medium and micro HPPs design, new hydroelectric stations to build and work that they are standing modernization to do according to "Uzbekhydroenergo" shareholding society one series projects done is increasing. Throat water warehouse next to small HPP, Big Ferghana on the channel small Hydroelectric power stations cascade construction, Iron man in the river Construction of Kamchik small hydroelectric power plant, Zarchob small hydroelectric power plants on the Topolang river cascade to build these are is from Strategic important have has been mother somicro from hydroelectric power plants one Tashkent of the region "Camel Throat" water warehouse undersmall hydroelectric power plant construction in 2017 has started the project

It was implemented and commissioned by the "Hydroproyekt" company [3]. SHE ISper year 41.2 million kW.h electricity energy work emits "HPP project value15.8 million to the dollar equal to being from that 8.1 million dollar PRC "Eksimbank"funded by

This micro hydroelectric power station near the Tuyabogiz reservoir was completed in fourteen months finished. Before such facility set up reach for at least three year time spentwas Experts say that the total capacity of the hydroelectric power station is 11.4 MW. An average of 41.2 million kWh of electricity is produced per year, 1 the electricity needs of 1,600 households are fully provided, means That's it because of

exactly small HPP from using them necessary when autonomous in mode using the rest situations to the network electricity energy transmission for easy connections using.

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