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Land Use on Private and Federal Lend in the USA

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ABSTRACT

The article examines the specific features of land use on private and public lands in the USA, focusing on economic, environmental, and social aspects of resource utilization. It highlights the benefits and challenges of the market-driven approach to private lands (PL) and the advantages of centralized management of federal lands (FL). Examples of successful revenue redistribution and its impact on infrastructure development and ecosystem preservation are provided. The study emphasizes the need for a balanced approach combining market incentives with government regulations to achieve sustainable resource use.

Keywords: private lands (PL), federal lands (FL), land use, ecology, regulation, sustainability.

Introduction

Subsoil utilization is one of the major directions in socio-economic development of any country, involving resources necessary for industries, energy, and infrastructure projects. In the USA, having substantial reserves of natural resources, this process faces complications because of the variety of forms of land ownership. Private and federate ownership play different roles in resource management; each of them has specific advantages and limitations.

Private lands (PL) are usually characterized by greater flexibility in resource exploitation and their economic profitability due to market incentives. On the other hand, public lands (FL) are governed by a complex system of legislation and environmental standards, which provides a higher level of control over their use. An important issue remains the balance between sustainable development, economic interests and environmental protection under both property regimes.

Modern challenges, including climate change, depletion of natural resources, and increased public control over their use, require a detailed analysis of approaches to subsoil use management. Research into these processes on PL and FL reveals institutional, economic, and environmental differences that affect the efficiency of natural resource use. The purpose of this paper is to assess the impact of different ownership regimes on subsoil use in the USA and formulate recommendations for its sustainable management.

Main part. Overview of land ownership regimes in the USA

The land ownership system in the USA is a complex interaction of private, state, and public interests. Private property, as enshrined in the Constitution, grants owners extensive rights, including mineral extraction, agricultural use, and development. The market orientation of such lands makes them attractive to mining companies, but the lack of strict control often leads to environmental consequences. For example, in the Appalachian Mountaintop Removal Mining industry, coal mining causes ecosystem destruction and water pollution [1].

On the other hand, state property land use is guided by a balance between economic and environmental interests. The Government Accountability Office reports that the federal government owns and manages about 650 million acres of land in the USA, which is about 30% of the country's total land area. Most of these lands are managed by four large FL management agencies: the Forest Service, the Bureau of Land Management (BLM), the Fish and Wildlife Service (FWS), and the National Park Service (NPS) that together control roughly 95% of FL [2]. These lands have tightly regulated uses of their resources, including oil, gas, and rare earth metal production. For example, the Prudhoe Bay Oil Field, which is the largest in North America, happens to be on the North Slope of Alaska. A combination of royalty, tax, and other revenues from oil extraction is shared between different stakeholders. The production and property taxes and royalties mean Alaska accrues quite a considerable revenue that is shared among different state funds and services. This financial structure played a major role in financing state operations, infrastructural, and governmental programs [3].

The legal framework regulates differences in governance. The Mineral Lease Act of 1920 provides for licensing of mining on FL, while private owners manage resources independently, subject to local environmental regulations [4]. This decentralization makes business easier, but can lead to insufficient environmental protection.

Private property is oriented towards market mechanisms, which increases economic efficiency, but requires increased regulation. State property, on the contrary, ensures environmental sustainability through centralized control, although it reduces flexibility. Thus, the combination of market incentives of private property and state regulation allows for the optimization of the use of natural resources, ensuring a balance between economic efficiency and environmental responsibility.

Economic impact study

The economic impact of mining on PL and FL in the USA plays an important role in the sustainable development of the economy and social infrastructure. PL demonstrate high economic efficiency due to the market orientation of owners. For example, in the Powder River Basin coal field (Wyoming and Montana), companies enter into agreements with PL owners, paying royalties and lease payments, which stimulates the expansion of mining areas in conditions of high demand [5]. However, this model is often accompanied by environmental challenges that require increased control. FL, by contrast, are managed with environmental and social considerations in mind. Lease and royalty revenues are redistributed to public use, including funding for education and infrastructure. For example, in Wyoming, revenues from coal mining on FL are used to develop regional projects. In 2024, federal lease revenues from FL were about $14 billion, much of which was invested in development programs (table 1).

Table 1 - Federal revenues from various sources for fiscal years 2023 and 2024 [6]

Category	**FY 2023**	**FY 2024**	**Change**
Rents and royalties	$15316 billion	$14449 billion	$ -866 billion
Onshore lease sales	$111 billion	$161 billion	$50 billion
Offshore lease sales – oil & gas	$271 billion	$397 billion	$126 billion
Offshore lease sales – renewable energy	$587 billion	$4 billion	$ -582 billion
Other revenues	$24 billion	$26 billion	$2 billion
Total custodial revenue	$16309 billion	$15040 billion	$ -1269 billion

Comparison of economic efficiency PL and FL reveal significant differences. On PL, resource exploitation is often characterized by higher speed and volumes of extraction due to minimal bureaucratic barriers. However, this can lead to overexploitation and resource depletion, which highlights the need for additional regulation. At the same time, on FL, strict environmental protection requirements are observed, which slows down the extraction processes but ensures more sustainable resource exploitation [7].

Fiscal policy also plays an important role in subsoil use. On PL, the tax system stimulates developers through preferential rates and deductions. At the same time, state lands bring in a stable income in the form of royalties, which are distributed between different levels of government. This helps to minimize regional disparities and support the development of remote and underdeveloped regions.

Thus, the economic impact of subsurface use in the USA is determined by the balance between private and public interests. The economic efficiency of PL makes them attractive to investors, while FL provide more sustainable development and a fair distribution of income. Optimizing the management of both types of property requires an integrated approach that takes into account both market and public interests.

Environmental and social aspects

The environmental and social aspects of mining on PL and FL in the USA vary significantly depending on the governance arrangements and the extent of responsibility of owners and government entities. PL are characterized by high resource intensity, which is associated with a focus on profit, while FL provide a more balanced approach through strict controls and environmental standards.

Environmental impact on PL is often associated with poor environmental management. The USA is the world leader in oil and natural gas production, thanks to advances in extraction technologies including horizontal drilling and hydraulic fracturing, and the development of resource-rich regions such as the Permian Basin. The most common environmental impact is methane (CH4) emissions, which form one of the significant environmental problems associated with oil and gas production (fig. 1).

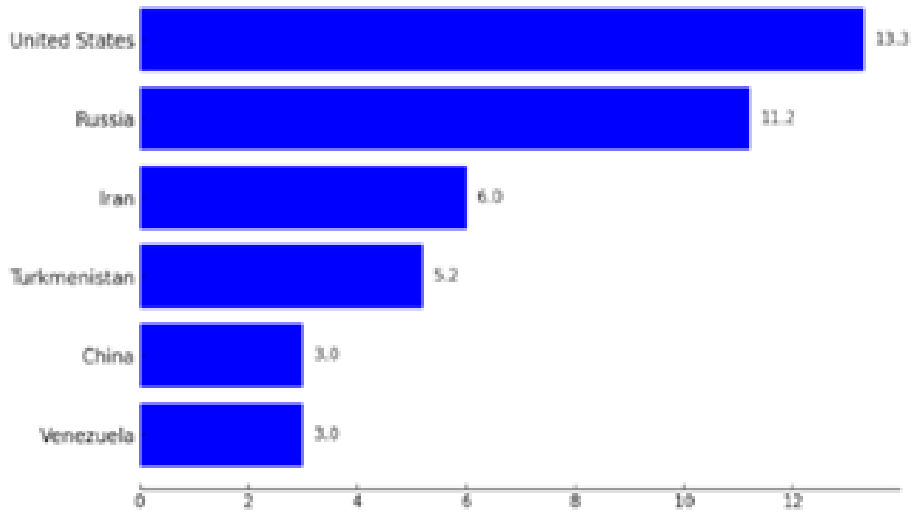

Fig. 1 - methane (CH4) emissions from oil and gas production worldwide in 2023, by select country, million metric tons [8]

However, as exemplified by the development of oil and gas in the Permian Basin in Texas and New Mexico, where a significant portion of the sites are privately owned, there are problems such as methane emissions and groundwater pollution. Although modern technologies, including emissions monitoring, are being actively implemented, private companies often focus on minimizing costs, which can reduce environmental responsibility [9].

Social aspects of mineral use differ between private and FL. On PL, the benefits accrue primarily to the owners, which can ignore the interests of local communities and cause social tensions. For example, shale gas extraction in Pennsylvania has worsened the quality of drinking water, causing protests from residents. On FL, revenue redistribution, for example through the Land and Water Conservation Fund, is aimed at social needs: the creation of parks, infrastructure development, and conservation, which improves the quality of life.

Regulatory systems differ: private landowners are required to meet minimum federal environmental standards, while FL are managed by agencies like the BLM, which conduct environmental assessments and public hearings before mining begins. This makes FL more sustainable to manage. PL require more regulation and social incentives.

Institutional and political differences

Institutional and political differences between private and FL in the USA are due to different approaches to governance, financing, and regulation. Private property, being integrated into a market economy, supports the autonomy of owners in decision-making. At the same time, public property is managed through specialized agencies, which ensures centralized control and consideration of public interests.

Institutional differences manifest themselves in resource management systems. On PL, owners have the right to independently determine the strategy for using their lands, including the development of minerals. This allows for a quick response to changes in market conditions, but can lead to insufficient coordination between owners and government regulators.

On FL, management occurs through agencies such as the BLM and NPS. These agencies develop long-term plans for resource use, including environmental impact assessments and public hearings.

Political differences are determined by the level of government involvement. On PL, federal regulation is limited to minimum requirements, such as safety standards and environmental regulations. However, in cases involving FL, federal and local government policies play a key role. For example, federal land leasing policies often give rise to disputes between economic and environmental interests.

Thus, state ownership provides a systemic approach to management, including consideration of environmental, social and economic factors. At the same time, private ownership demonstrates flexibility and economic efficiency, which requires balanced regulatory mechanisms to prevent conflicts between private and public interests. Optimization of management is possible through the integration of the best practices of both systems, including increased coordination between owners, government agencies and local communities.

Conclusion

Mining on PL and FL in the USA reflects a balance of economic, environmental, and social interests. Private ownership provides high economic efficiency through market incentives but comes with environmental risks, such as ecosystem destruction and water pollution from coal mining in Appalachia.

Federal land is characterized by strict regulation, which promotes sustainable use of resources. Revenues from mining, for example on Alaska's North Slope, are redistributed into social and environmental programs, promoting infrastructure development and conservation. The Mineral Leasing Act (1920) regulates mining on FL, while PL require increased monitoring to reduce environmental impacts.

For sustainable development, it is important to combine market mechanisms of private property with centralized regulation of state lands, creating a balance between benefit and responsibility.

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