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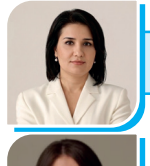

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IMPROVING THE EFFICIENCY OF FINANCIAL RESOURCE ALLOCATION FOR FUNDING CIVIL SOCIETY INSTITUTIONS THROUGH ARTIFICIAL INTELLIGENCE TECHNOLOGIES

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Abstract. This article examines how artificial intelligence can improve the efficiency of financial resource allocation to civil society institutions. Using official data from Uzbekistan's 2026 state grant competitions, the study assesses funding coverage, reviewer workload, and allocation risks. A human-in-the-loop model encompassing needs mapping, application screening, scoring support, monitoring, and outcome-based learning is proposed. Three practical recommendations focus on data management, governance, and phased implementation.

Keywords: civil society institutions, non-governmental non-profit organizations, artificial intelligence, machine learning, resource allocation, allocation efficiency, state grants, grant competition, social order, decision support system, human-in-the-loop, algorithmic fairness, explainability, data governance, needs assessment, outcome monitoring, digital government, public fund, Uzbekistan.

Аннотация. В статье рассматриваются возможности применения искусственного интеллекта для повышения эффективности распределения финансовых ресурсов, направляемых на финансирование институтов гражданского общества. На основе официальных данных о конкурсах государственных грантов в Узбекистане за 2026 год оцениваются охват финансированием, нагрузка на экспертов и риски распределения ресурсов. Предлагается модель с участием человека в процессе принятия решений (human-in-the-loop), охватывающая определение потребностей, предварительную проверку заявок, поддержку оценивания, мониторинг и обучение на основе достигнутых результатов. Сформулированы три практические рекомендации, направленные на совершенствование управления данными, механизмов управления и поэтапного внедрения предложенной модели.

Ключевые слова: институты гражданского общества, негосударственные некоммерческие организации, искусственный интеллект, машинное обучение, распределение ресурсов, эффективность распределения, государственные гранты, грантовый конкурс, социальный заказ, система поддержки принятия решений, участие человека в процессе принятия решений (human-in-the-loop), алгоритмическая справедливость, объяснимость, управление данными, оценка потребностей, мониторинг результатов, цифровое государственное управление, общественный фонд, Узбекистан.

INTRODUCTION

Civil society institutions deliver services, voice public concerns, and monitor public bodies, but their capacity to perform these functions depends on how financial resources are allocated to them. Grant allocation is essentially an information problem: funders must assess needs, compare proposals, verify eligibility, and monitor results with limited staff resources. Evidence from research funding illustrates the challenges associated with expert review: reviewers assessing the same applications submitted to the United States National Institutes of Health demonstrated agreement only marginally better than chance [5]. Artificial intelligence (AI) offers tools to reduce these information costs, and some funders have already begun using them. The La Caixa Foundation, which distributes approximately €145 million annually, used a trained AI model to screen applications submitted to a biomedical funding call, while two human reviewers examined every rejection [6]. At the same time, the EU Artificial Intelligence Act classifies AI systems used to determine access to essential public benefits as high-risk and requires human oversight [2]. The experience

of these pioneering organizations demonstrates the growing importance of establishing appropriate rules and safeguards for the use of AI in grantmaking.

In Uzbekistan, this issue has gained practical significance. More than 10,400 non-governmental non-profit organizations (NGOs) are registered in the country [10]. In 2026, the Public Fund under the Oliy Majlis announced three state grant competitions with a planned budget of approximately UZS 40.4 billion, with all stages conducted through the ngo.gov.uz platform [7-9]. For the first time, the digital platform provides a structured record of applications and results, while a law regulating the use of AI was signed in January 2026 [1]. Nevertheless, allocation decisions continue to rely on manual procedures: a limited pool of experts reviews each application, priorities are determined through field visits, and the results of funded projects are not yet systematically incorporated into subsequent funding rounds.

Research on this topic has developed unevenly. International studies have examined grant review, machine learning in public policy, and algorithmic fairness separately, but have rarely considered their application to funding civil society organizations in a transition economy. In Uzbekistan, state support for civil society has primarily been examined from legal and institutional perspectives, while the data generated by the new digital platform have not yet been systematically explored as a basis for resource allocation decisions. The research problem, therefore, concerns how these data and AI tools can be used to improve the targeting of limited public funds while maintaining the legitimacy of allocation decisions. The aim of this study is to assess the efficiency of the current resource allocation process and propose an AI-supported model for its improvement while preserving fairness, transparency, and human accountability.

LITERATURE REVIEW

Three strands of research provide the theoretical foundation for this study. The first concerns the reliability of expert review. The low level of agreement among reviewers [5] indicates that grant allocation decisions may involve considerable variability, which can be reduced through improved information quality and structured evaluation criteria. The second strand identifies areas in which machine learning can provide added value. Kleinberg et al. [3] introduced the concept of “prediction policy problems,” in which public decisions depend primarily on predicting an outcome, such as whether an application meets eligibility requirements or whether a project is at risk of failure. The third strand addresses the risks associated with algorithmic decision-making. Obermeyer et al. [4] demonstrated that an algorithm used to allocate healthcare resources produced biased outcomes because it relied on historical spending as a proxy for actual need. Similarly, a grant allocation model trained on previous funding decisions could favour experienced organizations over those demonstrating the greatest need. Regulatory frameworks address such concerns by requiring human oversight, documentation, and the right to an explanation in high-risk applications [2]. Taken together, these strands of research support a hybrid approach in which AI assists and verifies human decision-making rather than replacing it.

These research perspectives also help identify tasks suitable for automation. Repetitive, rule-based, and text-intensive activities, such as document verification, duplicate detection, and proposal summarization, can be supported by AI with relatively limited risk because potential errors can be identified and corrected. Tasks involving value judgments, such as determining whether support for people with disabilities should take priority over environmental projects in a particular district, require human decision-making because there is no single objectively correct answer for a model to learn. Between these two categories are predictive tasks, such as estimating territorial needs or assessing the likelihood of project failure. In these cases, AI can provide useful analytical evidence, but its outputs must be evaluated for potential bias.

RESEARCH METHODOLOGY

The study uses official data on the 2026 grant competitions [7-9] and the NGO sector [4]. Funding coverage and competition intensity were calculated using the formulas $C = G / N$ and $R = G / A$, where G represents the number of funded projects, N is the number of registered NGOs, and A is the number of applications. Expert workload was estimated using the formula $H = A \cdot e \cdot t$, where e represents the number of experts assigned to each application and t denotes the review time per expert. Because application-level data are not publicly available, the workload parameters are based on assumptions, and the scenario provides an approximate estimate rather than an exact measure of potential savings.

The resource allocation cycle was analysed stage by stage to identify sources of efficiency losses and determine which tasks could be supported by AI. Five stages were distinguished: needs mapping, application screening, assessment and selection, monitoring of funded projects, and learning from results. For each stage, the study identified current practices, sources of efficiency losses, AI functions that could address them, and

the individuals or bodies responsible for retaining final decision-making authority. The proposed safeguards were then compared with the requirements of Uzbekistan's 2026 AI law and international practices governing high-risk AI systems.

Artificial intelligence (AI) tools were used to a limited extent, accounting for approximately 10% of the overall research preparation process. Their use was primarily confined to language refinement, technical editing, and structural support. The selection of research methods, analysis and interpretation of findings, formulation of scientific conclusions, and development of recommendations were carried out independently by the author. The author assumes full responsibility for the accuracy, originality, and scientific integrity of the research.

ANALYSIS AND RESULTS

Funding coverage. The two completed competitions received 1,643 applications, of which 234 projects were selected or planned for funding, representing a success rate of 14.2%. Relative to the 10,400 registered NGOs, funding coverage amounts to only 2.3%. With an average project cost of approximately UZS 142 million, the key question concerning allocation efficiency is not merely how much funding is distributed, but whether the selected 14% of applications correspond to the most appropriate projects.

The regional situation further illustrates this issue. In Andijan region, where more than 600 NGOs operate, the Fund financed 11 projects during 2023–2024 and 10 projects in 2025 [10]. This indicates that approximately 2% of the region's organizations received a Fund grant in a given year. Under such selective funding conditions, the accuracy of allocation decisions becomes particularly important, as each decision affects the availability of resources for other projects that could address priority needs (Table 1).

Table 1
Indicators of the 2026 state grant competitions

Competition	Applications	Projects	Budget, UZS bn
First	943	146	21.7
Second	700	88	11.6
Third (announced)	—	—	≈7.1
Total	1,643	234	≈40.4

Source: authors' compilation based on [7-9].

Sources of Efficiency Loss. At the needs-mapping stage, competition priorities were established after a working group examined more than 600 social problems through field visits [9]. Although this approach is valuable, it requires considerable resources and is difficult to replicate in each funding round. At the screening and assessment stages, experts review large numbers of diverse proposals. Evaluation criteria, such as alignment with local needs, social significance, population coverage, and expected results, are applied [7], although their relative weights and the reasons for rejection are not publicly disclosed. At the monitoring stage, reports are collected but are not systematically linked to subsequent selection decisions, limiting the system's ability to identify which criteria are associated with successful outcomes. Each of these areas presents opportunities for improving efficiency through AI-supported processes (Table 2).

Table 2
Efficiency losses and AI support functions in the allocation cycle

Stage	Efficiency loss	AI support function
Needs mapping	Costly, infrequent field visits	Territorial need index from open data and citizen appeals
Screening	Expert time spent on ineligible or duplicate applications	Eligibility, completeness and duplicate checks
Assessment	Low agreement among experts; weights not published	Structured summaries; consistency alerts
Monitoring	Late detection of problems	Anomaly detection in reports and spending
Learning	No feedback to selection	Testing which criteria predict results

Source: authors' analysis.

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The table demonstrates that AI is most useful for repetitive, text-intensive tasks and for identifying patterns in large datasets. It is less appropriate for decisions involving choices between social priorities, where its role should be limited to providing supporting evidence.

Workload Scenario. In the baseline scenario, each of the 1,643 applications is reviewed by three experts for two hours, resulting in approximately 9,858 expert-hours. In the AI-supported scenario, automated screening flags 30% of applications, with each flagged application reviewed by two individuals for 30 minutes, following the practice adopted by the La Caixa Foundation [6]. AI-generated summaries also reduce the time required to review each application to 1.5 hours (Table 3).

Table 3
Scenario estimate of expert workload

Indicator	Baseline	AI-supported
Applications passed to full review	1,643	1,150
Review time per application, hours	2.0	1.5
Total expert-hours, incl. checks	9,858	5,668

Source: authors' calculations; parameters are assumptions.

Under these assumptions, AI support reduces expert review time by approximately 42%, or about 34% if only 15% of applications are flagged. The primary benefit is not merely cost reduction but the opportunity for experts to focus on comparing high-quality projects and providing clear explanations for their decisions.

A Human-in-the-Loop Model. Based on these findings, a five-stage model is proposed, comprising needs mapping, application screening, scoring support, monitoring, and outcome-based learning. AI generates supporting evidence rather than making final decisions. The weights assigned to evaluation criteria are established transparently by the expert panel and approved by the parliamentary commission. Every negative automated assessment is reviewed by a human expert, applicants receive explanations based on the established criteria, and outcome data are incorporated into subsequent funding rounds. Because project outcomes are observed only for funded projects, the Fund can periodically finance a small random sample of projects scoring just below the selection threshold. Comparing their results with those of selected projects would help determine whether the evaluation criteria accurately predict project success (Figure 1).

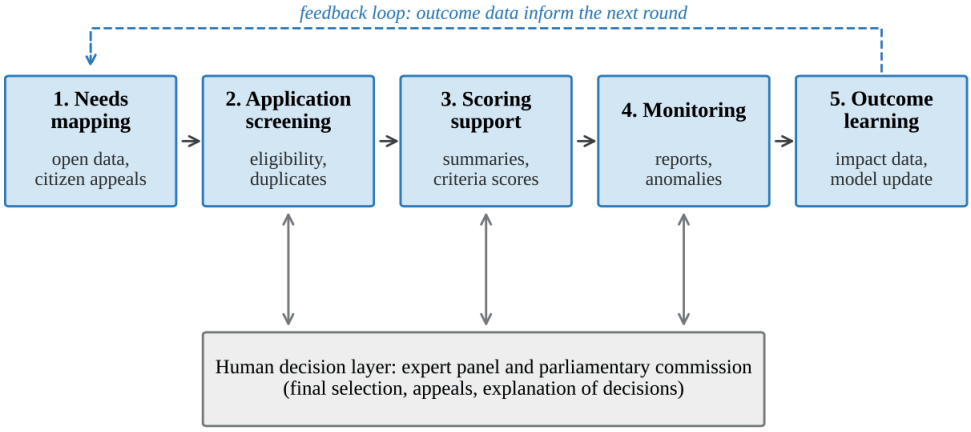

Figure 1. Human-in-the-loop model of AI-supported allocation of funds[1]

Risks and Safeguards. The most significant risk is proxy bias: a model trained on historical funding decisions may reproduce existing allocation patterns [10] and potentially disadvantage small rural organizations. This risk can be mitigated by incorporating independent indicators of need and conducting annual fairness audits of funded projects by region and organization size. The second risk is a lack of transparency, which can be addressed through criterion-level explanations and the right to human review and appeal, in accordance with international practices governing high-risk AI systems [2]. The third risk is excessive reliance on automated

1 Source: authors' development.

scores, which can be mitigated by presenting AI-generated results to experts only after they have completed their independent assessments.

Data protection practices must comply with Uzbekistan's 2026 AI law, which introduces administrative liability for the unlawful processing of personal data using AI [8]. Another potential risk is strategic behaviour: once applicants understand which characteristics the model rewards, they may tailor their proposals to algorithmic criteria rather than actual needs. This risk can be reduced by limiting the disclosure of technical model details, verifying key claims through field assessments, and retaining final decision-making authority with human experts.

To ensure the practical implementation of these safeguards, the pilot phase should assess not only time savings but also the level of agreement between AI-supported and independent expert assessments, the proportion of automated rejections overturned following human review, and the distribution of funded projects by region and organization size.

Theoretical Interpretation. The findings support the view that, once a grant allocation system has been digitized, the primary constraint on efficiency becomes informational rather than financial. With funding coverage of 2.3% and an application success rate of 14%, the quality of project selection largely determines the social return on public funding. According to the framework proposed by Kleinberg et al. [3], predicting eligibility, territorial needs, and project risks represents a set of prediction problems well suited to machine learning. In contrast, determining which social objectives should receive priority is a normative decision that must remain the responsibility of accountable public bodies.

The proposed model translates this distinction into a practical division of responsibilities between AI systems and human decision-makers. Safeguards derived from regulatory practices [2] help ensure that improvements in allocation efficiency are achieved while maintaining fairness and protecting applicants' rights to understand and contest decisions.

Practical Significance. For the Public Fund, the proposed model provides a low-risk approach to AI implementation, beginning with eligibility verification and application summarization before progressing to scoring support once system performance has been evaluated. For the platform operator, it identifies the standardized data that need to be collected. For legislators, it highlights the importance of complementing Uzbekistan's 2026 AI law with provisions governing explanations and appeals in public fund allocation.

For small and regional NGOs, the proposed needs index and fairness audit can help balance the advantages of more experienced applicants. More broadly, the approach could subsequently be extended to social orders commissioned by ministries and regional budgets supporting civil society initiatives, thereby establishing a common evidence base for public funding across the sector.

CONCLUSION AND RECOMMENDATIONS

Uzbekistan's system of support for civil society institutions has been digitalized, while resource allocation continues to rely on manual processes and available information. In 2026, 234 out of 1,643 applications were selected for funding, representing approximately 2.3% of registered NGOs. AI-supported screening and summarization could reduce expert review time by approximately 42%, provided that final decision-making authority remains with accountable human experts. Based on these findings, three proposals are presented.

1. Standardize data on the ngo.gov.uz platform. Establish a unified data model for applications, assessments, and results, incorporating standardized outcome indicators. Publish anonymized competition data, including scores by criterion, reasons for rejection, and project results, as open data. Such a framework would enable AI tools to operate on more complete and consistent information.

2. Adopt rules governing the use of AI in allocating public funds to civil society institutions. Ensure that every decision affecting an applicant is made by a person, every automated rejection is reviewed by responsible staff, and applicants receive explanations and have the right to appeal. An independent fairness audit should be published annually, while the weights assigned to evaluation criteria should be transparently approved by the parliamentary commission.

3. Introduce AI support in phases. Initially, pilot eligibility checks, duplicate detection, and application summarization in one competition, comparing the results with a control round. Subsequently, introduce a territorial needs index. Finally, apply anomaly detection and outcome data analysis to assess which evaluation criteria are associated with successful project outcomes.

These measures would transform the platform from an application submission channel into a decision-support system that enables more targeted allocation of public funds to priority needs while strengthening trust through transparency and human accountability.

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