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Ways to Improve the Efficiency of Housing Stock Management

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Abstract: This scientific article shows the existing problems in the management of the housing stock and ways to eliminate them, the peculiarities of the effectiveness of the management of the housing stock. The field of housing stock management is highlighted in ways to improve management efficiency, taking into account the peculiarities of the field of services from other branches, as well as the variety of views on socio-economic relations.

Keywords: housing fund, living standards of the population, housing and communal services, services, multi-apartment houses, residential buildings, housing demand, housing stock management, management efficiency, management methods, management mechanism, management companies.

Introduction. From the experience of developed countries, it is known that the sphere of management of the housing stock differs from other branches of the service sphere in its specifics and socio-economic relations with different nebulosity of participants. Because on the one hand, the industry is engaged in the creation and supply of vital services to consumers on the basis of market relations, on the other hand, the services created have the property of recreating the ability of consumers to work on the basis of meeting their social needs.

As a result of the reforms carried out in the field of housing stock management in our country in recent years, enterprises of the industry have been integrated into the structure of one whole system, by which the supply of quality services to the population is established as the main goal of the reforms.

Taking into account the degree of interconnection of indicators in the form of statistics related to the field of housing stock management, the processes carried out in the field in our country can be brought to the appearance of trends using econometric models, and these trends make it possible to determine the directions and forecasts of processes for the coming period.

In the conditions of modernization of the national economy and its industries, the services provided by housing stock management companies are expressed in the form of a unique complex dynamic system, in which many economic entities operate simultaneously and a multi-directional set of interactions is carried out between them.

At the same time, each economic entity operating in the industry seeks its goals and has the interests of entrepreneurial activity in this area.

The management of the housing stock is the most important component in the system of ensuring the life of citizens by companies, covering almost all the population of the country, and in this regard, it is the only one that seriously affects all aspects of life among other sectors of the entire economy. The housing

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stock management sector is an important branch of the national economy and includes enterprises that carry out clearly defined types of activities in the following areas: enterprises providing housing stock Services (housing stock maintenance and service; enterprises providing utilities (Heat Supply, hot water supply and sewerage, implementation of energy saving measures); enterprises providing improvement services (Road covers, corridors, corridors, Bridge Storage, roads, conductors, green spaces, street outdoor lighting, removal and disposal of solid household waste); enterprises providing non-waste types of household services to the population.

As a result of the development of market relations and the strengthening of conditions of uncertainty as the main negative factor in the transition to a market economy, housing stock management creates financial risks of various manifestations in the activities of companies. Therefore, conducting scientific research on improving the effectiveness of housing stock management always retains its relevance.

Analysis of thematic literature. When determining the effectiveness of Management in the field of housing fund, it is necessary to correctly consider the relationship with the uncertainty associated with the costs of maintaining the housing fund or the likelihood of unfavorable results for enterprises and end users of Housing and communal services associated with housing maintenance activities.

Russian economist A.R.Abdullina believes that "housing and communal services" - the necessary autonomy infrastructure of the economy is considered and interpreted as one of the main sectors that provide the population with vital services. At the same time, housing and communal services are defined by the researcher as follows: "housing and communal services are the sum of the areas that provide the activities of the autonomy infrastructure in various settlements, providing living facilities to citizens through the provision of comprehensive housing and communal services." [1] this interpretation can also be seen in the strategy for the development of Housing and communal services of the Russian Federation until 2020.[2]

E.M.Chernyaeva's theoretical research defines the term as: "housing and communal services – cold and hot water supply of Housing and communal enterprises by Public Administration and local self-government, sewage removal and treatment, power supply, natural gas supply and heating, domestic waste removal, maintenance and repair of residential buildings and their surroundings, cleaning streets, roads and squares, roads, sidewalks, bridge construction and repair, street lighting, at the same time, it is an area of economic activity that carries out its reliable and sustainable activities, providing comfortable living conditions in residential buildings for citizens in the direction of greening the territories."[3]

In the work of some researchers, the housing and communal services sector is interpreted as a mixed social blessing of high social importance, with characteristics that have the effect of indivisibility and non-selection, collaborative consumption, technical and economic exclusion from consumption, tightness and generalization over the long term.[4]

There are different methodological approaches to the issue of determining the effectiveness of the housing and communal services sector. Some approaches see increasing the efficiency of the industry with relatively low funds and rational use of available resources with labor costs in more fulfilling the needs of consumers with a relatively higher quality of Service.[5]

For Example, V.Chernyak defines the effectiveness of Housing and communal services not only in strengthening the volume of financing and the material and technical base through the introduction of additional tools, but also in saving costs while maintaining or increasing the quality of services.[6]

Yu.Simionov's research shows that the first of the main tasks of economic analysis of the activities of enterprises of Housing and communal services is the calculation of determining the economic efficiency

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of labor resources, material resources and financial resources, and, in turn, determining internal resources in improving the efficiency of activities.[7]

Researcher R.F.Gataullin believes that the efficiency of services is achieved when the results (revenues and volumes – for private individuals and for public goods) are equal to or exceed the minimum costs. [8] in addition, he notes that in areas where paid and free services are combined (education, health, utilities, etc.), the indicator of their profitability does not characterize the effect.

In recent years, modern innovative approaches to modernizing the housing and communal services system have been increasingly used in many developed countries. The introduction of such approaches will help to rapidly change the material and technical base of the housing sector, modernize and increase the housing stock, attract private investments, expand the use of innovative technologies and organizational and managerial mechanisms of interaction of economic subects in this area, improve the types of Housing and communal services provided and taking into account their quality parameters.[9]

When deducted from the total income of homeowners or renters, the amount of taxes paid first, followed by savings, increases the share of spending on housing utilities. In the European Union, consumer spending accounts for 75-80% of the total income of owners or tenants of residential buildings, so their share of spending on housing and communal services does not exceed 15%. For the United States, the ratio of Housing and communal services to the income used by owners or tenants of residential buildings was 19%, and taxable income was only 15%, which is much lower than 21%.[10]

In the process of reforming the housing and communal sphere, difficulties and conflicts of an economic and spiritual-psychological nature are encountered in all countries. One of the main problems of these problems is the regular increase in tariffs for housing and communal services for the population. At the initial stage of structural changes in the industry, tariffs for services from many countries were coordinated by the state, while the cost of the population in this direction increased even higher than the prices of the total consumption index and Real income. In recent years, there has been a trend of change in this situation, that is, the rate of tariff growth has slowed, there has been a trend of growth in the dynamics of Real incomes of the population.

Research methodology. The paper made extensive use of scientific study and inference, comparative comparison, statistical data study and economic comparison and analysis, logical reasoning, scientific abstraction, analysis and synthesis, induction, and deduction methods of improving the efficiency of housing stock management.

Analysis and results. Defining the housing stock total area indicator as a consequential factor, we define a link that represents the impact of investments on changes in the total housing stock area. The housing stock total area indicator, on the other hand, is defined as a factor affecting the change in the volume of consumption of the next 4 municipal resources.

The construction of a trend model of one-dimensional rows of non-random components of time rows is carried out in several stages: the analysis of time rows aprior (not based on experience); checking the estimate (hypothesis)about the presence of a trend in the studied time row; determining the main change feature and parameters of the model being determined; analysis of random participants (components);

At the next stage of Trend Analysis, the hypothesis about the existence of a trend is investigated. There are many criteria that differ in the capacity and complexity of the mathematical apparatus to verify the presence of a trend in the time series indicators under consideration. These criteria make it possible to determine the general trend in the development of the main indicators of the housing and communal services industry over time, as well as the trend by species-the average and dispersion trend.

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One of the techniques that allows you to determine the presence of a trend in a trend is the cumulative T-criterion. This method, on its basis, covers the calculation and analysis of the statistical description of the Yi series levels, calculated by the accumulated sums of deviations from the average of Y and the ratio between these deviations. The hypothesis is advanced that there may be no T-criterion-checked trend in the temporal series we are analyzing. The hypothesis that there is no trend on the basis of the data obtained on the time series of indicators of the housing and communal services sector is rejected, which means that there are general trends in the time series we are studying.

Trend models have been developed on variations of the six main indicators listed in Table 1 using polynomials of varying degrees through an analytical smoothing method to describe the trend of housing utility industry indicators.

The choice of the link form of the models can be made on a criterion taken as the sum of the squares of deviations of the factual values from the values calculated according to the trend equation. From within a set with a linear linkage, the minimum value of the criterion is chosen to correspond.

Table 1. Indicators for improving the efficiency of housing stock management are the state of detection based on trend models

№	Specification	Model
1.	The volume of investments in real estate, billion. Soum	$x_{кми} = 231,03 \cdot t - 210,36$
2.	The total area of the housing stock is, with an area of. м^2	$x_{уфм} = 460,611 + 0,047 \cdot x_{кми}$
3.	The volume of electricity transmitted to the consumption of the population, million. kWh	$y_{ээх} = 18,04 \cdot x_{уфм} + 3577,08$
4.	The volume of natural gas transferred to the consumption of the population, million.м^3	$y_{тгх} = 18105,09 - 16,97 \cdot x_{уфм}$
5.	Volume of heat energy transmitted to population consumption, thousand kcal	$y_{иэх} = 9771,84 - 3.72 \cdot x_{уфм}$
6.	The volume of drinking water transferred to the consumption of the population, million.м^3	$y_{исх} = 1721,59 - 1,66 \cdot x_{уфм}$

Thus, the chosen link of the trend should satisfy the following conditions:

- that the link is theoretically justified;
- to have as few parameters as possible;
- that its parameters have a clear economic content;
- the accounting values of the trend, according to their set, should differ as little as possible from the corresponding actual observations of the periodic series.

The mean error of approximations indicates how closely the analytic function of smoothing rotates the initial series values. The results of the calculations of the values of the accuracy and adequacy criteria for the time series of the main indicators of the housing and communal services sector of the module of average residues, the average error of approximations, the Darbin-Watson criterion are presented in Table 2.

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Table 2. The main descriptions of the adequacy of trend models of the main indicators affecting the effectiveness of management of the housing stock

Specification	The Shakli model	Model	R^2	Fisherm ezoni, F
The volume of investments in real estate, billion. Soum	linear	$x_{кми} = 231,03 \cdot t - 210,36$	0,714	9,99
The total area of the housing stock is, with an area of. m2	linear	$x_{уфм} = 460,611 + 0,047 \cdot x_{кми}$	0,738	11,25
The volume of electricity transmitted to the consumption of the population, million. kWh	linear	$y_{ээх} = 18,04 \cdot x_{уфм} + 3577,08$	0,633	2,67
The volume of natural gas transferred to the consumption of the population, million. m3	linear	$y_{тгх} = 18105,09 - 16,97 \cdot x_{уфм}$	0,478	1,18
Volume of heat energy transmitted to population consumption, thousand kcal	linear	$y_{иэх} = 9771,84 - 3.72 \cdot x_{уфм}$	0,402	1,11
The volume of drinking water transferred to the consumption of the population, million. m3	linear	$y_{исх} = 1721,59 - 1,66 \cdot x_{уфм}$	0,962	102,8

After the main indicators for improving the efficiency of housing stock management are proven to have a trend in their time rows, a trend description is carried out using a mathematical function. The Trend equation is chosen in such a way that it must best approximate the real existing trends and patterns of change in the field indicators. The use of exponential smoothing in this area also gave good results.

Trend models have been developed using polynomials of varying degrees through an analytical smoothing method to describe the trend of performance improvements in housing stock management.

The dynamics of the change in the period 2013-2021 of the calculated indicators for the application of the indicator of the volume of investments in real estate affecting the change in the total area of the housing fund in the field of Housing and communal services is presented in Figure 1

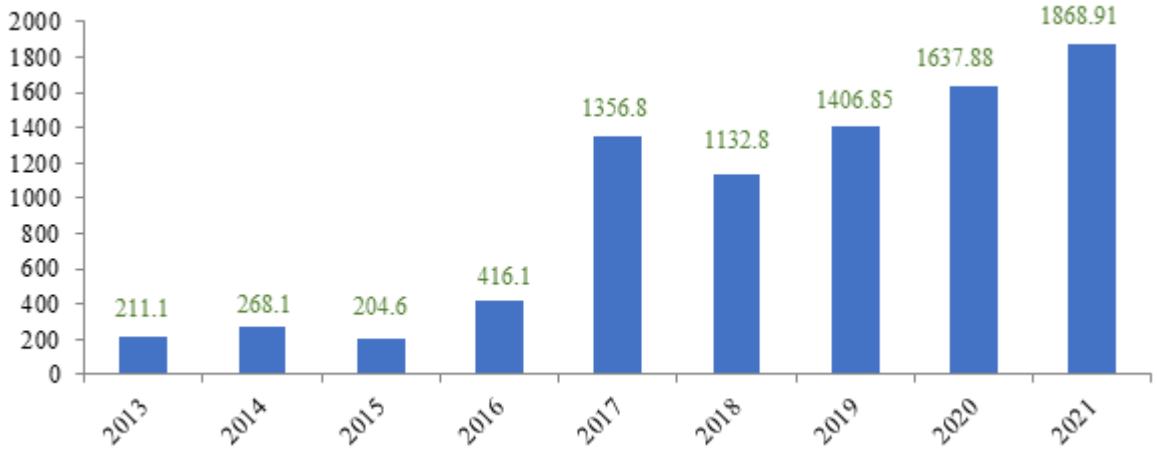

Figure 1. The volume of investments in real estate in the field of Housing and communal services (crore. Soum).

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As can be seen from this picture, the volume of financial resources allocated from various sources for the construction and renewal of real estate (funds of enterprises and organizations, bank loans, other borrowed funds, population funds, foreign investments and loans, as well as state budget funds) is in reality growing regularly, year after year.

The total area of the housing stock was steadily increasing depending on the investments included as well as other factors (457.9 million in 2013). m2 to 533.3 million in 2018. m2), showing that trend-based perspective indicators will grow steadily in the near future, i.e. in 2019-2021, this indicator will grow in linear bonding (Figure 2).

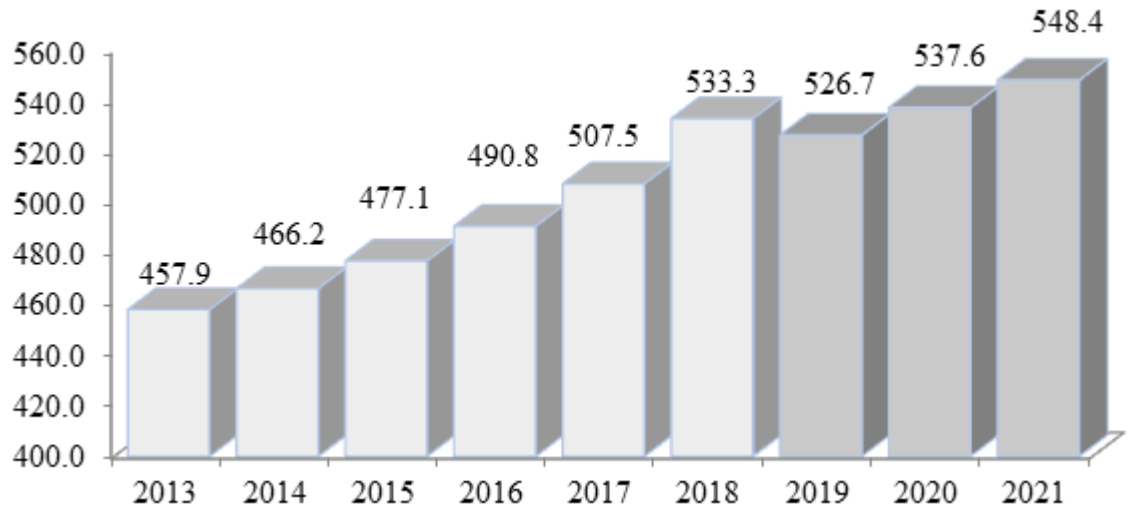

Figure 2. The dynamics of change of the total area of the housing fund in the Republic of Uzbekistan (mln. m2).

As a result of a steady increase in the Real income of the population, as well as the growth of various social needs, it is expected to increase from year to year even in the volume of electricity transmitted to the population of the total production (figure 3).

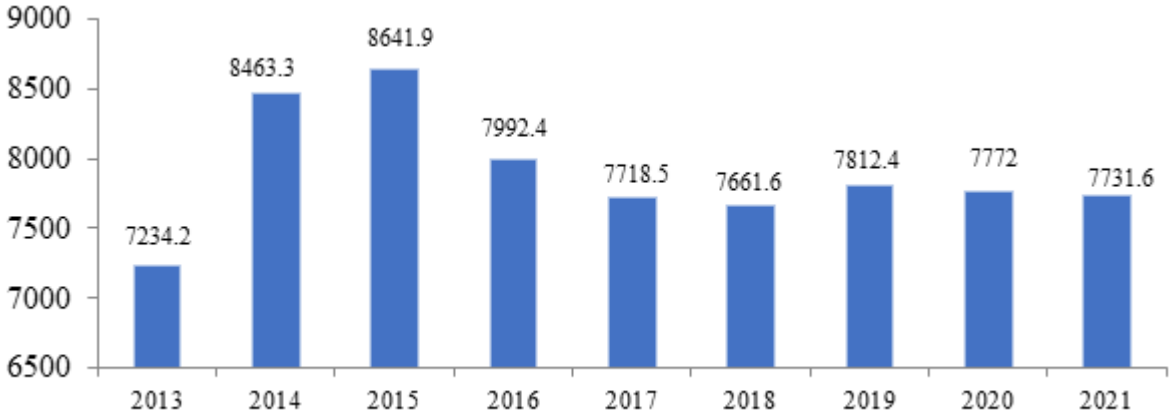

Figure 3. The volume of heat energy transferred to population consumption, (mln.м^3)

These analyses make it possible to assess and predict changes in housing management in general condition. When evaluating the prospects of the main aggregate indicators, an analysis, sorted by the degree of importance of the factors affecting it, can clearly show the future prospects of the industry.

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Conclusion. The provision of the effectiveness of housing stock management largely depends on the sequence of Organization of processes and the correct Organization of relations between the subjects involved in the process.

Housing stock management involves closed relationships in the production and consumption process in increasing efficiency. The period of viability under this model begins with the process of "service marketing", which is based on the regular monitoring of the consumer's need for services, and the identified need is the basis for organizing the process of "service design".

With the selection of tools necessary for the implementation of services at the stage of" maintenance of services", at the next stage of" development of the service process", the sequence of use of the selected tools in the process of performing services is formed.

At the stage of" Service formation", services are created by introducing the necessary tools into the process in the specified sequence, and the quality of services created at the stage of" consumer compliance control of services " is monitored based on comparison with the planned quality level. If at the stage of" organizational supply of services "performers participating in the process of creating the Treasury are selected, at the stage of" introduction of the consumer into the process of receiving services " consumers are prepared to receive services. The stage of" consumer acceptance of services " determines whether the consumer is directly involved in the process.

At the stage of" development of activities for the improvement of services", research is carried out on their improvement, studying the quality and characteristics of services, and activities are developed. The developed activities of the previous stage are introduced at the stage of" regular application of activities for improving services", and thus the period of viability of services goes to the next iterative cycle.

On the basis of the developed model, the creation of Housing and communal services and the organization of delivery to consumption will expand the possibility of effective organization of relations among the participants of the process, increasing the socio-economic efficiency of Service Management and improving the quality of services.

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