

Use of Gravitation Models in the Development of Tourism and Recreation

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Annotation: Gravitational models have been widely used to develop all areas of tourism and recreation, to attract vacationers. The problem of development of tourism and recreational activities in the Republic of Uzbekistan, in particular in Namangan region, is to find solutions, to develop appropriate solutions. The scientific development "7M-Gravity Rings" on the recreation facilities "Parda Tursun" and "Chartak" in Namangan region of the Republic of Uzbekistan was developed, obtained by comparing the two recreational facilities "Parda Tursun" and "Chartak" from multi-factor econometric-gravitational models. Statistical data were taken. If Chartak explains the multifactor econometric-gravitational model of the recreational facility, then the increase in the use of available natural resources and the quality of services in the sanatorium by one unit will increase the number of visitors to the sanatorium by 9.8 and 11.9 units, respectively. found to cause Commenting on the model developed for the Parda Tursun recreational facility, it was found that the selected factors increase the recreational competitiveness of the region and the recreational infrastructure of the region by 17.4 and 5.5 units, respectively, the number of visitors to the mountain recreation system. According to the results developed during the study and the set conditions ($TIC < 1$, $MAPE < 20$), the model is reliable and adequate because both models have good forecast accuracy.

Keywords: Recreation, tourism, health resort, mountain recreation, sanatorium-resort, rest houses and bases, econometric-gravitational models, gravitational rings, pilgrimage, water-beach, archeological monuments, zones, clusters, strategy

Introduction

It is aimed at the development of multi-factor econometric-gravitational modeling of recreational facilities in long-term strategies for economic development of the regions of the Republic of Uzbekistan, as well as based on the specifics of each recreational facility. Accelerated development of tourism and recreational activities will open up opportunities for extensive use of additional potential of recreational facilities. One of the most effective areas for countries in transition to a market economy is the development of tourism and recreational activities and increasing revenues from this area. It will emerge as a locomotive of tourism and recreation of economic development. For this reason, these areas are considered as one of the promising strategic sectors. As tourism and recreation affect many sectors of the economy, research and

development in this area is one of the most pressing issues.

Through the widespread use of gravity models in the development of tourism and recreational activities, it is possible to increase the attraction of vacationers to recreational facilities. In-depth study of the processes of their use in solving problems in the field of tourism and recreation, the development of analytical data on the factors influencing it on the basis of econometric-gravitational models, summarizing the results of the analysis of the region's virtual advertising platform "Tourist and recreational potential of Namangan region" virtual re-attraction of vacationers to recreational facilities it is necessary to create a platform.

Review of econometric-gravitational models in the recreational-tourist industry in the region

Recreation and its use is becoming one of the most common and lucrative areas of the 21st century in many countries. In European countries, the United States, Russia, China, the Republic of Korea, the Middle East, the industry is squeezing out traditional industries. In the current context of globalization, it is important to focus on the process of recovery of human energy, the process of recovery of human physical and mental strength, that is, the process of recreation. Especially in recreation and recreational activities, the state of innovation and implementation of innovations is unsatisfactory. "The theory of growth poles F. Developed by Perru (2003). His idea is dedicated to the point of growth, the center, the poles, and usually this idea is most effective in areas where the economic space is less formed, with a large production capacity. A large industrial enterprise will be located in such a region in a settlement with a favorable economic and geographical location, taking into account various factors and conditions. As a result, a center of growth will be created." Especially in the field of recreation and recreational activities, the state of innovation and implementation of innovations is unsatisfactory. "The theory of growth poles F. Developed by Perru (2003). His idea is dedicated to the point of growth, the center, the poles, and usually this idea is most effective in areas where the economic space is less formed, with a large production capacity. A large industrial enterprise will be located in such a region in a settlement with a favorable economic and geographical location, taking into account various factors and conditions. As a result, a center of growth is created." [1]

Gravity models play an important role in the rapid development of recreational objects, clusters activity in recreation. Gravity model (in Latin *gravitas*- means weight, force, motion). This model understands the process of gravity based on the distances between interconnected and interconnected objects (cities, regions, countries) in the social or economic sense. This model also has a regional character, under the influence of which the processes of urbanization, placement of productive forces, export-import relations, population migration will change. Riley's Gravity Model (Riley-Converse Model) - Large cities have a large mass of consumers who prefer to weigh their products from local retailers because of their remoteness from major shopping malls when delivering finished products. This gravitational model has been used in the commercial field. "This model was developed in 1931 by U.D. Reilly, a professor at the University of Texas, based on Newton's law of universal gravitation. P.D. Completed in 1949 by Converse. In 1931, he published his book, *The Law on Retail Gravity*. "Riley was one of the first to analyze the competitiveness of retail and develop a law of retail traction." S.Azam conducted an analysis of 1960-20 trade flows in 198 countries in 2012-2016 on the basis of UN Comtrade statistics. Uzbekistan's domestic trade has been studied through gravity models [13].

Based on the above research, gravitational models have been widely used to develop recreation and recreational activities in the regions. The author proposed a scientific development "Gravity Rings" consisting of seven rings in the development of recreational activities and the use of gravitational models. The concept of rings in the development of "gravitational rings" is derived from "Tunen rings" developed by I.G. Tunen (1826). A total of 6 tunes were designated by Tunen. "[4] Also in the description of "Gravitational rings" in recreational activities in Namangan region, the author suggested "BN Navruz-Zoda, N.S. Ibragimov, Z.B. Navruz-Zoda, Sh.B. Navruz-Zodalar (2017) and The developed competitiveness is based on the conceptual

model "7M" [5]. Based on the study of mono, mini, micro, meta, meso, macro, mega-levels, gravitational rings in recreational activities and five-stage development paths have been developed [12].

1. Mono gravitational rings - the shell of individuals engaged in recreational activities;
2. Mini gravitational rings - shells of houses engaged in recreational activities;
3. Micro-gravitational rings - the shell of the enterprise, organization engaged in recreation;
4. Meta-gravitational rings - the shell of the network and spheres involved in recreation;
5. Meso-gravitational rings - the crust of recreational areas and regional farms;
6. Macro-gravitational rings - the shell of the country-level farms engaged in recreation;
7. Mega gravitational rings - the shell of the world-class farms engaged in recreation.

In the development of recreation in the regions, it is necessary to accelerate the introduction of the above seven gravitational rings in the attraction of recreation objects and bases, recreation clusters, regions, zones.

The practical significance of gravitational rings in the development of recreational activities in the economy is that they are used to accurately study the activities of participants in the region, from small-scale recreational activities to international participants, to identify problems and find appropriate solutions.

1. Mono gravitational rings. In the villages of Parda Tursun in Pop district or Nanay in Yangikurgan district, the involvement of recreation in recreational activities depends on the population living in these villages, which is the shell of mono-gravitational rings.

2. Mini gravitational rings. If the recreational involved in the above addresses falls on family homes, mini-gravity rings are considered.

3. Micro gravitational rings. Their shell includes recreational facilities and bases engaged in recreational activities. These include firms with legal status in a small area, service enterprises.

4. Meta gravitational rings. These include industries and sectors engaged in recreational activities in Namangan region. It includes a complex of firms and service enterprises with legal status in a small area, which organizes the recreation of the involved vacationers. We include the above-mentioned complexes of interconnected and related companies and organizations in Parda Tursun of Pop district, Gova village of Chust district, Nanay village of Yangikurgan district.

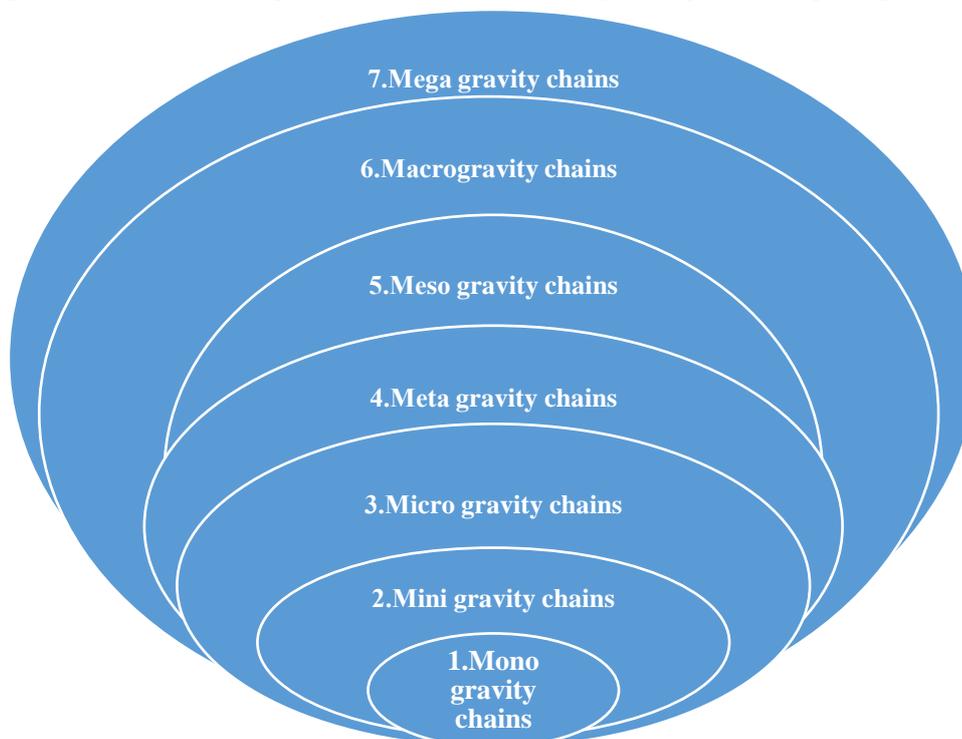


Figure 1. Gravitational rings in recreational activities

5. Meso gravitational rings. They are understood as the process of attracting vacationers from the organization, firm, recreation cluster, recreation zones, engaged in various forms of recreational activities within the regions, engaged in recreation. Chodak, Parda Tursun, Gova, Nanay, Chartak sanatorium, Shakhand sanatorium, Kosonsoy sanatorium, Aksikent archeological monument, Mugtepa archeological complex located in Namangan region are said to attract recreationists in the region. This process should be based on cooperation, interdependence and healthy competition between them.

Thus, we can see that the gravitational rings above attract the recreational processes in the regions depending on their different distances. A model of gravitational rings "7M" has been developed, which will be necessary in attracting vacationers to recreational activities.

In the development of gravitational models, "gravitational rings" are proposed. The main essence of these circles is the process of attracting tourists to the tourist and recreational facilities, small tourist zones and clusters in Namangan region.

In the first stage, it is necessary to organize recreation for the population of Namangan region, which has a population of 2 million 603 thousand people. It is necessary to involve them in these facilities in all four seasons of the year. To do this, government agencies in the region, manufacturing enterprises, private entrepreneurs, tourist and recreational facilities and small tourist zones with the participation of the local population, the participants of the clusters should conduct pre-season information, advertising on recreation. This will provide year-round recreation in the tourist and recreational facilities and zones of the region.

In the second stage,

1. Fergana and Andijan regions with a population of 6 million 390 thousand people are required to attract vacationers to the above facilities. This is related to the level of activity of recreational facilities in the process.

2. It is necessary to carry out such propaganda work throughout the region with a population of 5 million 164 thousand people, promoting the specifics of the region, the population of Tashkent and Tashkent region.

3. It should not be forgotten that Jizzakh and Syrdarya regions have a population of 2 million 27 thousand 200 people.

4. In Bukhara, Navoi, Samarkand regions, in a large area with a population of 6 million 356 thousand 400 people, first of all, it is necessary to carry out extensive propaganda work on the mountain massifs, sanatoriums and tourist bases of the region.

5. 3 million 518 thousand people live in the Republic of Karakalpakstan and Khorezm region. In order to treat and prevent the spread of diseases among the population due to the environmental situation, the health facilities of the region, children's camps will have to carry out advocacy work in the above area.

6. 5 million 463 thousand 500 people live in Surkhandarya and Kashkadarya regions. In this area, it is necessary to accelerate the work on attracting the population by increasing the information on health facilities, tourist bases, children's camps among the population of ecologically degraded areas.

In the third stage, the population of Osh and Jalal-Abad regions of the Kyrgyz Republic bordering on Namangan region will be involved in recreational facilities, health resorts, children's camps, tourist bases of the region.

In the fourth stage, it is possible to increase the number of visitors to the region from the CIS countries. "Afsona Namangan" amusement park, "Namangan-City", "Ecopark" in Pop district, "Nanay" small tourist zone in Yangikurgan district, "Govasay" small tourist zone in Chust district and "Chust-City" innovative-handicraft city cluster, small tourist zone "Parda Tursun" in Pop district, historical and archeological park "Axsikent" in Turakurgan district, medical cluster "Shahand", medical cluster "Chartaksay" attract visitors from CIS countries.

In the fifth stage, it is possible to organize the process of visits to the region by the population of distant foreign countries. To do this, it is necessary to organize the activities of recreational facilities and zones under construction in the region at the level of international standards.

The importance of recreation is growing due to the structural changes in the world economic system in recent years. With the increase in the living standards of the population, the level of use of recreation and tourism will increase. This leads to an expansion of the function of this sector. The main task of recreation is to increase the level of socio-economic development of the regions of the country through the construction of recreational facilities and their effective operation for the effective organization of recreation. A. S. Kuskov, V. L. Golubeva, T. N. Odintsovas divided recreational resources into four groups, which include water-beach recreation, mountain recreation, historical-cultural recreation, health-treatment recreation. In our opinion, it is expedient to take into account pilgrimage recreation when grouping the main types of recreation resources. A. S. Kuskov, V. L. Golubeva, T. N. Odintsovas divided recreational resources into four groups, which include water-beach recreation, mountain recreation, historical-cultural recreation, health-treatment recreation. In our opinion, it is expedient to take into account pilgrimage recreation when grouping the main types of recreation resources.

Water-beach recreation. These include rivers, lakes, streams, reservoirs, rivers, canals and others in the territory of Uzbekistan. Today, it is financially supporting a number of projects in the Central Asian region on the use of water resources by international financial institutions. In particular, the natural resources of Western Tianshan are attracting the attention of the world community. This is increasing the interest of foreign rafting fans to swim in the Chatkal River. In Central Asia, the Amudarya and Syrdarya water basins are the main water sources. River waters such as Zarafshan, Kashkadarya, Surkhandarya, Chirchik, Ahangaron are also used. The use of water resources during recreational activities plays a key role. Recreational use of existing water requires the study of the watershed and coastal portion of the watershed. In the development of recreation, the use of water bodies from the coastal part, and the integrated use of water bodies open up opportunities to reduce the recreational pressure on the water basin by regulating the number of visitors to the basins, setting visit times, taking into account the recreational capacity of the basin. Figure 2 is divided into the main major groups of recreation, which can be systematized as follows in Uzbekistan.

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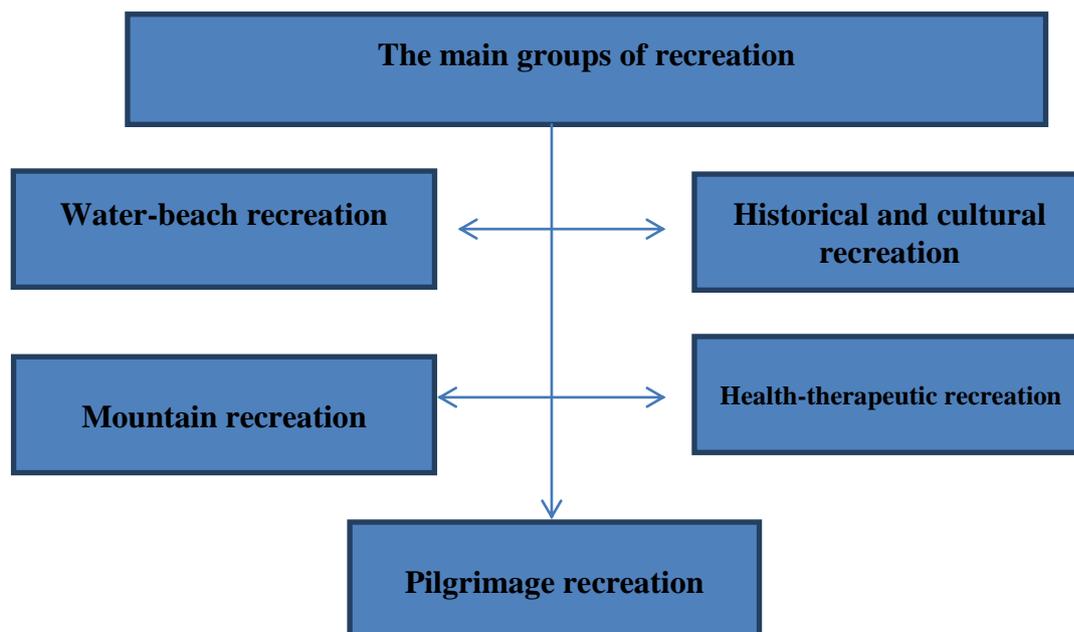


Figure 2. The main groups of recreation

During the season, the recreational pressure in water bodies rises to a high level, so it is necessary to intensify the use of natural complexes, to determine the amount and direction of pollution in a timely manner. It will also be necessary to determine the total water fund of water bodies in the assessment of water recreational resources of the regions. Recreational pressure - Understands the impact of vacationers on the natural environment and the facility during recreational activities.

The study and use of components of the natural environment can be divided into:

- damage caused by mechanical pressure, changes in the components of the natural environment (changes in soil cover, accumulation of plant biomass, etc.);
- chemical changes in the environment due to contamination of components of the natural environment.

The potential of water-beach recreational facilities includes water components and coastal complexes, the state of geosystems, the impact of water safety on the coast and the level of environmental safety during various recreational activities. Because water resources play a key role in the recreation of the population. According to world statistics, 85-90% of coastal water bodies operate on a long-term basis and 90-95% on a short-term basis. Extreme forms of recreation are developing in them. As the city's population grows rapidly, so does the demand for water recreational use. Therefore, reservoirs are also widely used in recreational activities. They will be able to organize recreation through swimming, beach vacations, sailing, windsurfing, fishing, use of small motor fleets, travel and hunting on scooters, the development of water skiing.

The use of water bodies for recreational purposes can be divided into 2 types:

- Effective use of natural complexes in the process of using the area for recreation through the organization of inpatient recreation in recreation organizations, hiking, picking mushrooms, sightseeing, the development of recreation by road;
- Swimming in the water area, the use of small motor fleets, the organization of trips on yachts and kayaks, fishing, scuba diving, windsurfing, etc.

Historical and cultural recreation. The historical and cultural potential of the country serves as a solid basis for the development of historical and cultural recreation in the regions. There are many types of historical and cultural potential in the country, including historical monuments, memorial sites, folk handicrafts, museums, all objects of cultural heritage (Figure 3).

Cultural heritage is the heritage formed during the development of historical development, accumulated in a certain area. The historical and cultural sites of the regions have always attracted tourists. This is because each region has its own unique historical and cultural heritage sites, which serve to conduct research across large areas. Wherever people live, they build their own historical and cultural heritage. The historical value of these objects will gradually increase over the years. The most important task in this regard is to use them carefully and pass them on to future generations.

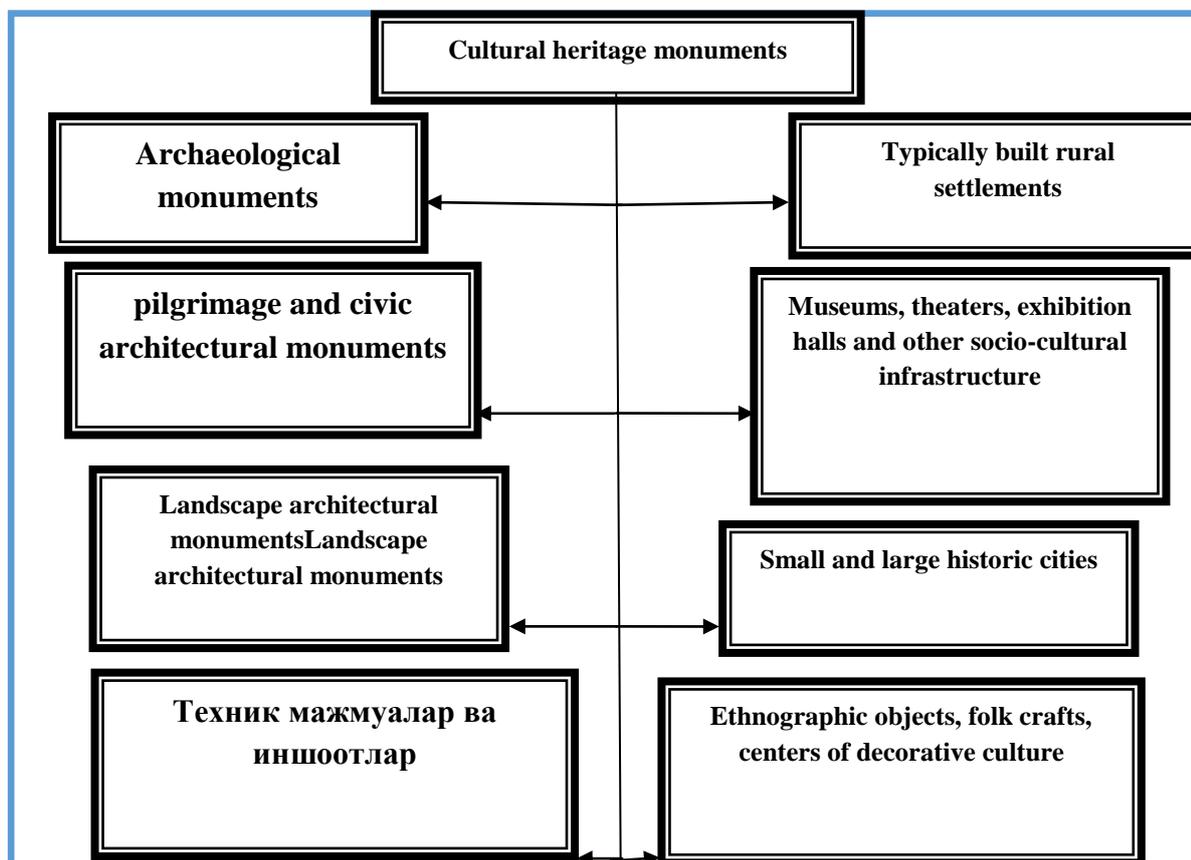


Figure 3. Cultural heritage monuments

Historical and cultural potential is the objects formed in socio-cultural development as a result of economic and domestic activities of the population. Any tourist visiting the country is primarily interested in cultural heritage complexes. Of course, the main place in the cultural heritage complexes is occupied by nature, cities and their parks, squares, streets, green areas of courtyards, scenic and orchards in rural areas, various religious sites, landscape parks and gardens of ancient buildings. Of course, they should not damage the historical landscape during use. Cultural and historical sites play an important role in this type of recreation and are taken into account in the development of tourist routes in different directions. By studying the cultural heritage and increasing its artistic and historical value, one can learn about the collection of clothes of that period, household items, national handicrafts, performances based on different traditions, theatrical activities, many national holidays, songs and festivals.

This will increase the number of visitors to the existing cultural heritage in the area. The value of cultural heritage is the most important factor for recreational purposes, and their preservation is relevant. Many museum exhibits require moderate heat and humidity. Also, knowing the value of cultural heritage allows us to determine their place in world and artistic culture on the basis of the work of sorting cultural complexes. This will require field trips to explore the local, regional, national and global significance of the complexes.

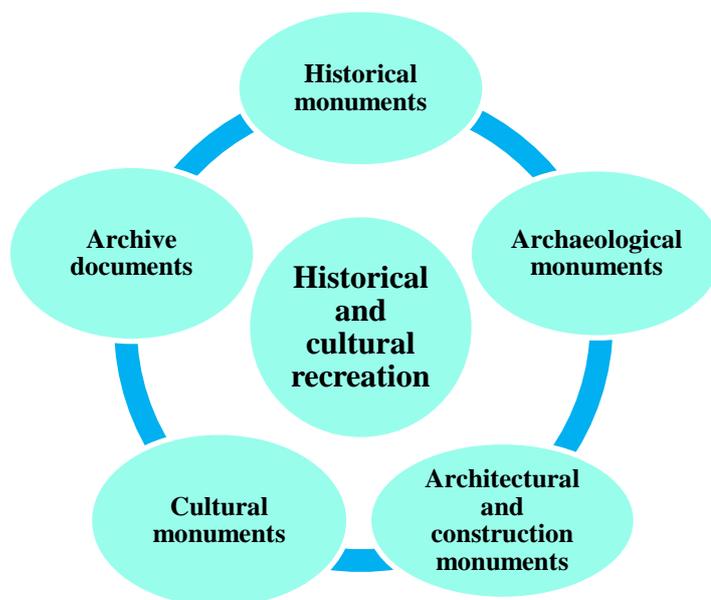


Figure 4. Historical and cultural recreation groups

For cultural complexes, it is important that they are a reliable complex and how much they have the capacity to receive visitors. The more vacationers visit, the higher the recreational pressure in the area. Therefore, in order to carry out recreational activities, it is necessary to determine the number of visitors to cultural complexes and manage groups of vacationers, the correct distribution of time, pre-season preparations for the growing season.

The use of recreational reliable cultural complexes needs to be improved. Such complexes are always of high interest to vacationers, who always want to visit them. "Also, today 4 cities of Uzbekistan and more than 31 historical monuments are included in the UNESCO World Heritage List" [6]. In the organization and implementation of cultural and historical recreation, it is necessary to determine the routes of travel of existing recreation groups to the objects. Cultural and historical objects are divided into material and spiritual types. Material objects include production facilities, other material assets of society, which contribute to historical development.

Cultural and historical resources, which play an important role in the effective use of recreation, play an important role in the rapid development of recreational activities.

In our opinion, it is expedient to divide it into five major groups based on the main features of the cultural-historical direction. This is because these groups also include the remaining resources in the sector (Figure 4).

1. Historical monuments may include historical sites, buildings, places associated with important historical events, as well as the cultural heritage of peoples, areas inhabited by famous historical figures.

2. Archaeological monuments - these include cities and villages, the remains of ancient settlements, canals, roads, ancient settlements and their stone carvings, various landscapes, antiques, artifacts.

3. Architectural and construction monuments - include architectural complexes, historical centers, symbolic squares, streets, ruins of ancient cities and villages, ancient military and industrial weapons, decorative landscapes, garden and park cultures.

4. Cultural monuments - include various fine arts, decorative landscapes drawn by people.

5. Archival documents - include acts and documents of public administration, various written and graphic documents, films, as well as ancient manuscripts, ancient music and songs.

The cultural-historical direction is related to recreation, they are historical, cultural objects.

It also organizes cultural and historical recreation, such as production facilities, agriculture, transport, theater, scientific and educational institutions, sports facilities, botanical gardens, zoos, ethnographic and folklore attractions, holiday events.

In our opinion, in order to ensure the arrival of tourists to the cultural and historical sites, first of all, it is advisable to have a brief description, full name of the object, location, information about the object in various literature, a drawing of the object. The availability of this information creates convenience for all-round visitors. To do this, of course, it is necessary to inform cultural and historical sites for recreational purposes. To look at objects, it is necessary to classify the object in order to have a complete picture. This ensures the duration of the viewing time.

Archaeological Monuments - Archaeological monuments can include villages, castles, monuments carved into ancient stone, springs, remnants of ancient development, and more. These archeological monuments are of great interest to historians and archaeologists. They organize trips in different directions. Vacationers can often be enticed by rock carvings and displays of archeological exhibits. **Ethnographic monuments** - monuments of ethnographic culture of the population should be developed along tourist routes. These include museum exhibits, local historical museums, national handicrafts, wooden architectural monuments, and preserved local customs and cultural symbols. It is also worthwhile for museums to include in the exposition of collections of national costumes, samples of folk art, the unique traditions of the population living in the regions. Ethnographic monuments can include economic services (ancient mills, special warehouses for flour storage) and places of worship, as well as the traditions of small peoples. **National handicrafts** - this type is known from history, are examples of very ancient culture.

These centers will also contribute to the development of souvenir manufacturers on the basis of folk handicraft centers. In this regard, depending on the specialization of the regions, it is possible to establish a number of national handicrafts, including blacksmithing, kitchenware, souvenirs and women's embroidery.

Health-therapeutic recreation. "Studying medical recreation is a complex process. It requires a systematic approach. High-precision research strategy development is required. The sanatorium-resort system is a complex system in which natural resources are used in a complex way and developed under the influence of many factors (natural resources - mineral water, mud, climate, social shell - recreational, service and management personnel, the interaction of environmental factors). Under the influence of the above factors, the regions specialize in resort and recreation areas [7]. The development of therapeutic-sanatorium direction of recreation is a comprehensively effective way. Rehabilitation is the treatment of mental, physical, and mental stresses through the natural environment during a person's labor activity. In the natural environment, the central nervous system of humans rests. The time, place, duration of rest have a positive effect on the recovery process of the human body.

In this regard, it is necessary to develop ways to effectively use the full potential and potential of the regions of the Republic of Uzbekistan, to study their potential. In recreational activities, the health-therapeutic type of recreation plays the largest role. Different types of mineral waters are widespread in the territory of Uzbekistan, and many people visit more than 300 healing groundwater sources in the country. Currently, 121 of these sources are operational. This type of recreation includes sanatoriums, sanatoriums, health resorts, rest homes, recreation centers. There are sanatoriums, sanatoriums, health resorts, as well as spa clinics in the health-improving types of recreation. The spa clinics provide water, mud treatments and excellent medical care. Sanatoriums, holiday homes, boarding houses are also trying to develop material and technical bases. They also have a dormitory, kitchen, cinema, concert, dance halls, library, sports complexes, several treatment rooms (massage, dentistry). Many holiday homes and boarding houses have wellness complexes with swimming pools, saunas, tennis courts, sports equipment. "There is a sign of seasonality in the activities of other areas of recreation, when there is a high concentration of customers in the sanatoriums and resorts of certain periods in these regions, there is a high pressure on the activities of sanatoriums" [9].

Mountain recreation. Another important role in the development of recreation is mountain recreation, where high mountain ranges play an important role in the development of this species in the countries. This species has a high importance of natural landscape in recreation and develops under the influence of various factors. In some sources this type of recreation is called mountain tourism, in some literature it is called ecological tourism, and these terms can be considered as close to each other. Mountaineering takes the first place in mountain recreation. Originally, this type of recreation was designed for the summer season, and mountain sports complexes were developed accordingly. "Skiing in the European Alps is open all year round. Development of hiking in altitudes up to 500 meters in the development of mountain recreation; Development of skiing in the zones up to 1000-2000 meters; It is recommended to develop skiing and mountaineering in the range of 2000-3000 meters "[8]. Elevation plays an important role in the development of this type of recreation, and mountaineering is an important sport of recreation. This type of recreation will require service professionals, coaches, rescue teams. Mountain recreation has a special significance within recreational activities.

Of course, this species also has its own risks. Including events such as avalanche ski crashes can scare vacationers. In order to overcome these risks, the availability of rescue teams, institutions that provide information on snow depth and climate change, and the exemplary organization of their activities will have an effective impact on the development of the industry. In it, visitors can observe the rich and diverse flora and fauna of the mountain landscape, enjoy climate change. "It is advisable to carry out recreational activities in the areas located in the intermountain basins. Examples of such places include the mountains of Khumsan, Khanjiza, Nurata, Gissar, and Kohitang, which have the potential to develop this type of recreation and increase their potential. "[11] Visitors to natural attractions increase the importance of the area and also ensure environmental safety.

This activity focuses not only on the use of available resources, but also on their protection. Not much convenience is required to organize a vacation in this round. Does not require infrastructure development. It is necessary to make an impression on the vacationer as a person visits for the first time, does not harm nature, does not change the natural object, does not affect the scenic appearance of nature. For this reason, this type of recreation is developing rapidly in foreign countries. With this type of small-scale service, it is possible to increase the share of this sector in the structure of local capital. The main factor in this is the organization of recreation in a natural way, in accordance with the wishes of the vacationer, without the development of infrastructure. The bustling city and modern development make up the majority of those who want to relax in a peaceful nature. Today, it is one of the most common types of recreation where you can make a lot of money without spending a lot of money. This type of aspiration is growing not only among the population of European countries, but also among the population of industrialized regions and densely populated megacities. This type of recreation takes into account all aspects of the economic, social, natural environment. Along with the development of sustainable recreation, it is necessary to protect and preserve natural and cultural sites, local planning, development of mountain recreation activities, organization of individual and group mountain recreation trips in natural and cultural heritage in recreation centers.

First, the main object of mountain recreation is wildlife. According to many experts, it is difficult to draw the line between the natural environment and ordinary cultural life. The presence of the vacationer in a completely natural environment, which is mainly typical for residents of the United States and Western European countries (the model of ecotourism activity of the United States and Western Europe). It can be seen that in these states the natural landscape is disappearing, the need of the members of the society for the natural environment is increasing. Now the construction of anthropogenic landscape objects in these countries is on the rise. Second, this type of recreation involves the use of nature, resource degradation, resource recovery. It takes into account travel, conservation of natural areas, the state of natural and national parks, conservation of other protected natural areas.

Third, it does not provide for separate service personnel. In specially protected areas, the population leads a normal life, engaged in economic activities as usual. In the meantime, they are serving the natural state and developing ways to use nature effectively. This will serve to increase the income of the population in the region through the development of the sector. It serves to raise the level of socio-economic development of the region. Pilgrimage recreation. Recreation includes pilgrimage recreation, which has been developing rapidly in recent years. In the recreation of the pilgrimage we include religious places where a person can rest and receive spiritual strength.

They also include pilgrimage architectural monuments. It is a monument that has existed since ancient times and has survived to the present day, including churches, monasteries, Orthodox temples, Catholic sabers, Lutheran kerchens, Jewish synagogues, Buddhist pagodas, Muslim mosques and mosques. Currently, people's travel to places of religious ceremonies is expanding. Religious pilgrimage has expanded among the population and is now becoming the most relevant, most lucrative species. The development of this sector is well established in many countries. Visits to the visiting architectural monuments are carried out in groups and individually. Visits to visiting architectural monuments are divided into several types (Figure 5).

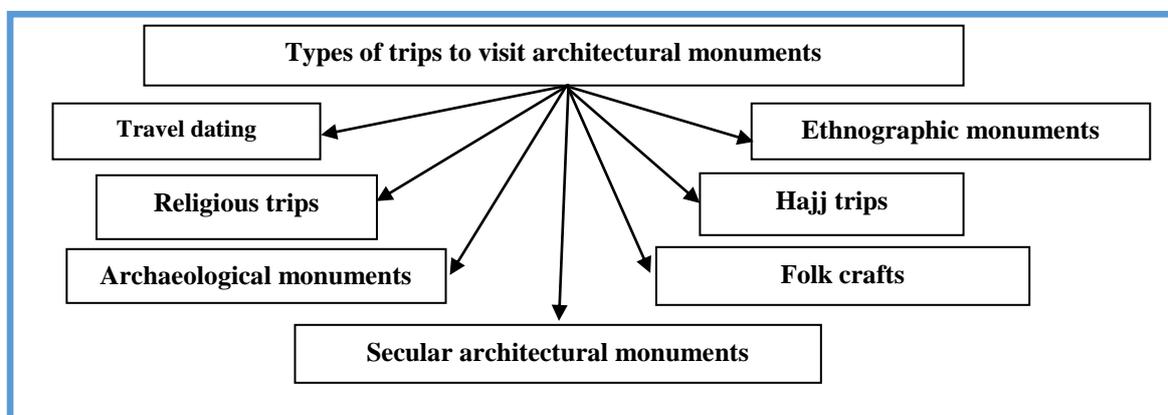


Figure 5. Types of trips to visit architectural monuments

Travel acquaintances include introductions to various religious sites, monasteries, mosques, madrassas, and khanogakhs. It is possible to get acquainted with the cultural and religious objects of the country or region. Religious trips include the practice of people of different faiths coming to religious sites to perform acts of worship and people visiting shrines. At the same time, the tourist is given detailed information about the history of the monastery, mosque, madrasa, the religious object in general, the service system there. Not only religious ceremonies but also cultural complexes are closely acquainted with the religious object. There are parks of natural-historical monasteries, where monks are engaged in traditional farming: growing ecologically clean agricultural products, picking and cooking mushrooms, collecting medicinal plants, preparing various dishes based on ancient recipes in the kitchens of monasteries, samples of folk crafts and various memorabilia. get acquainted with the processes of preparation of materials. Children can get souvenirs. Hajj pilgrimages are understood as the processes of performing Hajj in religious objects. Umrah and Hajj are prescribed for certain months in Islam. It involves performing a series of acts in separate garments, a few days in religious objects.

Recreation and its use is becoming one of the most common and lucrative areas of the 21st century in many countries. In European countries, the United States, Russia, China, the Republic of Korea, the Middle East, the industry is squeezing out traditional industries. In the current context of globalization, it is important to focus on the process of recovery of human energy, the process of recovery of human physical and mental strength, that is, the process of recreation.

If we focus on educational institutions here, it will be possible for them to regain their strength through leisure trips organized by people, the stress of work. In addition, they include recreational activities: holidays, vacations, extracurricular breaks. It is advisable to standardize working days for meaningful rest and holidays. Recreation is considered synonymous with

recreation and is divided into two types, i.e. active and passive types. It consists of natural and anthropogenic objects by category of recreational resources. For the development of the productive forces at the current level of specialization of recreational services of the population, the participants of the society should be fully satisfied with this system of services. It should be noted that each region has its own characteristics, climate and recreational resources, which in turn play an important role in the organization of recreational systems of the regions. Recreational activity refers to the use of full and partial recreational resources in the region. Recreational activities are used in the organization of short-term recreation of people in natural and cultural-historical sites, parks, forest parks, sea parks, landscaped areas, lawns, boulevards, squares, gardens.

Development of multi-profile econometric-gravitational modeling in recreational-tourist industry in the first Republic of Uzbekistan region Namangan

In Namangan region, one of the health resorts "Chartak" and one of the mountain recreation facilities "Parda Tursun" were studied using econometric-gravitational models. Through the scientific development "7M-gravitational rings" it was possible to identify opportunities and problems of two recreational facilities in Namangan region, and thus develop solutions to them. Based on the "gravitational rings" in the study, the following parameters can be cited to show the following parameters for the above model for groups of visitors from a distance of 100–150 km, depending on the distance of the current visitors to the two recreational facilities: It is expedient to consider the recreational facility "Chartak", which operates in the Namangan region of the Republic of Uzbekistan in the field of medical and recreational recreation.

Table 1
Information on the area of 100-150 km from the recreation facility "Chartak"

Fergana Valley	Namangan-87 km, population-2699.0 thousand	Fergana - 132 km, population - 3620.1 thousand	Andijan - 82 km, population - 3011.6 thousand.
Neighboring countries	Kyrgyz Republic, Jalal-Abad region. Ola-buqa- 75 km, population-1201.7 thousand.		

Therefore, first of all, according to the above model (1), the calculation is determined on the basis of data on the distance from the area inhabited by visitors to the area where the recreation facility "Chartak" is located and the population of this area (Table 1). Based on the data in Table 1, using the (1) -gravitational model, the gravitational force of each relative to the regions is determined by attracting vacationers to the recreation facility "Chartak". It takes into account the specific features of the system that encourages the visitor to visit, including the attractiveness, ease of arrival and the coefficients of change in the volume of places in the recreational systems (Table 2).

Table 2
The ability to attract the recreation facility "Chartak" from the regions in response to the needs of the population

T/R	Zones	Gravity
1	F_{Namangan}	0,00118962
2	F_{Fergana}	0,000613602
3	F_{Andijan}	0,001071487
4	$F_{\text{Jalal-abad}}$	0,000121225

According to the table, the closer the distance, the higher the gravitational force. The Chartak recreational facility is located in the Chartak district of Namangan Province and has a $F_{\text{Namangan}} = 0.0012$. explained by a number of functions. The results obtained from the survey results and calculations are reflected in Table 3 below.

Table 3
The number of visitors to the recreation facility "Chartak" from 100 to 150 km

Zones	Number on demand of the population	Distance	Number of visitors
Namangan	12146	87	3211
Fergana	10860	132	2221
Andijan	10541	82	3227
Jalal-abad	3966	75	146

It should be noted that currently only 26.4% (3211 people) of the total population of Namangan region wishing to rest and receive treatment in 12,146 sanatoriums, 20.5% and 30.6% of the total population of Fergana and Andijan regions, respectively. It was established that he had visited the Chartak recreational facility for treatment. If we look at the neighboring countries, we can see that 146 residents of Jalal-Abad region of the Kyrgyz Republic visited. It should be noted that this (1) -model is very simple and has been used effectively for distances from 100 km to 150 km. Based on this consideration, data on the distance from the area inhabited by visitors to the Pop district, where the recreation area "Parda Tursun" is located, and the population of this area were determined (Table 4). Based on the data in Table 4, using the gravitational model, the gravitational force of each relative to the regions is determined by attracting recreationalists to the Parda Tursun recreational zone.

Table 4
Information on the area of the recreation facility "Parda Tursun" from 100 to 150 km

Fergana Valley	Namangan-87 km, population-2699.0 thousand	Fergana - 132 km, population - 3620.1 thousand	Andijan - 82 km, population - 3011.6 thousand.
Neighboring countries	Tajikistan Konibodom - 144 km, population - 113,806 people	Kyrgyz Republic, Jalal-Abad region. Ola-buqa- 75 km, population-1201.7 thousand.	

It takes into account the specific features of the system that encourages the visitor to visit, including its attractiveness, ease of arrival and the coefficients of change in the volume of places in the recreation system (Table 5).

Table 5
Gravity of the recreational object "Parda Tursun" in relation to the regions

T/R	Zones	Gravity
1	F_{Namangan}	0,259591119
2	F_{Fergana}	0,133443093
3	F_{Andijan}	0,080992021
4	$F_{\text{Konibodom}}$	0,001016734
5	$F_{\text{Jalal-abad region}}$	0,019803755

According to the table, the closer the distance, the higher the gravitational force. Parda Tursun recreation area is located in Pop district of Namangan region, $F_{\text{Namangan}} = 0.2596$. and a

number of issues, such as the formalization of transition documents. In 2018, a lot of conveniences have been created for visitors to the regions of the country. Simplified visas for foreign nationals are being issued online, and visa issuance deadlines are being reduced. Attention is also paid to the speedy registration of holidaymakers at customs posts without taking much time. On the basis of such positive changes, recreational facilities and bases in Namangan region will lead to an increase in the number of visits to clusters, the loss of seasonality in recreation. In turn, the gravitational pull of the proposed gravitational models will be even stronger.

The results obtained from the survey results as well as the calculations are reflected in Table 5 below. It should be noted that currently 2.4% of the total population of Namangan region (63,600 people), 1.8% and 2.1% of the total population of Fergana and Andijan regions, respectively, go to Parda Tursun recreation area for recreation during the season. was determined to visit.

The attractiveness of the recreation facilities "Chartak" and "Parda Tursun" located in Namangan region of the Republic of Uzbekistan was studied by gravity models. One of the above two recreational objects of the Seventh Gravity Rings, developed using the gravity model used, was observed to have a six-ring in Chartak and a triple-ring in Parda Tursun. Using the above method, the processes related to the recreational attractiveness and competitiveness of facilities, the price of the treatment facility, the proximity of visitors to the facility, the psychological inertia of people were studied. In gravitational models, gravitational forces can be determined in a variety of ways by survey, expert method, and more.

Table 6

Criteria check of the regression equation representing the increase in the number of visitors to the recreation and treatment facility "Chartak"

Dependent Variable: Y

Method: Least Squares

Date: 11/06/18 Time: 16:57

Sample: 2006 2017

Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	9.821865	3.890847	2.524352	0.0356
X2	11.85347	2.684991	4.414716	0.0022
X3	-5.935111	3.804693	-1.559945	0.0514
C	-96941.94	8998.508	-10.77311	0.0000
R-squared	0.989993	Mean dependent var		9878.333
Adjusted R-squared	0.986240	S.D. dependent var		3385.195
S.E. of regression	397.0963	Akaike info criterion		15.06744
Sum squared resid	1261484.	Schwarz criterion		15.22907
Log likelihood	-86.40462	Hannan-Quinn criter.		15.00759
F-statistic	263.8026	Durbin-Watson stat		2.028768
Prob(F-statistic)	0.000000			

The selected recreational facility "Chartak" does not participate in the international rankings due to the low number of international visitors and the lack of recreational facilities "Parda Tursun". According to Table 6, the selected factors are strongly associated with the outcome factor, and there is a multicollinearity relationship between the level of competitiveness of the recreation facility "Chartak" and the relationship of the infrastructure factor ($r_{x3, x4} > 0.8$). The equation is constructed using the Eviews program and the adequacy of the model is checked (Table 6). According to the data in the table, only tx_3 - parameter was found to be insignificant (when $t_{sob} < t_{jad}$, $df = 11$ and $\alpha = 0.05$, $t_{jad} = 2,2010$). Therefore, it is necessary to check the retrospective forecast quality assessment criteria with $TIC < 1$ and $MAPE < 10$ (Figure 6).

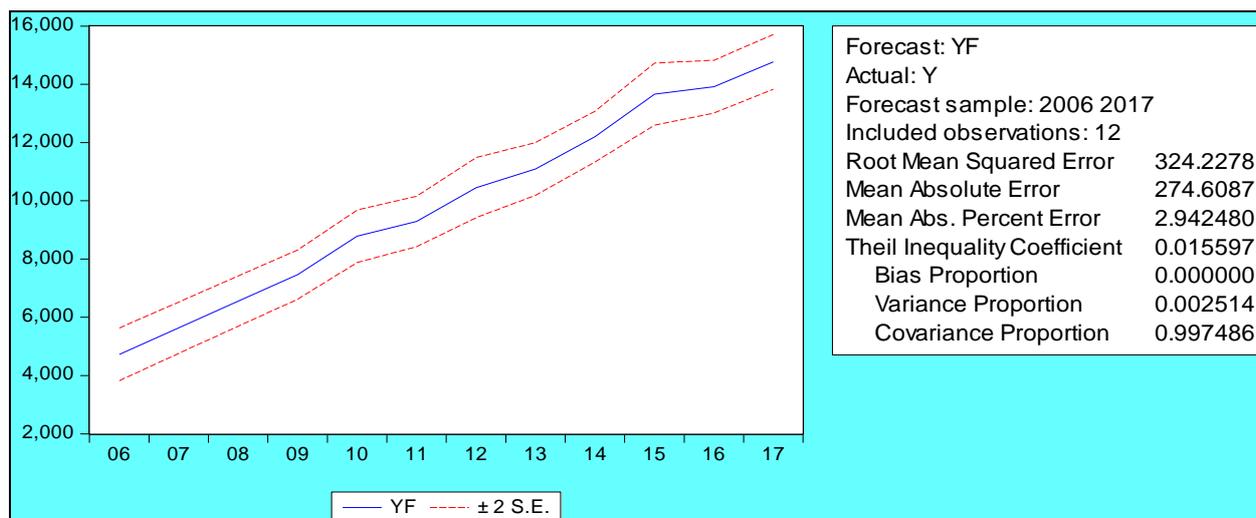


Figure 6. Assessing the quality of retrospective forecasting

Based on the data in Figure 6, $TIC (0.02) < 1$ and $MAPE (2.94) < 10$. According to these forecast criteria, the forecast accuracy is high, so the parameter is determined as follows:

$$Y_{\text{sanatorium}} = -97790.79 + 9.8 * X_1 + 11.9 * X_2 - 5.9 * X_3 \quad (1)$$

(1) The model is reliable and adequate.

Where: $Y_{\text{sanatorium}}$ - the number of visitors to the sanatorium for rest and treatment;

X_1 - use of available natural resources in the sanatorium;

X_2 - quality level of services;

X_3 - Sanatorium ticket price.

If the above model 1 is explained, then one unit increase in the use of available natural resources and quality of services in the sanatorium will lead to an additional 9.8 and 11.9 units increase in the number of visitors to the sanatorium for rest and treatment, respectively. It was determined that the cost of the voucher should be reduced as much as possible. Since there is a multicollinearity between $r_{(x_2, x_4)} (0.99953019) \geq 0.8$ between the quality of services at the Parda Tursun recreation facility and the recreational infrastructure of the region, we omit the quality of services in the mountain recreation system and process the regression equation with the remaining indicators. We will continue in Eviews. Simultaneous verification of the reliability and adequacy of the econometric model obtained using this program on the basis of t-Statistic, F-Fisher, Akaike, Schwarz, Hannan-Quinn, Durbin-Watson and other criteria. Planners and the results are reflected in Table 7.

Table 7**Schedule for the development and verification of the econometric model of the recreation facility "Parda Tursun"**

Dependent Variable: Y
 Method: Least Squares
 Date: 10/30/18 Time: 20:14
 Sample: 2006 2017
 Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	-7,07309	2,494514	-2,835458	0.0002
X2	17,32242	1,726815	10,031428	0.0000
X3	5,540868	1,089012	5,087977	0.0415
C	-5185,1	23762,52	-0,218205	0.1052
R-squared	0.979146	Mean dependent var		40663.33
Adjusted R-squared	0.971325	S.D. dependent var		35892.73
S.E. of regression	6077.933	Akaike info criterion		20.52392
Sum squared resid	2.96E+08	Schwarz criterion		20.68555
Log likelihood	-119.1435	Hannan-Quinn criter.		20.46408
F-statistic	125.2045	Durbin-Watson stat		2.027628
Prob(F-statistic)	0.000000			

Based on the results of the calculations, the following econometric model was identified:

$$Y = -5185.1 - 7.1 * X_1 + 17.3 * X_2 + 5.5 * X_3 \quad (2)$$

Where: Y is the number of vacationers visiting the mountain recreation system;

X1 - the state of use of recreational resources of the area;

X2 - recreational competitiveness of the region;

X3 is the recreational infrastructure of the area.

Since there is reliability in the importance of the parameters of the above model (when $df = 11$ and $\alpha = 0.05$, $t_{jad} = 2.2010$. $T_{x1} = -2,835458$ makes this parameter insignificant) check whether this parameter is significant or insignificant. The correlation coefficient between the retrospective, forecast, and practical values of a variable is usually used as a criterion for evaluating the predictive properties of mathematical models for. However, a high correlation coefficient between the predicted and observed values does not always indicate that it has been well tested, so it is advisable to use the Tayl (TIC) and Mean Absolute Percentage Error-MAPE criteria. This process is performed using Eviews, and the result is shown in Figure 7 below.

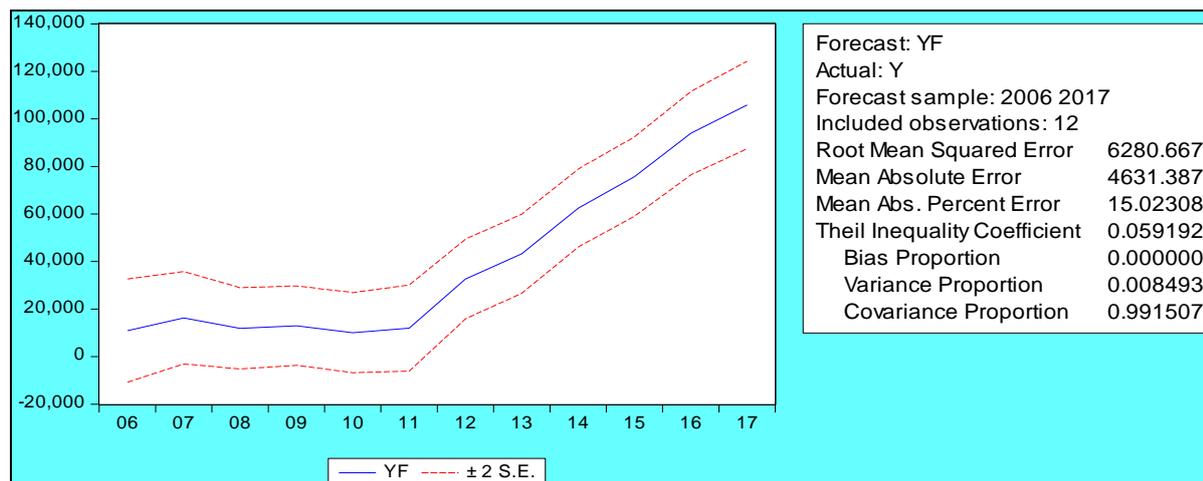


Figure 7. Assessing the quality of retrospective forecasting

According to the calculation results and the set conditions ($TIC < 1$, $MAPE < 20$), the overestimation of the trend and - (2) -model, which is determined by the good accuracy of the forecast, is reliable and adequate. Commenting on this model (2), the selected factors, including the recreational competitiveness of the area and the increase in the recreational infrastructure of the area by one unit, lead to an additional increase in the number of vacationers visiting the mountain recreation system by 17.4 and 5.5 units, respectively.

Conclusion

The rapid development of recreational activities in the regions should focus primarily on the effectiveness of recreational facilities, which is an important aspect. It is necessary to use gravitational models in attracting vacationers to recreational facilities. The analytical results obtained from econometric-gravitational models can be a solid basis for rapid application in practice. The decrease or increase in expected income from recreation is largely due to factors such as the potential of recreational resources, the level of development of recreational infrastructure, the laws, decrees, decisions, government programs in the country. In many ways, these processes have a positive impact on the human factor, their living standards, employment.

Extensive use of multifactor econometric-gravitational models in recreation, in turn, ensures the sustainable development of all-round recreational facilities in a market economy. It is also required to conduct research based on the laws of a market economy. This ensures a high level of accuracy of the analytical results obtained by multi-factor econometric-gravitational modeling. Based on effective, comprehensive, long-term and short-term forecast data from the potential of recreational facilities in each region, it provides opportunities to use the recreation and tourism industry as a unique locomotive of the economy. "Recreation" (in Polish rekreacja - rest, rekreacja - means recovery) [14] means the restoration of a person's strength lost during labor. Researchers have given different definitions of the term recreation, summarizing them as follows: , water basins, streams, waterfalls, natural monuments and reserves, sanatoriums for treatment and recreation, tourist bases, historical monuments, museums, various exhibitions, theaters Different parties and cultural events), including their socio-economic development process, described in the statement. Because recreation includes not only the restoration of the ability to work, but also mental relaxation, physical and mental strength. Today, recreation is becoming a shell that relieves production stresses, neuropsychological pressures [15].

The study examined the potential of internationally recognized tourism and recreation systems, based on common gravitational models in forecasting the number of vacationers, and applied this process to the specifics of the region. It is based on the findings of the population attraction to recreational areas and the development of the relationship between them. The study was primarily based on gravitational rings based on the

distance of current visitors to recreational facilities from recreational systems. The gravity model developed for visitors from a distance of 100-150 km was found to work effectively. Also, an econometric-gravitational model for recreation and recreational activities in Namangan region was developed on the basis of such factors as the state of use of recreational resources, recreational competitiveness of the region, recreational infrastructure of the region. At the same time, the activities of recreational facilities "Chartak" and "Parda Tursun" in the direction of mountain recreation were analyzed and studied.

The results of the multi-factor econometric-gravitational models of the two recreational facilities developed as a result of the above studies show that it is not possible to expand the activities due to the limited recreational capacity of the two recreational facilities. It will be crucial to create tourist and recreational zones.

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