

ISSN 2010-720X

ILIM HÁM JÁMIYET



FAN VA JAMIYAT

2022 (№1)

ISSN 2010-720X

2004-jildni mart ayidan boshlab shiga basladi

**ÓZBEKSTAN RESPUBLIKASI JOQARI HÁM ORTA
ARNAWLÍ BILIMLENDIRIW MINISTRILIGI**



**ÁJINIYAZ ATÍNDAGÍ NÓKIS MÁMLEKETLIK
PEDAGOGIKALÍQ INSTITUTÍ**



ILIM hám JÁMIYET

Ilmiy-metodikaliq jurnal

**Seriya: Tábiyy hám texnikaliq ilimler. Jámiyetlik hám ekonomikalq ilimler.
Filologiya ilimleri**

**Ajinoyat nomidagi Nukus davlat
pedagogika instituti**

FAN va JAMIYAT

Ilmiy-uslubiy jurnal

Seriya: Tabiiy va texnika fanlari. Ijtimoiy va iqtisodiy fanlar. Filologiya fanlari

**Нукусский государственный педагогический
институт имени Ажинияза**

НАУКА и ОБЩЕСТВО

Научно-методический журнал

**Серия: Естественно-технические науки. Социальные и экономические
науки. Филологические науки**

**Nukus State Pedagogical Institute
named after Ajiniyaz**

SCIENCE and SOCIETY

Scientific-methodical journal

**Series: Natural-technical sciences. Social and economic sciences.
Philological sciences**

№1

2022

Shólkemlestiriwshi: Ájiniyaz atındaǵı Nókis
mámleketlik pedagogikalıq institutı hám jurnal redakciyası jámaáti
Shólkemlestiriw komiteti baslıǵı: OTEMURATOV B. – NMPI rektori
Bas redaktor:
ALLAMBERGENOV K. - filologiya ilimleriniń doktori, professor

REDKOLLEGIYA AǴZALARÍ

f.i.d., prof. **Abdinazimov Sh.** (Nókis)
t.i.d., doc. **Abdullaeva Ya.** (Nókis)
t.i.d. (DSc), doc. **Bazarbaev R.** (Nókis)
f.i.d., prof. **Berdimuratova A.** (Nókis)
f.-m.i.d., doc. **Dawletmuratov B.** (Nókis)
f.-m.i.d. (DSc), prof. **Djumabaev D.** (Tashkent)
f.i.d., prof. **Raqmjan Turisbek** (NurSultan)
b.i.d., doc. **Esimbetov A.** (Nókis)
f.i.d., prof. **Eskeeva M.** (Nur-Sultan)
f.i.d., prof. **Eshonqulov J.** (Tashkent)
f.-m.i.d., prof. **Ismaylov Q.** (Nókis)
f.-m.i.k., doc. **Jalelov M.** (Nókis)
f.i.d., prof. **Járimbetov Q.** (Nókis)
g.i.d., prof. **Jollibekov B.** (Nókis)
b.i.d., prof. **Jumanov M.** (Nókis)
b.i.d. (DSc), doc. **Jumamuratov M.** (Nókis)
f.-m.i.f.d. (PhD) **Kalxanov P.** (Nókis)
f.-m.i.d., doc. **Kamalov A.** (Nókis)
f.-m.i.d., prof. **Kudaybergenov K.** (Nókis)
tex.i.d., doc. **Qayipbergenov A.** (Nókis)
tex.i.d., prof. **Qayipbergenov B.** (Nókis)

t.i.d., doc. **Qochanov B.** (Nókis)
f.i.d., prof. **Quramboev K.** (Nókis)
f.i.d., prof. **Mamedov A.** (Ashxabad)
b.i.d., prof. **Mambetullaeva S.** (Nókis)
b.i.d., prof. **Matchanov A.** (Nókis)
f.i.d., prof. **Mirzaeva S.** (Andijan)
b.i.d. prof. **Omonov M.I.** (Termiz)
f.-m.i.d. (DSc), doc. **Otemuratov B.** (Nókis)
f.-m.i.d. (DSc), doc. **Prenov B.** (Nókis)
f.i.d., prof. **Rahmonov N.** (Tashkent)
tex.i.d., prof. **Reymov A.** (Nókis)
t.i.d., doc. **Saribaev M.** (Nókis)
f.i.d., prof. **Suyunova N.** (Cherkas)
f.i.d., prof. **Sherbak S.** (S. Peterburg)
tex.i.d., doc. **Tagaev M.** (Nókis)
akademik, f.-m.i.d. **Temirbekov N.** (Alma-ata)
f.i.d., prof. **Turdimov Sh.** (Tashkent)
g.i.d., doc. **Turdimambetov I.** (Nókis)
f.i.d., prof. **Twxliev B.** (Tashkent)
f.-m.i.d., prof. **Utewliev N.** (Nókis)

Juwaplı redaktorlar:

f.i.k., doc. **E.Xojaniyazov** - ózbek tili boyınsha
PhD, doc. **G.Kdirbaeva** - rus hám inglis tilleri boyınsha
Q.Biysenbaev - qaraqalpaq tili boyınsha

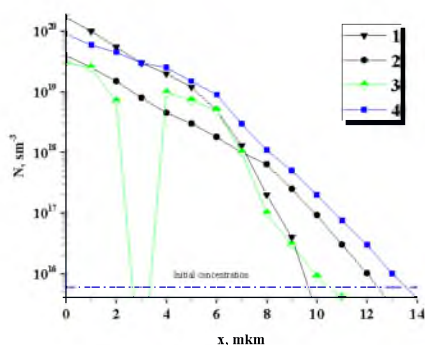
D.Dogarova - juwaplı xatker
Z.Xodjekeeva - korrektor
N.Allamuratova - operator

Jurnal 1992-jıldan «Qaraqalpaqstan muǵallimi» atamasında shıǵarıla baslaǵan. 2004-jilda «Ilm hám jámiyet» atamasına ózgeritilip, 01-022-sanlı gúwalıq penen Qaraqalpaqstan Respublikası Baspasóz hám xabar agentligi tárepinen dizimge alınǵan.

2020-jılı 07-avgustta Ózbekstan Respublikası Prezidenti Administracyası janındaǵı xabar hám ǵalaba kommunikacyalar agentligi tárepinen qayta dizimge alınıp, 1098-sanlı gúwalıq berilgen.

«Ilm hám jámiyet» jurnalı Ózbekstan Respublikası Ministirler kabineti janındaǵı Joqarı Attestaciya Komissiyası kollegiyasınıń qararı menen tómende kórsetilgen pánler boyınsha ilm doktori dárejesin alıw ushın maqalalar járiyalanıwı tiyis bolǵan ilimiy basılımlar dizimine kirgizilgen:

- 01.00.00 - fizika-matematika ilimleri;
- 03.00.00 - biologiya ilimleri;
- 05.00.00 - texnika ilimleri;
- 07.00.00 - tariyx ilimleri;
- 10.00.00 - filologiya ilimleri;
- 11.00.00 - geografiya ilimleri;
- 13.00.00 - pedagogika ilimleri;
- 19.00.00 - psixologiya ilimleri.



1-*рasm.* Кремнийда B ва P элементларининг тақсимоти: (1) Fosfor va (2) bor elementlarining 1200 C da 2 soat diffuziyasidan keyingi taqsimoti. 3. Dastlab fosfor, ortidan bor diffuziya qilingan kremniyda zaryad tashuvchilar taqsimoti. 4. Fosfor elementlarining 1200 C da 2 soat qo'shimcha qizdirishdan keyingi taqsimoti.

Fosforning bor bilan oddiy kompensatsiyasi bilan bunday natija mumkin emas, chunki bu holda materialning sirtidagi o'tkazuvchanligi turi o'zgarish kerak (8 mkm chuqurlikdagi material hajmi n-tipda bo'lishi kerak) edi. Natijada, sirtga yaqin sohada yoki elektroaktiv bor konsentratsiyasining oshishi yoki elektroaktiv fosfor konsentratsiyasining pasayishi kuzatiladi.

Natijalarni muhokama qilish Bunday o'zgarishlar bir nechta sabablarga ko'ra bo'lishi mumkin:

1) Borning diffuziya koeffitsiyentining kristall hajmida fosfor ionlari ishtirokida ortishi, bu kremniy panjarasi fosfor ionlari ta'siri natijasida kengayishi (fosfor ionining diametri panjara doimiysidan katta) tufayli sodir bo'ladi, bu sirt yaqinidagi bor konsentratsiyasining oshishiga olib keladi.

2) Kremniy panjarasining siqilishi tufayli bor ionlarini diffuziya qilish orqali fosfor ionlarini kristall hajmiga kiritishi (bor ionining diametri panjara doimiysidan kichik), bu yuzaga yaqin fosfor konsentratsiyasining pasayishiga olib keladi.

3) Diffuziya vaqtida kremniy panjarasida joylashgan neytral bor-fosforli komplekslarning hosil bo'lishi, bu tarqalish markazlari konsentratsiyasining pasayishiga va zaryad tashuvchilarning harakatchanligining oshishiga, shuningdek ikkalasining diffuziya koeffitsiyentining pasayishiga olib keladi.

4) Bor va fosfor ionlarining elektrostatik o'zaro ta'siri diffuziya koeffitsiyentlarining pasayishiga olib keladi.

Tajriba natijalari shuni ko'rsatdiki kremniy tarkibida fosforning konsentratsiyasi borning elektroaktiv konsentratsiyasining oshishiga olib keladi deb tasdiqlashga imkon beradi. Shunday qilib, fosfor va borning ketma-ket diffuziya qilinish sharoitida sirtidagi elektroaktiv bor atomlarining konsentratsiyasi kuchsiz legirlangan kremniy uchun hisoblanganidan 2,5-3 baravar yuqori bo'ldi. Olingan eksperimental ma'lumotlar [5] ish natijalari bilan mos tushadi.

Olingan eksperimental natijalarni faqat fosfor va bor aralashmasi atomlarining o'zaro kompensatsiyasi bilan izohlash mumkin emas. Shuning uchun, bu hodisa diffuziya jarayonida fosfor va bor atomlari oqimlarining o'zaro ta'siri bilan bog'liq deb aytish mumkin.

Yuqorida ko'rsatilgandek, olingan natijalar [6] ning xulosalariga zid kelmaydi va shuni aytish mumkinki, kremniy panjarasidagi o'zaro ta'sir natijasida donor-akseptor $\{P^+B^-\}$ komplekslarining katta qismi paydo bo'ladi. $\{P^+B^-\}$ komplekslar faqat fosfor va bor atomlari bir-biriga yaqin bo'lganida mavjud, ya'ni ular kremniy kristalli panjarasida ikkita qo'shni joyni egallaydilar.

Adabiyotlar

1. Бахадырханов М. К., Исамов С. Б. Журнал технической физики. 2021, том 91, вып. 11.
2. Bakhadyrkhanov M.K., Auropov K.S., Mavlyanov G.Kh., Isamov S.B. Semiconductors, 44 (9), 1145 2010.
3. Бахадирханов М.К., Абдурахманов Б.А., Зикриллаев Х.Ф. Приборы. 5 (215), 39 (2018).
4. Bakhadyrkhanov M.K., Sodikov U.X., Piev Kh.M., Tachilin S.A., Tuerdi Wumaier. Materials Physics and Chemistry, 1, 89. 2019.
5. Эмсли Дж. Элементы: Пер. с англ. Мир, -С.256. 1993.
6. Тишковский Е.Г., Ободников В.И., Таскин А.А., Фекистов К.В., Серяпин В.Г. ФТП, 34 (6), 655 2000.

REZYUME

Bu ishda kremniyga alohida bor, fosfor, ketma-ket bor va fosfor diffuziya qilingan 3 guruh namunalari o'rganildi. Buni o'rganishdan maqsad kremniyga ketma-ket diffuziya qilingan bor va fosforning o'zaro ta'siri va taqsimotini o'rganish. Natijada katta konsentratsiyada fosfor kiritilgan kremniyga borning diffuziyasi vaqtida elektroaktiv bor atomlari 2,5-3 marta ko'p fosfor atomlarini kompensatsiya qilib material o'tkazuvchanlik turini o'zgartirishi aniqlandi.

РЕЗИЮМЕ

В этой работе исследованы и изучены 3 группы образцов диффузии в кремнии, отдельно фосфор и бор, последовательного диффузии фосфора и бора. Целью данного исследования является изучение взаимодействия и распределения фосфора и бора диффузии с кремнием. В результате было обнаружено, что при диффузии бора в кремний с высокой концентрацией фосфора атомы электроактивного бора компенсируются в 2,5-3 раза больше атомов фосфора и меняют тип проводимости материала.

SUMMARY

In this work investigated and studied 3 groups of diffusion samples in silicon, separately phosphorus and boron, sequential diffusion of phosphorus and boron. The aim of this study is to study the interaction and distribution of phosphorus and boron diffusion of silicon. As a result, it was found that when boron diffuses into silicon with a high phosphorus concentration, the atoms of electroactive boron compensate 2,5-3 times more phosphorus atoms and change the type of material conductivity.

SIMULATION OF REPRODUCTION OF FIXED ASSETS AND CURRENT CAPITALS OF THE AGROINDUSTRIAL COMPLEX

Д.Т.Мухамедиева – doctor of Technical Sciences, professor
Д.Ш.Зиядуллаев – candidate of Technical Sciences, docent
Ш.Ўроқов – researcher

Тошкент ирригация ва қишлоқ хўжалигини механизациялаш муҳандислари институти
 миллий тадқиқот университети

Таянч сўзлар: модел, моделлаштириш, агросаноат, оптималлаштириш, технология.

Ключевые слова: модель, моделирование, агропромышленность, оптимизация, технология.

Key words: model, modeling, agro-industry, optimization, technology.

1. Introduction. As shown by the results of the study, in the branches of the agro-industrial complex there are great potential opportunities to provide the domestic consumer market, increase the volume of exports in the form of finished products [1].

The main task of deepening economic reforms is to

optimize the structure of production in agriculture and processing industries, taking into account the demand of both the internal and external markets. In a market economy, improving the quality of breeding varieties of agricultural crops and obtaining a high income is one of the main problems [2].

Research into the principles of preparation and assessment of the consequences of decisions made in the agro-industrial complex has shown that in the procedure for making decisions on the choice of the structure of production, it is necessary to substantiate the system of macroeconomic indicators. For this, it is necessary to formulate the functional tasks included in the decision-making process. In contrast to the usual solution of problems, experts are connected to this process, from whom it is possible to obtain information for input into the model. Based on this, it is possible to formulate a decision-making procedure for choosing the structure of production of products of the agro-industrial complex. For this purpose, a complex of decision-making models has been developed on the choice of the structure of production of products of the agro-industrial complex [3].

Using mathematical models and methods of their implementation, an information base has been developed and a dialogue system has been created, which serve as a reliable tool for developing the theoretical prerequisites for decision-making in the agricultural sector of the economy of the Republic. From an information point of view, the implementation of a system of models makes specific requirements for the development of a unified data bank and the corresponding software system. At the same time, the software allows the implementation of both individual models and the system as a whole, taking into account the possibility of expert intervention [2].

The development of a forecasting system for macroeconomic indicators such as the need for agricultural products, the volume and structure of production, as well as the sale of products for the automated management of agricultural facilities and services to the population in conditions of uncertainty of initial information is associated with the collection, storage, classification, updating, processing and delivery in a convenient for the user in the form of very large volumes of various analytical and summary information.

The established traditional methods do not include them in a unified system for forecasting macroeconomic indicators of agricultural production. To raise to a new qualitative level the provision of specialists in the agro-industrial complex with tools in the form of information and dialogue systems allows you to develop the most realistic management decisions that contribute to determining the optimal option for the development of production and sales of products in the sectoral sub-complexes of the agro-industrial complex. This is achieved through the development of a complex of applied programs and the creation of an integrated database of information and dialogue systems for forecasting at the macrolevel of indicators, taking into account the characteristics of breeding varieties of agricultural crops and animal breeds.

At various levels of government, for the purpose of state regulation of the development of the agricultural sector and the implementation of various projects in the sectoral sub-complexes of the agro-industrial complex and the sphere of public services, forecast and analytical data on the formation of the structure of production are used along with regulatory and reference and reporting and statistical data. The substantiation of forecast and analytical data is most effectively carried out on the basis of the construction and use of macroeconomic models for forecasting the choice of the structure of production. For the normal functioning of sectoral sub-complexes of the agro-industrial complex, it is necessary to ensure the reproduction of fixed assets and working capital of the agro-industrial complex [1,2].

2. Modeling the reproduction of fixed assets and working capital of the agro-industrial complex. We represent the equation of the dynamics of fixed capital in the form: $K_t = a_{11}K_{t-1} + a_{12}A_{t-1} + a_{13}P_{t-1} + I_{t-1}$, (1)

where K - fixed assets; A - depreciation charges; P - net profit; I - external investments; $a_{11} = (1-n)$, n - depreciation rate; a_{12} - part of depreciation charges used to restore property, plant and equipment; a_{13} - part of the net profit for the restoration of fixed assets. Let us denote by z^{-1} shift operator, $z^{-1}y_t = y_{t-1}$. Taking into account this designation, equation (1) can be represented as: $K_t = a_{11}z^{-1}K_t + a_{12}A_{t-1} + a_{13}P_{t-1} + I_{t-1}$. (2)

We transform this equation:

$$K_t(1 - a_{11}z^{-1}) = a_{12}A_{t-1} + a_{13}P_{t-1} + I_{t-1},$$

$$K_t = (a_{12}A_{t-1} + a_{13}P_{t-1} + I_{t-1}) / (1 - a_{11}z^{-1}).$$

The last expression can be represented in the form of a block diagram (see Figure 1).

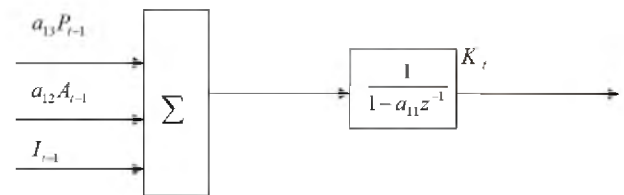


Figure 1. Model of reproduction of fixed assets.

Consider the dynamics of the reproduction of circulating assets. We will assume that due to inflation, the working capital of the sectoral sub-complexes of the agro-industrial complex is depreciated and part of the net profit is sent to restore them. With this in mind, the equation for the dynamics of working capital will look like:

$$L_t = a_{21}L_{t-1} + a_{22}P_{t-1}, \tag{3}$$

where L - working capital; $a_{21} = 1/(1+i)$; i - discount rate that takes into account inflationary depreciation of working capital; a_{22} - the share of net profit used to replenish working capital. The shift operator brings the difference equation (3) to the form:

$$L_t = a_{21}z^{-1}L_t + a_{22}P_{t-1} \tag{4}$$

Equation (4) will correspond to the structural diagram shown in Figure 2.

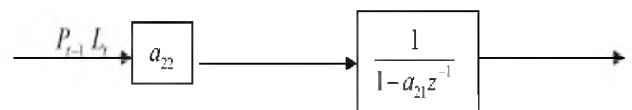


Figure 2. Working capital reproduction model.

The added value produced by the sectoral sub-complexes of the agro-industrial complex for a time equal to the duration of the production cycle is written using the production function $y = f(K, L)$.

This approach will allow us to improve the accuracy of the analysis and evaluate the real reproduction processes in the sectors of the agro-industrial complex.

3. Optimization of production products. In economics, functions are widely used that express the technological dependence between the results of the activity of a production facility and the costs of factors of production. Such functions are called production functions [3]. Many economic models use the Cobb-Douglas production function, which is given by the formula [4]:

$$y = a_0 L^{a_1} K^{a_2}, \tag{5}$$

where y - added value produced by sectoral sub-complexes of the agro-industrial complex for a time equal to the duration of the production cycle,

a_0, a_1, a_2 , - positive constants, L – working capital K -main capital.

K Let the dependence of the added value produced by the sectoral sub-complexes of the agro-industrial complex on resources has the form of the Cobb-Douglas production function: $y = a_0 K^{a_1} L^{a_2}$,

Resource prices are set C_K and C_L and the total amount of funds C for production. To determine the amount of resources K and L , at which the added value is maximal, we use the theorem [3-7]. Theorem 1 By solving the extremal

problem $\prod_{i=1}^n x_i^{\beta_i} \rightarrow \max,$

with restrictions $\sum_{i=1}^n \alpha_i x_i = S, x_i > 0, x_i \in \mathbb{R},$

where $\beta_i > 0, \alpha_i > 0, \beta_i \in \mathbb{R}, \alpha_i \in \mathbb{R}, i = \overline{1, n},$

is the vector x^* with components

$$x_i^* = \frac{\beta_i S}{\alpha_i \beta}, \text{ where } \beta = \sum_{i=1}^n \beta_i. \tag{6}$$

The maximum value of the objective function μ calculated by the formula

$$\mu = \left(\frac{S}{\beta}\right)^\beta \prod_{i=1}^n \left(\frac{\beta_i}{\alpha_i}\right)^{\beta_i}. \tag{7}$$

Mathematical model of problem (5) can be written as follows: $y = a_0 K^{a_1} L^{a_2} \rightarrow \max,$

with restrictions $c_K K + c_L L = C, K \geq 0, L \geq 0.$

To solve this problem, we apply. Theorem 1 for

$n = 2, S = C, x_1 = K, x_2 = L, \beta_1 = a_1, \beta_2 = a_2, \alpha_1 = c_K, \alpha_2 = c_L.$

Optimal amounts of consumed resources K^* and L^* are calculated by the formulas (6):

$$K^* = \frac{a_1}{a_1 + a_2} \times \frac{C}{c_K}; L^* = \frac{a_2}{a_1 + a_2} \times \frac{C}{c_L}.$$

output y^* calculated by the formula (7):

$$y^* = a_0 \left(\frac{C}{a_1 + a_2}\right)^{a_1 + a_2} \left(\frac{a_1}{c_K}\right)^{a_1} \left(\frac{a_2}{c_L}\right)^{a_2}.$$

Let us now present a theorem, which deals with the inverse problem.

Theorem 2 By solving the extremal problem [3-7]

$\sum_{i=1}^n \alpha_i x_i \rightarrow \min,$

with restrictions $\prod_{i=1}^n x_i^{\beta_i} = P,$ where

$x_i > 0, \beta_i > 0, \beta_i \in \mathbb{R}, \alpha_i \in \mathbb{R}, i = \overline{1, n},$

is the only vector x^* with components

$$x_i^* = \frac{\beta_i}{\alpha_i} \left[P \prod_{i=1}^n \left(\frac{\alpha_i}{\beta_i}\right)^{\beta_i} \right]^{1/\beta} = \frac{\beta_i \mu}{\alpha_i \beta}, \tag{8}$$

where $\beta = \sum_{i=1}^n \beta_i,$ objective function minimum μ is calculated by the formula:

$$\mu = \beta \left[P \prod_{i=1}^n \left(\frac{\alpha_i}{\beta_i}\right)^{\beta_i} \right]^{1/\beta}. \tag{9}$$

The next example considers the problem inverse to problem (5). To solve it, we use Theorem 2.

Let us find at what least cost of resources a given volume of output will be achieved.

Mathematical model of problem (5) will take the form:

$C = c_L K + c_L L \rightarrow \min$

with restrictions

$a_0 K^{a_1} L^{a_2} = y, K \geq 0, L \geq 0. \tag{10}$

We transform constraint (10): $K^{a_1} L^{a_2} = \frac{y}{a_0}.$

To solve this problem, we use Theorem 2 for

$n = 2, x_1 = K, x_2 = L, P = \frac{y}{a_0}, \alpha_1 = c_K, \alpha_2 = c_L, \beta_1 = a_1, \beta_2 = a_2.$

Substituting the parameter values into formula (8), we obtain the optimal amounts of resources:

$$K^* = \frac{a_1}{c_K} \left[\frac{y}{a_0} \left(\frac{c_K}{a_1}\right)^{a_1} \left(\frac{c_L}{a_2}\right)^{a_2} \right]^{\frac{1}{a_1 + a_2}} =$$

$$= \left(\frac{y}{a_0}\right)^{\frac{1}{a_1 + a_2}} c_K^{\frac{-a_2}{a_1 + a_2}} c_L^{\frac{a_2}{a_1 + a_2}} a_1^{\frac{a_2}{a_1 + a_2}} a_2^{\frac{-a_2}{a_1 + a_2}} =$$

$$= \left(\frac{y}{a_0}\right)^{\frac{1}{a_1 + a_2}} \left(\frac{c_L a_1}{c_K a_2}\right)^{\frac{a_2}{a_1 + a_2}},$$

$$L^* = \frac{a_2}{c_L} \left[\frac{y}{a_0} \left(\frac{c_K}{a_1}\right)^{a_1} \left(\frac{c_L}{a_2}\right)^{a_2} \right]^{\frac{1}{a_1 + a_2}} =$$

$$= \left(\frac{y}{a_0}\right)^{\frac{1}{a_1 + a_2}} c_K^{\frac{a_1}{a_1 + a_2}} c_L^{\frac{-a_1}{a_1 + a_2}} a_1^{\frac{-a_1}{a_1 + a_2}} a_2^{\frac{a_1}{a_1 + a_2}} =$$

$$= \left(\frac{y}{a_0}\right)^{\frac{1}{a_1 + a_2}} \left(\frac{c_K a_2}{c_L a_1}\right)^{\frac{a_1}{a_1 + a_2}}.$$

Least cost C^* for resources are calculated by the formula (9):

$$C^* = (a_1 + a_2) \left[\frac{y}{a_0} \left(\frac{c_K}{a_1}\right)^{a_1} \left(\frac{c_L}{a_2}\right)^{a_2} \right]^{\frac{1}{a_1 + a_2}}.$$

4. Conclusion. Thus, one of the priority directions for the development of the industrial sphere of sovereign Uzbekistan is the production and processing of agricultural products. As the results of the study have shown, these industries have great potential for supplying the domestic consumer market, increasing the volume of exports in the form of finished products [6-8].

The main task of deepening economic reforms is to optimize the structure of production in agriculture and processing industries, taking into account the demand of both the internal and external markets.

References

1. Ovchinnikov A 2015 *Strategic management of sustainable development of agro-industrial complex with economic integration* European Research Studies Journal V 18 –P. 307-315.
2. Bukhvalova VA, Bukhvalova VV 2015 *MyOpenMath: from task generation to full network support of courses* Computer tools in education V2. –P. 49-62
3. Plakunov MK and Rayackas RP 2011 *Production functions in economic analysis* (Vilnius: Minthis, 1984.5. Creese R) Geometric Programming for Design and Cost Optimization (with Illustrative case study problems and solutions) Morgan & Claypool Publishers
4. Lange K and Zhou H M M 2014 *Algorithms for geometric and signomial programming* (Math. Program., Ser. A) V 143. –P. 339-356
5. Ziyadullayev D.Sh., Mukhamedieva D.T., Ziyodullaeva G.E., Ibadullaeva Z.J. 2018 *Develop the student model. Journal of Advanced Research in Dynamical and Control Systems – JARDCS Vol. 10(14) <http://www.jaracs.org/backissues/archives-special.php?year=2018&issue=14>*

РЕЗЮМЕ

Мақолада агросаноат мажмуасининг асосий фондлари ва айланма маблағларини такрор ишлаб чиқаришни моделлаштириш ва саноат маҳсулотларини оптималлаштириш кўриб чиқилади, ишлаб чиқариш объекти фаолияти натижалари ва ишлаб чиқариш омилини харажатлари ўртасидаги технологик боғлиқлик ифодаланади. Агросаноат мажмуасида кенг фойдаланилади.

РЕЗЮМЕ

В статье рассматривается моделирование воспроизводства основных фондов и оборотных средств агропромышленного комплекса и оптимизация выпуска промышленной продукции, выражающее технологическую зависимость между результатами деятельности производственного объекта и затратами факторов производства, которые широко используется в агропромышленном комплексе.

SYMMARY

The paper examines the modeling of the reproduction of fixed assets and working capital of the agro-industrial complex and the optimization of industrial products, expressing the technological dependence between the results of the activity of a production facility and the costs of production factors, which are widely used in the agro-industrial complex.

SINFLARGA AJRATISH MASALASIDA ALOMATLARNING INFORMATIVLIGINI BAHOLASH VA ULARNI TANLASH

E.R.Navruzov – doktorant

Q.T.Maxarov – doktorant

M.A.Raximova – doktorant

Mirzo Ulug'bek nomidagi O'zbekiston milliy universiteti

Tayanch so'zlar: o'lchamni qisqartirish, alomatlarning informativligini baholash, alomatlarni tanlash, yashirin qonuniyatlarni qidirish, Naïve Bayes.

Ключевые слова: снижение размерности, оценка информативности признаков, выбор признаков, поиск скрытых закономерностей, Naïve Bayes.

Key words: dimensionality reduction, assessment of the informativeness of features, feature selection, search hidden patterns, Naïve Bayes.

Kirish. Zamonaviy informatsion texnologiyalarni tibbiyotda qo'llash tibbiy informatsion tizim yordamida saqlanuvchi va qayta ishlanuvchi katta miqdordagi berilganlarni to'planishiga olib keladi. Bu berilganlar qaror qabul qilishda ishlatiladigan tibbiy bilimlarni o'zida saqlashi mumkin. Ushbu berilganlarni tadqiq qilish jarayonida o'lcham muammosi yuzaga keladi. Shuning uchun alomatlar fazosini qisqartirish va informativ alomatlar to'plamini ajratish tibbiy axborot tizimlari uchun aktual masalalardan biri bo'lib bormoqda.

Alomatlar fazosini qisqartirish yoki alomatlarni tanlash ko'pincha tibbiy prognoz modellarini qurishda va tahlil qilishda yuzaga keladi [1]. Tadqiq qilishda ishlatiladigan alomatlar miqdorini kamaytirish hisoblash murakkabligini pasaytirish [2], obyekt haqidagi qo'shimcha ma'lumotlarni olish uchun o'tkaziladigan tibbiy tadqiqotlar uchun zarur bo'lgan harajatlarni kamaytirish [3] uchun ishlatiladi.

Obyektni sinfga ajratish bo'yicha qaror qabul qilishda uni bir nechta alomatlari bo'yicha baholash va bu baholarni to'g'ri hisobga olish muammosi yuzaga keladi [4]. Bu muammo ikkita qism muammolarga ajratiladi: natijaviy qoidani ko'rinishini belgilash va alomatlarning muhimlik koeffitsientini – vaznlarini [5] aniqlash.

Ma'lumotlar miqdori bo'yicha individual mustaqil xususiyatlarning ahamiyatini baholash zarur bo'lganda, statistik usullar keng qo'llaniladi: to'plangan chastotalar usuli, Shennon usuli va Kulbak usuli [6,7]. Intelktual qaror qabul qilish tizimlarida bu usullarni tanlash quyidagi sabablarga bog'liq: bu usullar axborot mazmunini o'lchashning juda oddiy algoritmlariga asoslangan, bu usullarni qo'llash natijalarini talqin qilish oson,

berilganlarda tushurib qoldirilgan qiymatlar mavjud bo'lganda, alomatlar qiymatlari turli o'lchamda bo'lganda va ularning miqdori katta bo'lganda ham qo'llash mumkin [8,9].

Alomatlar informativligini baholash. Standart ravishda qo'yilgan obrazlarni anglash masalasi qaraladi. O'zaro kesishmaydigan $K_1...K_d$ ($d>1$) sinflar vakillarini o'z ichiga olgan $E_0 = \{S_1, ..., S_m\}$ obyektlar to'plami berilgan. Tanlanmaning mumkin bo'lgan obyekt n ta turli toifadagi $X = (x_1, ..., x_n)$ alomatlar (miqdoriy va nominal) bilan tavsiflangan bo'lib, ularning ξ tasi miqdoriy, $n-\xi$ tasi nominal shkalalarda o'lchanadi.

Ishning maqsadi obyektlarni sinfga ajratishda alomatlarni tanlash uchun Shennon, Kulbak va [9] da taklif etilgan intervallarga ajratishning stoxostik usulini qo'llash va ularning solishtirma tahlilini o'tkazishdan iborat (intervallarga ajratishning stoxastik usulini CR1 deb nomlab ketiladi). Buning uchun quyidagilarni aniqlash zarur:

- alomatlarning informativligini baholash;
- sinfga ajratish uchun informativlik bahosi asosida alomatlarni tanlash.

Shennon usuli asosida alomatlar informativligini baholash. Shennon usuli alomatlarning turli gradatsiyalariga mos keluvchi ma'lumotlarning o'rtacha og'irligi sifatida informativlikni baholashni taklif qiladi. i-alamatning informativligi quyidagicha aniqlanadi:

$$I(x_i) = 1 + \sum_{i=1}^G (P_i \sum_{k=1}^K P_{i,k} * \log_k P_{i,k}) \tag{1}$$

MAZMUNÍ
TÁBIYIY HÁM TEXNIKALÍQ ILIMLER

Fizika. Matematika. Texnika. Informatika

Alaminov M.X., Igilikov A.J. Ekinshi tártipli differencial-operator teńleme ushın qoyılǵan koshi máselesiniń sheshimi haqqında	3
Asqarov M.A., Koshkarbaeva R., Ubaydullaeva A. Sızıqlı teńlemeler sistemasının bazibir qollanıwları	4
Asqarov M.A., Sarsenbaeva M., Gubanova G.T. Kópaǵzalılar korenlerin anıqlawdın bazibir usılları	7
Байгураев А.М., Шахобиддинова З.Б. Некоторые кардинальные свойства плоскости немецкого	8
Islomov Sh.E., Asqarov I.B. Avtotransport korxonalarini boshqarishda qaror qabul qilish usullarini qo`llash	11
Каландаров И.И., Буранов Б.М., Калханов П.Ж. Инвариантные системы автоматического управления с релейным усилителем	13
Корабоев К.А., Сапаев У.К. Теоретическое исследование влияния квантового ограничения на энергетический спектр полупроводниковых сферических квантовых точек с использованием частицы в модели ловушки	15
Qutlmuratov B.J., Ubbiniyazova A.B. Lere-koppelmanńń tiykarǵı integrallıq formulası hám onnan kelip shıǵıwshı nátiyje	18
Махмудов М.Ж., Суяров М.Т. Кислородли қўндирмаларнинг автобензин компонентларининг чўкма ҳосил қилиш хоссаларига таъсири	20
Mavlonov G'.X., Isamov S.B., Usmonov A.A., Kenjayev Z.T. Kremniyga fosfor va bor atomlarining ketma-ket diffuziyasi	23
Мухамедиева Д.Т., Зиядуллаев Д.Ш., Ўроқов Ш. Simulation of reproduction of fixed assets and current capitals of the agroindustrial complex	24
Navruzov E.R., Maxarov Q.T., Raximova M.A. Sinflarga ajratish masalasida alomatlarıning informativligini baholash va ularni tanlash	27
Nurimbetov K., Yavidov B. External light induced increase of superconductivity of cuprates	30
Зикриллаев Н.Ф., Кушиев Г.А., Турсунов О.Б., Ҳамроқулов Ш.И. Диффузион технология билан Ge_xSi_{1-x} асосида гетеро ва варизон структура ҳосил қилиш ва унинг оптик хусусиятларини ўрганиш	32

Biologiya. Ximiya

Baltabaev M.T., Baltabaeva V.M., Karlıbayeva M. «Aralqum» toǵayzarlıqqa aylanbaqta	34
Бўриев С.Б., Шаропова Ш.Р. Бухоро шахрида жойлашган ҳовузларнинг санитар-гигиеник текширув натижалари	35
Кабулова Л.К., Атакузиев Т.А., Оразимбетова Г.Ж., Избасарова Г.Б. Термообработанный туффит – в качестве гидравлической добавки для портландцемента	37

JÁMIYETLIK HÁM EKONOMIKALÍQ ILIMLER

Ekonomika

Ешимбетов У.Х., Искендеров А.Б., Турдыбекова З.М., Атамуратов И.А. формирование территориальных минерально-сырьевых комплексов в Республике Каракалпакстан	40
Узақбаев Қ.К. Аҳолига хизмат кўрсатиш соҳаларини тадқиқ этишнинг илмий-услубий асослари	43

Tariyx. Huqıqtanıw

Абдуллаева Я.А. Олий таълим муассасаларида жамоатчилик назоратини ўрнатишнинг меъерий-хуқуқий асослари ва жамоатчилик назоратини ташкил қилиш тарихи (қорақалпоғистон отмлари мисолида)	45
Рузиева Д.И., Арзымбетова Ш.Ж., Даулеталиева Д.М. Патриотическое воспитание в казахстане и странах ближнего зарубежья	48
Жайнаров О.Х. Туркистон Аср адлия органлари фаолияти тарихи манбашунослиги: турлари ва таҳлили	49
Tilevov E.M., Pirniyazova M.K. Saylaw huqıqı puqaralardıń siyasiy huqıqı sıpatında	52

TIL BILIMI HÁM ÁDEBIYATTANÍW

Til bilimi

Allaniyazova Sh., Ótebaeva D. Ekologiyalıq terminler – sózlik quramńń bir bólegi	54
Байниязова С.Т. Выражение темпоральности в немецком и каракалпакском языках	55
Халмуратов И., Кдырбаева Г. Вопрос категории падежа в каракалпакском и английском языках	57
Ибрагимов Ю.М. Жанубий Оролбўйи ўзбек шевалари лексикасидаги айрим сўзларнинг этимологик талқини	58

Qarasaev A. Qaraqalpaq tilinde ayırım muzikalıq ásbap atamalarınń leksika-semantikalıq ózgeshelikleri	61
Qarlıbaeva G., Asanova D. Qaraqalpaq tilindegi fizika atamalarınń qollanılıw ózgesheligi	63
Қурбанов М.Д. Қарақалпақстан ойконимлериниң номинациясында негативлик принципі	65
Қуттымуратова Ы.А., Кушкарбекова М.Ү. Тамды районы қазақларының тилиндегі кәсіптік лексика	67
Madaminova R.M. Hofiz xorazmiy devoni tilida «qizil» soʻzining sinonimlari va ular vositasida hosil boʻlgan soʻz birikmalari	68
Торebaева Ф.Қ. Инглис тил билиминде фраземалардың изертлениўи хэм олардың рус тил билиминде тәсири	70
Shunnazarova S. Somatizmlik frazeologizmlerdiń lingvomádeniy izertleniwi	72
Ádebiyattanıw	
Ахмедова О.М. Фольклор ва оммавий ахборот воситалариниң тарихан синкретлиги	75
Алламбергенов К. Жийен-жыраў Аманлық улының өмири хэм дөретиўшилигин жаңаша көзқараста үйрениўдиң айырым мәселелери	77
Алламбергенова Г.К. Қарақалпақ эпосларының сырт елдерде үйренилиўиниң тийкаргы илимий аспектлери анализи	81
Алламбергенова Г.К. Қарақалпақ эпосларының сырт елдерде үйренилиўинде халық аралық конференциялардың тутқан орны	84
Алимқулов Э. Қадимги туркий халқлар мифо-эпик тасаввурларида химоя тотемлари тавсифи	87
Aliyeva X.R. Türkiy xalıqlar ádebiyattanıw iliminde hayal-qızlar dóretiwhiliginiń izertleniwi	89
Амирқулова З.М. Тарихий ҳикояларда “Умаршайх мирзо” образиниң бадий талқини	92
Арзыев Ш.А. Ерте дәўирдеги шығыс әдебиятында қуслар образының жасалыўы	94
Асенбаева Г.Х. К.Султановтың «Өмир дәптери» шығармасында халық нақыл-мақалларының көркемлик хызмети	96
Баўатдинова С. Қарақалпақ фольклорында басқы жанры	98
Бийсенбаев Қ. Сөз ойын қосықлары – қарақалпақ балалар фольклорының өз алдына бир жанры сыпатында	100
Дошанова Г. Фарида Афрўз ижодидаги учликлар шеърый жанр сифатида	101
Esemuratova U. «Dáwletiyarbak» dástanında kórkemlew qurallarınıń qollanılıw ózgeshelikleri	104
Эгамқулова Г.М. Қарақалпақ жыраўшылық өнери хэм Шаңқай жыраў дөретиўшилиги	105
Худайқулова Л. Чори бахши Умиров ижодига бир назар	107
Жаксимова У.Ж. Қарақалпақ лиро-эпик достонлариниң шаклланиш жараёни масалалари	109
Jaqsılıqova A. K.Allambergenovtiń satiraliq prozasi	110
Jollibaeva G. Sheshenlik sózler hám sheshenler aytisiniń payda bolıw hám qalıplesiw jollari	112
Jollibaeva G. Sheshenlik óneriniń hám sheshenler aytisiniń janrlıq ózgeshelikleri	114
Кеңесбаева Ш.К. Ерте тип сюжетли хэм тарийхый-қахарманлық дәстанларда даралық дөретиўшилиқ дәстүрлери көринислери	115
Қурамбоева Г. Адабий алоқалар - адабий жараён тақозоси (ўзбек ва қарақалпақ адабий алоқалари мисолида)	118
Matyakupov S. Muloqot shaklida tasvir va ifoda mutanosibligi	121
Пиримқулов А.Э. Сирожиддин Саййид хажвиялари	123
Прекеева А., Қутлымуратов К. М.Юсуф шығармаларында талмех усылының қолланылыўы ...	125
Рахмонова С.Р. Аслиятга ҳамоҳанг	127
Satbaev A.B. Sađınbay Ibragimov poeziyasında kishi lirikalıq janrlar hám olarda mazmun hám forma birligi	128
Сайтова З.К. Қарақалпақ, англичан халықлары ертеклери хэм ертеқилердиң тутқан орны, атқарыўшылық шеберлиги	130
Сарсенбаев Қ. Adabiyotda badiiy mahorat haqida (T.Qayıpbergenovning «Uyqısız tınler» povesti asosida)	133
Тортқулбаева Т.А., Базарбаева Г., Ержанова Н. Т.Аманжоловтың «Асаў-барақ» жырындағы патриотлық идея	134
Зинатдинова Г.И. Қарақалпақ нақыл-мақалларында ўақыт хэм кеңислик мәселелери	137