

YALPI HUDUDIIY MAHSULOT HAJMINI EKONOMETRIK MODELLASHTIRISH

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Annotatsiya: Ushbu maqolada Surxondaryo viloyati yalpi hududiy mahsulot hajmi eksponentsial, chiziqli, polinomli, darajali, logarifmli trend modellari yordamida 2028 yilga qadar prognoz qilingan hamda iqtisodiy jarayonga eng mos model turi aniqlangan.

Kalit so'zlar: eksponentsial, chiziqli, polinomli, darajali, logarifmli trend modellari, regressiya.

Ko'rsatkichlarni yillar oralig'idagi o'zgarishini o'rganish ahamiyati katta. Sababi ular vaqt davomida o'zgarib turadi. Bunday holatlarda trend modellari bilan prognozlashtirish ko'rsatkichlarning nazariy qiymatlarini aniqlash orqali kelgusi holatni tadqiq etish imkonini beradi. Trend modellari tajribalarda keng qo'llaniladigan eng sodda prognozlash modellaridan biri hisoblanadi.

Trend – tasodifiy ta'sirlardan holi holda vaqt bo'yicha harakat qonuniyatidir. Trend vaqt bo'yicha regressiya bo'lib, doimiy omillar ta'sirida yuzaga keladigan rivojlanishning determinik tarkibiy qismidir. Trendlardagi chetlanishlar tasodifiy omillar sababli yuzaga keladi¹. Unda natijaviy belgi sifatida o'rganayotgan ko'rsatkich,



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omil belgi sifatida esa kuzatuv davri soni olinadi. Odatda trend modellari umumiy ko'rinishi quyidagicha bo'ladi²:

$$y_t = f(t) + \varepsilon_t \quad (1)$$

bu yerda, $f(t)$ - jarayonlarning vaqt bo'yicha yo'nalishining doimiy tarkibiy qismi; ε_t - tasodifiy tarkibiy qism;

Trend modellarining keng qo'llaniladigan quyidagi turlari mavjud^{3 4 5 6}:

- $y = a + bt$ - chiziqli trend modeli
- $y = ae^{bt}$ - eksponentsial trend modeli
- $y = a + b_1x + b_2x^2$ - 2-darajali polinom
- $y = at^b$ - darajali
- $y = a + blnt$ - logarifmik trend tenglamalari

Odatda, trend parametrlari eng kichik kvadratlar usuli yordamida baholanadi. Egri chiziqli trend modellari logarifmlash yo'li bilan chiziqli trend ko'rinishiga keltiriladi va tegishli hisob-kitoblar amalga oshiriladi.

Eng maqbul modelni tanlash uchun ularning determinatsiya koeffitsienti va xatoliklariga ko'zdan kechiriladi.

Surxondaryov viloyati yalpi hududiy mahsuloti hajmini eksponentsial, chiziqli, darajali va 2-tartibi polinom trend modellari bilan modellashtirish uchun Microsoft

² Фукина С.П. Трендовые модели в экономических исследованиях // Экономический анализ: теория и практика. 2011. №11. URL: <https://cyberleninka.ru/article/n/trendovye-modeli-v-ekonomicheskix-issledovaniyah> (дата обращения: 28.11.2023).

³ Tuychiyeva, M. K., & Turayev, B. E. (2024). Trend modellari yordamida elektron tijorat aylanmasi hajmini modellashtirish va prognozlashtirish. Technical science research in Uzbekistan, 2(2), 193-199.

⁴ Mirzohidovna, P. M., & Turayev, B. E. (2024). Surxondaryo viloyati asosiy kapitalga kiritilgan investitsiyalar hajmini trend modellari orqali modellashtirish. Journal of Universal Science Research, 2(2), 296-302.

⁵ Xursanova, S. A., & Turayev, B. E. (2024). Hudud dehqonchilik mahsulotlari ishlab chiqarish hajmini trend modellari yordamida prognozlashtirish. Technical science research in Uzbekistan, 2(2), 200-208.

⁶ Tulaganova, M. H., & Turayev, B. E. (2024). Asosiy kapitalga kiritilgan investitsiyalarni trend modellari yordamida prognozlash (Surxondaryo viloyati misolida). Technical science research in Uzbekistan, 2(2), 223-230.





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Excel dasturiy ta'minotining «Анализ данных» paketidan foydalangan holda amalga oshirildi. Dastlab tahlil uchun 1-jadvaldagi ma'lumotlardan foydalanildi.

1-jadval

Surxondaryo viloyati yalpi hududiy mahsulot hajmi (mlrd so'm)⁷

Yillar	y	Yillar	y
2010	3394,7	2017	14404,4
2011	5217,1	2018	18592,5
2012	6436,4	2019	22288,1
2013	7436,4	2020	24625,6
2014	9213,2	2021	29693,2
2015	11114,4	2022	34385,3
2016	12179,6	2023	40909,8

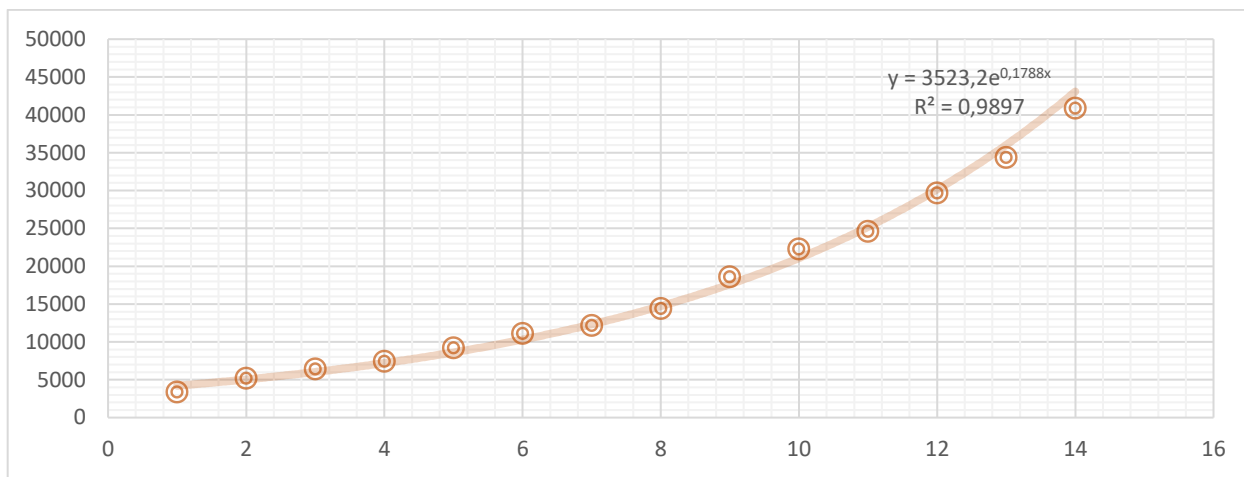
Tajriba uchun ma'lumotlarni MS Excelga yuklab oldik. Ma'lumotlar oraligini belgilab olib, “Вставка – Диаграмма – Точечная – Точечная” diagrammasini, keyin esa, istalgan nuqtani belgilab, sichqonchanning o'ng tugmasini bosish orqali hosil qilinadigan menyudan “Добавить линию тренда...” ni tanladik. Natijada quyidagiga ega bo'ldik

⁷ Surxondaryo viloyati Statistika boshqarmasi rasmiy sayti www.surxonstat.uz ma'lumotlari.



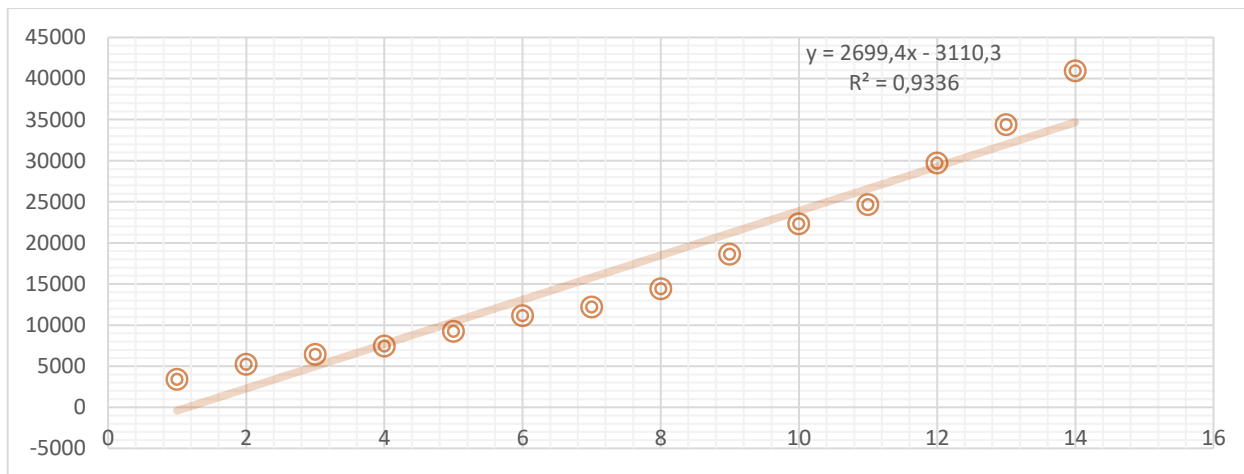


(1-rasm).

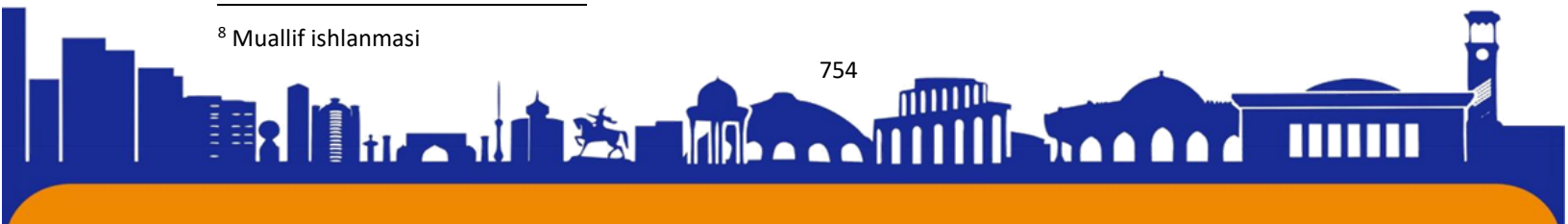


1-rasm. Eksponentsial trend modeli⁸

Boshqa model turlarini tanlab 2-5-rasmlardagi natijalarga ega bo'lamiz.

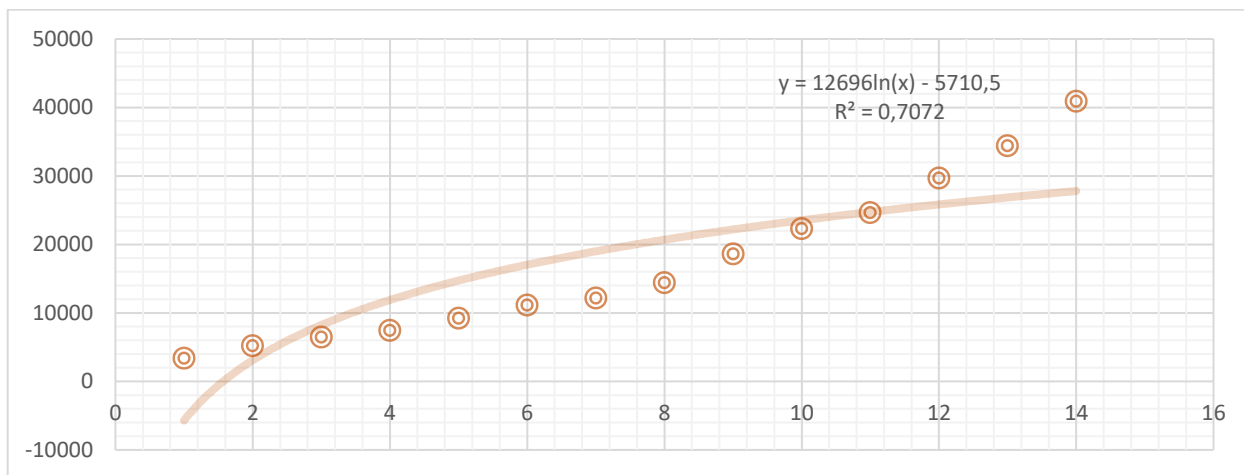


⁸ Muallif ishlanmasi

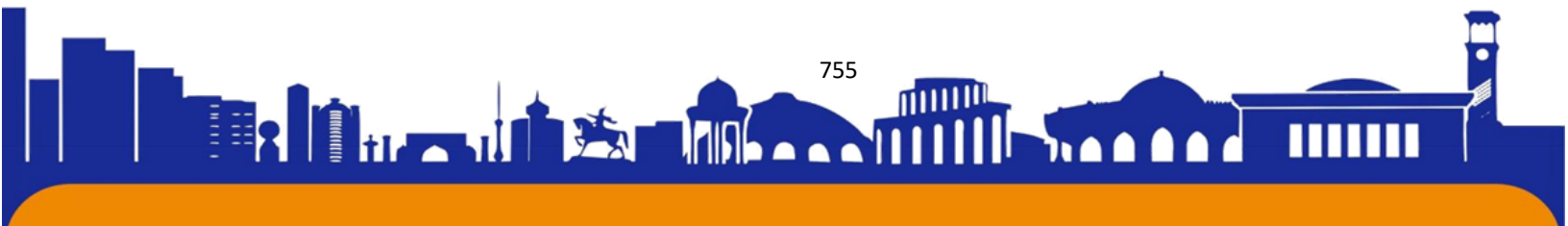
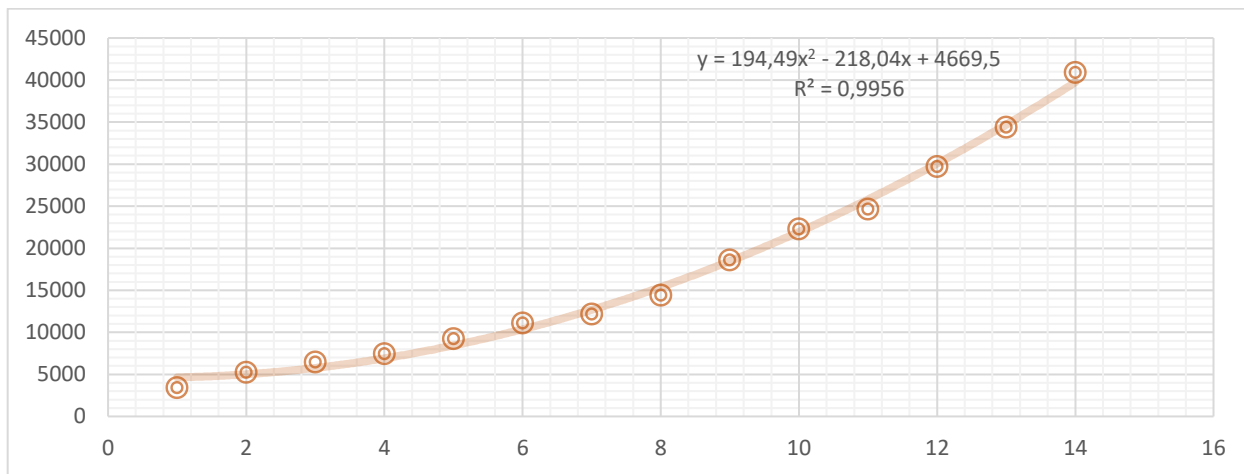




2-rasm. Chiziqli trend modeli

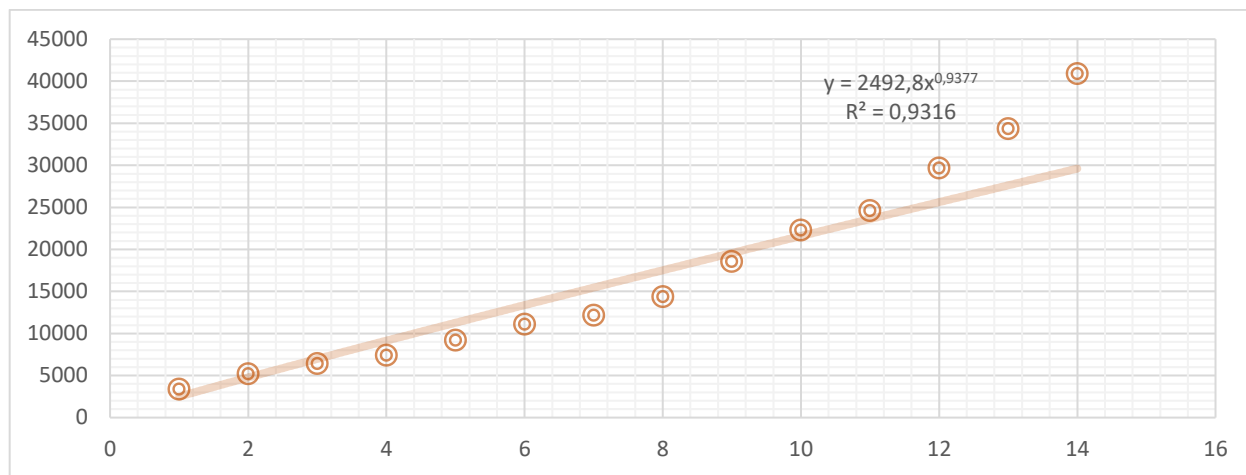


3-rasm. Logarifmik trend modeli





4-rasm. 2-darajali polinom trend modeli



5-rasm. 2-darajali trend modeli.

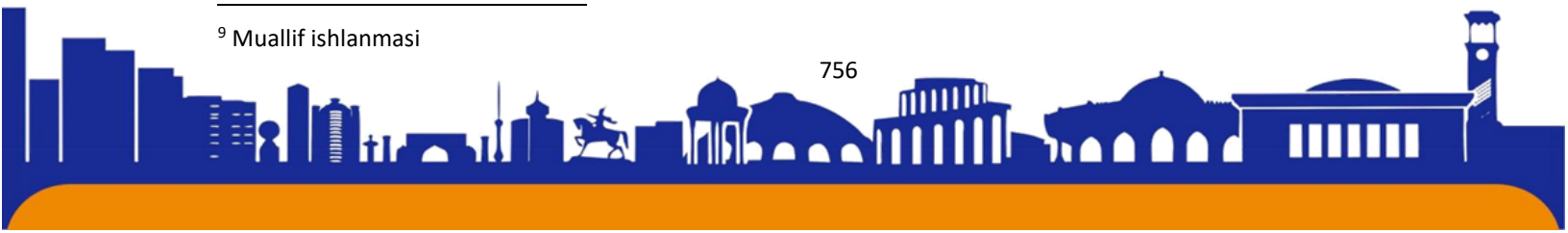
Shunday qilib, barcha turdagi modellarni tuzib oldik. Endi ularning sifatini va ahamiyatligini tekshirib ko'ramiz (2-jadval).

2-jadval

Regression tahlil natijalari⁹

T/r	Model turi	Model tenglam,asi	Determinatsiya koefitsienti
1	Ekspontentsial	$y = 3523,2e^{0,1788t}$	0,9897
2	Chiziqli	$y = 2699,4t - 3110,3$	0,9336
3	Logarifmik	$y = 12696 \ln(t) - 5710,5$	0,7072
4	Polinomli	$y = 194,49t^2 - 218,04t + 4669,5$	0,9956
5	Darajali	$y = 2492,8t^{0,9377}$	0,9316

⁹ Muallif ishlanmasi





2-jadvaldan 2-darajali polinom trend modeli bo'yicha determinatsiya koeffitsienti eng katta. Demak, model sifati boshqalarga qaraganda yuqori. Modelning ahamiyatini Fisher mezoni bilan va parametrlari statistik ishonchliligini Styudent t mezoni bilan tekirshilganda ba'zi koeffitsiyentlari statistik ahamiyatga ega bo'lmadi. Shu sababli o'zgarmas qatnashmagan 2-darajali polinom model turini tajribadan o'tkazdik (3-jadval).

3-jadval

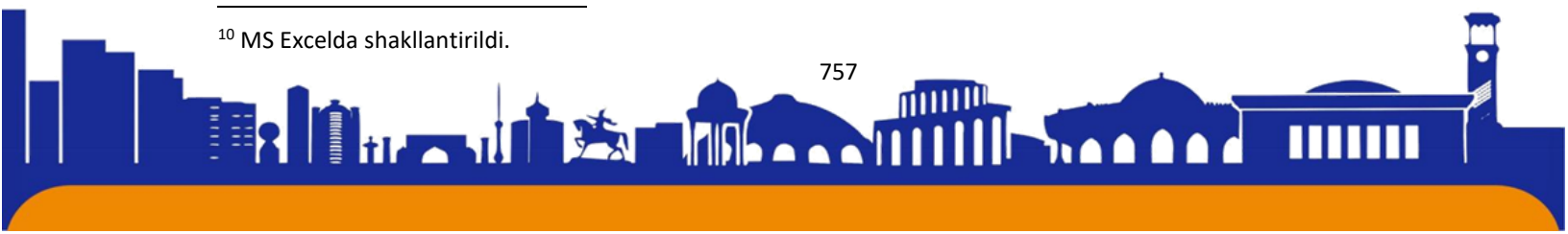
Regression tahlil natijalari¹⁰

ВЫВОД

ИТОГОВ

<i>Регрессионная статистика</i>	
Множественный R	0,997
R-квадрат	0,994
Нормированный R-квадрат	0,911
Стандартная ошибка	1656,643
Наблюдения	14

¹⁰ MS Excelda shakllantirildi.





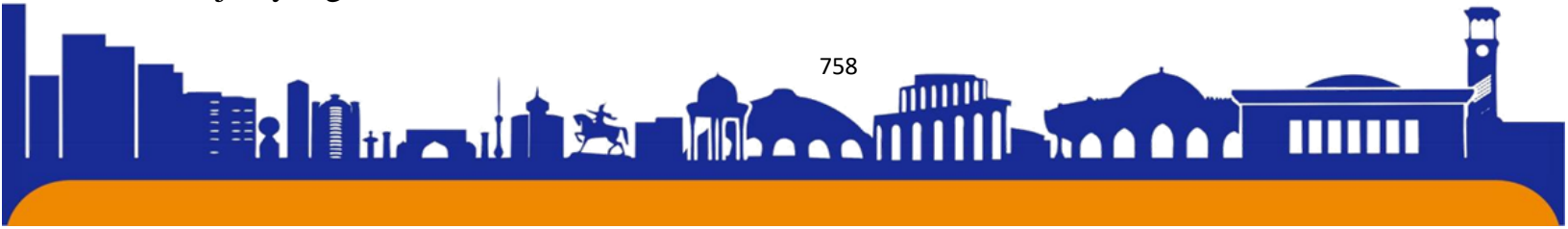
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Дисперсионны
й анализ

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Значимос ть F</i>
Регрессия	2	585328549	2926642747	1066,379	2,54796E-13
Остаток	12	32933604,4	2744467,03	9	
Итого	14	588621909			

	<i>Коэффи- циенты</i>	<i>Стандарт -ная ошибка</i>	<i>t- статисти ка</i>	<i>P- Значение</i>	<i>Нижние 95%</i>
У-пересечение	0,000	#Н/Д	#Н/Д	#Н/Д	#Н/Д
Переменная X 1	1067,553	208,622	5,117	0,000	613,006
Переменная X 2	120,610	18,600	6,484	0,000	80,083

3-jadvalga ko'ra, Fisher F mezoni qiymati 1066,379. Bu qiymat jadval qiymatidan katta. Sababi, p-qiymat $2,54796 \cdot 10^{-13}$ ga teng. Shuningdek, parametrlarining Styudent t mezoni bo'yicha qiymati esa 208,622 va 18,6 ga teng. Bunda p-qiymat 0,05 ahamiyatlilik darajasidan kichik. Demak, model iqtisodiy jarayonga mos.





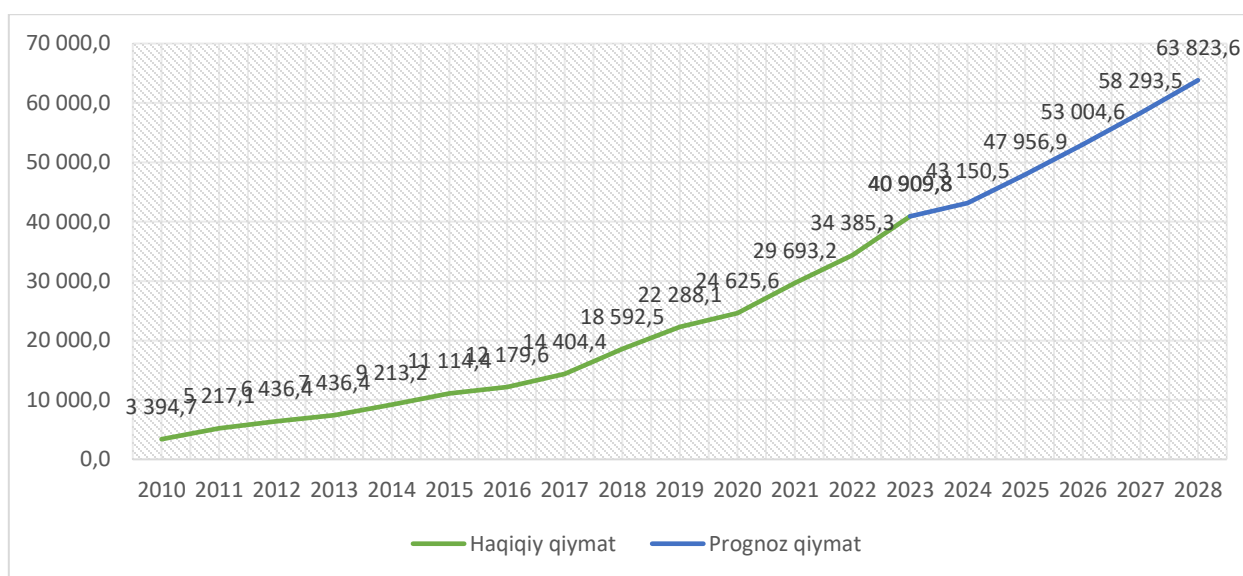
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Shunday qilib, Surxondaryo viloyati yalpi hududiy mahsulot hajmi bo'yicha modeli umumiy ko'rinishi quyidagicha bo'ldi:

$$y = 1067,553t + 120,64t^2 \quad (1)$$

Bu modeldan foydalanib, hudud yalpi hududiy mahsulot hajmi prognoz qilindi.

(6-rasm)

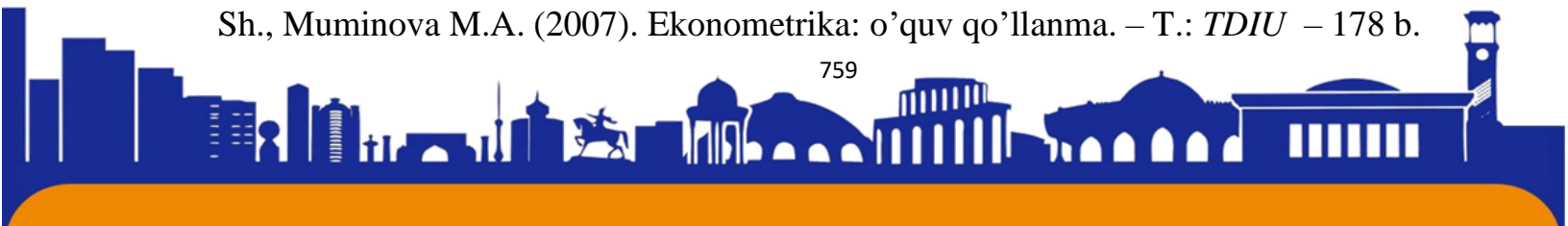


6-rasm. Surxondaryo viloyati yalpi hududiy mahsuloti hajmi prognoz qiymatlari (mlrd so'm).

6-rasmga ko'ra 2028 yilga kelib, hudud yalpi hududiy mahsuloti hajmi 63 823,6 mlrd so'mni, o'sish esa 156% ni tashkil etishi kutilmoqda.

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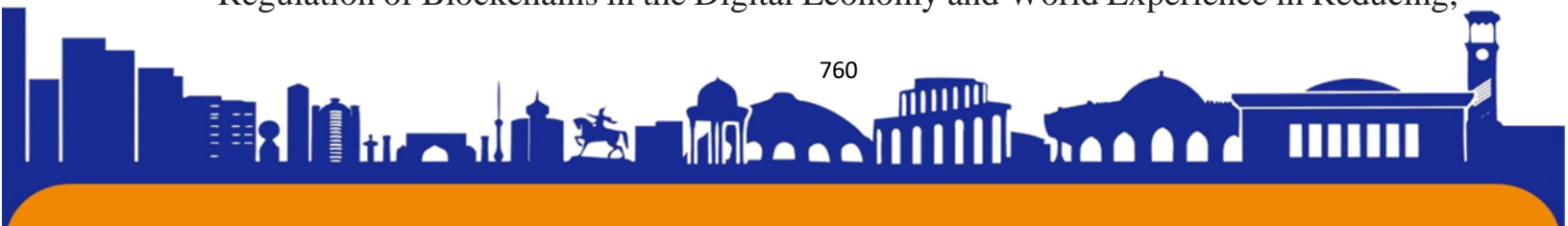
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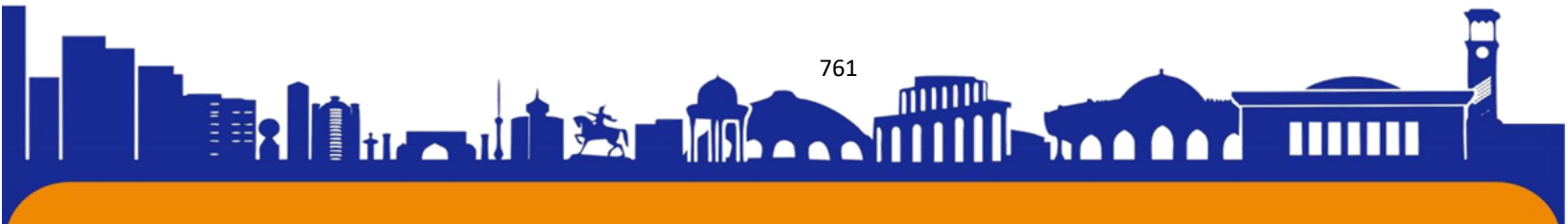
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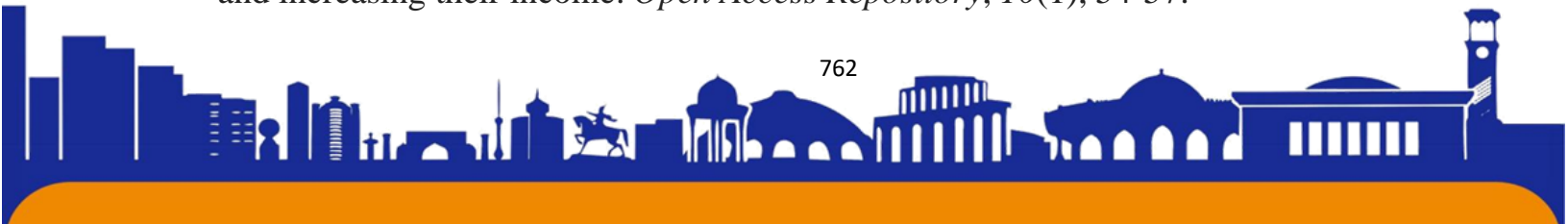
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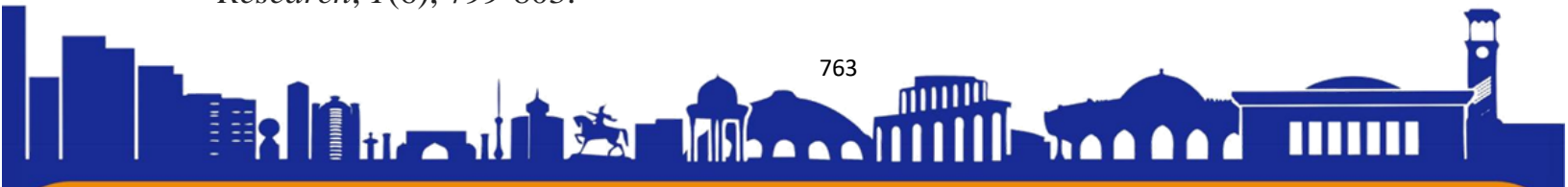
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