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TOSHKENT DAVLAT IQTISODIYOT UNIVERSITETI

KARIMOV XOJAKBAR MAXAMADJON O‘G‘LI

SANOAT TARMOQLARIDA INNOVATSION INFRAUZILMALARNING
TASHKILY-IQTISODIY MEXANIZMLARINI TAKOMILLASHTIRISH
(To‘qimachilik sanoati misolida)

08.00.03 – Sanoat iqtisodiyoti

Iqtisodiyot fanlari bo‘yicha falsafa doktori (PhD) dissertatsiyasi
AVTOREFERATI

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**Contents of dissertation abstract of the doctor of philosophy (PhD) on
economical sciences**

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экономическим наукам**

Karimov Xojakbar Maxamadjon o‘g‘li

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KIRISH (falsafa doktori (PhD) dissertatsiyasi annotatsiyasi)

Dissertatsiya mavzusining dolzarbligi va zarurati. Jahon iqtisodiyotida sanoat tarmoqlarida innovatsion infratuzilmalar (texnoparklar, sanoat parklari, klasterlar va inkubatorlar)ning tashkiliy-iqtisodiy mexanizmlarini takomillashtirishning ahamiyati ortib bormoqda. Mazkur jarayonlar ishlab chiqarishda yangi texnologiyalarni o'zlashtirish tezligini oshirmoqda, tranzaksion xarajatlarni pasaytirmoqda, ta'minot zanjirlarida kooperatsiyani chuqurlashtirib, bilimlar diffuziyasi va innovatsiyalarni o'zlashtirish qobiliyatini kuchaytirish orqali korxonalarning mehnat unumdorligi va umumiy faktorli samaradorligini barqaror o'sish trayektoriyasiga olib chiqmoqda. "Bunda infratuzilma operatorlarining boshqaruvcha roli (yagona loyiha-quvvat ofislari, akseleratsiya va transfert xizmatlari, klasterlar uchun tartiblar)ni institutsional ravishda aniqlash va samara indikatorlari bilan bog'lash muhim, chunki mahalliy va tarmoqaro bilimlar oqimiga qaratilgan tarkibiy islohotlar korxona samaradorligini sezilarli darajada oshiradi"¹. Bundan ko'rinadiki, innovatsion infratuzilmalarni to'liq sikl boshqaruvi va o'lchanadigan natija mezonlari asosida shakllantirish uzoq muddatli davrda sanoat raqobatbardoshligining o'sishiga olib keladi.

Jahon iqtisodiyotida sanoat tarmoqlarida innovatsion infratuzilmalarning tashkiliy-iqtisodiy mexanizmlarini takomillashtirish bo'yicha tadqiqotlar asosan innovatsion infratuzilmalar klasterlari va ekotizimini shakllantirish (yoqilg'i, ta'lim, transfer institutlari, startup-xablar), ularning tarmoq ichidagi zamonaviy bilimlar hamda texnologiyalarni ko'paytirish jarayoni, infratuzilmalarning xarajat-samaradorlik tarmoq modellari (investitsiya sarflari, infratuzilmadan foydalanish koeffitsiyenti, ishlab chiqarishning yangi mahsulotlarga o'tkazilishi) va sanoat infratuzilmasini raqobatbardoshlikka yo'naltiruvchi me'yoriy jihatdan tarmoqlash (ahamiyati pasayib borayotgan tarmoqlarni transformatsiya qilish, "yashil" texnologiyalarga o'tish, tarmoqlarning raqamlashuvi) ustuvor yo'nalishlar sifatida aniqlangan. Bular infratuzilmalar orqali sanoat tarmoqlarida innovatsiyalarni tezroq joriy qilish, mahsulotlarni qiymat zanjiriga kiritish va barqaror iqtisodiy o'sishni ta'minlashda muhim omillardan sanaladi.

O'zbekistonda amalga oshirilayotgan iqtisodiy islohotlar natijasida sanoat sohasida innovatsion rivojlanishga alohida e'tibor qaratildi, bunda ilmiy va texnologik parklarga asoslangan innovatsion infratuzilmalar faoliyati kengaytirildi. Biroq, bugungi kunda innovatsiyalarga asosan iqtisodiyotni yo'lga qo'yish, ilmiy yutuqlar va texnologik taraqqiyotdan foydalangan holda sanoatning raqobatbardoshligini oshirish, innovatsion mahsulotlarni tijoratlashtirish hamda investitsiyalarni jalb qilish mexanizmlari yetarli darajada yo'lga qo'yilmagan. Buning oqibatida, sanoatda yuqori va o'rta texnologiyali ishlab chiqarish ulushi 29,5 foiz, ilm-fanga ajratilgan mablag' ulushi 0,2 foizni tashkil etmoqda². Bundan tashqari oliy ta'lim bilan qamrov darajasi 42 foizga yetkazilib, yiliga 600-700 ming aholi mehnat

¹ M. Mostak Ahamed, Kul B. Luintel, Sushanta K. Mallick. Does local knowledge spillover matter for firm productivity? The role of financial access and corporate governance, Research Policy, Volume 52, Issue 8, 2023, 104837, ISSN 0048-7333, <https://doi.org/10.1016/j.respol.2023.104837>.

² <https://www.gazeta.uz/oz/2023/09/30/education/>

bozoriga kirib kelishi yuqori texnologik ish o‘rinlarini tashkil qilish mehanizmlarini joriy qilishni taqozo etmoqda. Texnologik parklarning tashkiliy va iqtisodiy faoliyatida xususiy sektorning faolligi past darajada ekanligi, ularning samaradorlik ko‘rsatkichlari belgilanmaganligi hamda tashkil qilingan texnologik parklarga turlicha yondashuv asosida berilgan imtiyoz va yengilliklar ishlab chiqarishning turli sohalarida nomutanosib tarzda innovatsiyalarni joriy etilishiga olib kelmoqda³. Shu munosabat bilan, iqtisodiyotning jadal o‘tib borayotgan tarmoqlarida amaliy tadqiqotlar sonini oshirishda “korxona-oliygoh-ilmiy tashkilot” zanjirini tashkil qilish orqali mamlakatdagi yetarli xomashyo bazasini qayta ishlash va unga qo‘shilgan qiymat yaratish bo‘yicha belgilab berilgan vazifalarni bajarish innovatsion ekotizimda innovatsion infratuzilmalarni rivojlantirish va ularning samaradorligini oshirishni talab qiladi, bu esa mazkur tadqiqot mavzusining dolzarbligini yanada oshiradi.

O‘zbekiston Respublikasi Prezidentining 2025-yil 30-yanvardagi PF-16-son ““O‘zbekiston - 2030” strategiyasini “Atrof-muhitni asrash va “yashil iqtisodiyot” yilida amalga oshirishga oid davlat dasturi to‘g‘risida”, 2023-yil 10-yanvardagi PF-2-son “Paxta-to‘qimachilik klasterlari faoliyatini qo‘llab-quvvatlash, to‘qimachilik va tikuv-trikotaj sanoatini tubdan isloh qilish hamda sohaning eksport salohiyatini yanada oshirish chora-tadbirlari to‘g‘risida”, 2022-yil 7-iyuldagi PF-165-son “2022-2026-yillarda O‘zbekiston Respublikasining innovatsion rivojlanish strategiyasini tasdiqlash to‘g‘risida”gi farmonlari, 2022-yil 6-iyuldagi PQ-307-son “2022-2026-yillarda O‘zbekiston Respublikasining innovatsion rivojlanish strategiyasini amalga oshirish bo‘yicha tashkiliy chora-tadbirlar to‘g‘risida”gi qarori, O‘zbekiston Respublikasi Vazirlar Mahkamasining 2024-yil 13-martdagi 128-son “O‘zbekiston Respublikasining innovatsion rivojlanish strategiyasini 2024-2025-yillarda amalga oshirish chora-tadbirlari to‘g‘risida”, 2021-yil 27-avgustdagi 545-son “Ilmiy va innovatsion faoliyatni boshqarish tizimini tashkil etish chora-tadbirlari to‘g‘risida”gi qarorlari va boshqa me‘yoriy-huquqiy xujjatlarda belgilangan vazifalarini amalga oshirishda mazkur dissertatsiya ishi muayyan darajada xizmat qiladi.

Tadqiqotning respublika fan va texnologiyalari rivojlanishining ustuvor yo‘nalishlariga bog‘liqligi. Dissertatsiya tadqiqoti respublika fan va texnologiyalarni rivojlantirishning I. “Axborotlashgan jamiyat va demokratik davlatni ijtimoiy, huquqiy, iqtisodiy, madaniy, ma‘naviy-ma‘rifiy rivojlantirishda, innovatsion g‘oyalar tizimini shakllantirish va ularni amalga oshirish yo‘llari” ustuvor yo‘nalishiga muvofiq bajarilgan.

Muammoning o‘rganilganlik darajasi. Milliy innovatsion tizimda institutsional asoslarni o‘rganish va tarmoq korxonalari samaradorligini innovatsion infratuzilmalar orqali oshirish ko‘plab xorijlik olimlar tomonidan o‘rganilgan. Xususan, ushbu yo‘nalishda R.Solov, M.Porter, J. Shumpeter, R.Nelson, B.Lundvall,

³ Kun.uz (2022) 58 ta OTMda yangi texnologiyalarni joriy etish bo‘yicha 377 ta loyiha amalga oshiriladi. <https://kun.uz/news/2022/09/03/58-ta-otmda-yangi-texnologiyalarni-joriy-etish-boyicha-377-ta-loyiha-amalga-oshiriladi>.

S.Friman, D.Asemoglu, P.Restrepo, U.Ganlon, F.Perru, G.Ettskvitz, L.Leydesdorf kabi olimlar tomonidan ilmiy-tadqiqot ishlari olib borilgan⁴.

Innovatsion infratuzilmalar yordamida ilimga asoslangan korxonalarni tashkil qilib keyinchalik ularni iqtisodiyotda yirik sanoat ishlab chiqaruvchi darajasiga yetkazish va hududlarning barqaror ijtimoiy-iqtisodiy rivojlanishiga hissa qo'shishi mavzularida Mustaqil davlatlar hamdo'stligi mamlakatlaridan O.Korolyova, V.Vasyaycheva, E.Cherkasova, M.Aristarxova, L.Borisoglebskaya, S.Yemelyanov, N.Skornichenko, S.Bayev, M.V. Ponomaryov kabi olimlar tomonidan tadqiq etilgan⁵.

Yuqori texnologik ishlab chiqarishni yo'lga qo'yish, ishlab chiqarish hajmini va samaradorligini oshirish, texnologiyalarni transferini amalga oshirish va ijtimoiy taraqqiyotda "Aqlli shahar" konsepsiyalarini innovatsion infratuzilmalar xususan, texnoparklar yordamida amalga oshirish bo'yicha A.Laspiya, A.Link, J.Skot, C.Novelers, A.Kleibrink, K.Stankova, A.Barj-Xil, S.Perez-Kanto, A.Modrego, A.Arikan, S.Byudri, H.Lyofsten, P.Lindelyof, S.Makdonald, A.Badalova, G.Sahabiyeva, B.Gerasimov, E.Kutsenko, A.Zatikyan, O.Bildina va boshqa olimlar ilmiy tadqiqot ishlari olib borganlar⁶. Mazkur ilmiy ishlarda, innovatsion ekotizimda

⁴ Solow, R.M., 1957. Technical change and the aggregate production function. *The Review of Economics and Statistics*, 39(3), pp.312-320. Porter, M.E. and Stern, S., 2001. National innovative capacity. *The Global Competitiveness Report*, pp.1-19. Schumpeter, J.A., 1947. The creative response in economic history. *The Journal of Economic History*, 7(2), pp.149-159. Nelson, R.R., 1993. *National Innovation Systems: A Comparative Analysis*. Oxford University Press, pp.1-500. Lundvall, B.Å., 2007. National innovation systems—analytical concept and development tool. *Industry and Innovation*, 14(1), pp.95-119. Freeman, C. (1995). The 'National System of Innovation' in historical perspective (2nd ed., pp. 10-17). *Cambridge Journal of Economics*. Acemoglu, D. and Restrepo, P., 2019. Automation and new tasks: How technology displaces and reinstates labor. *Journal of Economic Perspectives*, 33(2), pp.3-30. Hanlon, W.W., 2012. Innovation and Industry Development: Lessons from the British Cotton Textile Industry During the U.S. Civil War. *Doctor of Philosophy*. Columbia University, pp.1-250. Perroux, F., 1955. Note sur la notion de 'pôle de croissance'. *Économie appliquée*, 8(1), pp.307-320. Etzkowitz, H., 2003. Innovation in innovation: The triple helix of university-industry-government relations. *Social Science Information*, 42(3), pp.293-337. Leydesdorff, L., 2003. The mutual information of university-industry-government relations: An indicator of the Triple Helix dynamics. *Scientometrics*, 58(2), pp.191-203.

⁵ Королева О.В. Управление инновационной деятельностью промышленных предприятий на основе создания технопарков // *Транспортное дело России - 2006*, №9 Ч 3 (0,3 п л). Васяйчева, В.А., 2020. Моделирование процесса управления инновационной деятельностью предприятий промышленной сферы. *Вестник Воронежского государственного университета. Серия: Экономика и управление*, (4), с. 74-82. DOI: 10.17308/econ.2020.4/3195. Черкасова, Е.М., 2016. Теоретико-методологические проблемы в сфере управления инновационной деятельностью организаций. *Креативная экономика*, 10(7), сс. 713-732. DOI: 10.18334/ce.10.7.35399. Аристархова, М.К. и Порошин, Ю.Г., 2009. Моделирование системы показателей управления инновационной деятельностью промышленного предприятия. *Управление инновациями и инвестиционной деятельностью*, 12(3), сс. 88-97. Борисоглебская, Л.Н. и Миронова, В.И., 2012. Разработка системы управления технопарком легкой промышленности на основе механизмов взаимодействия его субъектов. *Право, менеджмент, маркетинг и инновации*, 6(164), сс. 122-128. Емельянов, С.Г., Борисоглебская, Л.Н. и Мальцева, А.А., 2010. Разработка организационной модели технопарка на основе методов проектного управления. *Вестник Челябинского государственного университета*, (26), сс. 42-47. Скорниченко, Н.Н. и Стрелкова, Н.В., 2023. Роль технопарков в развитии инновационной деятельности и укреплении технологического суверенитета России. *Вестник Самарского университета. Экономика и управление*, 14(2), сс. 114-124. DOI: 10.18287/2542-0461-2023-14-2-114-124. Баяев, С.А., 2021. Теоретические основы развития инновационной инфраструктуры. *Финансы и управление*, (4), сс. 83-98. DOI: 10.25136/2409-7802.2021.4.36730. Пономарев, М.В. и Савельева, Л.В., 2021. Университетские технопарки: универсальная модель и инструменты цифрового проектирования. *Architecture and Modern Information Technologies*, (4)57, сс. 377-393. DOI: 10.24412/1998-4839-2021-4-377-393.

⁶ Laspiya, A., Sansone, G., Landoni, P., Racanelli, D. и Bartezzaghi, E., 2021. The organization of innovation services in science and technology parks: Evidence from a multi-case study analysis in Europe. *Technological Forecasting and Social Change*, 173, 121095. DOI: 10.1016/j.techfore.2021.121095. Link, A. N., & Scott, J. T. (2007). The economics of university research parks. *Oxford Review of Economic Policy*, 23(4), 661–674. <https://doi.org/10.1093/oxrep/grm030>. Nauwelaers, C., Kleibrink, A., and Stancova, K., 2014. The role of science parks in smart specialisation strategies. *S3 Policy Brief Series*, pp.1-30. Barge-Gil, A., Perez-Canto, S., and Modrego, A., 2018. The influence of science and technology park characteristics on firms' innovation results. *Papers in Regional Science*, 97(5), pp.1205-1227. Arikan AT (2009) Interfirm knowledge exchanges and the knowledge creation capability of clusters. *Academy of Management Review* 34: 658-676. Beaudry C, Swann P (2009) Firm growth in industrial clusters of the United Kingdom. *Small Business Economics* 32: 409-424. Löfsten H, Lindelöf P (2002) Science Parks and the growth of new technology-based firms: Academic-industry links, innovation and

texnologik parklarning ahamiyati, ularni qo'llab-quvvatlashda davlat dasturlarining ahamiyati va qishloq xo'jaligi, axborot texnologiyalari va kommunikatsiyalari hamda og'ir sanoatda innovatsion ishlanmalarni amaliyotga tatbiq qilishdagi muhim o'rni isbotlab berilgan.

O'zbekistonda milliy innovatsion tizim, sanoat korxonalarga innovatsiyalarni joriy qilish, texnologik parklarning tarmoq korxonalarining taraqqiyoti va bozor iqtisodiyotida raqobatbardoshlikni oshirish bo'yicha mahalliy olimlardan Sh.N. Zaynutdinov, S.S G'ulomov, R.I Nurimbetov, Sh.I Otajonov, T.Z Teshabayev, Sh.E Sindarov, I.S Xotamov, A Ortiqov, A.E Norov, A.T Shermuxamedov, B.M Xolboev, G.Sh Karabayeva, Sh.O Sharifxo'jayev, M.X Voxidova, B.B Baxtiyorov, G.B Shanazarova, G.N Maxmudova va boshqalarning ilmiy izlanishlarida tadqiq qilingan⁷.

O'z navbatida innovatsion infratuzilmalar orqali O'zbekiston iqtisodiyotining yetakchi ishlab chiqarish korxonalari, xususan to'qimachilik sanoatni texnologik darajasini oshirish bilan tovarlarga qo'shilgan qiymat yaratish, ularni amalga oshirishda aniq mexanizmlar va omillarning kompleks tahlili, shuningdek,

markets. Research Policy 31: 859-876. Macdonald S (1987) British Science Parks: Reflections on the politics of high technology. R&D Management 17: 25-37. Бадалова, А.Г. и Мизинцева, А.Н., 2016. Инструменты стратегического управления рисками инновационно ориентированных промышленных предприятий. Право, менеджмент, маркетинг и инновации, 8(214), сс. 62-65. Сахабиева, Г.А., 2020. О повышении эффективности региональной экономики. Менеджмент, 3(22), сс. 23-27. Герасимов, Б.Н., 2019. Формирование инновационной деятельности в благоустройстве города. International Journal of Humanities and Natural Sciences, vol.9-1, сс. 14-17. DOI: 10.24411/2500-1000-2019-11553. Kutsenko, E., Islankina, E., and Abashkin, V., 2017. The evolution of cluster initiatives in Russia: the role of policy, region of origin, and industry context. Foresight and STI Governance, 11(3), pp. 21-30. Затицян, А.Т., 2019. Влияние технопарков на развитие инновационной инфраструктуры РА. Научно-практический электронный журнал Аллея Науки, 10(37), сс. 1-15. Бильдина, О.В., 2007. Государственная поддержка технопарков как организационной формы развития инновационной сферы национальной экономики. Автореферат диссертации на соискание ученой степени кандидата экономических наук. Государственный университет управления, Москва.

⁷ Zaynutdinov, Sh.N. (2011) Innovatsion salohiyatni oshirish strategiyasi, Iqtisodiyot va innovatsion texnologiyalar ilmiy elektron jurnali, №1, Sentabr. Гулямов С.С., Шермухамедов А.Т., Холбоев Б.М. Цифровая экономика: инновационные цифровые технологии// Учебное пособие//Закрытое акционерное общество "Университетская книга", Российский экономический университет им. Г.В. Плеханова. DOI: 10.47581/2022/Xolboev-Gulamov-Shermukhamedov.01 Нурибетов Р.И. Факторы конкурентоспособности в условиях рынка. International Journal of Experimental Education, no. 8, part 3, pp. 343-347. Moscow: Academy of Natural History. Отажонов Ш.И. Инновация фаолияти инфратузилмасини бошқариш самарадорлигини ошириш. Монография. –Т.: Fan va texnologiya, 2018. – 264 б. Тешабаев Т.З., Аллаёров Ш.А., Джурабаев О.Д. Оптимизации операционной стратегии и повышение экономического потенциала хлопково-текстильных кластеров. "Innovations in Science and Technologies" scientific electronic journal. Volume 1 №8, 2024, pp 4-15. Sindarov Sh.E. The economic mechanism of use of innovative processes in business Uzbekistan. ICEIC: International Conference on Electronics, Informations and Communications. 2008, pp 86-89. Khotamov, I. and Jurayev, A. (2023) Sanoat-4.0 sharoitida barqaror iqtisodiy o'sish istiqbollarini tahlil qilish, Iqtisodiyot va innovatsion texnologiyalar (Economics and Innovative Technologies), no. 6 (November – December), pp. 143-152. 2. Норов А.Э. Инновацион фаолият ва унинг натижаларини тижоратлаштиришнинг назарий ва услубий асослари // "Iqtisodiyot va innovatsion texnologiyalar" ilmiy elektron jurnali.– Тошкент, 2020. – № 1. – Б. 116-131. Шермухамедов, А.Т. и Холбоев, Б.М. (2023) Инновационное развитие технопарков в Узбекистане. Инновационная экономика: перспективы развития и совершенствования, №3(69), с. 177–184. Карабаева, Г.Ш. (2020) Основные аспекты активизации инновационных процессов в промышленности Узбекистана. Вестник РЭУ им. Г. В. Плеханова, №5(113), с. 42-55. DOI: <http://dx.doi.org/10.21686/2413-2829-2020-5-42-55>. Шарифхўжаев, Ш.О. и Вохидова, М.Х. (2018) Mamlakatimizda innovatsion infratuzilmani rivojlantirishning zaruriyati. Иқтисод ва молия (Экономика и финансы), №5, с. 61-66. Бахтиёрв, Б.Б. (2022) Саноат корхоналари инновацион бошқарувини ривожлантиришда илғор хориж тажрибасидан фойдаланиш имкониятлари. Иқтисодиёт ва инновацион технологиялар (Economics and Innovative Technologies), №1 (январь – февраль), с. 109-120. Махмудова, Г.Н. (2023) Оценка и сравнительный анализ промышленного потенциала Республики Беларусь и Республики Узбекистан в рамках ЕАЭС. Иқтисодиёт ва инновацион технологиялар (Iqtisodiyot va innovatsion texnologiyalar), №5 (сентябрь – октябрь), с. 397-422. DOI: https://doi.org/10.55439/EIT/vol11_iss5/a43. Махмудова Г.Н., Бабкин А.В. Теоретические аспекты инновационного развития в условиях модернизации экономики: тенденции, анализ и перспективные возможности // Научно-технические ведомости СПбГПУ. Экономические науки. 2020. Т. 13, № 2. С. 40-52. DOI: 10.18721/JE.13204

innovatsion infratuzilmalarning samaradorlik ko'rsatkichlarini belgilash va doimiy monitoring olib borish bo'yicha model ishlab chiqilmagan. Bugungi kundagi ehtiyoj ushbu mavzuning dolzarbligini yanada oshiradi. Bu esa dissertatsiya tadqiqotining maqsadi, vazifalari, tuzilishi va mantiqiy asoslarini belgilaydi.

Tadqiqot mavzusining dissertatsiya bajarilgan oliy ta'lim muassasasining ilmiy-tadqiqot ishlari rejalari bilan bog'liqligi. Tadqiqot ishi Toshkent davlat iqtisodiyot universitetining ilmiy tadqiqot rejasiga muvofiq FM-1-sonli "O'zbekistonda ijtimoiy-iqtisodiy rivojlanishning makroiqtisodiy barqarorligi va prognozlashtirilishini ta'minlashning ilmiy-uslubiy asoslari va uslubiyatlarini takomillashtirish" mavzusidagi loyiha doirasida bajarilgan.

Tadqiqotning maqsadi to'qimachilik sanoatida innovatsion infratuzilmalarning tashkiliy-iqtisodiy mexanizmlarini takomillashtirish bo'yicha ilmiy taklif va amaliy tavsiyalar ishlab chiqishdan iborat.

Tadqiqotning vazifalari quyidagilardan iborat:

innovatsion infratuzilmalarning tashkiliy-iqtisodiy mexanizmlarini takomillashtirish orqali to'qimachilik sanoatiga innovatsion faoliyat natijalarini joriy qilish usullarini tadqiq qilish;

to'qimachilik korxonalarining raqobatbardoshligini oshirishda innovatsion infratuzilmalarni rivojlantirish bo'yicha xorijiy ilg'or tajribani qiyosiy o'rganish;

innovatsion infratuzilmalarning tashkiliy jihatdan turlarini tahlil qilish va ularning har birini ishlab chiqarishga innovatsiyalarni joriy qilishda vazifa va funksiyalarini tahlil qilish;

to'qimachilik tarmoq korxonalarida tayyor mahsulot eksporti hajmini oshirishda innovatsion faoliyat omillarining, xususan texnologik parklarning ta'sirini o'rganishda ko'p omilli ekonometrik model ishlab chiqish, prognozlashtirish va tahlil qilish;

innovatsion infratuzilmalar faoliyatini samaradorligini oshirishda ularning faoliyatini baholovchi mezonlar va metodologiyasini ishlab chiqish;

to'qimachilik korxonalarining ishlab chiqarishdagi xarajatlarini hamda mahsulot tannarxini innovatsion infratuzilmalar orqali kamaytirishga erishishdagi ahamiyatini hamda bugungi kundagi zamonaviy texnologiyalar, xususan Sanoat 4.0 elementlarining tatbiq etilishi holatini tahlil qilish;

prognozlar asosida to'qimachilik sanoat korxonalarining texnologik intensivligini oshirish, zamonaviy texnologiyalarni ishlab chiqarish jarayoniga joriy qilishda innovatsion infratuzilmalarning ahamiyatini oshirishda yaqin, o'rta va uzoq muddatli chora-tadbirlar rejasini ishlab chiqish.

Tadqiqot obyekti sifatida texnoparklar va ularning to'qimachilik rezident korxonalari tanlab olingan.

Tadqiqotning predmeti to'qimachilik sohasidagi innovatsion infratuzilmalar orqali sohaga innovatsiyalarni tatbiq qilishda texnoparklarning samaradorligini oshirish jarayonida yuzaga keladigan ijtimoiy-iqtisodiy munosabatlar tashkil etadi.

Tadqiqotning usullari. Tadqiqot jarayonida ilmiy mushohada, mantiqiy fikrlash, qiyosiy tahlil, ekonometrik tahlil va prognozlashtirish kabi usullardan foydalanilgan.

Tadqiqotning ilmiy yangiligi quyidagilardan iborat:

to'qimachilik korxonalarida ishlab chiqarish jarayoniga innovatsiyalarni joriy qilishning klaster-infratuzilmaviy tashkiliy modeli innovatsion infratuzilma subektlari (texnoparklar, loyiha markazlari, inkubatorlar, venchur fondlar va ilmiy-tadqiqot

institutlari) o'rtasida bilim transferi va texnologiya diffuziyasi asosida shakllanadigan ko'p funksiyali hamkorlik tizimini yo'lga qo'yish asosida takomillashtirilgan;

O'zbekiston to'qimachilik korxonalarida tayyor mahsulotlar eksport hajmiga ta'sir etuvchi omillarning ko'p o'zgaruvchili ekonometrik modeli asosida 2030-yilga qadar prognoz ko'rsatkichlari ishlab chiqilgan;

to'qimachilik sanoatida innovatsion infratuzilmalar faoliyatini moliyaviy, rezidentlar faoliyati, ichki boshqaruv jarayonlari va inson kapitali mezonlari kesimida ko'p omilli baholash sanoat tarmog'i xususiyatlarini yaqqolroq ifodalovchi ko'rsatkichlar yordamida takomillashtirilgan;

Andijon, Navoiy, Nukus, Samarqand, Sirdaryo Yoshlar texnoparklari asosiy faoliyat ko'rsatkichlari asosida iqtisodiy samaradorlikning "yuqori" (2,25-3,00), "o'rtadan yuqori" (1,75-2,24), "o'rta" (1,25-1,74), "quyi" (0-1,24) chegara diapazonlariga ko'ra guruhlash orqali ularning to'qimachilik korxonalariga ta'sir etish darajasi asoslangan.

Tadqiqotning amaliy natijalari quyidagilardan iborat:

ilg'or xorijiy tajribadan kelib chiqib, milliy innovatsion ekotizimda innovatsion infratuzilmalarni rivojlantirish bo'yicha institutsional islohotlarni amalga oshirishga qaratilgan uslubiy yondashuv ishlab chiqilgan;

to'qimachilik korxonalarida tayyor mahsulotlar eksport hajmini oshirishda innovatsion infratuzilmalarning ahamiyatini ko'rsatuvchi ekonometrik model amaliyotga tadbiq qilinib, ularning natijadorligi aniqlangan;

innovatsion infratuzilmalarning samaradorlik ko'rsatkichlarini aniq mezonlar asosida belgilash va baholash metodologiyasi ishlab chiqilib, ularni to'qimachilik sanoati korxonalarida qo'llash imkoni asoslab berilgan;

to'qimachilik sanoatida qayta ishlash texnologiyalarini joriy qilish va mahsulotlarga qo'shilgan qiymat yaratishda zamon talabiga asoslangan milliy innovatsion ekotizimni tashkil etish bo'yicha ta'sir etuvchi omillar majmui ishlab chiqilgan;

Andijon Yoshlar texnoparki misolida to'qimachilik ishlab chiqarishga ixtisoslashgan rezident korxonasining mahsulotlarining tannarxini kamaytirishda natijadorligi isbotlangan.

Tadqiqot natijalarining ishonchliligi. Tadqiqot natijalarining ishonchliligi tadqiqotda qo'llanilgan uslubiy yondashuv va usullarning maqsadga muvofiqligi, O'zbekiston Respublikasi Oliy ta'lim, fan va innovatsiyalar vazirligi va uning huzuridagi Innovatsion rivojlanish agentligi, O'zbekiston Respublikasi Milliy statistika qo'mitasi, O'zto'qimachilik sanoat uyushmasining statistik ma'lumotlari hamda Birlashgan Millatlar tashkilotining sanoat iqtisodiyotiga oid statistik ma'lumotlari va axborotnomalaridan keng foydalanilganligi, ilmiy tadqiqotlarning zamonaviy usullari hamda nazariy ishlanmalari amaliy vazifalarni hal etishda qo'llanilishi, shuningdek, xulosa, taklif va tavsiyalarning amalda sinovdan o'tganligi hamda olingan natijalarning amaliyotda qo'llanilganligi bilan izohlanadi.

Tadqiqot natijalarining ilmiy va amaliy ahamiyati. Tadqiqot natijalarining ilmiy ahamiyati unda ishlab chiqilgan ilmiy-amaliy takliflardan fan, ta'lim va ishlab chiqarish integratsiya qilish mexanizmlarini ishlab chiqish, milliy innovatsion ekotizimda innovatsion infratuzilmalarning ahamiyatini belgilovchi tashkiliy-iqtisodiy

mexanizmlar asoslarini yaratish va takomillashtirishga qaratilgan ilmiy tadqiqotlarni olib borishda foydalanish mumkinligi bilan izohlanadi.

Tadqiqot natijalarining amaliy ahamiyati unda ilgari surilgan takliflardan sanoat iqtisodiyotiga innovatsiyalarni joriy etish orqali barqaror iqtisodiy o'sishni ta'minlash, raqobatbardosh milliy innovatsion ekotizimni shakllantirish hamda innovatsion infratuzilmalarning faoliyatini takomillashtirishga qaratilgan kompleks chora-tadbirlar, metodik tavsiyalar va rivojlanish dasturlarini ishlab chiqish, ko'p omilli ekonometrik tahlil va prognozlash natijalari asosida innovatsion infratuzilmalarning tarmoq korxonalari samaradorligi va tayyor mahsulotlar eksport hajmiga ta'sirini baholashda foydalanish mumkinligi bilan izohlanadi.

Tadqiqot natijalarining joriy qilinishi. To'qimachilik sanoatida innovatsion infratuzilmalarning tashkiliy-iqtisodiy mexanizmlarini takomillashtirish bo'yicha ishlab chiqilgan ilmiy taklif va amaliy tavsiyalar asosida:

to'qimachilik korxonalarida ishlab chiqarish jarayoniga innovatsiyalarni joriy qilishning klaster-infratuzilmaviy tashkiliy modeli innovatsion infratuzilma subyektlari (texnoparklar, loyiha markazlari, inkubatorlar, venchur fondlar va ilmiy-tadqiqot institutlari) o'rtasida bilim transferi va texnologiya diffuziyasi asosida shakllanadigan ko'p funksiyali hamkorlik tizimini yo'lga qo'yish asosida takomillashtirish taklifi O'zbekiston Respublikasi Oliy ta'lim, fan va innovatsiyalar vazirligi tomonidan texnoparklarga joriy etilgan (O'zbekiston Respublikasi Oliy ta'lim, fan va innovatsiyalar vazirligining 2025-yil 16-sentabrdagi 02/17-3620-son hamda O'zbekiston Respublikasi Vazirlar Mahkamasi huzuridagi Yengil sanoatni rivojlantirish agentligining 2025-yil 8-noyabrdagi 01-28-son ma'lumotnomalari). Mazkur ilmiy taklifning amaliyotga joriy etilishi natijasida innovatsion infratuzilmalar turlarining tavsifi, vazifa va funksiyalarining belgilanishi orqali to'qimachilik sohasida texnoparklar tomonidan ishlab chiqilgan startap loyihalar soni 15% ga ortib va ularning amaliyotga joriy qilish muddati o'rta hisobda 15-20% ga qisqargan;

O'zbekiston to'qimachilik korxonalarida tayyor mahsulotlar eksport hajmiga ta'sir etuvchi omillarning ko'p o'zgaruvchili ekonometrik modeli asosida 2030-yilga qadar ishlab chiqilgan prognoz ko'rsatkichlari "O'zto'qimachilik sanoat" uyushmasi tomonidan korxonalarda innovatsiyalarni joriy qilishga oid ko'rsatkichlarni rejalashtirishda foydalanilgan (O'zbekiston Respublikasi Vazirlar Mahkamasi huzuridagi Yengil sanoatni rivojlantirish agentligining 2025-yil 8-noyabrdagi 01-28-son ma'lumotnomasi). Mazkur ilmiy taklifning amaliyotga joriy etilishi natijasida 2030-yilgacha innovatsion rivojlanish strategiyasini ishlab chiqishda 75 ta tashkil etiladigan innovatsion infratuzilmalar hisobiga yuqori texnologiyali mahsulotlar eksportining ulushi 6% ga oshish prognozi belgilangan;

to'qimachilik sanoatida innovatsion infratuzilmalar faoliyatini moliyaviy, rezidentlar faoliyati, ichki boshqaruv jarayonlari va inson kapitali mezonlari kesimida ko'p omilli baholash sanoat tarmog'i xususiyatlarini yaqqolroq ifodalovchi ko'rsatkichlar yordamida takomillashtirish taklifi O'zbekiston Respublikasi Oliy ta'lim, fan va innovatsiyalar vazirligi tomonidan innovatsion infratuzilmalar faoliyatini baholashda hamda strategik yo'nalishlarini belgilashda foydalanilgan (O'zbekiston Respublikasi Vazirlar Mahkamasi huzuridagi Yengil sanoatni rivojlantirish agentligining 2025-yil 8-noyabrdagi 01-28-son, O'zbekiston Respublikasi Oliy ta'lim, fan va innovatsiyalar vazirligining 2025-yil 16-sentabrdagi 02/17-3620-son hamda

“Andijon Yoshlar texnoparki” davlat muassasining 2025-yil 24-iyuldagi 5-son ma’lumotnomalari). Mazkur ilmiy taklifning amaliyotga joriy etilishi normallashtirilgan integratsion baholash natijalariga ko’ra texnoparklar faoliyati ustuvor yo’nalishlar bo’yicha qayta tuzish va resurslarni optimal taqsimlash orqali innovatsion loyihalarning tijoratlashuvini 1,5 barobarga tezlashtirish imkonini bergan;

Andijon, Navoiy, Nukus, Samarqand, Sirdaryo Yoshlar texnoparklari asosiy faoliyat ko’rsatkichlari asosida iqtisodiy samaradorlikning “yuqori” (2,25-3,00), “o’rtadan yuqori” (1,75-2,24), “o’rta” (1,25-1,74), “quyi” (0-1,24) chegara diapazonlariga ko’ra guruhlash orqali ularning to’qimachilik korxonalariga ta’sir etish darajasini asoslash taklifi O’zbekiston Respublikasi Oliy ta’lim, fan va innovatsiyalar vazirligi tomonidan Yoshlar texnoparklari reytingini yuritishda foydalanilgan (O’zbekiston Respublikasi Oliy ta’lim, fan va innovatsiyalar vazirligining 2025-yil 16-sentabrdagi 02/17-3620-son ma’lumotnomasi). Mazkur ilmiy taklifning amaliyotga joriy etilishi natijasida innovatsion infratuzilmalar faoliyatini baholash va ularning reytingini tuzish orqali tarmoq korxonlariga, xususan to’qimachilik korxonalariga ta’sirini baholash imkonini berib, mazkur faoliyatni kompleks rivojlantirish bo’yicha chora-tadbirlar rejasi qabul qilinishi natijasida innovatsion loyihalar soni 1,3 barobarga ortgan.

Tadqiqot natijalarining aprobatyasi. Dissertatsiyaning asosiy ilmiy va amaliy natijalari 3 ta xalqaro va 5 ta respublika ilmiy-amaliy anjumanlarida ma’ruza qilingan va muhokamadan o’tkazilgan.

Tadqiqot natijalarining e’lon qilinganligi. Dissertatsiya mavzusi bo’yicha jami 10 ta ilmiy ish, O’zbekiston Respublikasi Oliy attestatsiya komissiyasining doktorlik dissertatsiyalari asosiy ilmiy natijalarini chop etishga tavsiya etilgan ilmiy nashrlarda 10 ta maqola, jumladan, 9 tasi respublika va 1 tasi xorijiy ilmiy jurnallarda chop etilgan.

Dissertatsiyaning tuzilishi va hajmi. Dissertatsiya tarkibi kirish, uchta bob, xulosa, foydalanilgan adabiyotlar ro’yxati hamda ilovalardan iborat. Dissertatsiyaning hajmi 123 betdan iborat.

DISSERTATSIYANING ASOSIY MAZMUNI

Dissertatsiya ishining kirish qismida qismida tadqiqot mavzusining dolzarbligi va zarurati asoslangan, tadqiqotning maqsadi, vazifalari, obyekti va predmeti tavsiflangan, respublikada fan va texnologiyalarni rivojlantirishning ustuvor yo’nalishlariga mosligi ko’rsatilgan. Shu bilan birga, tadqiqotning ilmiy yangiligi, amaliy natijalari bayon qilingan, olingan natijalarning ilmiy va amaliy ahamiyati yoritib berilgan, tadqiqot natijalarini amaliyotga joriy etish, nashr qilingan ishlar va tuzilishi bo’yicha ma’lumotlar keltirilgan.

Dissertatsiyaning “Sanoat tarmog’ida iqtisodiyotda innovatsion infratuzilmalarning tashkiliy-iqtisodiy mexanizmlarining nazariy va uslubiy asoslari” deb nomlangan birinchi bobida sanoat iqtisodiyotda innovatsion infratuzilmalarning tashkiliy-iqtisodiy mexanizmlarining mazmun mohiyati, o’ziga xos xususiyatlari va ilg’or xorijiy tajriba o’rganilib uni O’zbekiston sharoitiga moslashtirish istiqbollari tahlil qilingan.

Dissertant tomonidan, “milliy innovatsion tizim” va “innovatsion infratuzilma” tushunchalariga iqtisodchi olimlar tomonidan berilgan ta’riflar tadqiq etilgan. Innovatsion ekotizimning samaradorligi asosan turli institutlar o’rtasidagi (hukumat, oliy ta’lim muassasalari, tarmoq korxonalari) aloqalarni mustahkamlovchi innovatsion infratuzilmalarning natijadorligi bilan o’lchanishi aniqlangan. Shu sababli, milliy innovatsion tizimni samarali yo’lga qo’yishda innovatsion infratuzilmalarning ahamiyati bo’yicha turli nazariyalar tadqiq qilingan. Ilmiy tadqiqotda bugungi kunda ushbu mavzuga oid uchta asosiy nazariya tadqiq qilingan: Uchburchak spiral (Triple Helix) modeli, Klaster nazariyasi va O’sish qutbi nazariyasi.

Shu bilan birga, rivojlangan mamlakatlar tajribasi tahlili natijasida innovatsion ekotizimni rivojlantirishda innovatsion infratuzilmalarning faoliyati yuqori ahamiyatga ega ekanligi, ya’ni uchburchak spiraldagi hukumat, universitet va tarmoq korxonalari faoliyatining bog’liqlik darajasi fan, ta’lim va ishlab chiqarish integratsiya qilishda muhim ahamiyatga ega ekanligi aniqlangan. Ilmga asoslangan iqtisodiyotni yo’lga qo’yishda uchta institutning o’zaro ta’siri muhim ahamiyatga ega ekanligi isbotlangan. Bundan tashqari, innovatsion infratuzilmalar muayyan soha bo’yicha ixtisoslashgan korxonalarni shakllantirishning asosiy omili sifatida xizmat qilishi aniqlangan. Shuningdek, hududlardagi iqtisodiy rivojlanish darajasi bir tekis taqsimlanmasligini, balki muayyan asosiy markazlar yoki “qutblar” atrofida jamlanishini tahlil qilingan. Ya’ni ushbu qutblar hududiy iqtisodiy rivojlanishning asosiy drayver korxonalarining jamlanmasi bo’lib, qo’shni hududlarni rivojlantirish salohiyatini yuzaga keltirish imkoniyatini beradi. O’z navbatida innovatsion infratuzilmalar, xususan, ilmiy va texnologik parklar hududlarning innovatsion salohiyatini oshirish orqali ularning iqtisodiy o’sishini ta’minlashga ko’maklashuvchi institutsional asos ekanligi ko’rib chiqilgan.

So’nggi yillarda O’zbekistonda innovatsion ekotizimni shakllantirish, rivojlantirish va uni yangi bosqichga olib chiqish bo’yicha bir qator ishlar amalga oshirilib kelinmoqda. Xususan, innovatsion ekotizimning institutsional asoslarini belgilashda 88 ta normativ-huquqiy hujjat, xususan 3 ta Qonun, 34 ta O’zbekiston Respublikasi Prezidenti Farmonlari va qarorlari, 52 ta Hukumat qarorlari qabul qilindi. Natijada, O’zbekistonda innovatsion ekotizimni yo’lga qo’yishda institutsional asos shakllantirildi, xususan Global Innovatsion Indeks reytingida O’zbekiston 40 o’rin yuqorilab dunyoda 79-o’rinni egalladi⁸. Bundan tashqari 018-yildan buyon ilmiy-tadqiqotlar uchun davlat byudjeti mablag’lari hajmi uch barobar oshirilib, xozirda yiliga 1.5 trln. so’m ajratilmoqda. Ilmiy-tadqiqot va innovatsion faoliyatni moliyalashtirish bilan shug’ullanuvchi tashkilotlar (innovatsion jamg’armalar va venchur tashkilotlar) soni 28 taga yetkazildi, Respublika bo’ylab 98 ta innovatsion infratuzilmalar tashkil qilindi. 2020-yilda qabul qilingan “Innovatsion faoliyat to’g’risida”gi qonunda, innovatsion infratuzilmalar asosiy tushuncha sifatida ko’rsatilib, ularning turlari belgilandi. Innovatsion infratuzilmalar xususan texnologik parklar ishlab chiqarish xarajatlarini kamaytirish va mahsulot sifatini oshirishga qaratilgan innovatsion faoliyatni amaliyotga tatbiq qilish orqali ishlab chiqarish samaradorligini va raqobatbardoshligini oshirish uchun xizmat qiladi. Shu sababli, bugungi kunda mazkur innovatsion infratuzilmalarni faoliyatini to’liq

⁸ <https://gov.uz/oz/innovation/news/view/86181>

samarali tashkil qilishda sohaning xususiyatlari, iqtisodiy sharoitlar va xalqaro tajribadan kelib chiqib ularning tashkiliy-iqtisodiy mexanizmlarini belgilash dolzarb masalalardan biri hisoblanadi. Bugungi kunda, olimlar ushbu mexanizmlarni samarali tashkil qilishda har bir mamlakat o'zining iqtisodiy, ijtimoiy va an'anaviy sharoitlaridan kelib chiqib moslashuvchan mexanizmlarni ishlab chiqishi lozimligi ta'kidlangan (1-rasm).



1-rasm. Ilmiy va texnologik parklarning tashkiliy jihatdan turlari ⁹

Mazkur ilmiy ishda iqtisodiyot tarmoqlarida to'qimachilik sanoat mamlakat iqtisodiyotida yetakchi tarmoqlardan biri hisoblanganligi hamda texnologik rivojlanish uchun yuqori salohiyatga ega ekanligi sababli ushbu tarmoq misol sifatida tanlab olindi. So'nggi yillarda sohaga 5,3 mlrd AQSh dollari miqdorida to'g'ridan-to'g'ri xorijiy investitsiyalar, shuningdek, 3 mlrd AQSh dollari hajmida imtiyozli kreditlar jalb qilindi. Natijada 350 ta yangi korxonalar ishga tushirilib, 4 mlrd AQSh dollarilik 265 ta loyihalar ishga tushirildi, 300 mingga yaqin yangi ish o'rni yaratildi. Ishlab chiqarish hajmi 2016-yil bilan solishtirganda besh baravar oshdi, eksport esa to'rt barobar oshdi.

Amalga oshirilgan islohotlarga qaramay, sohada bugungi kunda tayyor mahsulotlarni qayta ishlash darajasi atigi 23 foizni tashkil etmoqda. Bundan tashqari, zamonaviy texnologiyalarni joriy qilish orqali qayta ishlash darajasini 2 barobar oshirish hamda yaratiladigan ischi o'rnini 1 millionga yetkazish imkoniyati mavjud¹⁰. Shu munosabat bilan to'qimachilik korxonalarida ishlab chiqarish jarayoniga innovatsiyalarni joriy qilishning klaster-infratuzilmaviy tashkiliy modeli innovatsion infratuzilma subyektlari (texnoparklar, loyiha markazlari, inkubatorlar, ventchur fondlar va ilmiy-tadqiqot institutlari) o'rtasida bilim transferi va texnologiya diffuziyasi asosida shakllanadigan ko'p funktsiyali hamkorlik tizimini yo'lga qo'yish asosida takomillashtirish taklifi ishlab chiqilgan (2-rasm).

Tarmoq korxonalarining ehtiyojidan kelib chiqib, ilmiy tadqiqot va oliy ta'lim muassasalari tomonidan ishlab chiqilgan konsepsiya ilmiy parklar tomonidan marketing tahlili va texnik jihatdan takomillashtirish ishlari olib boriladi. Ilmiy va texnologik parklarda prototiplash, standartlashtirish jarayoni hamda kichik ishlab chiqarish amalga oshiriladi. Keyingi bosqichda tashkil etilgan korxonalar industrial parklarda yirik hajmli ishlab chiqarishni amalga yoki tarmoq korxonalari bilan birlashadi. Butun ekotizim shakllangandan so'ng innovatsion hududlarga asos solinadi.

To'qimachilik sanoatda innovatsiyalarni joriy qilishda ilg'or mamlakatlarning tajribasi (Hindiston, XRR, Janubiy Koreya va Misr) atroflicha o'rganib chiqilganda o'xshash bosqichlar bosib o'tilgan. Dastlabki bosqichda iqtisodiyotlar arzon ishchi kuchiga asoslangan oddiy ishlab chiqarishdan malakali ishchi kuchi yordamida yuqori qiymatli mahsulotlar ishlab chiqarishga o'tish strategiyasi belgilangan. Bu jarayon

⁹ Muallif ishlanmasi

¹⁰ Sh.Mirziyoyev. 2023. "Qishloq xo'jaligidagi dolzarb masalalar muhokama qilindi" <https://president.uz/uz/lists/view/5831>

yangi tarmoqlarni, masalan, kimyoviy tolalar va ip yigirishni kengaytirish yoki tashkil etishni talab etgan. Bundan tashqari mahsulotni sotishda marketing va dizayn, xomashyo sifatini yaxshilash bo'yicha ilmiy-yondashuv asosida kadrlar tayyorlash, strategiya ishlab chiqish va ularni amaliyotga tatbiq qilish texnologik parklar tomonidan amalga oshirilgan.



2-rasm. Ilmiy va texnologik parklarning tashkiliy jihatdan turlari ¹¹

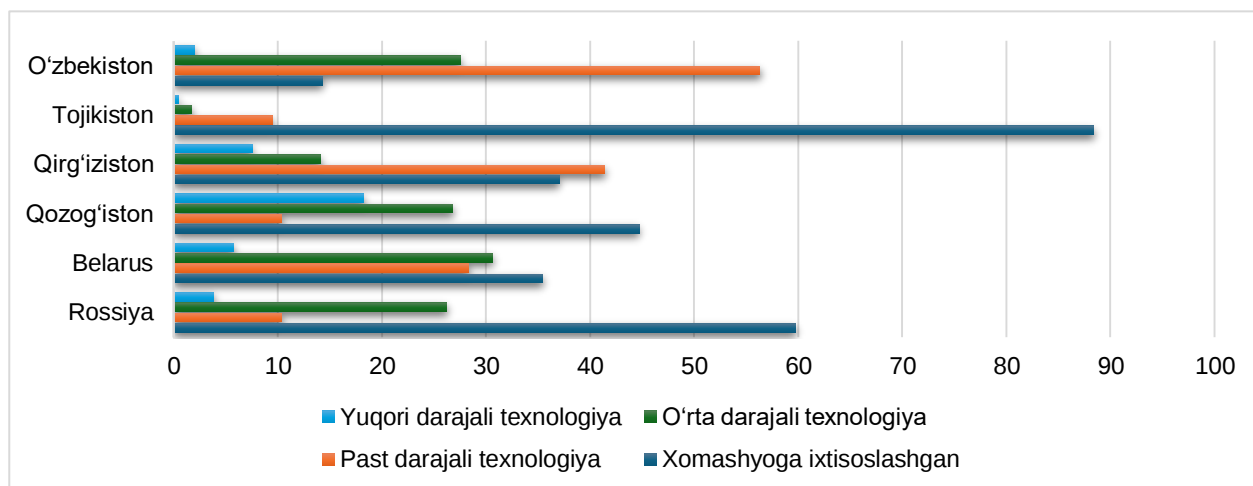
“To'qimachilik sanoatida innovatsion infratuzilmalar tashkiliy-iqtisodiy mexanizmining zamonaviy holati tahlili” nomli ikkinchi bobda, O'zbekiston sanoatida innovatsion infratuzilmalarning rivojlantirish borasidagi islohotlar tendensiyasi, to'qimachilik sanoatida innovatsion infratuzilmaning tashkiliy-iqtisodiy mexanizmlari samaradorligini baholash hamda ularga ta'sir etuvchi omillar tahlili olib borilgan.

Bugungi kunda, O'zbekiston nisbatan past qo'shilgan qiymatga ega xomashyo ishlab chiqarishdan yuqori qo'shilgan qiymatga ega tayyor mahsulotlar ishlab chiqarishga o'tishga yo'naltirilgan faol sanoat siyosatini olib bormoqda. Innovatsion faoliyatga asoslangan raqobatbardosh sanoat iqtisodiyotini yo'lga qo'yishda mamlakatning uzoq muddatli barqaror rivojlanishida doimiy hissa qo'shib kelishi mumkin bo'lgan sanoat yo'nalishini va mahsulotlarini belgilab olish va uni doimiy rivojlantirib borish bo'yicha chora-tadbirlar amalga oshirib borish lozim. Drayver tarmoq korxonalarini belgilashda sanoat ishlab chiqarishining barqaror o'sishi, tarmoqning YaIM o'sishiga qo'shgan hissasining ortishi, sanoat rivojlanishining innovatsion omili o'sish tendensiyasining ijobiy dinamikasi, resurslardan samarali foydalanish darajasining hamda yuqori texnologiyali mahsulotlar ishlab chiqarish hajmining ortishi va mahsulotni mahallilashtirish jarayonini jadallashtirish kabi mezonlarga asoslangan bo'ladi.

¹¹ Muallif ishlanmasi

Bugungi kunda iqtisodiy vaziyatdan kelib chiqib, ishlab chiqarish sektorining texnologik intensivligini oshirish juda muhim. Chunki, birinchidan, bu sanoatning raqobatbardoshligini oshirishga yordam beradi, zamonaviy texnologiyalar xususan, avtomatlashtirish, sun'iy intellekt (AI), buyumlar interneti (IoT) kabilarni joriy etish samaradorlik va iqtisodiy tejamkorlikni yaxshilashga imkon beradi. Ikkinchidan, bu mamlakatning eksport salohiyatini oshirishning asosiy omili bo'ladi, chunki yuqori qo'shilgan qiymatga ega mahsulotlar ishlab chiqarish iqtisodiyotning xomashyo eksportiga qaramligini kamaytiradi. Uchinchidan, ishlab chiqarishning rivojlanishi yuqori texnologiyali sohalarda – robototexnika, mexatronika yoki "aqlli" ishlab chiqarishni boshqarish kabi yo'nalishlarda yangi ish o'rinlarini yaratishga xizmat qiladi.

Tadqiqotda MDH mamlakatlarining – Rossiya, Belarus, Qozog'iston, Qirg'iziston, Tojikiston va O'zbekistonning ishlab chiqarish sektori texnologik jihatdan tarkibiy tuzilmasi bo'yicha ma'lumotlari tahlil qilindi. Har bir iqtisodiyotning sanoatlashtirish darajasi, texnologik rivojlanish va iqtisodiy yo'nalish bo'yicha farqlanishi aniqlandi. Statistik ma'lumotlar shuni ko'rsatadiki, ba'zi mamlakatlar xomashyo bazasiga yuqori darajada bog'liq bo'lsa, boshqalari past va o'rta texnologiyali ishlab chiqarishga ixtisoslashgan (3-rasm).



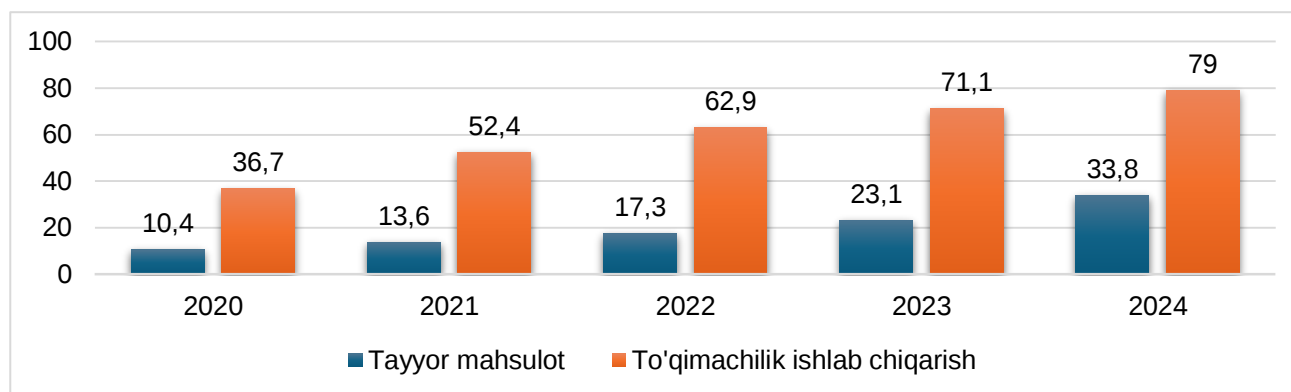
3-rasm. MDH mamlakatlarida sanoat korxonalarining texnologik darajasi 2024¹²

Tabiiy resurslarning boy zaxiralari mavjudligi sababli Rossiya Federatsiyasi va Qozog'iston Respublikasi iqtisodiyoti asosan xomashyoga ixtisoslashgan, mos ravishda 59,7% va 44,7%. Shuni alohida ta'kidlash lozimki, Qozog'iston yuqori texnologiyali ishlab chiqarish bo'yicha eng yuqori ko'rsatkichni (18,2%) qayd etgan. Belarus (28,3%) va Qirg'iziston (41,4%) past texnologiyali sanoatning yuqori ulushiga ega. Tojikiston iqtisodiyotining deyarli 90 % ulushi tabiiy resurslar bazasiga ixtisoslashgan. Taqqoslash uchun, O'zbekiston Respublikasi o'z iqtisodiyotini diversifikatsiya qilish siyosati natijasida xomashyo eksportidan voz kechib, past texnologiyaliga asoslangan ishlab chiqarish ulushini sezilarli darajada oshirishga muvaffaq bo'ldi (56,3%). O'z navbatida o'rta texnologiyali ishlab chiqarish sektori 27,5% ni tashkil etmoqda. Biroq, yuqori texnologiyali sanoat hali ham rivojlanmagan bo'lib, atigi 2% ni tashkil qilmoqda.

¹² Birlashgan Millatlar Tashkilotining sanoatni rivojlantirish tashkiloti (UNIDO) ma'lumotlari asosida muallif ishlanmasi.

Sanoat iqtisodiyotining texnologik darajasini oshirish yangi texnologiyalarga asoslangan ishlab chiqarishni tashkil qilish yoki mavjud sanoat korxonalarining innovatsiyalar yordamida modernizatsiya qilish mexanizmlari mavjud. Bundan tashqari, muayyan sanoat ichida bosqichma-bosqich rivojlanish, ya'ni past texnologiyali ishlab chiqarishdan o'rta yoki yuqori texnologiyali darajaga o'tish strategiyasi ham samaralari va natijadorligi yuqori bo'lgan siyosat hisoblanadi. Masalan, O'zbekiston to'qimachilik sohasida katta salohiyatga ega bo'lib (umumiy sanoat ishlab chiqarishda sohaning ulushi 17,2 foizni tashkil qiladi), bunday o'tish jarayoni uchun yorqin misol bo'lishi mumkin. Ilmiy-tadqiqot ishlari orqali avtomatlashtirish, aqlli to'qimachilik, ilg'or materiallar va raqamlashtirishni ishlab chiqarish jarayoniga integratsiya qilish mavjud sanoatni o'rta yoki yuqori texnologiyali sanoatga aylantirish imkoniyatini yaratadi. Shu bois, uzoq muddatli sanoat o'sishini qo'llab-quvvatlash uchun innovatsion infratuzilmalar orqali kuchli innovatsion ekotizim yaratish nihoyatda muhimdir.

Bundan tashqari, O'zbekistonda to'qimachilik ishlab chiqarishi (to'qimachilik tolalarini tayyorlash va yigirish, shuningdek, to'qimachilik matolarini ishlab chiqarish, ularni bezash hamda kiyim-kechak ishlab chiqarish) hajmi 2024-yilda mazkur ko'rsatkich 79 trillion so'mni tashkil qilib, so'nggi besh yil ichida 2 barobarga oshganini ko'rsatadi (4-rasm). Ushbu davrda kiyim-kechak va aksessuarlar (tayyor mahsulotlar) hajmi 3 barobarga oshib 33,8 trillion so'mni tashkil qilgan.



4-rasm. O'zbekistonda to'qimachilik sanotida ishlab chiqarish hajmi (2020-2024 yy.) trln. so'mda¹³

Shuni alohida ta'kidlash lozimki, mamlakatda to'qimachilik ishlab chiqarish mahsulotlari hajmi tayyor mahsulotlariga nisbatan yuqori darajada qolmoqda. Yuqoridagilardan kelib chiqib, to'qimachilik korxonalari eksportini oshishirda innovatsion faoliyat omillarining ta'sirini ilmiy jihatdan baholash maqsadida

2015-2024- yillarda qayd etilgan har olti oylik statistik ma'lumotlar asosida ko'p chiziqli regressiya tahlili o'tkazildi. Regressiya tahlili Milliy Statistika qo'mitasi, Innovatsion rivojlanish agentligi hamda Birlshagan Millatlar Tashkilotining sanoatni rivojlantirish tashkilotining vaqt qatorlari ma'lumotlari asosida o'tkazildi. Dastlabki bosqichda ishlab chiqarishda sanoatning tuzilishini, innovatsion faoliyatni hamda investitsiyalar oqimini aks ettirishga oid 13 ta o'zgaruvchidan iborat namuna shakllantirildi. Ya'ni mustaqil o'zgaruvchilar sifatida innovatsion infratuzilmalar

¹³ O'zbekiston Respublikasi Milliy statistika qo'mitasi ma'lumotlari asosida muallif ishlanmasi.

soni, rezidentlar soni, ilmiy tadqiqot olib boruvchi korxonalar soni, joriy qilingan innovatsiyalar soni, innovatsiyalarni joriy etgan korxonalar soni, moliyalashtirilgan ilmiy-tadqiqot loyihalari soni, ro'yxatga olingan patentlar soni, ilmiy-texnik xizmat ko'rsatuvchi tashkilotlar soni, ilmiy-tadqiqot ishlari uchun yillik xarajatlar hajmi, to'qimachilik sohasida yaratilgan qo'shimcha qiymat, kapital qo'yilmalar va korxonalar soni olindi. Bog'liq o'zgaruvchi sifatida eksport qilingan to'qimachilik mahsulotlari hajmi olindi. Tegishli eknometrik modelga o'zgaruvchilarni tanlab olish uchun Pirson korrelatsiya koeffitsienti asosida korrelyatsiya tahlili o'katzildi.

Korrelyatsiya matritsasi tahlili shuni ko'rsatkiki, ayrim ko'rsatkichlar eksport hajmiga nisbatan past statistik ahamiyatga ega bo'lib, ularni modelda qoldirish maqsadga muvofiq emas edi. Shu bilan birga, Pearson korrelyatsiya koeffitsientlari yuqori bo'lgan va iqtisodiy mazmun jihatidan asosli bo'lgan ko'rsatkichlar qoldirildi. Keyingi bosqichda VIF (Variance Inflation Factor) yordamida multikollinearlik darajasi tekshirilib, $VIF < 3$ natija olindi, ya'ni omillar o'zaro mustaqil ekanligi tasdiqlandi. Natijada eksport hajmiga mustaqil va sezilarli ta'sir ko'rsatuvchi uchta omil tanlab olindi: innovatsion infratuzilmalar soni (X_{INF}), Kapital qo'yilmalar (X_{GFCF}) va moliyalashtirilgan ilmiy-tadqiqot loyihalari soni (X_{RD}). Ushbu omillar iqtisodiy mazmuni va statistik ahamiyati jihatidan eng maqbul natijalarni ko'rsatdi¹⁴.

$$\ln(\widehat{Y}) = \beta_0 + \beta_1 \ln(X_{inf}) + \beta_2 \ln(X_{GFCF}) + \beta_3 \ln(X_{RD}) + \epsilon \quad (1)$$

Tadqiqot natijalariga ko'ra, innovatsion infratuzilmaning 1% ga oshishi ishlab chiqarish hajmini taxminan 0,1% ga oshirishi ($p < 0,01$) aniqlangan va bu omilning sohani rivojlantirishda fundamental ahamiyatga egaligini tasdiqlaydi. Moliyalashtirilgan innovatsion loyihalari ijobiy, ammo unchalik kuchli bo'lmagan ta'sir ko'rsatadi (koeffitsient 0,32; $p \approx 0,15$), bu esa uzoq muddatli samarani aks ettiradi. Shu bilan birga, asosiy kapitalga qo'yilmalarning 1% ga o'sishi ishlab chiqarish hajmini taxminan 0,36% ga ko'paytirishi ($p \approx 0,09$) aniqlangan bo'lib, kapital qo'yilmalarning muhim rolini ko'rsatadi (1-jadval).

1-jadval

Koeffitsientlar tahlili¹⁵

O'zgaruvchilar	Koeffitsient	Std.Error	t-Statistic	p-Value	VIF
Const	3.511	1.746	2.01	0.062	-
$\ln(X_{INF})$	0.096	0.031	3.12	0.007	2.13
$\ln(X_{RD})$	0.320	0.214	1.50	0.154	3.81
$\ln(X_{GFCF})$	0.363	0.200	1.82	0.088	1.97

Ishlab chiqilgan modelda $R^2=0.855$ (Adj $R^2=0.828$) ga teng bo'lib, model 83 foizga yaqin o'zgarishlarni tushuntirib berishini bildiradi. F-statistic = 31.55 natijasi model umumiy ahamiyatli ekanini tasdiqlaydi. SE of regression 0.53 bo'lib, prognoz xatoligi past darajada. Durbin – Watson ko'rsatkichi 1.90 ga teng, bu esa avtokorrelyatsiya mavjud emasligini ko'rsatadi. Jarque – Bera testi p-value = 0.57 bilan qoldiqlar normal taqsimlangan va modelning statistik jihatdan barqaror ekanini tasdiqlaydi.

¹⁴ Muallif tomonidan ishlab chiqilgan.

¹⁵ Muallif tadqiqotlari asosida hisob-kitob qilingan

Ishlab chiqilgan model innovatsion infratuzilmalar samaradorligini oshirish, ishlab chiqarishda kapital qo'yilmalarni oshirib borish va moliyalashtirilgan innovatsion loyihalarning sifatiga e'tibor berish va amaliyotga tatbiq qilish to'qimachilik tayyor mahsulot eksport hajmini oshirishiga olib kelishini isbotladi. Shu munosabat bilan, tahlil natijalari ushbu omillarni inobatga olgan tegishli strategiya ishlab chiqish zarurligini ta'kidlaydi. Bundan tashqari ishlab chiqilgan model asosida 2030-yilgacha prognoz ko'rsatkichlari ishlab chiqildi (2-jadval).

2-jadval

**Ishlab chiqilgan model asosida tekstil mahsulotlarining
2030-yilgacha prognoz ko'rsatkichlari ¹⁶**

Yillar	Tayyor mahsulot eksporti hajmi, mlrd so'm (Y)	Innovatsion infratuzilmalar, birlik (X1)	Moliyalashtirilgan ilmiy-tadqiqot loyihalari, birlik (X2)	Kapital qo'yilmalar, mlrd so'm, (X3)
2014	559,61	-	167	715,85
2015	557,50	-	190	653,01
2016	716,42	-	205	1195,61
2017	2138,83	1	194	2079,00
2018	2415,13	2	146	3763,00
2019	3373,28	3	112	9813,87
2020	5308,66	5	125	8648,48
2021	6992,46	21	429	9261,09
2022	10419,47	25	306	9364,02
2023	15454,31	45	153	9561,02
2024	16137,53	48	161	10134,72
2025*	16850,95	52	169	10742,81
2026*	17595,92	55	177	11387,38
2027*	18373,82	59	186	12070,62
2028*	19186,11	63	195	12794,86
2029*	20034,31	68	205	13562,55
2030*	20920,00	75	215	14376,30

*-prognoz davri

2025-2030 yillar davri uchun mustaqil o'zgaruvchilarning trend qiymatlaridan va regressiya koeffitsiyentlaridan foydalanilgan holda tekstil mahsulotlari eksportining kutilayotgan hajmi modellashirildi. Prognoz natijalari shuni ko'rsatadiki, agar tanlab olingan omillarning ko'rsatkichlar hozirgi sur'atda davom etsa, 2030 yilga borib eksport hajmi 20 trillion so'mdan oshishi mumkin. Bu esa modelning strategik rejalashtirishda amaliy ahamiyatga ega ekanligini tasdiqlaydi.

“To'qimachilik sanoatida innovatsion infratuzilmalarning tashkiliy-iqtisodiy mexanizmlarining samaradorligini oshirishning ustuvor yo'nalishlari” deb nomlangan uchinchi bobda sanoat to'qimachilik sanoatida innovatsion infratuzilmani strategik rivojlantirishning asosiy yo'llari, innovatsion infratuzilmalarning samaradorlik ko'rsatkichlarini aniqlash uslubiyati va uning to'qimachilik korxonasiga ta'siri hamda iqtisodiyotda innovatsion infratuzilmalarni prognozlash ko'rsatkichlari ishlab chiqilgan.

¹⁶ Maullif tadqiqotlari asosida hisob-kitob qilingan.

Bugungi kunda O'zbekistonda hukumat tomonidan innovatsion infratuzilmalarga ya'ni texnologik parklarga berilgan bojxona hamda soliq imtiyozlaridan unumli foydalanish, to'qimachilik korxonalarining raqobatbardoshligini oshirishda ularning ahamiyatini oshirish maqsadida innovatsion infratuzilmalar faoliyatini monitoringini olib borish, baholash va reyting ishlab chiqish muhim ahamiyat kasb etadi. Shu munosabat bilan, mazkur ilmiy ishda Amerikalik iqtisodchilar Robert Kaplan va David Norton tomonidan ishlab chiqilgan BSC metodi orqali innovatsion infratuzilmalarning samaradorlik ko'rsatkichlarini baholash uslubiyo'ti ishlab chiqildi. Boshqa samaradorlik ko'rsatkichlarini baholash tizimlaridan farqli o'laroq ushbu tizim tashkilotlarning nafaqat moliyaviy balki rezidentlar faoliyati, ichki boshqaruv jarayonlari va inson kapitali mezonlarini o'z ichiga oladi¹⁷.

Yuqoridagilardan kelib chiqib, tadqiqot davomida faoliyati to'liq yo'lga qo'yilgan 5 ta yoshlar texnoparklarining 2024-yildagi faoliyati natijalari asosida 11 ta indikatorlari tanlab olindi (2-jadval). Ushbu indikatorlar asosida quydagi formula¹⁸ orqali har bir texnoparkning samaradorlik ko'rsatkichlari hisoblab chiqildi:

$$E_{BSC}^{(r)} = \sum_{i=1}^n w_i \times X_i^{norm(r)} \quad (2)$$

Bunda:

$E_{BSC}^{(r)}$ – texnoparkning samaradorlik ko'rsatkichi

w – i indikatorning og'irlik koeffitsienti

$X_i^{norm(r)}$ – i indikatorining r texnoparki uchun normallashtirilgan qiymati

n – ko'rsatkichlar soni

Har bir ko'rsatkichning og'irlik koeffitsienti mavjud bo'lib, umumiy baholash tizimidagi nisbiy ahamiyatni aks ettiradi. Ko'rsatkichlarning qiymatlari Min-Max usuli orqali normallashtirildi va Kaplan metodika asosan 3 birlikka ko'paytirildi, natijada o'lchov birliklarini ta'sirini yo'qotish va qiymatlarini taqqoslash imkoniyati yaratildi. Og'irlik koeffitsientlari savolnomalar, ilmiy adabiyotlar va Innovatsion rivojlanish strategiyasi asosida belgilandi.

Hisoblab chiqilgan samaradorlik ko'rsatkichlariga asosan natijalar 4 guruhga ajratildi:

Yuqori	2.25-3.00
O'rtadan yuqori	1.75-2.24
O'rta	1.25-1.74
Quyi	0-1.24

3-jadvalda keltirilgan Yoshlar texnoparklarining 2024-yildagi ko'rsatkichlari asosida ularning samaradorlik indekslari hisoblab chiqildi. Natijalarga ko'ra Andijon (2.60) va Nukus (2.57) Yoshlar texnoparklari "Yuqori" samaradorlik darajasiga erishgan. Navoiy (1.55) va Samarqand (1.43) "O'rta" natijani qayd etgan bo'lsa, Sirdaryo yoshlar texnoparki 1.27 koeffitsienti bilan eng quyi natijani qayd etgan.

¹⁷ Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard—measures that drive performance. Harvard Business Review, 70(1), 71-79. Retrieved from <https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2>

¹⁸ Kaplan metodi asosida maullif tomonidan ishlab chiqilgan.

Yoshlar texnoparklarining 2024-yildagi ko'rsatkichlari ¹⁹

Guruh	Ko'rastkichlar	Andijon	Nukus	Samarqand	Navoiy	Sirdaryo
Moliyaviy (w=0.25)	Rezidentlardan kelib tushgan tushumlar (AQSH dollari)	31 000	30 000	13 000	27 000	12 000
	Eksport hajmi (%)	6	6.5	0.5	1.3	0
	Jalb qilingan investitsiyalar (AQSH dollari)	13500	15000	8700	16 000	9400
Rezidentlar faoliyati (w=0.15)	Qoniqarlik darajasi (1-5 baholash shkalasida)	4	4	3	3	2
	Rezidentlikka topshirgan korxonalar soni	9	13	23	10	14
Ichki boshqaruv jarayonlari (w=0.25)	Murojatlarga javob berish vaqti (kunlar)	15	15	20	15	20
	Tugatilgan innovatsion loyihalar soni	18	19	13	12	9
	Ochiqlik indeksi (1-5 baholash shkalasida)	4	3	1	2	1
Inson kapitali (w=0.35)	Ro'yhatga olingan patentlar	0	1	0	0	1
	Joriy qilingan innovatsiyalar soni	7	3	5	4	3
	Akseleratsiya, inkubatsiya, treninglar	29	26	13	30	32

Yuqoridagi jadvaldan kelib chiqib, Inson kapitalini rivojlantirish guruhi yuqori og'irlik koeffitsientiga ega ekanligidan kelib chiqib, ushbu guruhdagi indikatorlari yuqori natijani qayd etgan texnoparklar yuqori samaradorlik ko'rsatkichlarini qayd etgan. O'z navbatida shuni alohida ta'kidlash lozimki, og'irlik koeffitsientlari O'zbekiston Respublikasi Innovatsion rivojlanish hamda "O'zbekiston - 2030" strategiyalarida belgilangan vazifalar asosida belgilab chiqilgan.

Qo'shimcha tadqiqot sifatida Andijon Yoshlar texnoparki misolida uning to'qimachilik sohasiga ta'siri o'rganildi. Obyekt sifatida mazkur texnoparkning "Eko fabrika" MCHJ rezident korxonasi tanlandi (4-jadval).

Andijon Yoshlar texnoparki rezidenti "EKO fabrik" MCHJning tekstil mahsulotlari ishlab chiqarishdagi xarajatlarining qiyosiy tahlili ²⁰

Xarajat turlari	Texnoparkga sifatida a'zo bo'lishdan oldin		Texnoparkga sifatida a'zo bo'lgandan so'ng		Farqi	
	mln.so'm	%	mln.so'm	%	± abs	±%
Moddiy xarajatlar	409.92	64.2	387.36	65.1%	-22.56	-5.5%
Mehnat xarajatlari						
– asosiy ish haqi	49.60	7.8	44.48	7.5	-5.12	-10.3%
– ish haqi fondi badallari	17.28	2.7	15.84	2.7	-1.44	-8.3
Amortizatsiya xarajatlari						
– Infratuzilmalar	19.20	3.0	17.84	3.0	-1.36	-7.1
– Asbob-uskunalar	65.44	10.2	57.92	9.7	-7.52	-11.5
Boshqa xarajatlar	77.12	12.1	72.00	12.1	-5.12	-6.6
Tannarxi	638.56	100%	595.44	100	-43.12	-6.8

¹⁹ Yoshlar texnoparklari ma'lumotlari asosida muallif ishlanmasi.

²⁰ "Andijon Yoshlar texnoparki" DM rezidenti "EKO fabrik" MCHJ ma'lumotlari asosida muallif ishlanmasi.

Korxona 2023-yilda Andijon Yoshlar texnoparkining rezidenti sifatida qabul qilingan bo'lib, innovatsion infratuzilmada yaratilgan sharoitlar natijasida ishlab chiqarish jarayoni avtomatlashtirildi, optimallashtirildi va raqamli buyurtma boshqaruv tizimi yo'lga qo'yildi. Shuningdek, startap akseleratsiya dasturlarida ishtirok etish natijasida, Jahon Banki tomonidan korxona tomonidan ishlab chiqilgan startap loyihaga 20 ming AQSH dollarilik grant mablag'lari jalb etildi. Korxonada ishlab chiqarish xarajatlari 638.56 mln so'mdan 595.44 mln so'mga kamayib, 6.8% tejamkorlikka erishildi. Eng katta tejamkorlik uskunalarning amortizatsiyasi (-11.5%), ish haqi (-10.3%) va boshqa xarajatlarning (-6.6%) bo'yicha qayd etildi. (6-jadval) Texnik va operatsion samaradorlik natijasiga modernizatsiya hamda raqamlashtirish orqali erishildi. Bundan tashqari, qolgan Yoshlar texnoparklarining "Imstar", "Fromoda tekstil", "Sobithon tikuv uskuna", "Construction of online fashions" Mas'uliyati cheklangan jamiyatlarning daromadlari, eksport hajmi, amalga oshirilgan innovatsion loyihalari, ro'yhatga olingan patentlari soni ko'rsatkichlari to'g'ridan-to'g'ri texnoparklarning samaradorlik ko'rsatkichlariga bog'liq ekanligi isbotlandi ($r > 0.9$).

Bundan tashqari, texnoparklarning rezident korxonalarining ishlab chiqarish jarayoniga zamonaviy texnologiyalar xususan sanoat 4.0 elementlarining joriy qilinganlik darajasi tahlil qilindi (5-jadval).

5-jadval

Texnopark rezidentlarining ishlab chiqarish jarayonida Sanoat 4.0 elementlarining tahlili²¹

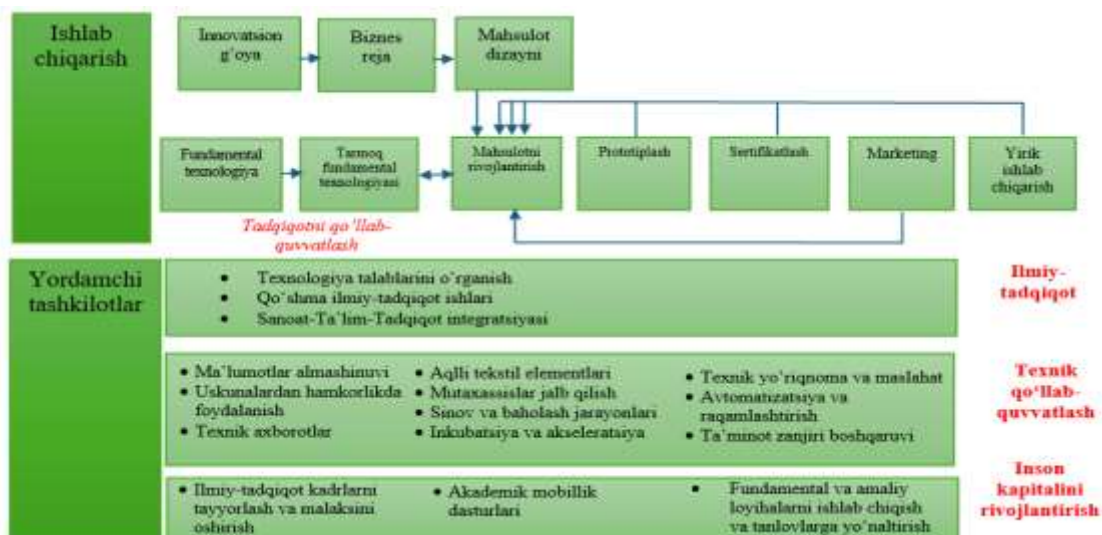
№	Texnopark	Mavjud Sanoat 4.0 elementlari	Zaif tomonlari	Rivojlantirish istiqbollari
1	Andijon yoshlar texnoparki	Avtomatlashtirilgan tikuv liniyalari, IoT asosida sifat nazorati.	Integratsiyalashgan raqamli platforma mavjud emas, Katta hajmdagi ma'lumotlar (Big Data) yig'ilmaydi	IoT texnologiyalarni asosida ma'lumotlarni yig'ish orqali, ishlab chiqarish jarayonini monitoring qilish tizimini joriy qilish imkoniyati mavjud
2	Nukus yoshlar texnoparki	Kelib tushgan buyurtmalarni modelini ishlab chiqish Sun'iy intellekt orqali amalga oshirilib boriladi.	Ishlab chiqarish jarayonini modellash uchun raqamli egizaklar ishlab chiqilib to'liq ishga tushirilmagan	Robototexnika va raqamli jarayonlarni boshqarish tizimlarini rivojlantirish imkoniyati mavjud
3	Samarqand yoshlar texnoparki	Matolarga rang berishda avtomatlashtirilgan.	Avtomatlashtirilgan tizimni keyingi bosqichga olib chiqish bo'yicha ishlar olib borilmaydi.	Mutaxassislarni malakasini oshirish orqali ishlab chiqarish jarayoniga IoT hamda Sun'iy intellekt tizimlarini joriy qilish imkoniyati mavjud
4	Navoiy yoshlar texnoparki	Ombordagi mavjud xomashyo bazasi Sun'iy intellekt orqali yuritiladi	Ishlab chiqarish jarayonida Sun'iy intellekt tizimi qisam joriy qilingan.	IoT va sun'iy intellekt yordamida operatsion rejalashtirishni yo'lga qo'yish imoniyati mavjud
5	Sirdaryo yoshlar texnoparki	Raqamli dizayn va onlayn savdo	Mijozlar bilan ishlashda ularning buyurtmalarini tahlil qilishda sun'iy intellekt texnologiyalari joriy qilingan	Onlayn platformalar va raqamli kiyim dizayni texnologiyalarini rivojlantirish

²¹ Yoshlar texnoparklari ma'lumotlari asosida muallif ishlanmasi.

Umuman olganda, beshta yoshlar texnoparkining to‘qimachilik sohasidagi rezidentlarida raqamlashtirish darajasi 4.0 sanoatni joriy etishning dastlabki bosqichi sifatida baholanishi mumkin. Keyingi bosqichda esa innovatsion texnopark infratuzilmasini rivojlantirish, raqamli kompetensiyalarni shakllantirish, investitsiyalarga kengroq kirish imkoniyatini yaratish, shuningdek IoT, Big Data va AI asosidagi integratsiyalashgan ishlab chiqarish yechimlarini joriy etish talab etiladi.

Innovatsion infratuzilma, moliyaviy barqarorlik va inson kapitalini rivojlantirish bo‘yicha mustahkam asosga ega bo‘lish orqali mamlakat barqaror va raqobatbardosh to‘qimachilik sanoatini yaratadi. Innovatsion ekotizimda, ishlab chiqaruvchilar bilan qo‘llab-quvvatlovchi elementlar yoki turli institutlar ushbu jarayonning turli bosqichlarda rivojlantirishga hissa qo‘shadi (5-rasm). Ishlab chiqarish jarayonining dastlabki bosqichi biznes-reja tuzish bosqichidan boshlanadi. Bozordagi ehtiyojlardan kelib chiqib, ishlab chiqarilishi rejalashtirilayotgan mahsulot konsepsiyasi yoki dizayni ishlab chiqiladi. Dastlabki konsepsiya shakllantirilgach, ishlab chiqarish bosqichi rivojlantiriladi. Prototiplash, sertifikatlash, marketing strategiyasini tasdiqlash, ommaviy ishlab chiqarishni yo‘lga qo‘yishni o‘z ichiga oladi. Bu bosqichda ilmiy-tadqiqot va tajriba-konstruktorlik ishlari doimiy ravishda qo‘llab-quvvatlanadi, bu esa fundamental texnologik konsepsiyalar va ilmiy tadqiqotlar yordamida ishlab chiqarish jarayonining samaradorligini oshiradi.

Qo‘llab-quvvatlovchi tashkilotlar ilmiy-tadqiqot jarayonida tashkilotlar bozor talablariga javob beradigan ilg‘or texnologiyalarni izlash va tadqiq qilish bilan shug‘ullanadi. Ushbu jarayon odatda oliy ta‘lim va ilmiy-tadqiqot muassasalari bilan hamkorlikda amalga oshiriladi. Texnik qo‘llab-quvvatlash jarayonida texnoparklar sanoatga quyidagi xizmatlarni taqdim etadi: Inkubatsiya va akseleratsiya jarayonlari orqali yangi bizneslarni rivojlantirish, Aqlli to‘qimachilik elementlarini joriy etish, Ishlab chiqarish va ta‘minot zanjirlarini raqamlashtirish hamda avtomatlashtirishni o‘z ichiga oladi.



5-rasm. To‘qimachilik korxonalarining texnologik darajasini oshirish sxemasi ²²

Yakuniy komponent inson kapitalini rivojlantirish yoki kadrlarni tayyorlash va qayta tayyorlash ga qaratilgan bo‘lib, xodimlar yangi sanoatdagi yangi

²² Maullif ishlanmasi.

texnologiyalaridan samarali foydalanish uchun zarur bo'lgan ko'nikmalarni egallaydi. Xodimlarni doimiy ravishda o'qitish sanoatning bozor o'zgarishlariga moslashuvchan va dinamik rivojlanishini ta'minlaydi.

Xulosa qilib aytganda, sanoatning innovatsion infratuzilmalar orqali tizimli qo'llab-quvvatlanishi to'qimachilik sanoatining umumiy raqobatbardoshligi va barqarorligini oshirishga xizmat qiladi.

XULOSA

Dissertatsiya tadqiqotining bajarilishi natijasida quyidagi ilmiy xulosalarni shakllantirishga muvaffaq bo'lindi:

1. Tadqiqotning maqsadi va vazifalaridan kelib chiqqan holda milliy innovatsion ekotizimda tarmoq korxonalarida innovatsiyalarni joriy qilishda innovatsion infratuzilmalarning ahamiyati bo'yicha jahon tajribasi qiyosiy tahlil qilindi.

2. Klaster-infratuzilmaviy yondashuv innovatsion infratuzilma subyektlarining funksional ixtisoslashuvi va o'zaro muvofiqlashtirilgan hamkorligini kuchaytirish orqali texnologiya diffuziyasi jarayonlarini jadallashtirishi hamda innovatsion ishlanmalarni ishlab chiqarish jarayoniga tizimli joriy etish imkonini berishi aniqlandi.

3. Tadqiqot natijalari asosida to'qimachilik sanoatiga innovatsiyalarni joriy qilishda innovatsion infratuzilmalarning tashkiliy-iqtisodiy mexanizmlari ishlab chiqilib, ular orqali innovatsion faoliyat natijalarini ishlab chiqarish jarayoniga joriy qilishning samarali usullari asoslab berildi. Texnoparklar negizida ilmiy-tadqiqot natijalarini tijoratlashtirish, startup va spin-off korxonalarni qo'llab-quvvatlash orqali yangi innovatsion mahsulotlarni yaratish va eksport hajmini oshirish takliflari ishlab chiqildi.

4. Ko'p omilli ekonometrik model natijalariga ko'ra, innovatsion infratuzilmalar, moliyalashtirilgan ilmiy-tadqiqot loyihalari, kapital qo'yilmalar to'qimachilik korxonalarining eksport hajmini oshirishda asosiy omillar sifatida qay etildi ($R^2 = 0.86$; $DW=1.90$ JB $p=0.57$).

5. Ishlab chiqilgan model asosida 2030 yilgacha to'qimachilik korxonalari eksport hajmi innovatsion faoliyat ko'rsatkichlari tempi saqlangan holda 20 trillion so'mdan oshishi kutilmoqda. Bu esa ishlab chiqilgan modelning strategik rejalashtirishdagi amaliy ahamiyatini ko'rsatadi

6. Innovatsion infratuzilmalar faoliyatini kompleks baholashda moliyaviy mezonlar ($w = 0,25$), rezidentlar faoliyati ($w = 0,15$), ichki boshqaruv jarayonlari ($w = 0,25$) hamda inson kapitali ($w = 0,35$) kesimida og'irlik koeffitsiyentlari belgilandi. Mazkur og'irliklar O'zbekiston Respublikasining Innovatsion rivojlanish strategiyasi ustuvor yo'nalishlari hamda innovatsion infratuzilmalar vakillari o'rtasida o'tkazilgan so'rovnoma natijalari asosida shakllantirilib, to'qimachilik sanoati innovatsion infratuzilmalarining rivojlanishiga ta'sir etuvchi omillar ahamiyatini yanada aniqroq aks ettirish imkonini berdi.

7. BSC baholash metodikasi asosida ishlab chiqilgan mezonlarga muvofiq Yoshlar texnoparklari reytingiga muvofiq Andijon va Nukus texnoparklari "Yuqori" samaradorlik ko'rsatkichini qayd etib, Andijon Yoshlar texnoparki rezidenti "Eko Fabrik" MCHJ yaratilgan shart-sharoitlar asosida ishlab chiqarilayotgan tekstil mahsulotlarining tannarxi 7.8% ga pasaydi.

**SCIENTIFIC COUNCIL AWARDING OF SCIENTIFIC DEGREES
№ DSc.03/30.07.2022.I.16.05 AT THE TASHKENT STATE
UNIVERSITY OF ECONOMICS**

TASHKENT STATE UNIVERSITY OF ECONOMICS

KARIMOV KHOJAKBAR MAKHAMADJON UGLI

**DEVELOPMENT OF THE ORGANIZATIONAL AND ECONOMIC
MECHANISMS OF INNOVATIVE INFRASTRUCTURES IN THE
INDUSTRIAL ECONOMY
(In the example of textile industry)**

08.00.03 – Industrial Economics

**DISSERTATION ABSTRACT
of the doctor of philosophy (PhD) in economic sciences**

Tashkent – 2026

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INTRODUCTION (Thesis annotation)

Topicality and necessity of the thesis. In the global economy, the importance of improving organizational and economic mechanisms of innovative infrastructures (technoparks, industrial parks, clusters and incubators) in industry is growing. Current process aims to accelerate the adoption of new technologies in production, reducing transaction costs, developing cooperation in supply chains and through improving knowledge diffusion and innovation absorption capacity bring are bringing labor productivity and total factor efficiency onto a sustainable growth trajectory for enterprises. “It is important to define the managerial role of infrastructure operators (unified project-capacity offices, acceleration and transfer services, cluster regulations) from institutional perspective and link them with performance indicators, as structural reforms focused on local and cross-sectoral knowledge flows that increase enterprise efficiency”¹. The implementation of suitable management systems with performance metrics for innovative infrastructure projects functions as a vital element for industrial competitiveness expansion through continuous development.

Research on improving the organizational and economic mechanisms of innovative infrastructure in industrial sectors in the global economy, mostly focuses on the following priority areas: forming clusters and ecosystems of innovative infrastructure (including energy, education, transfer institutions, and startup hubs); developing the process of increasing modern knowledge and technologies within industries; developing cost-effectiveness models for these infrastructures in different sectors (considering investment costs, infrastructure utilization coefficients and the transition to new production) and implementing regulatory approaches that directs industrial infrastructure for increasing competitiveness (such as transforming declining industries, transitioning to “green” technologies and digitalization of industries). These factors are considered important for in the process of implementing innovations in industry through infrastructure, integrating products into the value chain and for sustainable economic growth.

As a result of the economic reforms in Uzbekistan, special attention has been given to innovative development of the industry, with the expansion of activities in innovative infrastructures based on science and technology parks. However, nowadays, the mechanisms for establishing an economy based on innovations through introducing scientific achievements and technological advancements, commercializing innovative products and attracting investments are not sufficiently developed. Thus nowadays the proportion of high and medium technology industrial production consists 29.5 percent and proportion of funds allocated to research and development is 0.2 percent. Besides that, there is a big demand for high-technology job opportunities due to the fact that level of the coverage with the level of higher education has reached 42 percent and annually 600-700 thousand graduates are entering into the labor market².

¹ M. Mostak Ahamed, Kul B. Luintel, Sushanta K. Mallick. Does local knowledge spillover matter for firm productivity? The role of financial access and corporate governance, Research Policy, Volume 52, Issue 8, 2023, 104837, ISSN 0048-7333, <https://doi.org/10.1016/j.respol.2023.104837>.

² <https://www.gazeta.uz/oz/2023/09/30/education/>

The low level of private sector involvement in the organizational and economic activities of technology parks, absence of monitoring effectiveness indicators for these parks and the different approaches in providing tax and custom incentives for them are leading to a disproportionate implementation of innovations across different industries³. National innovation ecosystems require innovative infrastructure system performance improvement to process raw materials and add value in manufactured products. This can be accomplished by establishing an “enterprise-university-research organization” chain to increase the number of applied research projects in rapidly growing economic sectors. Such factors show the relevance of the chosen topic.

Current research certain extent will serve to implement tasks that are highlighted in Presidential decree of Uzbekistan № DP-16 dated from 30.01.2025 “On the state program for the implementation of the strategy “Uzbekistan – 2030” in the “Year of environmental protection and green economy”, № DP-16 dated from 10.01.2023 “On measures to support the activities of cotton-textile clusters, fundamental reform of the textile and clothing-knitwear industries, as well as further increase the export potential of the sector”, № DP-307 from 07.07.2022 “Organizational Measures for the Implementation of the Strategy for Innovative Development of the Republic of Uzbekistan for 2022-2026” and Presidential Resolution № PF-165 “Approving the Strategy for Innovative Development of the Republic of Uzbekistan for 2022-2026”, Resolutions of the Cabinet of Ministers of Uzbekistan №128 dated from 13.03.2024 “On measures to implement the Strategy for Innovative Development of the Republic of Uzbekistan for 2024-2025”, № 545 dated from 27.08.2021 “On measures to organize a system for managing scientific and innovative activities” and other relevant legislative acts.

Relevant research priority areas of science and developing technology of the Republic. The dissertation research has been conducted in accordance with the first priority direction of the national development of science and technology, namely “Forming and implementing a system of innovative ideas in the social, legal, economic, cultural, and spiritual-educational development of an information society and a democratic state”.

Problem development status. The effective functioning of national innovation systems of the countries and the enhancement of the competitiveness of the industrial enterprises through innovative infrastructures have been studied by many foreign researchers. In particular, scientific research in this area has been conducted by scholars such as R.Solow, M.Porter, J.Schumpeter, R.Nelson, B.Lundvall, S.Freeman, D.Acemoglu and P.Restrepo, W. Hanlon, F.Perroux, H.Etzkowitz, L.Leydesdorff and others⁴.

³ Kun.uz (2022) 58 ta OTMda yangi texnologiyalarni joriy etish bo'yicha 377 ta loyiha amalga oshiriladi. Available at: <https://kun.uz/news/2022/09/03/58-ta-otmda-yangi-texnologiyalarni-joriy-etish-boyicha-377-ta-loyiha-amalga-oshiriladi>.

⁴ Solow, R.M., 1957. Technical change and the aggregate production function. *The Review of Economics and Statistics*, 39(3), pp.312-320. Porter, M.E. and Stern, S., 2001. National innovative capacity. *The Global Competitiveness Report*, pp.1-19. Schumpeter, J.A., 1947. The creative response in economic history. *The Journal of Economic History*, 7(2), pp.149-159. Nelson, R.R., 1993. *National Innovation Systems: A Comparative Analysis*. Oxford University Press, pp.1-500. Lundvall, B.Å., 2007. National innovation systems – analytical concept and development tool. *Industry and Innovation*, 14(1), pp.95-119. Freeman, C. (1995). *The 'National System of Innovation' in historical perspective* (2nd ed., pp. 10-17). Cambridge Journal of Economics. Acemoglu, D. and Restrepo, P., 2019. Automation and new tasks: How technology displaces and reinstates labor. *Journal of Economic Perspectives*, 33(2), pp.3-30. Hanlon, W.W., 2012. *Innovation and Industry*

Fundamental research on establishing science-based enterprises through innovative infrastructures to establish new leading industrial enterprises in the economy and increase sustainable regional socio-economic growth has been conducted by researchers from the Commonwealth of Independent States (CIS) such as O.V.Koroleva, V.A.Vasyaycheva, E.M. Cherkasova, M.K. Aristarkhova, L.N. Borisoglebskaya, S.G. Emelyanov, N.N. Skornichenko, S.A. Baev, M.V. Ponomarev and others⁵.

The role of innovative infrastructures, especially technology parks, in increasing the efficiency of production in industry, establishing the production of high-tech products, facilitating technology transfer, and implementing “Smart Cities” for social growth has been studied by many researchers, including A.Laspia, A.Link and J.Scott, C.Nauwelaers, A.Kleibrink and K.Stankova, A.Barge-Gil, S.Perez-Canto and A.Modrego, A.Arikan, C.Beaudry, H.Löfsten and P.Lindelöf, S.Macdonald, A.Badalova, G.Sakhabieva, B.Gerasimov, E.Kutsenko, A.Zatikyan, O.Bildina and others⁶. They have studied the importance of technology parks in the national

Development: Lessons from the British Cotton Textile Industry During the U.S. Civil War. Doctor of Philosophy. Columbia University, pp.1-250. Perroux, F., 1955. Note sur la notion de 'pôle de croissance'. *Économie appliquée*, 8(1), pp.307-320.] Etzkowitz, H., 2003. Innovation in innovation: The triple helix of university-industry-government relations. *Social Science Information*, 42(3), pp.293-337. Leydesdorff, L., 2003. The mutual information of university-industry-government relations: An indicator of the Triple Helix dynamics. *Scientometrics*, 58(2), pp.191-203.

⁵ Королева О.В. Управление инновационной деятельностью промышленных предприятий на основе создания технопарков // Транспортное дело России - 2006, №9 Ч 3 (0,3 п л.). Васяйчева, В.А., 2020. Моделирование процесса управления инновационной деятельностью предприятий промышленной сферы. Вестник Воронежского государственного университета. Серия: Экономика и управление, (4), с. 74-82. DOI: 10.17308/econ.2020.4/3195. Черкасова, Е.М., 2016. Теоретико-методологические проблемы в сфере управления инновационной деятельностью организаций. Креативная экономика, 10(7), сс. 713-732. DOI: 10.18334/ce.10.7.35399. Аристархова, М.К. и Порошин, Ю.Г., 2009. Моделирование системы показателей управления инновационной деятельностью промышленного предприятия. Управление инновациями и инвестиционной деятельностью, 12(3), сс. 88-97. Борисоглебская, Л.Н. и Миронова, В.И., 2012. Разработка системы управления технопарком легкой промышленности на основе механизмов взаимодействия его субъектов. Право, менеджмент, маркетинг и инновации, 6(164), сс. 122-128. Емельянов, С.Г., Борисоглебская, Л.Н. и Мальцева, А.А., 2010. Разработка организационной модели технопарка на основе методов проектного управления. Вестник Челябинского государственного университета, (26), сс. 42-47. Скорниченко, Н.Н. и Стрелкова, Н.В., 2023. Роль технопарков в развитии инновационной деятельности и укреплении технологического суверенитета России. Вестник Самарского университета. Экономика и управление, 14(2), сс. 114-124. DOI: 10.18287/2542-0461-2023-14-2-114-124. Баев, С.А., 2021. Теоретические основы развития инновационной инфраструктуры. Финансы и управление, (4), сс. 83-98. DOI: 10.25136/2409-7802.2021.4.36730. Пономарев, М.В. и Савельева, Л.В., 2021. Университетские технопарки: универсальная модель и инструменты цифрового проектирования. *Architecture and Modern Information Technologies*, (4)57, сс. 377-393. DOI: 10.24412/1998-4839-2021-4-377-393.

⁶ Laspia, A., Sansone, G., Landoni, P., Racanelli, D. и Bartezzaghi, E., 2021. The organization of innovation services in science and technology parks: Evidence from a multi-case study analysis in Europe. *Technological Forecasting and Social Change*, 173, 121095. DOI: 10.1016/j.techfore.2021.121095. Link, A. N., & Scott, J. T. (2007). The economics of university research parks. *Oxford Review of Economic Policy*, 23(4), 661–674. <https://doi.org/10.1093/oxrep/grm030>. Nauwelaers, C., Kleibrink, A., and Stankova, K., 2014. The role of science parks in smart specialisation strategies. *S3 Policy Brief Series*, pp.1-30. Barge-Gil, A., Perez-Canto, S., and Modrego, A., 2018. The influence of science and technology park characteristics on firms' innovation results. *Papers in Regional Science*, 97(5), pp.1205-1227. Arikan AT (2009) Interfirm knowledge exchanges and the knowledge creation capability of clusters. *Academy of Management Review* 34: 658–676. Beaudry C, Swann P (2009) Firm growth in industrial clusters of the United Kingdom. *Small Business Economics* 32: 409–424. Löfsten H, Lindelöf P (2002) Science Parks and the growth of new technology-based firms: Academic-industry links, innovation and markets. *Research Policy* 31: 859–876. Macdonald S (1987) British Science Parks: Reflections on the politics of high technology. *R&D Management* 17: 25–37. Бадалова, А.Г. и Мизинцева, А.Н., 2016. Инструменты стратегического управления рисками инновационно ориентированных промышленных предприятий. Право, менеджмент, маркетинг и инновации, 8(214), сс. 62-65. Сахабиева, Г.А., 2020. О повышении эффективности региональной экономики. Менеджмент, 3(22), сс. 23-27. Герасимов, Б.Н., 2019. Формирование инновационной деятельности в благоустройстве города. *International Journal of Humanities and Natural Sciences*, vol.9-1, сс. 14-17. DOI: 10.24411/2500-1000-2019-11553. Kutsenko, E., Islankina, E., and Abashkin, V., 2017. The evolution of cluster initiatives in Russia: the role of policy, region of origin, and industry context. *Foresight and STI Governance*, 11(3), pp. 21-30. Затикиан, А.Т., 2019. Влияние технопарков на

innovation system, the support of these parks through state programs, and their importance in introducing innovations in economic sectors such as agriculture, ICT and heavy industry.

In Uzbekistan, the issues of forming a national innovation system, introducing innovations into the industry, developing technology parks and evaluating the innovation activities of the industry have been studied by local scientists such as Sh.N. Zaynutdinov, S.S. Gulomov, R.I. Nurimbetov, Sh.I. Otajonov, T.Z. Teshabayev, Sh.E. Sindarov, I.S. Xotamov, A. Ortiqov, A.E. Norov, A.T. Shermuxamedov, B.M. Xolboev, G.Sh. Karabayeva, Sh.O. Sharifkhodjayev, M.X. Vokhidova, B.B. Bakhtiyorov, G.B. Shanazarova, G.N. Makhmudova and others⁷.

However, despite this, the need for a comprehensive analysis of the specific mechanisms and factors that determine the importance of innovative infrastructures in increasing the technological level of products manufactured by the industry, particularly in light industry, as well as the need for a model based on clear criteria to determine their efficiency, highlights the relevance of this topic, as well as the objectives, tasks, structure, and logic of the dissertation research.

Relevance of the dissertation research with the plans of the scientific-research works of the higher educational or scientific research institutions where the dissertation has been conducted. The research was conducted in accordance with the research plan of Tashkent State University of Economics within the framework of the project No. FM-1 entitled “Improving the scientific and

развитие инновационной инфраструктуры РА. Научно-практический электронный журнал Аллея Науки, 10(37), сс. 1-15. Бильдина, О.В., 2007. Государственная поддержка технопарков как организационной формы развития инновационной сферы национальной экономики. Автореферат диссертации на соискание ученой степени кандидата экономических наук. Государственный университет управления, Москва.

⁷ Zaynutdinov, Sh.N. (2011) Innovatsion salohiyatni oshirish strategiyasi, Iqtisodiyot va innovatsion texnologiyalar ilmiy elektron jurnali, №1, Sentabr. Гулямов С.С., Шермухамедов А.Т., Холбоев Б.М. Цифровая экономика: инновационные цифровые технологии// Учебное пособие//Закрытое акционерное общество "Университетская книга", Российский экономический университет им. Г.В. Плеханова. DOI: 10.47581/2022/Xolboev-Gulamov-Shermukhamedov.01 Нуримбетов Р.И. Факторы конкурентоспособности в условиях рынка. International Journal of Experimental Education, no. 8, part 3, pp. 343–347. Moscow: Academy of Natural History. Отажонов Ш.И. Инновация фаолияти инфратузилмасини бошқариш самарадорлигини ошириш. Монография. –Т.: Fan va texnologiya, 2018. –264 б. Тешабаев Т.З., Аллаёров Ш.А., Джурабаев О.Д. Оптимизации операционной стратегии и повышение экономического потенциала хлопково-текстильных кластеров. “Innovations in Science and Technologies” scientific electronic journal. Volume 1 №8, 2024, pp 4-15. Sindarov Sh.E. The economic mechanism of use of innovative processes in business Uzbekistan. ICEIC: International Conference on Electronics, Informations and Communications. 2008, pp 86-89. Xotamov, I. and Jurayev, A. (2023) Sanoat-4.0 sharoitida barqaror iqtisodiy o'sish istiqbollarini tahlil qilish, Iqtisodiyot va innovatsion texnologiyalar (Economics and Innovative Technologies), no. 6 (November–December), pp. 143–152. 2. Норов А.Э. Инновацион фаолият ва унинг натижаларини тижоратлаштиришнинг назарий ва услубий асослари // “Iqtisodiyot va innovatsion texnologiyalar” ilmiy elektron jurnali.– Тошкент, 2020. – № 1. – Б. 116-131. Шермухамедов, А.Т. и Холбоев, Б.М. (2023) Инновационное развитие технопарков в Узбекистане. Инновационная экономика: перспективы развития и совершенствования, №3(69), с. 177–184. Карабаева, Г.Ш. (2020) Основные аспекты активизации инновационных процессов в промышленности Узбекистана. Вестник РЭУ им. Г. В. Плеханова, №5(113), с. 42–55. DOI: <http://dx.doi.org/10.21686/2413-2829-2020-5-42-55>. Шарифхўжаев, Ш.О. и Вохидова, М.Х. (2018) Mamlakatimizda innovatsion infratuzilmani rivojlantirishning zaruriyati. Иқтисод ва молия (Экономика и финансы), №5, с. 61–66. Бахтиёрв, Б.Б. (2022) Саноат корхоналари инновацион бошқарувини ривожлантиришда илғор хориж тажрибасидан фойдаланиш имкониятлари. Иқтисодиёт ва инновацион технологиялар (Economics and Innovative Technologies), №1 (январь–февраль), с. 109–120. Махмудова, Г.Н. (2023) Оценка и сравнительный анализ промышленного потенциала Республики Беларусь и Республики Узбекистан в рамках ЕАЭС. Иқтисодиёт ва инновацион технологиялар (Iqtisodiyot va innovatsion texnologiyalar), №5 (сентябрь–октябрь), с. 397–422. DOI: https://doi.org/10.55439/EIT/vol11_iss5/a43. Махмудова Г.Н., Бабкин А.В. Теоретические аспекты инновационного развития в условиях модернизации экономики: тенденции, анализ и перспективные возможности // Научно-технические ведомости СПбГПУ. Экономические науки. 2020. Т. 13, № 2. С. 40–52. DOI: 10.18721/JE.13204

methodological foundations and methodologies for ensuring macroeconomic stability and forecasting of socio-economic development in Uzbekistan.”

The aim of the research. Development of scientific proposals and practical recommendations for improving the organizational and economic mechanisms of innovative infrastructures (in the example of technoparks) in the industrial sector sector (in the example of textile enterprises).

Tasks of the research work:

Researching methods for introducing the results of innovative activities into the textile industry through the development of organizational and economic mechanisms of innovative infrastructures;

Conducting comparative study of the best foreign practices in increasing the importance of innovative infrastructure to increase the competitiveness of textile enterprises;

Analysis of the types of organization of innovative infrastructures as well as the tasks and functions each of them in the introduction of innovations into production;

Developing, forecasting and analyzing a multi-factor econometric model that explains the impact of factors related to innovation, particularly technological parks, on increasing the export volume of ready products in textile industry enterprises;

Developing criteria and methodologies for assessing the performance of innovative infrastructures to improve their effectiveness;

Analysis the importance of reducing production and product costs through innovative infrastructures for a textile enterprise as well as examine current condition in implementing modern technologies particularly elements of Industry 4.0 in the production process;

Proposing short-, mid- and long-term development plans to increase the technological intensity of light industry enterprises, introducing modern technologies in the manufacturing process and boost the role of innovative infrastructures.

The object of the research work are technoparks and their resident which produce textile products.

The subject of the research work. Socio-economic relations arising in the process of increasing the efficiency of technoparks in the introduction of innovations into the industry through innovative infrastructures of the textile industry.

Methods of the research. In the research process, methods such as scientific observation, logical reasoning, comparative analysis, correlation-regression analysis and BSC assesment methodolgy were used.

Scientific novelty of the research work:

In the production process of textile industry the cluster-infrastructure model for implementing innovation was developed. This improvement is based on establishing a multifunctional cooperation model formed through knowledge transfer and technology diffusion among the types of innovative infrastructures (technoparks, project centers, incubators, venture funds, and research institutes).

forecast indicators till 2030 have been developed based on a multivariate econometric model of factors influencing the export volume of ready textile products in Uzbekistan;

the multifactorial assessment model of innovative infrastructure performance in the textile industry has been improved by using indicators of financial aspects, resident activities, internal management process and human capital that more clearly reflect the characteristics of the industrial sector;

the impact level of Youth Technoparks in Andijan, Navoi, Nukus, Samarkand, and Syrdarya on textile enterprises has been analyzed by categorizing them as “high” (2.25-3.00), “above average” (1.75-2.24), “medium” (1.25-1.74), and “low” (0-1.24). based on economic efficiency.

Practical results of the research work:

based on advanced foreign experience, a methodological approach was developed aimed at implementing institutional reforms for the development of innovative infrastructures within the national innovation ecosystem;

an econometric model demonstrating the importance of innovative infrastructures in increasing the export volume of finished textile products was applied in practice, and their effectiveness was determined;

a methodology for defining and evaluating the performance indicators of innovative infrastructures on the basis of clear criteria was developed, and the possibilities of applying it in textile industry enterprises were substantiated;

A set of factors influencing the establishment of a national innovation ecosystem, aligned with modern requirements, for the introduction of processing technologies in the textile industry and the creation of added value in products was developed;

Using the example of the Andijan Youth Technopark, the effectiveness of a resident enterprise specialized in textile production in reducing production costs was demonstrated.

Authenticity of the research results. The reliability of the research results is explained by the appropriateness of the methodological approaches and methods used in the study, the extensive use of statistical data from the Ministry of Higher Education, Science, and Innovation of the Republic of Uzbekistan and its Innovation Development Agency, the National Agency of Statistics of Uzbekistan and “O‘zto‘qimachilik sanoat” Association as well as statistical data and reports of UNIDO. It explains the reliability of the results of the research as modern research methods and theoretical developments were applied testing of results, proposals and recommendations which are concluded in the dissertation.

Scientific and practical value of the research results. The scientific significance of the research results is explained by the potential application of the developed scientific and practical proposals. Which can be utilized in conducting scientific research aimed at developing mechanisms for integrating science, education and production, as well as creating and improving the foundations of organizational and economic mechanisms. These proposed models shows the importance of innovative infrastructures in national innovative system.

Practical value of the research is explained by the proposals that can be applied during the process of introducing innovations in the industry for reaching sustainable economic development. These proposals include methodological recommendations as well as development programs which aim creating competitive national innovation

system and improving performance of innovative infrastructures. Furthermore, current research allows organizations assess to how new infrastructure system effects the export performance of industry in terms of value added products through econometric modeling and predictive analysis.

Implementation of the research results. . Based on the developed scientific proposals and practical recommendations for improving the organizational and economic mechanisms of innovative infrastructure in the textile industry:

Proposed the cluster-infrastructure organizational model for implementing innovations in the production process of textile enterprises has been improved. This improvement is based on establishing a multifunctional cooperation model formed through knowledge transfer and technology diffusion among the types of innovative infrastructures (technoparks, project centers, incubators, venture funds, and research institutes) was introduced to technoparks by the Ministry of Higher education, science and innovation of Uzbekistan (References from the Ministry of Higher education, science and innovation of the Republic of Uzbekistan № 02/17-3620 dated from 16.09.2025 and from Agency for the development of light industry under the Cabinet of Ministers № 01-28 dated from 08.11.2025). As a result of determining functions and obligations of all types of innovative infrastructures, the number of startup projects that are created in technoparks increased by 15% and the average time implementation of those projects into real sector economy decreased by 15-20%.

Forecast indicators up to 2030, developed based on a multivariate econometric model of factors affecting the export volume of finished products in Uzbekistan's textile enterprises have been implemented by the Association of "O'zto'qimachiliksanot" in planning indicators for implementing innovations in enterprises. (Reference from the Agency for the development of light industry under the Cabinet of Ministers № 01-28 dated from 08.11.2025). As a result, during the making innovative development strategy until 2030, a forecast method was used to calculate an increase in the share of high-tech exports by 6% due to the creation of 75 innovative infrastructures.

The proposal for the multi-factorial assessment of innovative infrastructure performance in the textile industry has been implemented by the Ministry of Higher Education, Science and Innovation of Uzbekistan in evaluating innovative infrastructure performance and determining strategic directions. This assessment focuses on financial aspects, resident activities, internal management processes and human capital criteria which uses indicators that more distinctly reflect the characteristics of the industrial sector. (References from the Agency for the development of light industry under the Cabinet of Ministers № 01-28 dated from 08.11.2025 and from Ministry of Higher education, science and innovation of the Republic of Uzbekistan № 02/17-3620 dated from 16.09.2025). As a result of a standardized integrated assessment, priority area performances for technoparks have been set through optimal allocation of resources, the commercialization of projects were accelerated by 1.5 times. (Reference "Andijan Youth technopark" State entity №5 dated from 24.07.2025)

Based on the main performance indicators of the Youth Technoparks of Andijan, Navoi, Nukus, Samarkand, Syrdarya the proposed level of impact on textile

enterprises by categorizing according to the boundary ranges of economic efficiency “high” (2.25-3.00), “above average” (1.75-2.24), “average” (1.25-1.74), “low” (0-1.24) was used by the Ministry of Higher Education, Science and Innovation of Uzbekistan in maintaining the rating of Youth Technoparks. (Reference Ministry of Higher education, science and innovation of Uzbekistan № 02/17-3620 dated from 16.09.2025). As a result of ranking a plan of measures for the comprehensive development of their activities, the number of innovative projects increased by 1.3 times. In particular, a system of “marking” of cotton fiber produced by 59 cotton processing enterprises in 10 regions was introduced.

Approbation of research results. The main scientific and practical results of the dissertation were presented and discussed at 3 international and 5 national scientific and practical conferences.

Publication of research results. A total of 10 scientific works have been published on the topic of the dissertation, including 10 articles in scientific journals recommended by the Higher Attestation Commission of the Republic of Uzbekistan for publishing the main scientific results of dissertations. Of these, 9 were published in national scientific journals, and 1 in an international scientific journal.

The structure and size of the dissertation. The structure of dissertation consists of introduction, three chapters, conclusion, list of references and appendices with total of 123 pages.

MAIN CONTENT OF DISSERTATION

In the introduction part aim, tasks, objectives, subject, methods, scientific novelty and practical results of the research work was shown. Additionally this part also includes authenticity, scientific and practical value, implementation, approbation, publication and the outline of the thesis.

In the first chapter called “Theoretical and methodological foundations of organizational and economic mechanisms for innovative infrastructures in industrial sector” essence and meaning of organizational and economic foundations, importance and distinctive features of innovative infrastructures in the industrial economy and advanced foreign experience current topic with perspectives in Uzbekistan were analyzed.

The definitions of the concepts “national innovation system” and “innovation infrastructure” proposed by economists were examined by the dissertation author. It was determined that the effectiveness of an innovation ecosystem is largely measured by the performance of innovation infrastructures that strengthen interactions among various institutions, including government bodies, higher education institutions, and industry enterprises. Accordingly, various theoretical approaches addressing the role of innovation infrastructures in establishing an effective national innovation system were analyzed. Within the scope of the study, three major theories relevant to this topic were examined: the Triple Helix model, Cluster Theory, and Growth Pole Theory.

Furthermore, an analysis of the experience of developed countries revealed that the functioning of innovation infrastructures plays a crucial role in the development

of innovation ecosystems. In particular, the degree of interconnection among government, universities, and industry enterprises within the Triple Helix framework was found to be of significant importance for integrating science, education, and production. The study confirms that the interaction among these three institutions is essential for establishing a knowledge-based economy. In addition, innovation infrastructures were identified as a key factor in the formation of specialized enterprises within specific sectors.

The analysis also demonstrated that regional economic development is not evenly distributed but rather concentrated around certain core centers or “growth poles.” These poles represent clusters of key driver enterprises that stimulate economic development and generate growth potential for neighboring regions. In this context, innovation infrastructures—particularly science and technology parks—were examined as institutional foundations that enhance regional innovation capacity and thereby contribute to sustained economic growth.

Over past six years, Uzbekistan has undertaken significant legislative and regulatory measures aimed at forming, developing and fostering its innovation ecosystem. This period has seen the enactment of 88 legislations, including 3 Laws, 34 Presidential and 52 Governmental decrees and resolutions. As a result, Uzbekistan has made impressive strides in fostering innovation, and the Global Innovation Index which is announced annually can be a great example of this progress in other words Uzbekistan climbed by 40 positions since 2015 and now holds 79th position in the world⁸. Meanwhile, there has been a tripling in the annual state budget allocation for sectors pertaining to research and development since 2018, amounting to 1.5 trillion soums. The share of young scientists in the nation has expanded significantly by 1.5-fold. The number of institutions financing the research activity increased to 28 including innovation funds and venture organizations . In 2020 the Innovative activity Act was approved in Uzbekistan officially mentioned innovative infrastructure as a basic concept. Innovative infrastructures, particularly technology parks, serve to enhance production efficiency and competitiveness by applying innovation activities aimed at reducing production costs and improving product quality. Therefore, one of the most pressing issues today is to define their economic and organizational mechanisms, taking into account the characteristics of the sector, economic conditions, and international experience in order to ensure the effective functioning of these innovative infrastructures. At present, scholars emphasize that, in order to effectively organize these mechanisms, each country should develop flexible mechanisms tailored to its own economic, social, and traditional conditions (Figure 1).



Figure 1. Organizational types of scientific and technological parks⁹

⁸ <https://gov.uz/oz/innovation/news/view/86181>

⁹ Developed by the author based on literature review

In our research we took the textile industry as an example as it is considered as a perspective industrial sector in the economy. Due to several reforms in the light industry, particularly with the establishment of a cluster system, 5.3 bln USD of foreign direct investment and 3 bln. USD preferential credits have been attracted to this sector. As a result, 350 factories were launched, 265 projects worth 4 billion dollars have been initiated, creating 300,000 new jobs. Production volume has increased fivefold compared to 2016 exports have quadrupled reaching to 3 bln USD. Despite this, the level of processing finished products remains at a mere 23 percent. With proper organization of the system based on science and modern technologies, it is possible to increase the number of jobs to 1 million and processing level to twofold increase¹⁰. Subsequently, a proposal has been developed to improve the cluster-infrastructure organizational model for implementing innovations in the production process of textile enterprises. This improvement is based on establishing a multifunctional cooperation system that is formed through knowledge transfer and technology diffusion among innovative infrastructure entities (such as technoparks, project centers, incubators, venture funds, and research institutes) (Figure 2).

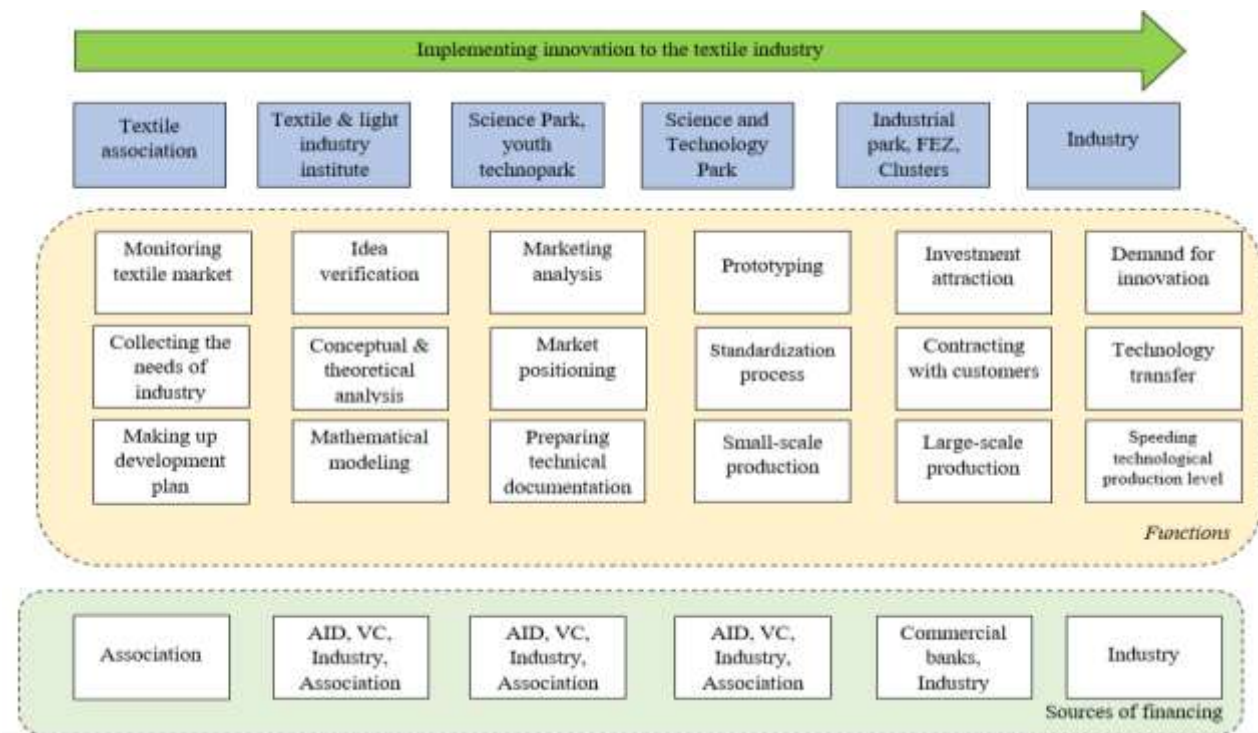


Figure 2. Organizational model of innovative infrastructures for implementing innovations in textile industry¹¹

Based on the needs of industry enterprises, concepts developed by research institutes and higher education institutions undergo marketing analysis and technical refinement by science parks. In science and technology parks, processes such as prototyping, standardization and small-scale production carried out. Newly established enterprises either conduct large-scale production in industrial parks or

¹⁰ Sh.Mirziyoyev. 2023. "Current issues in agriculture were discussed" <https://president.uz/uz/lists/view/5831>

¹¹ Muallif tomonidan olib borilgan ilmiy-tadqiqotlar asosida ishlab chiqilgan

merge with existing industry enterprises. Once the entire ecosystem is formed, innovation districts are established.

When examining the experience of leading countries (India, China, South Korea, and Egypt) in implementing innovations in the textile industry, it becomes evident that similar stages have been followed. In the initial phase, a strategy was adopted to shift from simple production based on cheap labor to the manufacture of high-value products through skilled labor. This transition required the expansion or establishment of new sectors, such as chemical fibers and yarn spinning. Furthermore, technology parks played a key role in applying a scientific approach to marketing, design, and improving raw material quality, as well as in training specialists, developing strategies, and implementing them in practice.

In the second chapter called **“Analysis of modern condition of organizational and economic mechanisms for innovative infrastructures in textile industry of Uzbekistan”** the tendency of development of innovative infrastructures including their assesment of organizational and economic mechnizms and analysis of variables related innovation activity affecting the efficiency of textile industry was conducted.

Uzbekistan is pursuing an active industrial policy aimed at transitioning from the production of low value-added raw materials to high value-added finished products. In establishing a competitive industrial economy based on innovative activities, it is essential to identify and continuously develop strategic industrial sectors and product lines that can contribute to the country’s long-term sustainable development. When determining the driver sectors, criteria such as stable growth in industrial output, increasing contribution of the sector to GDP growth, positive trends in innovation-driven development, efficient use of resources and acceleration of the localization process should be taken into account.

For now, it is important for the government to increase the level of technological intensity of the manufacturing sector. Because firstly it helps to boost industrial competitiveness by adapting modern technologies like automation, AI, IoT which helps them to improve efficiency, cost-effectiveness and productivity. Secondly, it will be a main factor in increasing the export potential of a country as it creates high-value-added products as the economy becomes less dependent of exporting raw materials. Thirdly, advancement of manufacturing brings to new job opportunities in high tech fields.

In our research we analyzed the data of the manufacturing sector structure of CIS: Russia, Belarus, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan. Each economy show different levels of industrialization, technological advancement and economic focus. Statistics show that some countries depend heavily on raw material-based industry, whereas others specialize in low-tech or medium-tech production. Almost all countries remain underdeveloped in high-tech industries (figure 3). Due to the abundance of natural resources, the economies of the Russian Federation and the Republic of Kazakhstan are primarily specialized in raw materials, accounting for 59.7% and 44.7%, respectively. It is worth noting that Kazakhstan has recorded the highest share of high-tech manufacturing at 18.2%. Belarus (28.3%) and Kyrgyzstan (41.4%) have a significant share of low-tech industries. Nearly 90% of Tajikistan's economy is specialized in resource-based sectors.

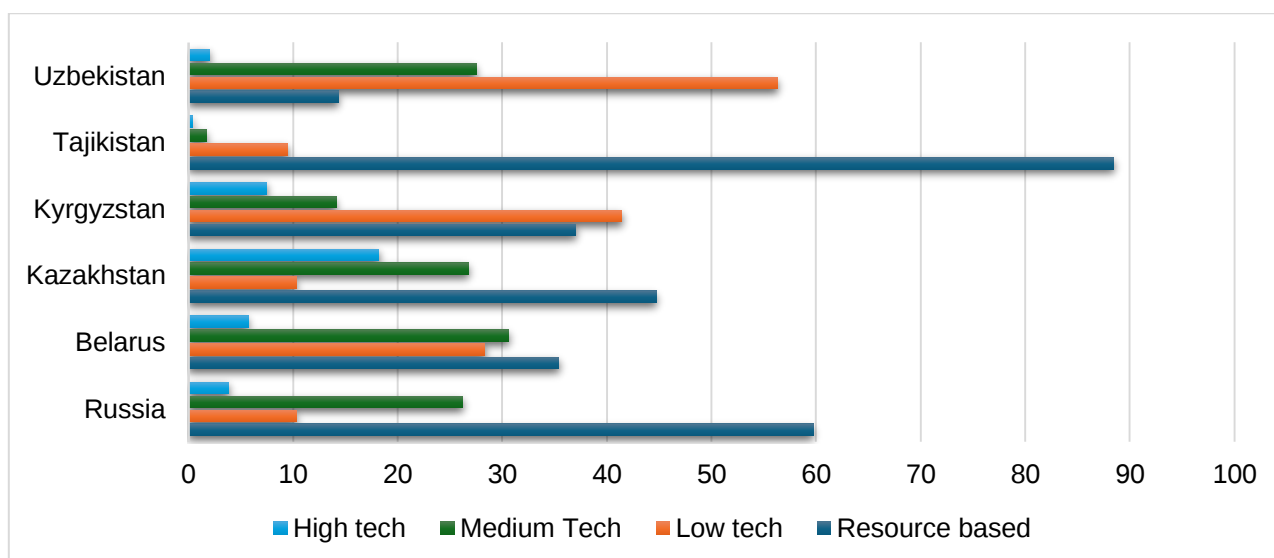


Figure 3. Manufacturing Industry Structure Across CIS countries for 2024¹²

In comparison, as a result of its economic diversification policy, the Republic of Uzbekistan has moved away from raw material exports and significantly increased the share of low-tech manufacturing to 56.3%. Meanwhile, the share of medium-tech manufacturing stands at 27.5%. However, the high-tech industry remains underdeveloped, accounting for only 2%.

There are different ways to further develop technology-based industries, by fostering new high-tech sectors or by upgrading existing industries through innovations. Another possible policy is to shift from one level to the next within a specific industry. For instance, Uzbekistan has a great potential in textile industry, making it an ideal case study for such a transition. Integrating automation, smart textiles, advanced materials, and digitalization into production through R&D gives opportunity to transform the current sector into a medium- or high-tech industry. Thus, it is crucial to develop a strong innovative ecosystem through innovative infrastructures to support this transformation in long-term industrial growth.

Enhancing the technological level of an industrial economy can be achieved either by establishing new production based on advanced technologies or by modernizing existing industrial enterprises through innovation. Additionally, a gradual development strategy within a specific industry – transitioning from low-tech to medium- or high-tech production – has proven to be an effective and impactful policy. For instance, Uzbekistan, with its significant potential in the textile sector (which accounts for 17.2% of total industrial output), serves as a clear example of such a transition. Through scientific research, the integration of automation, smart textiles, advanced materials, and digitalization into production processes can transform existing industries into medium- or high-tech sectors. Therefore, to support long-term industrial growth, it is essential to build a strong innovation ecosystem through innovative infrastructures. In addition, textile production in Uzbekistan – including the preparation and spinning of textile fibers, the production and finishing of fabrics, as well as the manufacturing of garments – reached 79 trillion UZS in

¹² Developed by the author based on UNIDO statistics

2024, indicating a twofold increase over the past five years (Figure 4). During the same period, the volume of apparel and accessories (finished products) tripled, reaching 33.8 trillion UZS.

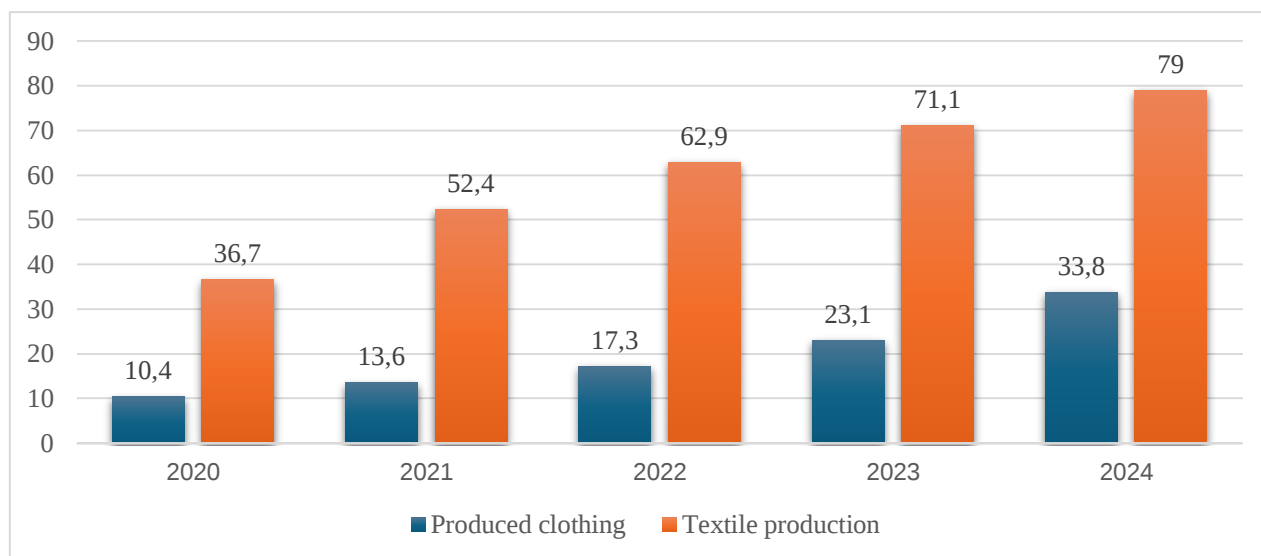


Figure 4. Produced textile products in Uzbekistan (2020-2024) in trln. UZS¹³

It is important to emphasize that in Uzbekistan, the volume of textile production still significantly exceeds that of finished textile products. Based on this observation, in order to scientifically assess the impact of innovation-related factors on the export performance of textile enterprises, a multiple linear regression analysis was conducted using statistical data recorded from 2015 to 2024.

The regression analysis was based on time series data obtained from the State Committee on Statistics, the Agency for Innovative Development, and the United Nations Industrial Development Organization (UNIDO). In the initial phase, a sample consisting of 13 independent variables was constructed to reflect the structure of industrial production, innovation activity, and investment flows. These independent variables included: number of innovation infrastructures, number of resident enterprises, number of research-performing enterprises, number of implemented innovations, number of enterprises implementing innovations, number of funded R&D projects, number of registered patents, number of scientific and technical service organizations, and annual expenditures on R&D. Additionally, sector-specific indicators such as value added in the textile industry, capital investments, and the number of textile enterprises were considered.

The dependent variable in the model was the volume of exported textile products. To select appropriate variables for the econometric model, a correlation matrix was developed based on Pearson correlation coefficients.

Correlation analysis showed that certain indicators had low statistical significance in relation to export volume, making it impractical to keep them in the model. At the same time, indicators with high Pearson correlation coefficients and sound economic rationale were retained. In the next stage, the degree of multicollinearity was tested using the VIF (Variance Inflation Factor), which resulted

¹³ Developed by the author based on the data of National Statistics Committee of Uzbekistan

in $VIF < 3$, confirming that the factors were mutually independent. As a result, three factors that independently and significantly influenced export volume were selected: the number of innovation infrastructures (XINF), gross fixed capital formation (XGFCF), and the number of funded research projects (XRD). These factors demonstrated the most appropriate outcomes both in terms of economic meaning and statistical significance¹⁴.

$$\ln(\widehat{Y}) = \beta_0 + \beta_1 \ln(X_{inf}) + \beta_2 \ln(X_{GFCF}) + \beta_3 \ln(X_{RD}) + \epsilon \quad (1)$$

According to the research results, a 1% increase in innovation infrastructure is estimated to raise production volume by approximately 0.1% ($p < 0.01$), confirming the fundamental importance of this factor in the development of the sector. Funded innovation projects have a positive but not particularly strong effect (coefficient 0.32; $p \approx 0.15$), which reflects their long-term impact. At the same time, a 1% growth in gross fixed capital formation is found to increase production volume by about 0.36% ($p \approx 0.09$), highlighting the significant role of capital investments (Table 1).

Table 1

Coefficient analysis¹⁵

Variables	Coef.	Std.Error	t-Statistic	p-Value	VIF
Const	3.511	1.746	2.01	0.062	-
$\ln(X_{INF})$	0.096	0.031	3.12	0.007	2.13
$\ln(X_{RD})$	0.320	0.214	1.50	0.154	3.81
$\ln(X_{GFCF})$	0.363	0.200	1.82	0.088	1.97

In the developed model, $R^2 = 0.855$ (Adj. $R^2 = 0.828$), which indicates that the model explains nearly 83% of the variation. The F-statistic = 31.55 confirms the overall significance of the model. The standard error of regression is 0.53, suggesting a low level of forecast error. The Durbin–Watson statistic equals 1.90, which indicates the absence of autocorrelation. The Jarque–Bera test, with a p-value of 0.57, shows that the residuals are normally distributed and confirms that the model is statistically stable.

The developed model demonstrated that enhancing the efficiency of innovation infrastructures, increasing capital investment in production, and focusing on the quality and implementation of funded innovation projects lead to an increase in the export volume of finished textile products. Accordingly, the analysis results emphasize the necessity of developing an appropriate strategy that takes these factors into account. Furthermore, based on the developed model, forecast indicators up to 2030 were produced (Table 2).

For the period 2025–2030, the expected volume of textile product exports was modeled using the trend values of the independent variables and the regression coefficients. The forecast results indicate that, if the selected factors continue at the current pace, by 2030 the export volume could exceed 20 trillion UZS. This confirms the practical significance of the model in strategic planning.

¹⁴ Authors calculation results

¹⁵ Authors calculation results

Table 2

Forecast indicators of textile products to 2030 based on developed model¹⁶

Year	Export volume of textile, bln UZS (Y)	Innovative infrastructures, units (X1)	Financed R&D projects, units (X2)	Gross fixed capital formation, bln UZS, (X3)
2014	559,61	-	167	715,85
2015	557,50	-	190	653,01
2016	716,42	-	205	1195,61
2017	2138,83	1	194	2079,00
2018	2415,13	2	146	3763,00
2019	3373,28	3	112	9813,87
2020	5308,66	5	125	8648,48
2021	6992,46	21	429	9261,09
2022	10419.47	25	306	9364.02
2023	15454.31	45	153	9561.02
2024	16137.53	48	161	10134.72
2025*	16850.95	52	169	10742.81
2026*	17595.92	55	177	11387.38
2027*	18373.82	59	186	12070.62
2028*	19186.11	63	195	12794.86
2029*	20034.31	68	205	13562.55
2030*	20920.00	75	215	14376.30

**-forecast indicators*

In the third chapter called “**Priorities for improving the efficiency of organizational and economic mechanisms of innovative infrastructures in the textile industry**” the main directions for the strategic development of innovation infrastructure in the textile industry, the methodology for determining the efficiency indicators of innovation infrastructures and their impact on textile enterprises, as well as the forecasting indicators of innovation infrastructures in the economy were developed.

Nowadays, it is important to monitor, evaluate and develop a ranking system for the performance of innovation infrastructures to effectively utilize the customs and tax incentives, increase their role in boosting the competitiveness of textile enterprises. Thus a methodology for evaluating the efficiency indicators of innovative infrastructures was developed using the Balanced Scorecard (BSC) method¹⁷. Unlike other methods, it considers not only financial metrics, but also criteria related to customer satisfaction, internal business processes, and the development of human capital. Based on the above, during the research, 11 indicators were selected (Table 3) based on the performance results of five fully operational youth technoparks in 2024. Using these indicators, the efficiency score for each technopark was calculated using the following formula¹⁸:

¹⁶ Authors calculation results.

¹⁷ Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard—measures that drive performance. Harvard Business Review, 70(1), 71-79. Retrieved from <https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2>

¹⁸ Developed by the author based on the works of Kaplan, R. S., & Norton, D. P. (1992).

$$E_{BSC}^{(r)} = \sum_{i=1}^n w_i \times 3 \times X_i^{norm(r)} \quad (2)$$

Where

$E_{BSC}^{(r)}$ – final assessment of technopark efficiency r

w – weight of i indicator

$X_i^{norm(r)}$ – normalized indicator of i for technopark r

n – overall number of indicators

Each indicator was assigned a weighting coefficient, reflecting its relative importance within the overall evaluation system. The values of the indicators were normalized using the Min-Max method and multiplied by 3 points, which eliminated the influence of measurement units and enabled meaningful comparisons across values. The assigned weights were determined based on scientific literature, survey and the Innovation Development Strategy. In this context, the highest weight was allocated to the development of human capital, while equal importance was given to economic stability and management efficiency.

After all the calculation of BSC indicators we grouped them into four groups:

Level of efficiency	Range
High	2.25-3.00
Higher than average	1.75-2.24
Average	1.25-1.74
Low	0-1.24

Table 3

Indicators of Youth technoparks in 2024¹⁹

Group	Indicator	Andijan	Nukus	Samarkand	Navoi	Sirdarya
Financial (w=0.25)	Revenue from residents (USD)	31 000	30 000	13 000	27 000	12 000
	Export share (%)	6	6.5	0.5	1.3	0
	Investments (USD)	13500	15000	8700	16 000	9400
Customer (w=0.15)	Satisfaction level (level 1-5)	4	4	3	3	2
	New applications from companies	9	13	23	10	14
Internal business process (w=0.25)	Duration of response	15	15	20	15	20
	Amount of finished projects	18	19	13	12	9
	Transparency index (points 1-5)	4	3	1	2	1
Human capital (w=0.35)	Registered patents	0	1	0	0	1
	Number of innovations introduced	7	3	5	4	3
	Educational events	29	26	13	30	32

¹⁹ Calculated by the author

Based on the 2024 performance indicators presented in Table 3, the efficiency indices of the Youth Technoparks were calculated. According to the results, the Youth Technoparks of Andijan (2.60) and Nukus (2.57) achieved a “High” level of efficiency. Navoiy (1.55) and Samarkand (1.43) recorded “Average” performance, while the Sirdarya Youth Technopark showed the lowest result with an index of 1.27.

As an additional study, the impact of the Andijan Youth Technopark on the textile sector was examined. For this purpose, the technopark's resident enterprise “Eko Fabrika” LLC was selected as a case study (Table 4).

Table 4

Cost Analysis of Children's Clothing Production at ECO Fabric LLC²⁰

Expenditure	Before becoming resident		After becoming resident		Difference	
	mln.UZS	%	mln.UZS	%	± abs	±%
Material production costs	409.92	64.2	387.36	65.1%	−22.56	−5.5%
Direct labor costs						
– Basic wages	49.60	7.8	44.48	7.5	−5.12	−10.3%
– Payroll fund contributions	17.28	2.7	15.84	2.7	−1.44	−8.3
Depreciation of fixed assets						
– Buildings	19.20	3.0	17.84	3.0	−1.36	−7.1
– Machinery and equipment	65.44	10.2	57.92	9.7	−7.52	−11.5
Other production costs	77.12	12.1	72.00	12.1	−5.12	−6.6
Total Cost	638.56	100%	595.44	100	−43.12	−6.8

In 2023, the enterprise was accepted as a resident of the Andijan Youth Technopark. As a result of the conditions created in the innovative infrastructure, the production process was automated, optimized, and a digital order management system was implemented. Moreover, through participation in startup acceleration programs, the enterprise secured a \$20,000 grant from the World Bank for its startup project. The company's production costs decreased from 638.64 million soums to 595.44 million soums, achieving savings of 7.8%. The greatest savings were recorded in equipment depreciation (−11.5%), wages (−10.3%), and other expenses (−6.6%). (Table 6) Technical and operational efficiency improvements were achieved through modernization and digitalization. Furthermore, it was proven that the indicators of revenues, export volumes, implemented innovative projects, and number of registered patents of other Youth Technoparks' companies such as “Imstar”, “Fromoda tekstil”, “Sobithon tikuv uskuna”, and “Construction of online fashions” LLC directly correlate with the performance indicators of the Technoparks ($r > 0.9$).

Additionally, the level of implementation of modern technologies, particularly elements of Industry 4.0, in the production processes of resident enterprises in technoparks was analyzed (Table 5).

²⁰ Developed by the author

Table 5

Adoption level of Industry 4.0 for the textile residents of Youth technoparks²¹

№	Technopark	Existing Elements of Industry 4.0	Missing Elements / Weak Points	Development Prospects
1	Andijon Youth Technopark	Uses modern sewing lines, elements of automation, and basic IoT-based quality control systems; exports children's clothing	Lack of an integrated digital platform, weak data analytics and integration, no use of Big Data	Potential for introducing cloud-based solutions and production monitoring systems
2	Nukus Youth Technopark	Applies innovative sewing technologies, partial automation, active in exports; uses energy-efficient equipment	No digital twins, weak IT infrastructure, lack of data management systems	Potential for the development of robotics and digital process control
3	Samarqand Youth Technopark	Automated production lines, participation in incubation programs, elements of ERP systems	Lack of IoT integration and digital demand forecasting	Opportunity to implement cloud services and Big Data tools for production planning
4	Navoiy Youth Technopark	Modernized equipment, partial digitalization of document workflow	Lack of automated production control and analytical systems	Potential for implementing IoT and simple AI tools for operational planning
5	Sirdaryo Youth Technopark	Uses digital design and online sales (elements of e-commerce), participates in incubation programs	Production base not digitalized, no IoT, robotics, or internal automation	Development of online platforms and digital clothing design technologies

Overall, the level of digitalization among the textile industry residents in the five youth technoparks can be assessed as the initial stage of implementing Industry 4.0. The next stage requires developing the innovative technopark's infrastructure, forming digital competencies, creating broader access to investments, as well as introducing integrated production solutions based on IoT, Big Data, and AI.

By establishing a strong foundation in innovation infrastructure, financial stability, and human capital development, the country can build a sustainable and competitive textile industry, while also reinforcing its position as a leader in high-tech, innovative, and sustainable textile manufacturing. Within the innovation ecosystem, producers are supported by various institutional elements that contribute to different stages of development (Figure 5).

Every production process begins with the generation of innovative ideas and the development of a business plan. Based on market demand, the concept or design of the planned product is then developed. Once the initial concept is formed, the production stage is further advanced. This stage includes prototyping, certification, approval of marketing strategies, and the launch of mass production. Throughout this process, scientific research and experimental design activities are continuously supported, which helps improve production efficiency through fundamental technological concepts and scientific advancement.

Supporting organizations provide assistance in developing human capital, conducting research, and offering technical support. During the research process, these organizations focus on identifying and studying advanced technologies that

²¹ Developed by the author

meet market demands. This process is typically carried out in cooperation with higher education and research institutions.

In the technical support process, technoparks offer the following services to the industry: guidance and technical documentation on equipment usage, business development through incubation and acceleration programs, integration of smart textile elements, and the digitalization and automation of production and supply chains.

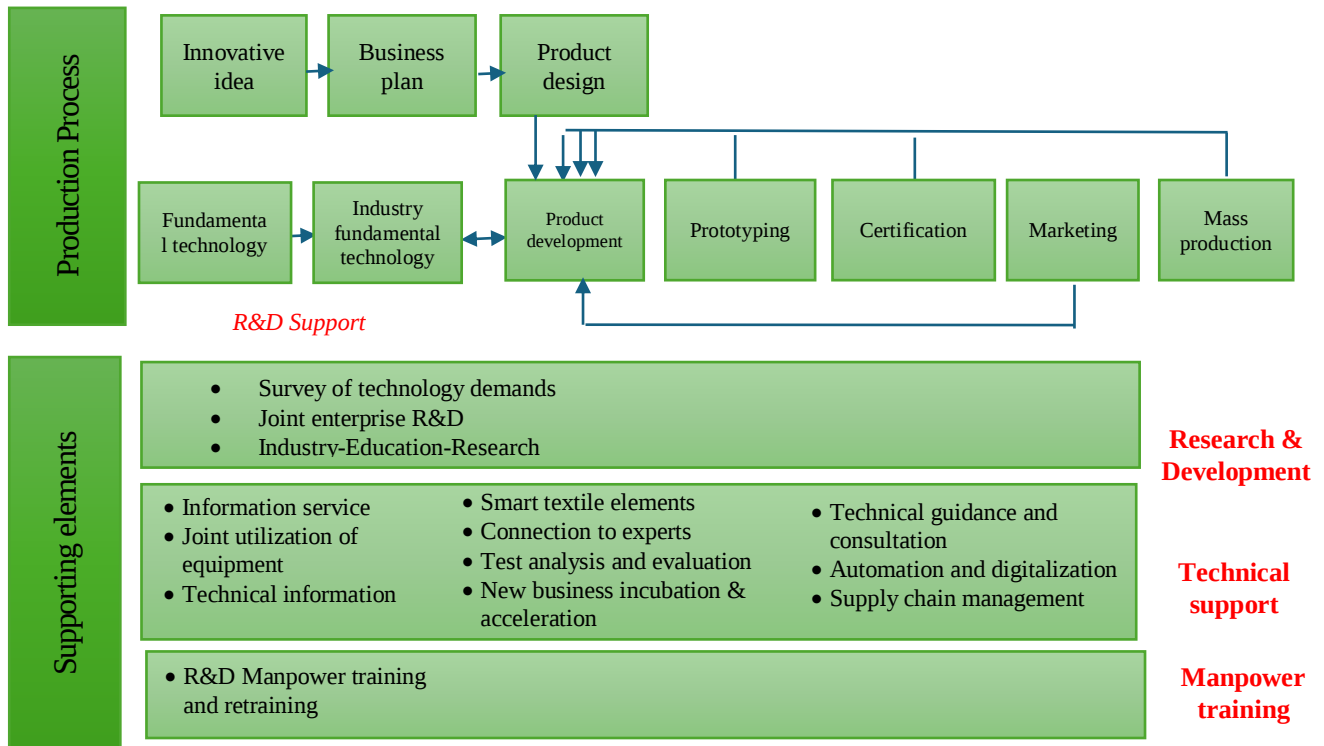


Figure 5. Support of innovative ecosystem in the manufacturing process²².

The final component focuses on human capital development, specifically the training and retraining of personnel, enabling employees to acquire the necessary skills to effectively utilize new technologies in emerging industries. Continuous training of staff ensures that the industry remains adaptable and develops dynamically in response to market changes. In conclusion, systematic support of the industry through innovative infrastructures contributes to enhancing the overall competitiveness and sustainability of the textile sector.

CONCLUSION

Based on the results of research followings are concluded and recommendations developed:

1. Based on the objectives and tasks of the study, a comparative analysis of international experience was conducted regarding the role of innovation infrastructures in the implementation of innovations at industry enterprises within the national innovation ecosystem.

²² Developed by the author

2. It was determined that the cluster-infrastructure approach accelerates technology diffusion processes by strengthening the functional specialization and coordinated cooperation among innovation infrastructure entities, thereby enabling the systematic introduction of innovative developments into the production process.

3. Based on the research findings, organizational and economic mechanisms of innovation infrastructures for introducing innovations into the textile industry were developed, and effective methods for integrating the results of innovative activities into production processes were substantiated. Proposals were formulated to commercialize research outcomes, support start-up and spin-off enterprises based on technoparks, create new innovative products, and increase export volumes.

4. According to the results of the multivariate econometric model, innovation infrastructures, funded research projects, and capital investments were identified as the main factors contributing to the increase in textile enterprises' export volume ($R^2 = 0.86$; $DW = 1.90$; $JB\ p = 0.57$).

5. Based on the developed model, if the current pace of innovation activity is maintained, the export volume of textile enterprises is projected to exceed 20 trillion UZS by 2030, demonstrating the practical importance of the model for strategic planning.

6. In the comprehensive assessment of innovation infrastructure performance, weighting coefficients were assigned to financial indicators ($w = 0.25$), resident activity ($w = 0.15$), internal management processes ($w = 0.25$), and human capital ($w = 0.35$). These weights were determined based on the priority areas of the Innovation Development Strategy of the Republic of Uzbekistan and the results of a survey conducted among representatives of innovation infrastructures, enabling a more accurate reflection of the factors influencing the development of innovation infrastructures in the textile industry.

7. In accordance with the criteria developed based on the Balanced Scorecard (BSC) evaluation methodology, Andijan and Nukus technoparks were classified as having "High" performance levels within the Youth Technoparks rating. As a result of the conditions created, the production cost of textile products manufactured by the resident enterprise "Eko Fabrik" LLC of the Andijan Youth Technopark decreased by 7.8%.

НАУЧНЫЙ СОВЕТ DSc. 03/30.07.2022.I.16.05
ПО ПРИСУЖДЕНИЮ УЧЕНЫХ СТЕПЕНЕЙ ПРИ ТАШКЕНТСКОМ
ГОСУДАРСТВЕННОМ ЭКОНОМИЧЕСКОМ УНИВЕРСИТЕТЕ

ТАШКЕНТСКИЙ ГОСУДАРСТВЕННЫЙ ЭКОНОМИЧЕСКИЙ
УНИВЕРСИТЕТ

КАРИМОВ ХОЖАКБАР МАХАМАДЖОН УГЛИ

СОВЕРШЕНСТВОВАНИЕ ОРГАНИЗАЦИОННО-ЭКОНОМИЧЕСКИХ
МЕХАНИЗМОВ ИННОВАЦИОННОЙ ИНФРАСТРУКТУРЫ В
ОТРАСЛЯХ ПРОМЫШЛЕННОСТИ
(на примере текстильных предприятий)

08.00.03 – Промышленная экономика

АВТОРЕФЕРАТ
диссертации доктора философии экономических наук (PhD)

Ташкент – 2026

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ВВЕДЕНИЕ (аннотация диссертации доктора философии (PhD))

Целью исследования является разработка научных предложений и практических рекомендаций по совершенствованию организационно-экономических механизмов инновационной инфраструктуры в текстильной промышленности.

В качестве **объекта исследования** были выбраны инновационные технопарки и их резиденты специализирующиеся в текстильной отрасли.

Предметом исследования являются социально-экономические отношения, возникающие в процессе повышения эффективности технопарков при внедрении инноваций в текстильную отрасль посредством инновационной инфраструктуры.

Методы исследования. В процессе исследования были разработаны и использованы научное наблюдение, сравнительный и логический анализ, корреляционный и регрессионный анализ.

Научная новизна исследования заключается в следующем:

усовершенствована кластерно-инфраструктурная организационная модель внедрения инноваций в производственный процесс на текстильных предприятиях на основе создания системы многофункционального сотрудничества, формируемого на основе трансфера знаний и диффузии технологий между субъектами инновационной инфраструктуры (технопарки, проектные центры, инкубаторы, венчурные фонды и научно-исследовательские институты);

На основе многофакторной эконометрической модели, учитывающей влияние различных параметров на объем экспорта готовой продукции текстильных предприятий Узбекистана, разработаны прогнозные показатели до 2030 года;

Многофакторная оценка деятельности инновационной инфраструктуры в текстильной промышленности по критериям финансирования, деятельности резидентов, процессов внутреннего управления и человеческого капитала усовершенствована с использованием показателей, более четко отражающих особенности отрасли;

На основе основных показателей деятельности молодежных технопарков Андижана, Навои, Нукуса, Самарканда и Сырдарьи обоснована степень их влияния на текстильные предприятия путем группировки по диапазонам экономической эффективности: «высокий» (2,25-3,00), «выше среднего» (1,75-2,24), «средний» (1,25-1,74), «низкий» (0-1,24).

Внедрение результатов исследований. На основе разработанных научных предложений и практических рекомендаций по совершенствованию организационно-экономических механизмов инновационной инфраструктуры в текстильной промышленности:

Предложение по совершенствованию кластерно-инфраструктурной организационной модели внедрения инноваций в производственный процесс на текстильных предприятиях на основе создания системы многофункционального сотрудничества, формируемой на основе трансфера знаний и диффузии

технологий между субъектами инновационной инфраструктуры (технопарки, проектные центры, инкубаторы, венчурные фонды и научно-исследовательские институты), внедрено в технопарки Министерством высшего образования, науки и инноваций Республики Узбекистан (справки Министерства высшего образования, науки и инноваций Республики Узбекистан № 02/17-3620 от 16 сентября 2025 г. и Агентства по развитию лёгкой промышленности при Кабинете Министров Республики Узбекистан № 01-28 от 8 ноября 2025 года). В результате внедрения данного научного предложения, благодаря описанию видов инновационной инфраструктуры, определению задач и функций, количество стартап-проектов, разработанных технопарками в текстильной отрасли, увеличилось на 15%, а сроки их внедрения сократились в среднем на 15-20%.

Прогнозные показатели до 2030 года, разработанные на основе многофакторной эконометрической модели влияния на объем экспорта готовой продукции текстильных предприятий Узбекистана, были использованы ассоциации “Узтекстильпром” при планировании показателей внедрения инноваций на предприятиях (справка Агентства по развитию лёгкой промышленности при Кабинете Министров Республики Узбекистан № 01-28 от 8 ноября 2025 года). В результате внедрения данного научного предложения при разработке стратегии инновационного развития до 2030 года прогнозируется увеличение доли экспорта высокотехнологичной продукции на 6% за счет создания 75 объектов инновационной инфраструктуры.

Предложение по совершенствованию многофакторной оценки деятельности инновационной инфраструктуры в текстильной промышленности в разрезе критериев финансовой, деятельности резидентов, процессов внутреннего управления и человеческого капитала с использованием показателей, более четко отражающих особенности промышленной отрасли, было использовано Министерством высшего образования, науки и инноваций Республики Узбекистан при оценке деятельности инновационной инфраструктуры и определении ее стратегических направлений (справки Министерства высшего образования, науки и инноваций Республики Узбекистан № 02/17-3620 от 16 сентября 2025 г., Агентства по развитию лёгкой промышленности при Кабинете Министров Республики Узбекистан № 01-28 от 8 ноября 2025 года и государственного учреждения «Андижанский молодежный технопарк» № 5 от 24 июля 2025 года). Внедрение данного научного предложения в практику позволило ускорить коммерциализацию инновационных проектов в 1,5 раза за счет перестройки деятельности технопарков по приоритетным направлениям и оптимального распределения ресурсов по результатам нормализованной интеграционной оценки;

Предложение по обоснованию степени влияния Андижанского, Навоийского, Нукусского, Самаркандского, Сырдарьинского молодежных технопарков на текстильные предприятия путем группировки их по предельным диапазонам экономической эффективности «высокий» (2,25-3,00), «выше среднего» (1,75-2,24), «средний» (1,25-1,74), «низкий» (0-1,24) на основе основных показателей их деятельности было использовано Министерством

высшего образования, науки и инноваций Республики Узбекистан при ведении рейтинга молодежных технопарков (справка Министерства высшего образования, науки и инноваций Республики Узбекистан № 02/17-3620 от 16 сентября 2025 г.). В результате внедрения данного научного предложения в практику стало возможным оценить влияние инновационной инфраструктуры на отраслевые предприятия, в частности на текстильные предприятия, путем оценки их деятельности и составления рейтинга, а в результате принятия плана мероприятий по комплексному развитию данной деятельности количество инновационных проектов увеличилось в 1,3 раза.

Апробация результатов исследований. Результаты исследования рассмотрены и апробированы на 5 республиканском и 3 международных научно-практических конференциях.

Опубликованность результатов исследований. По теме диссертации опубликовано всего 10 научных работ, в том числе 10 статей в научных изданиях, рекомендованных Высшей аттестационной комиссией для публикации основных научных результатов докторских диссертаций, из них 9 опубликованы в республиканских и 1 в зарубежных научных журналах.

Структура и объем диссертации. Диссертационная работа состоит из введения, трех глав, заключения, списка литературы и приложений, с общим объемом 123 страниц.

E'LON QILINGAN ISHLAR RO'YXATI
СПИСОК ОПУБЛИКОВАННЫХ РАБОТ
LIST OF PUBLISHED WORKS

I bo'lim (часть I, part I)

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II bo‘lim (II част, part II)

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