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GLOBAL DISRUPTIVE TECH CHALLENGE 2021

RESTORING LANDSCAPES IN THE ARAL SEA REGION

SYNOPSIS OF THE REPORT ON MARKET ANALYSIS OF INNOVATION AND STARTUPS IN THE FIELD OF LAND RESTORATION IN THE REPUBLIC OF UZBEKISTAN

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Introduction

The environmental disaster of the Aral Sea negatively affects the Republic of Uzbekistan. The State pays special attention to environmental problems, particularly, to the drying up of the Aral Sea and abatement of its consequences in the region. To address this problem, in 1993 the International Fund for Saving the Aral Sea (IFAS) and in 1998[1] the Agency for the Management of Project Implementation of the Aral Sea Basin and GEF (Agency of IFAS) in Tashkent were established in Tashkent together with other Central Asian countries.[2] Moreover, several international programs and organizations are functioning in the republic and contributing to the improvement of the environment and socio-economic conditions in the country. However, there is a lack of consolidated information regarding new technologies, innovations, and startups functioning or applicable to address the environmental problems in the Aral Sea area.

The main purpose of this report is to study the market of existing innovations and startups in the field of restoration of natural resources applicable in the Aral Sea basin. The report is done with the support of the project "Disruptive technology and innovation challenge for landscape restoration in the Aral sea watershed (Kazakhstan & Uzbekistan" implemented by Kazakh-German University (DKU) and the Global Landscapes Forum (GLF) within Central Asia Water and Energy Program (CAWEP), administered by the World Bank and financed by the European Union, Switzerland, and the United Kingdom, and is part of the World Bank Resilient Landscape in Central Asia RESILAND CA + Program.

For this report, the interview with key stakeholders, publicly available materials, reports from the international, regional organizations, and official websites of state bodies of the Republic of Uzbekistan were analyzed. The analysis aimed to reflect core information regarding baseline situation and perspectives with startups and innovations in Uzbekistan and its' potential to address land degradation problems in the Aral Sea area.

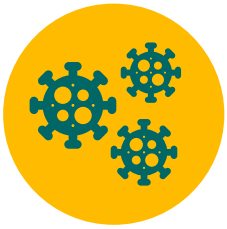
The current economic situation in the country and economic trends in the implementation of land restoration innovations

Geography

The Republic of Uzbekistan is located between the Amu Darya and the Syr Darya rivers and occupies an area of 448.9 thousand sq. km. Most of the territory of Uzbekistan is covered by flatlands (about four-fifths of the territory). The Turan Lowland is one of the main flatlands. The foothills of the Tien Shan and Pamir are in the east and northeast of the country with the highest elevation of 4,643 m. One of the world's largest deserts – Kyzylkum – is located in the north of the central part of Uzbekistan, Karakum – in the west.[3]

Economy and population

Uzbekistan's natural resources and human capital avail the country economic growth, but low GDP per capita still holds it back. As of October 1, 2019, the residential population of Uzbekistan was 33,724.5 thousand people (urban - 17,034.0 thousand people, rural population - 16,690.5 thousand people)[4], which is the highest among all Central Asian countries. In the recent decade, the growth of Uzbekistan gross domestic product (GDP) ranged from 4.5% to 7.8%[5], with a 5.6% increase at the end of 2019, while inflation in 2019 was 15.2 %.[6] Despite stabilization of the economy and inflation rates in the recent decades, poverty alleviation in Uzbekistan is identified as a top-priority task by Uzbekistan President and declared as a strategic work direction[7]. Programs are being implemented to improve the living conditions and territories in rural areas.



COVID influence

The issue of poverty is exacerbated by the COVID-19 pandemic, which brought additional risks to the country's economy. It already caused the decline of investments, retail turnover, GDP growth rates, worsen the reduction in domestic and external demand, aggravated the supply disruptions, and halted much of economic activity. At the same time, the rise in gold prices and the increased export of fruit and vegetable products are expected to have a positive impact on the state budget and economic entities.[8] According to the World Bank's report, among 24 European and Central Asian countries, GDP growth in 2020 was only expected in Uzbekistan. In April 2020, the World Bank forecasted GDP growth in Uzbekistan of 1.6 % in 2020, 6.6 % in 2021.[9] However, the data collected during the investigation "Listening to Citizens of Uzbekistan (L2CU)" shows that the poverty rate (with a threshold of 3.2 USD per person per day) has increased to 8.7–10 % after the beginning of the COVID-19 pandemic compared to an estimate of 7.4 % before the virus spread in Uzbekistan. This means that this year at least another 448 thousand people may find themselves below the poverty line as a result of the fall of living standards. Complete economic recovery from such a crisis will require the colossal efforts of all representatives of the Uzbekistan society.[10]

Trends in land restoration

Innovative technology and approaches in agriculture can create new employment opportunities in the rural areas, the lack of which currently undermines Uzbekistan's efforts to decrease its poverty rate. Decades of questionable Soviet policies in the agricultural sector and continuing pursuit for greater cotton production resulted in a catastrophic scenario with the agricultural industry being the main contributor to the pollution and devastation of both air and water in the country.[11] Such a situation calls for the country's transition to sustainable agriculture policies with the integration of innovation and new technologies that can restore the environment while maintaining agricultural production. Current economic trends in the implementation of land restoration innovations in Uzbekistan mostly address the issue of water resources deficit for irrigation. That issue requires making changes in the cropping planning, growing drought-tolerant crops, use of water-saving technologies, such as drip irrigation system, water boxes for growing trees, moisture-retaining fertilizers, stimulators of plant growth and development, etc.

Organizations, projects, and programs supporting startups and innovation projects

According to the current analysis of support for innovations and startups, Uzbekistan has sufficiently good conditions and human resources to create innovative and technological enterprises. There are both government support programs, such as IT Park Startup programs, CAT Accelerator, Startup Initiatives, Youth Support Centers, University startup incubators, etc., and private incubation and acceleration programs, such as IdeaLab, Startup Factory, IdeaThon, GameDev, WomenInTech, WVA, and others, as well as co-working centers Ground Zero, C-Space, etc. The analysis identified 22 organizations, projects, and programs supporting innovations. Out of them, 36% are with government funding, 59% with private ownership, and 5% with international funding. *[The list of organizations can be found in the full report, Annex 1].*

Eighty percent of business founders are young people under the age of 30 with higher education, most of them are focused on B2B (business to business) sector. Despite Covid-19, most of the surveyed new founders plan to expand their business and attract new employees. Startups are mostly developed in such fields as FinTech, MedTech, EduTech, and 50% of them have a positive experience in launching a previous startup. Most of the startups are aimed at the domestic market and less than 10% of startup projects plan to enter the global markets.[19] The balance of gender distribution of the project co-founders is much less than that in technologically advanced countries.

Some problems that business founders are facing in developing their business are the lack of capital for development and the lack of interest from large companies in cooperation with startups, which makes it difficult to upscale their business. Along with capital, the founders need entrepreneurial skills (smart capital) and qualified specialists, programmers, marketing experts. One of the most frequently asked questions by startups: "Where to get funding? What to do if you have an idea, but have no money to implement it?" This issue is especially critical in Uzbekistan where venture funds are limited for innovations and startups.

Business startups and innovative projects for land restoration applicable in the Aral Sea basin

Uzbekistan is making great strides in mitigating the environmental damage to the Aral Sea through implementing national policies and environmental projects in cooperation with international institutions. Nevertheless, there is a lack of existing startups and innovative projects with cutting-edge solutions to address land degradation and desertification challenges in the Aral Sea region. To address this issue, the Fund for Support of Innovative Development and Innovative Ideas under the Ministry of Innovative Development has launched startup projects, as well as innovative scientific research, design, and experimental projects in different areas including land restoration thematic.

There are several projects that strive to restore the ecosystem and degraded lands in the Aral Sea region, implemented by the international organizations together with the ministries and departments of the Republic. The State Forestry Committee of Uzbekistan together with the German Agency for International Cooperation (GIZ) are implementing the project "Land use based on ecosystem approach and preservation of ecosystems in the lower course of Amu Darya river", with the Turkish Agency for Cooperation and Coordination (TIKA) "Promotion of natural regeneration of tugay in the coastal lands of the Amu Darya delta and strengthening of material and technical base of forestry enterprises in the Aral zone", with the International Center for Agricultural Research in Dry Areas (ICARDA) "Measurement and assessment of services for the preservation of soil ecosystems at the dried bottom of the Aral Sea in Uzbekistan", and others.

Photo Credit: Камар Ахрор

Existing financial sources for support of the innovative projects and startups

In Uzbekistan, there are 5 major financial sources available for innovative projects and startups in the field of sustainable land use: (1) loan, (2) subsidy, (3) venture funding, (4) grant, (5) FFF (Family, Friends & Fools). There is also an in-kind contribution for startup projects via acceleration centers.

Financial sources available for SLM innovative projects and startups in Uzbekistan	
Loans and subsidies	Loans and subsidies are mostly available through government funding and state banks.
	For example, the government program **Yoshlar Fund – kelajagimiz under the Youth Union** established in 2018 aims to employ idle youth, support the implementation of youth business initiatives, startups, ideas, and projects. To get the funding, one has to apply via the regional branch of the Youth Union of Uzbekistan. Yoshlar fund allocates preferential loans and property leasing via banks at the 7% interest rate per annum for the implementation of business ideas and startups. The fund also grants security for 50% of a loan amount up to 1 billion soms. The fund can participate in entrepreneurial projects carried by buying out half of the company's value (somewhat like venture capital funding) with the condition of selling its share within five years and gaining half of the company profit while owning the shares. In 2018, the fund allocated 725 billion soms (about $86 million) for the implementation of more than 6 thousand projects throughout the country. So far, only four banks provide preferential loans: UzNatsBank, Ipak yuli, People's bank, and Khamkorbank. It is planned to increase their number to ten.
Venture capital funding (VCF)	VCF in Uzbekistan needs development and both national and international private investors.
	IT Park Venture Fund with government participation is the first venture fund in Uzbekistan that opened in July 2019. IT Park has already supported 28 new startups, created dozens of projects in the field of information technology, as well as trainings, workshops, and meetings to encourage the youth of the country.[12] IT Park Venture Fund cooperates with international venture capital companies. A start-up project can get $25-100 thousand depending on its stage of development. Fund reviews a wide range of thematic including AgroTech, E-Gov, MedTech, E-commerce, and others.[13] Another form of venture capital funding in Uzbekistan is done by business angel;s. Business angels are private investors with entrepreneurial and managerial experience able to financially support the project at the initial stage of development. In the IT-sphere alone, at a conservative estimate of experts, there are about 50 **business angels** in Tashkent. Among them are Anvar Irchaev, Bakhtiyor Khasanov, Botir Arifdzhanov, Zafar Khashimov.

Grants	Grants for the innovative projects and start-ups in Uzbekistan are also mostly provided through the government structures, but also are available via international projects.
	Fund for Support of Innovative Development and Innovative Ideas under the Ministry of Innovative Development is the major option to receive a grant for an innovative idea. The state budget allocated 50 billion soms to the fund to support start-up projects, as well as innovative scientific research, design, and experimental projects. The supervisory board of the fund includes 16 heads of ministries and departments, and any decision, including the release of funds, has to be approved by each member of the board. The rigorous selection and requirement for a united decision lead to a long period (about six months) between application admission and winner identification. The first annual competition was announced in fall 2018, and out of 170 applicants, 16 startup projects got funding. The amount of funding is up to 1.5 billion soms. It is important to note that the project should pay off the investments in about two years. It is also important when applying, to submit a complete and detailed business plan, and to carefully consider the financial component. Grantees have to be able to report on all the spending and follow all the reporting requirements, which can be very bureaucratic. For example, a company may be required to provide procurement contracts and the next three months' budget estimate. **Startup initiatives support programme** is another way to get grant funding. This program is a part of the joint project of the United Nations Development Programme (UNDP) and the Ministry of Employment and Labour Relations "Promoting Youth Employment in Uzbekistan". The fifth cycle of the youth innovative ideas and startup support program with financial support from the Government of the Russian Federation and the Government of Japan took place online in October 2020 and has shown record-breaking results compared to previous cycles. 905 applications were received for the programme (38% more than in the previous years) with the total number of youth participants at 1,972. Overall, the programme is a short-term intensive course to train and support the development of innovative ideas and startup projects of youth and is aimed at accelerated testing of the viability of innovative ideas, creation of maximum viable products, testing business models, developing innovative entrepreneurship skills among young people. I.e., all the participants get the support, but the winners receive grants up to 50 million sums for the realization of their startups. In 2020, 40 projects will receive targeted grants.[14] The previous cycles of the programme, apart from the State support, were also funded by Great Brittan Embassy in Uzbekistan [15] and Russian Federation[16].
Private funds and FFF	Funding from FFF is the most basic form of crowdsourcing a business venture that works all over the world and is applicable in Uzbekistan.
	Friends and family members may want to support one's business venture by lending funds or purchasing a business share. However, this method, in general, can attract low-level funds. Although it might be enough to test the business model, develop a minimal product, and get perspectives on future income.

In-kind support	The in-kind support of startup and innovative projects is also done via various acceleration centers, competitions, and programs.
	C.A.T. Science Accelerator is the first accelerator for scientific projects established at the Center for Advanced Technologies under the Ministry of Innovative Development and aims to commercialize scientific developments. Participants have the opportunity to use the laboratories and reagents of the center to conduct their experiments, the assistance in launching the minimum working draft project, the consulting support, all free of charge. The teams are supported by the experts of science, business, project launching. It was launched in 2019, and in 2021 is running its third cycle, accepting ideas in projects in the areas of Green technologies, including water purification and recycling, alternative energy sources, biodegradable materials, alternative food sources, etc.[17] Other competitions and programs, supporting innovations in Uzbekistan are international competitions, conferences, and startup-accelerator. Competitions like **Start Haifa**, **Seedstars**, **Climate Launchpad, K-Startup Grand Challenge** allow winners to get funding. Available for Uzbekistan participants, there are startup trainings in Central Asia **Global Innovation through Science & Technology** and startup-accelerator **Water Solutions Innovation Lab** for the projects of green technologies and water issues. The international **Falling Walls conference** provides an opportunity for young scientists, specialists, and entrepreneurs to announce their ideas and social initiatives to the world community or propose their innovative methods for solving various problems and tasks in almost all fields of human activity.[18]

Results of the key stakeholder survey

Survey goal

To address the shortage of structured data regarding existing projects and practices with innovative approaches and technologies on land restoration in the Aral Sea basin area, the key stakeholders were surveyed. The survey aimed to gain information from the key stakeholders regarding the current situation, existing projects, practices, and technologies in the field of land restoration, as well as recommendations for priority innovation directions for landscape restoration in the Aral Sea watershed. Out of six conducted interviews, one was with a representative of the government institutions, four represented international organizations, and one a non-profit organization.

Responses on the current situation

According to the respondents' answers, the current situation in the region remains extremely difficult. Among the consequences of land degradation, the respondents gave the first place to an increase in respiratory diseases, followed by impaired productivity of people, increased child mortality, loss of vegetation cover and biodiversity, loss of industrial sectors such as fish processing and ship repair, deterioration of water quality, reduction in crop yields due to erosion, degradation of the region itself caused by population migration to other suitable places for living, rise in crime.

Responses on existing actions

Among the currently implemented projects, practices, and technologies the respondents noted successful creation of saxaul plantation over 1 million hectares where biological recovery of highly saline and degraded lands is observed, the use of sand-binding systems for mechanical protection against movement of dunes, and protection of auto and railroads, drip irrigation and laser planning. Moreover, awareness-raising activities are carried out regarding cattle grazing around settlements and especially around watering places. Attention is paid to health care and education of planting and forestry specialists. These activities are mainly performed by the State Forestry Committee, the Ministry of Emergency Situations, the Ministry of Innovation and Development, local authorities (hokimiyats of districts and regions) with the participation of international organizations, such as UNDP, FAO, ICARDA, World Bank, EC, and GIZ.

Respondents' recommendations

The stakeholders' recommendations for further work to restore the Aral Sea watershed are incorporated in the following section.

Conclusions and recommendations for the development of the support of land use innovations applicable in the Aral region

Conclusions and recommendations

Current information analysis shows that: (1) the Government of the Republic together with international partners and stakeholders pay attention to mitigation of the effects of the Aral disaster on the environment and people's life in the Aral Sea region, through various projects and initiatives, and that (2) Uzbekistan is striving to support startup initiatives and innovations. However, there is a lack of emphasis on the need for innovations and startup development in the field of land restoration, sustainable land, and water management, applicable in the Aral Sea area.

The recommendation for the development of the innovative potential of Uzbekistan include:

Policy

- Review legal instruments and tax preferences to stimulate the development and integration of innovative approaches and practices.
- Strengthen cooperation with international development agencies promoting R&D in the field of land restoration, SLM, WRM, and innovations testing and integration into practice. Simplify the working procedure for cooperation.
- Emphasize the necessity to work in a consistent manner and with a systematic approach to solving the existing problems in the Aral Sea region.
- Reduce bureaucratic procedures and simplify reporting procedures for the government grants for innovations development in the field of land restoration.
- Promote more respectful and careful attitude towards nature and environment among local people, e.g., introduce "Environmental responsibility" discipline in the general educational system.

Economy

- Create investment attractiveness of the country to engage more international venture capital funds and business investing in innovations and start-ups.
- Allocate specific theme and funding for the innovations, start-up, and R&D in the field of land restoration, SLM, WRM, applicable in the Aral Sea area

Human capital and research

- Study reasons why adults (those over 30 years old) and women are less involved in founding a startup, and address identified barriers to involve more women and experienced adults in establishing the innovative business.
- Establish Research stations on the dried Aral seabed to study and introduce innovative technologies. Research stations need to be equipped with all necessary infrastructure, received funding and support for R&D, staff training and education.
- Focus the R&D and measures to restore and protect land resources on afforestation, water-saving technologies, crop diversification with inclusion of high-income crops, economic diversification (e.g. development of eco-tourism).

Recommended direction for innovations and startups

Two main directions to focus on are recommended for the innovations and startup in the field of land restoration, SLM, WRM, applicable in the Aral Sea: one applies to forestry and another to agriculture *[see annex 1 for the full list of directions recommendations]*. The general directions in the forestry section focus on conservation of significant and valuable plant species, promotion of reforestation, afforestation, and agroforestry, as well as technologies that would help tree plantings survive in the harsh environment of the Aralkum desert. The general directions for the agriculture sector focus on water-saving and soil salinity controlling technologies, salt-tolerant and drought-tolerant plant species, and diversification of the local economy.

Endnotes

1 International Fund for Saving the Aral Sea (IFAS)
2 Agency of IFAS for implementation of IFAS projects in Uzbekistan
3 Ministry of Foreign Affairs of the Republic of Uzbekistan
4 News portal Review.uz
5 World Bank data on GDP growth (annual %) – Uzbekistan, https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=UZ
6 The Ministry of Economic Development and Poverty Reduction of the Republic of Uzbekistan
7 The message of the President of the Republic of Uzbekistan Shavkat Mirziyoyev addressed to the Supreme Assembly (Oliy Majlis)
8 newspaper "Pravda Vostoka" No. 139 dd. 2/07/20.
9 Report of the World Bank "World Economic Outlook" for June. ("Economic Review").
10 https://www.gazeta.uz/ru/2020/06/29/economy/
11 "Environment Archived 8 December 2013 at the Wayback Machine". In Glenn E. Curtis (Ed.), Uzbekistan: A Country StudyArchived 23 September 2006 at the Wayback Machine. Washington: Government Printing Office for the Library of Congress, 1996.
12 IT Park official webpage
13 Где найти инвестора в Ташкенте, чтобы запустить свой стартап
14 UNDP Uzbekistan press release from October 8, 2020.
15 The third cycle of the 'Startup Initiatives' Programme
16 UNDP Uzbekistan press release from November 19, 2019
17 C.A.T. Science Accelerator official webpage
18 Обзор: как стартапу в Узбекистане найти деньги на финансирование проекта, May 8, 2019

Photo Credit: Тихонина

Annex 1. Focus directions for the innovations and startup applicable in the Aral Sea area

Forestry

Conservation

- Conservation and restoration of rare, vulnerable plant communities, hawthorn, carnation, alfalfa, and Herba Anabasidis.
- Protection of natural reserves in saxaul areas. For example, integration of alternative energy sources for the local population in order to reduce logging of saxaul.

Reforestation

- Restoration and promotion of natural regeneration of tugay forests (riparian buffers) of the Amu Darya and Syr Darya deltas.

Afforestation

- Establishment of plantations of fast-growing native tree and shrub species that can survive and thrive in the Aralkum desert and be used for sand retention on the dried bottom of the Aral Sea
- Creation of the regional selection forest seed base of desert species and seed nursery.

Agroforestry

- Promotion of agroforestry in the region via subsidies, government support, and technical expertise.
- Introduction of innovative crops (including perineal and woody species) to be cultivated on degraded lands of the Aral Sea basin. For example, dog-rose, unabi, sea buckthorn, the fruits of which have many useful properties and can be developed into different products.
- Pasture restoration and forage production via new approaches like establishing silvopasture and Management-intensive Grazing (MiG) systems.

Technology for tree plantings survival

- Use of small aircrafts (hang gliders and drones) equipped with capsulated and granulated seeds to improve the planting technique of desert plants.
- Technology that would increase tree saplings' survival in arid conditions (watering, protection from extreme temperature changes, etc.)

Agriculture

Water

- Promotion of water-saving technologies in agriculture and reduction of the area under crops that require a lot of water.
- Development and modification of low-moisture and drought-resistant plant species.

Salinity

- Advanced technologies for irrigated land salinization control that can be replicated throughout the Aral Sea region
- Micro-cloning of salt-tolerant and drought-tolerant plant species and use of local ameliorants for fixing and water retention of arid soils.

Diversification

- Livestock sector product diversification, like karakul production.
- Establishment of tourist complexes on the territory of natural objects of the Aral Sea region (Lake Sudachye, Nizhny-Amudarya biosphere reserve, etc.) as an economic alternative for local population income.

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