



HYDROPONIC FODDER AND LIVESTOCK FARMING INITIATIVE

CASE STUDY

BUSINESS: LLC ZIRA

LOCATION: DUSHANBE, TAJIKISTAN

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Summary

Established in 2015, Zira Group has focused on importing quality food products and equipment while developing local production capabilities, particularly in dairy. Through its Hydroponic Fodder and Livestock Farming Initiative it is aiming to revolutionize the agricultural landscape in Tajikistan by introducing innovative and sustainable farming practices. This project centers around the establishment of advanced hydroponic systems designed to produce high-quality fodder for livestock. By focusing on this technology, the initiative addresses several critical challenges, including the impacts of climate change, food insecurity, and economic instability. The hydroponic systems are engineered to optimize fodder production, ensuring a consistent and reliable supply of nutritious feed for livestock, which is crucial for maintaining agricultural productivity in the front of environmental and economic pressures.

In addition to improving the quality and availability of fodder, the initiative promotes eco-friendly farming practices that support climate resilience and food security. By reducing the reliance on traditional, resource-intensive methods, Zira Group's project contributes to a more sustainable agricultural model that aligns with environmental conservation goals. This approach not only enhances the efficiency and sustainability of livestock farming but also strengthens the climate resilience and food security in the region.

Background & Challenges Addressed

The agricultural sector in Tajikistan plays a pivotal role in the nation's economy, providing essential livelihoods and contributing significantly to overall economic stability. However, this sector faces numerous challenges that are increasingly exacerbated by the impacts of climate change and the scarcity of vital resources. These challenges include fluctuating weather patterns, water shortages, and soil degradation, all of which undermine agricultural productivity and threaten food security. The Hydroponic Fodder and Livestock Farming Initiative aims to address this critical issue by introducing advanced hydroponic systems that enable the year-round production of high-quality fodder. Unlike conventional methods, hydroponic systems require significantly less land and water while producing nutrient-dense fodder efficiently. By implementing these systems, Zira Group not only provides a sustainable solution to the fodder shortage but also enhances the resilience of local farmers against the adverse effects of climate change.



The initiative is designed to ensure a reliable supply of feed, thereby improving livestock health, boosting milk production, and ultimately contributing to enhanced food security in Tajikistan. This approach not only meets immediate fodder needs but also aligns with broader goals of sustainable agriculture, promoting practices that are environmentally friendly and economically viable for local farmers. In response to these pressing issues, Zira Group has been at the forefront of addressing these needs by focusing on the introducing of high-quality food products and equipment while simultaneously fostering the development of local production capabilities, with a particular emphasis on dairy farming.



CLIMATE CHANGE

The increasing frequency of climate-related events has caused more unpredictable and extreme weather patterns, severely disrupting traditional farming methods and food production. Events such as droughts, floods, and unseasonal temperature fluctuations are making it difficult for farmers to plan and maintain consistent crop yields, leading to reduced productivity and greater economic risk. As a result, food security is threatened, and there is a growing need for innovative, resilient agricultural practices to adapt to the changing climate and safeguard future food supplies.



ECOLOGICAL CHALLENGE

Conventional farming practices, such as overuse of chemical fertilizers, pesticides, and inefficient irrigation systems, have contributed significantly to soil degradation and water scarcity, depleting essential natural resources. These practices strip the soil of its nutrients, reduce its ability to retain moisture, and increase the vulnerability of ecosystems to erosion and desertification. As a result, there is an urgent need to adopt more sustainable farming methods to preserve soil health, conserve water resources, and promote long-term ecological balance.



ECONOMIC CHALLENGE

The local economy in Tajikistan is heavily dependent on agriculture, with a large portion of the population relying on farming for their livelihoods. However, fluctuating market prices for crops and livestock, combined with low agricultural productivity, create significant challenges for economic growth and stability. These issues limit farmers' ability to invest in modern technologies and sustainable practices, further hindering the sector's potential to contribute to long-term economic development and financial security in the region.



SOCIAL CHALLENGE

Gender inequality in agriculture limits women's participation and leadership roles in farming, affecting community resilience and development. This disparity also hampers access to training, financial resources, and decision-making processes, which are crucial for agricultural success. Empowering women through targeted initiatives not only improves their livelihoods but also enhances productivity and fosters inclusive growth within communities.

Objectives

Objective 1

To introduce a Hydroponic Farming System that produces high-quality fodder to improve livestock nutrition and milk production.

Objective 2

To establish demonstration farms that provide training and knowledge-sharing opportunities for local farmers and entrepreneurs.

Objective 3

To empower women in agriculture by promoting their involvement in sustainable farming practices and leadership roles.

Building on this foundation, Zira Group's Hydroponic Fodder Initiative is set to make a transformative impact on livestock farming practices within the region. By implementing advanced hydroponic systems, the initiative aims to significantly improve the nutrition and productivity of livestock. Hydroponic systems offer a sustainable solution for producing high-quality fodder with minimal resource use, addressing both the challenges of fodder scarcity and the need for more efficient farming practices. This approach not only enhances the quality of feed available to livestock but also supports the broader goals of climate resilience and food security in Tajikistan, putting the agricultural sector for long-term sustainability and growth.

1 Analysis and market research

The project commenced with a comprehensive planning phase involving requirement analysis, market research, and site preparation for the hydroponic systems. The concept of using hydroponics for fodder production was born out of the urgent need for sustainable and efficient farming practices to combat ongoing challenges such as changing weather patterns and limited agricultural infrastructure in Tajikistan. Traditional farming methods have struggled to meet the growing demand for fodder, especially as these environmental and structural constraints intensify. Extensive research into innovative agricultural methods led to the discovery of hydroponics—a solution that offers enhanced productivity while minimizing the use of vital resources like water and land.

2 Capacity building of farmers

Training sessions were conducted for local farmers on hydroponic techniques and livestock management, emphasizing sustainable practices and resource efficiency. To bring this vision to life, a reputable Spanish supplier, known for its advanced hydroponic systems, was selected through a competitive tender process. This company, with decades of experience in developing hydroponic technologies, provided a full-service package, including business consultancy, system manufacturing, delivery, installation, and setup. Recently, the company's expert visited Tajikistan to oversee the installation of the hydroponic system and provide hands-on training to local farmers. These sessions addressed common challenges in hydroponic farming, such as managing root rot and bacterial diseases, ensuring that farmers could effectively manage their new systems from the start.



3 Launch of the production facility

The hydroponic fodder production facility was launched, supplying high-quality fodder to local farms and initiating monitoring and evaluation to track progress and impact. The flexibility of the hydroponic system allows for adaptation to farmers' needs, offering scalability depending on resource availability. Smaller, premanufactured systems can be used initially, reducing the financial burden for farmers, while locally sourced materials can further cut costs before larger setups are adopted. In many rural areas where men often migrate in search of employment, women have increasingly taken on significant agricultural roles. By learning smart farming techniques such as hydroponics, women gain critical skills in business and resource management. These new capabilities not only improve their self-reliance but also empower them to become leaders in their communities, inspiring other women to engage in sustainable farming and advocate for gender equality.

Results and Impacts

Climate change adaptation and mitigation outcome

The project reduces greenhouse gas emissions by implementing hydroponic farming, which requires significantly less water and land compared to traditional farming.

Economic outcomes

The initiative is projected to save approximately \$46,743 annually by reducing feed costs and increasing milk production by 10%, benefiting both farmers and the local economy.

Environmental outcomes

Hydroponically grown fodder enhances soil health and biodiversity while minimizing the use of pesticides and fertilizers.

Social outcomes

The project has improved access to quality food, empowered women in agriculture, and fostered community engagement in sustainable practices.

Future steps

Key lessons emerged from Zira Group's implementation of the Hydroponic Fodder and Livestock Farming Initiative. Early community engagement during the planning phase proved essential for building trust and ensuring local buy-in, particularly in Tajikistan's agricultural context. The project revealed that sustained farmer training and support systems were critical for successful adoption of hydroponic technology, rather than relying on initial training alone. While the hydroponic system demonstrated effectiveness in enhancing agricultural productivity, the project encountered early challenges in securing consistent quality inputs through local supply chains and managing operational costs effectively. These insights will be valuable for future scaling efforts across other regions in Tajikistan and suggest the need for robust supply network development and cost optimization strategies in subsequent implementations.

Participation in the Climate Smart Business Challenge Facility has provided Zira Group with valuable insights and access to a network of like-minded businesses. The project has shifted the business model towards sustainability, with plans to scale the hydroponic system to other regions in Tajikistan. Recommendations for future participants include prioritizing community engagement and ensuring gender inclusivity in agricultural initiatives.

The Hydroponic Fodder and Livestock Farming Initiative demonstrates Zira Group's commitment to climate-smart agricultural practices. By addressing critical challenges in Tajikistan's agricultural sector, this project not only enhances food security but also promotes sustainable economic growth and social equity.

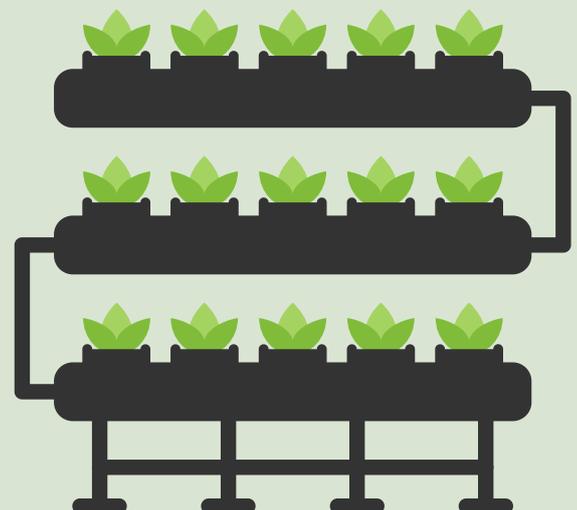


How does hydroponic fodder technology work?

Hydroponic fodder grows animal feed without soil in controlled environments using only water and nutrients. Common grains like barley, wheat, and oats are pre-soaked and spread on trays, with specific temperature and humidity requirements maintained throughout growth.

Plants are watered multiple times daily, reaching harvest in 6-8 days with impressive yields - 1kg of seeds produces 6-8kg of feed. The system works year-round in minimal space, making it highly efficient.

The fodder is rich in protein, enzymes, and vitamins, offering excellent livestock nutrition while using 90% less water than field production. This efficiency makes it an attractive option for sustainable farming.



The Climate Smart Business Challenge Facility (CSBCF)



Also referred to as **Facility** – is a pilot project that aims to identify and support Small and Growing Businesses (SGBs) focusing on low-carbon and climate-resilient solutions in Tajikistan, Pakistan, and India.

The facility provides



Technical support

Technical support to SGBs to execute innovative climate-smart solutions



Grants

Access to much-needed grants to leverage additional private sector capital.

The Facility (CSBCF) is a pilot project implemented by Aga Khan Foundation Tajikistan in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). This project is supported by the IKI Small Grants program, which is part of the International Climate Initiative (IKI) and financed by the German Federal Ministry of Economic Affairs and Climate Action (BMWK) in close cooperation with the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and the Federal Foreign Office (AA). Focusing on the agriculture, forestry, and other land use (AFOLU) and water nexus (both adaptation and mitigation), the facility will create incentives for SGBs to become champions of green practices and tap into the potential of the private sector to contribute to climate resilience.



Innovative climate smart solutions that are contextual, scalable, and inclusive will be prioritized.

The Facility defines innovation as developing new and/or refining/adapting existing practices, goods, services, and technologies that have potential to address issues related to the impacts of climate change in the targeted countries more effectively than existing approaches. A pre-requisite for an idea to be categorized as an innovation is that it recognizes and addresses, where possible, the sensitive needs of marginalized groups such as women, children, and senior citizens. As such, an idea that negatively impacts marginalized groups cannot be categorized as innovative based on CSBCF's criterion. The Facility focuses on supporting highly innovative climate-smart solutions and refrains from funding the replication or scaling up of existing, proven solutions. Therefore, proposed innovations must not yet be considered commercially viable, thus not qualifying for loans or repayable capital due to innovation risks, justifying the use of grant subsidies. Despite their current status, solutions should have the potential to become viable and scalable after successful pilot testing as evidenced by documented technical and financial results.



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