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## **Solving Malnutrition in Kyrgyzstan: Farms, Infrastructure, and Renewable Energy**

In Kyrgyzstan, a developing country in central Asia, a large proportion of families are unable to acquire enough nutritious food to sustain themselves. There are many children that struggle with stunted growth, and many pregnant women that have many nutrient deficiencies. The high rate of these effects of malnutrition should not be acceptable. Unfortunately, Kyrgyzstan's unique geography, climate, and infrastructure make it difficult to procure the same level of food security and nutrition that is available in other places, as maintenance of food sources and safe transport of produce are both affected quite hard. These challenges pose a serious problem in solving malnutrition, but there is potential for progress by improving farming, recreating infrastructure to better fit the geography, and starting to invest in renewable energy.

Kyrgyzstan is an extremely mountainous country, with an elevation between 500 and 24,000ft. Nearly 90% of the country is at 4,500ft above sea level, meaning that the climate is generally very cold, snowy, and dry (World Travel Guide, *Discover the climate...* 2019). A major result of having such mountainous terrain is a lack of flat, fertile land to farm on. Only about 13% of the land in the country is arable, and only a small percentage more is under more permanent cultivation. Most farms are large (2500 - 3000 hectares), and are funded by the government or are collectively owned by the workers. There are also some small farms (3ha on average) that are privately owned by working-class farmers (Land-Links, *Kyrgyzstan* 2018). These larger farms usually produce both for the area they are located in and also ship their products around for the rest of the country to use. The smaller farms, however, are more focused on just the towns or cities they are located near, because they do not produce enough to provide for a wider area.

With a population of 6.4 million, there are some jobs that are more specialized, such as something more related to altitude, or being a farmer on collective land, but most jobs are pretty similar to other places in the world. The average salary is between \$1,320 and \$4,100(USD) per year, which is not enough to live on (PayLab, *Salaries on positions in Kyrgyzstan* 2021). However, these salaries are supported by very low housing costs, and generally low-expense living in many places. This almost makes up for the general lack of money, but nutritious food is still hard to acquire for most families with only one or two people earning money. But, healthcare has always been important to the Kyrgyz people and government, so it is usually affordable, although inaccessible, unless you live in a major city, meaning that farmers and people in rural areas have a very difficult time accessing it. Education is also similarly affordable, and many schools do a lot to help improve the health of their students, but the quality of education is pretty low, meaning that around 50% of students don't reach basic goals set for them in academic achievement (UNICEF, *Education* 2017). However, that is not the only issue the children of Kyrgyzstan struggle with.

Children in Kyrgyzstan often struggle with serious malnutrition. A lot of families aren't able to acquire enough nutritious food to properly feed themselves, so they rely a lot on starchy, carbohydrate-heavy foods that are enough to give them energy and sustain them, but don't contain the proteins, fats, vitamins and minerals that are necessary to grow and develop correctly (Zalkin, *Kyrgyzstan: World Food Programme* 2021). This is largely due to three factors: the high rate of poverty, a lack of developed infrastructure, and a high rate of natural disasters that makes it difficult to maintain transport routes and infrastructure. Another major cause is the lack of fresh foods, which is caused by an inability to effectively farm them due to high altitude. All of these factors

together mean that families often have to rely on foods that can be farmed easily, or ones that can be cheaply bought, which aren't always the most healthy. Because of this high abundance of starchy foods, 13% of children under 5 suffer from growth and development stunting. For comparison, in the U.S. only 3.5% of children have the same issues. In Kyrgyzstan, 39% of women of reproductive age, as well as 43% of children under 5 suffer from anaemia (Zalkin, *Kyrgyzstan: World Food Programme* 2021), as compared to 13% of women in the U.S (Global Nutrition Report, *Country nutrition profiles* 2017). Also, 43% of school-age boys and girls show signs of iodine deficiencies, as well as 62% of pregnant women (Zalkin, *Kyrgyzstan: World...* 2021). Iodine deficiencies have symptoms such as weight gain, fatigue, increased sensitivity to cold, and elevated blood cholesterol levels (Raman, *10 Signs and Symptoms...* 2017). Some of these symptoms can be extremely problematic for those living in a higher-elevation environment. This is a serious challenge for Kyrgyzstan, but there are many efforts to try and reverse the effects of malnutrition.

## **Solutions**

The first of three potential solutions is providing meals to schoolchildren. This means providing resources, food, and training to school workers and families in order to provide them with nutritious meals. This solution is extremely effective, provides immediate results, and allows careful records to be kept about who is receiving what food and who needs more. In 2006, the Kyrgyz government created the "School Meals Programme," which is a program that provides schools with the resources and training needed to give students "school lunches" (SUN, *Optimizing primary...* 2017). In 2013, they collaborated with the World Food Programme to improve its reach. As of today, the program covers over 2,200 schools across the country (Zalkin, *Kyrgyzstan: World...* 2021). Students receive one hot meal every day, usually consisting of soups, cereal porridges, salads, and a variety of other things using nutritious ingredients, as well as a vitamin-rich drink, such as a cup of tea or fruit juice of some kind. Any time baked goods are made, fortified wheat or other grains are used. Staff are given training on how to prepare these meals, and schools are given support in refreshing culinary equipment and replacing water and sanitary systems. These improvements replaced the "hot bun and cup of tea" meal system, which didn't require any trained staff and didn't provide adequate nutrition, and overall the new program is more effective (Khachatryan and Tilenbaeva, *Scaling up and improving nutrition...* 2019).

However, there are likely some more remote cultural groups that have been independent for a long time that would object to certain ingredients, but that isn't a problem that has happened before. The simple way to address this would be to ask those groups for ingredients or meals that they want to avoid, and provide special accommodations for them. The one major problem with this solution is that it doesn't help anyone who isn't a student. This is difficult to deal with, as it is not always possible to provide meals to families, for reasons such as lack of funding, which is already a problem, or difficulty transporting food or people in order for those people to access it. For staff and faculty however, there is definite possibility for improvement. Actual resources and access are already in place, and the only issue comes down to funding. Overall, this is an extremely effective short-term fix for malnutrition problems, and is easy to implement. However, there are still other things affecting the issue.

The second potential solution is strengthening and developing infrastructure in places prone to natural disasters such as landslides and floods. This would lead to an easier time transporting food to and from remote areas, generally better living conditions, and many other benefits. In 2016, Kyrgyzstan participated in the Japan-World Bank Program for Mainstreaming Disaster Risk Management in Developing Countries (World Bank Group, *In the Kyrgyz REPUBLIC, remembering...*), which is a way for smaller governments to be educated about the risks of natural

disasters. The Kyrgyz government has come up with numerous ways to increase the safety of their residents. Some of these systems include National Disaster Risk Reduction Day, a program focused on increasing education about natural disasters, and the implementation of drills meant to help people practice what to do in emergency situations. The World Food Programme has also provided money and food to smaller towns who are working to improve their local infrastructure on a smaller scale, as well as provided assistance to local governments to help with planning and future issues (Zalkin, *Kyrgyzstan: World...* 2021). One potential concern is the fact that certain individuals, families, or cultural groups that are in possession of land that is essential to the development of infrastructure, and don't want to give it up. This would pressure the government to either take over that land forcefully, or stop or change the project. Either course of action would cause major dissatisfaction with citizens, so it would be a difficult decision. The best course of action would probably be to compromise in some way. Maybe scale down the amount of that land that is being used, or change the project in a way that makes it less intrusive in order to make sure that everyone is satisfied. However, if this does not work, and the landowners do not give permission for the development, then the best choice would be to change the project and work around the area that is being protected. Developing infrastructure like this is good for solving malnutrition by improving food accessibility, and also helps the overall living quality of the country, but this still does nothing to address improving the actual quality of food available to the citizens of Kyrgyzstan.

The third major solution is increasing the number and efficiency of farms in Kyrgyzstan. This could mean giving money to smaller, rural farmers to allow them to get more land, crops, or machines, or helping to educate them on new technologies and systems that they don't yet have access to. In rural areas with smaller farmers, much of the produce grown is inconsistent in quality, and there often isn't enough to be the sole source for a market. There are many reasons for this, such as lack of modern technology, older methods of maintenance that are less efficient than newer ones, an insufficient workforce, or poor soil quality. Providing solutions to all of these problems would greatly improve the general nutritional quality of food in rural Kyrgyzstan. One program that has had a major impact is Farmer-to-Farmer, created by USAID. Running from 2013 to 2023, Farmer-to-Farmer educates on newer techniques, methods, and technologies that allow for more efficient production of crops. As of April 2nd, 2020, nearly 4,500 people have benefited from this program, with around 85% of them fully trained in modern farming methods (USAID, *Farmer-to-farmer: Fact sheet: Kyrgyz republic* 2020). Although these farmers have been taught new techniques, they may not have the money to afford the technology that comes along with them. As well as this, some farmers may not want to change their techniques from the traditional ones they've been using.

The World Food Programme (WFP), run and sponsored by the United Nations, is an extremely successful and beneficial program that has done lots of work supporting food security in Kyrgyzstan, as well as many other places throughout the world. Their work and programs have helped millions of people get easier access to nutritious food. The WFP is by far the most active program in Kyrgyzstan, but it mostly focuses on larger urban areas that require a huge amount of development and help. A smaller, more local organization that provides lots of food security support and other humanitarian aid is the Red Crescent Society Kyrgyzstan. This organization was founded in 1926, and has specialized in medical aid, disaster management, and other social work and activities since then, and has recently started branching out to helping with food and malnutrition support, mostly with children without homes by relocating them to shelters and providing them with the food and other things that they need to be healthy in their development (Kyrgyz Red Crescent Society, *Social Care Activities* 2021). All in all, they are a great help for smaller towns and rural areas in Kyrgyzstan, and have been extremely successful in their work. Other organizations like USAID and the International Fund for Agricultural Development have donated and done volunteer work in Kyrgyzstan, but the other organization that has done the most

is the Food and Agriculture Organization (FAO) run by the United Nations. The FAO has worked in Kyrgyzstan for years, and over time have worked on multiple projects including school meal funds, and introducing new social ideas to help improve food production and conservation. They have worked with UNICEF, the WFP, the Kyrgyz government, and other non-governmental partners to develop the National Food Security and Nutrition Programme, which is essentially an ordered list of things that need to happen in order to solve the malnutrition issues in a satisfactory way (FAO, *Developing Capacity...* 2019).

All of these programs, solutions, and systems are extremely effective, and have made huge impacts on thousands of people in Kyrgyzstan. They have improved nutrition in children, created more safe environments for tens of thousands of people, and have educated small farmers on ways to improve their techniques. However, there is one major factor that has been holding all of these things back: economics. Part of it is that all of these projects require massive amounts of money, resources, and workers, who would need to be paid, but the larger problem is the fact that many people just can't afford to buy food. You can spend hundreds of thousands of dollars reworking the infrastructure of a region, improving transport to that area and ensuring there is always food available, and train local farmers to be more efficient and grow higher quality produce, but none of that matters if families literally don't have enough money to buy food. This is a major challenge throughout the world, but in a developing country like Kyrgyzstan it is especially bad. There aren't many opportunities for new jobs, and the population is steadily increasing. But, taking into account the geography within Kyrgyzstan, there is one opportunity that would be perfect, which is renewable energy.

Renewable energy is newer technology that emerged to replace fossil fuels as an energy source. It mainly takes three forms: solar energy, wind energy, and hydroelectric energy. The mountains in Kyrgyzstan provide perfect places for all three types of energy. On the tops of mountains, where the air is thinner and trees don't grow as much, it's a perfect place to put a solar farm. There is lots of already open space, and the sun's energy is slightly more powerful at the higher altitude. In between the mountains, there are long valleys that are very conducive to high wind speeds, which is great for wind energy. Wind turbines could be erected in the valleys, with the added bonus of being easier to access than a mountaintop. There is a moderate amount of rain, but the height and steepness of the mountains could create pretty major rivers, which would be perfect for hydroelectric energy. Creating these new energy plants would be extremely beneficial to Kyrgyzstan. It would create thousands of new jobs, and open up new career opportunities for interested people. It could power the whole country, and also become a major export. This would improve the general wealth flow, help many impoverished people recover, and create new connections with other developing and developed countries that are nearby. With the advancement of renewable energy technology, there soon may be ways to store and easily transport this resource, which would provide even more opportunities.

## **Conclusion**

Kyrgyzstan definitely faces a lot of challenges around malnutrition, but progress is being made. Many organizations and the government are all working hard to create systems, ideas and programs in order to help improve food security and malnutrition, and have put in a lot of work in ways outside of just schools, disaster management and farm improvement. All of these programs have made a huge impact on the people living there, but there is still more work to be done in terms of economic development. With the introduction of renewable energy plants, the economy will skyrocket, and malnutrition levels will decrease significantly. The serious malnutrition problems in Kyrgyzstan need to be solved, but the continuation of short-term and long term solutions, and

improving the overall economy of the nation will result in a happier and safer place for once-malnourished children and families to live.

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