

# What are the Perspectives of the Circular Economy in Kazakhstan?

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## Abstract

This research study aims to investigate the perspectives of the circular economy in Kazakhstan. The research question is based on the necessity to transform from a linear economy to a circular economy, which promotes sustainable production and consumption practices. The study examines the effects of the circular economy in the construction, plastic industry, and recycling sectors. The study draws on international examples of countries that have successfully implemented circular economy principles and the strategies they have used to achieve sustainability goals. In addition, the study presents the results of surveys and interviews conducted with a teacher, students, a civil engineer, and an ecologist, to assess their perspectives on the circular economy in Kazakhstan. The findings suggest that the circular economy has the potential to contribute to the country's sustainable development goals by reducing waste, conserving resources, and improving economic efficiency. The study concludes that there is a need for policymakers, industry leaders, and consumers to adopt circular economy principles and promote sustainable practices in Kazakhstan.

**Keywords:** Circular economy • Linear economy • Perspectives • Sustainable development • Kazakhstan

## Introduction

Today's manufacturing processes use natural resources from the environment as raw materials to create new goods that are ultimately dumped into the atmosphere. It has a beginning and an end and is a linear process source. In traditional linear economies, the take-make-dispose approach is employed. The "take, make and waste" or "linear" economy of today has profound and wide-ranging environmental effects. Since 1970, resource extraction has increased threefold, and by 2050, it is expected to increase by another 70% while the effects of pollution, biodiversity loss, and climate change are felt globally attention [1]. In order to tackle the current triple planetary crises on climate, biodiversity, and pollution humanity should switch from a linear economy to a circular economy. In recent years, the circular economy has gained increasing prominence as a tool that presents solutions to some of the world's most pressing crosscutting sustainable development challenges. The circular economy is a brand-new, all-encompassing economic paradigm that strives to reduce waste and pollution, lengthen product lifecycles, and facilitate the widespread sharing of natural and physical resources. It aims for a vibrant, competitive economy that generates good jobs for the environment while maintaining planetary resource limits [2]. A circular economy involves markets that encourage the reuse of products rather than their scrapping and subsequent resource extraction. Many countries want to change from a linear economy to a circular economy. One of the countries is Kazakhstan. Kazakhstan faces a large-scale task to achieve a sustainable, balanced, "green" economy. The Republic strives to get into the top thirty most developed countries in the world by the middle of the century due to the transition from a resource-oriented economy to a cleaner, innovative, and diversified model. This will require further transformations aimed at improving the public

administration system, increasing the openness and competitiveness of the economy, promoting environmentally oriented development, eliminating waste and pollution, circulating products and materials (at their highest value), and regenerating nature, ensuring equal access to employment and other economic opportunities. In Kazakhstan, the volume of accumulated solid household waste (plastic of various types) is more than 100 million tons. At the same time, 5–6 million pieces of waste are generated annually in the country and a small part is recycled. There is a huge carbon footprint from it. It leads to environmental problems in the country. 1.2 percent of the population is unemployed in Kazakhstan. It shows an ineffective economy in the country. Transitioning to a circular economy can help to deal with this and other problems. Personally, I am interested in the economy and ecology. I read many articles about issues that Kazakhstan faces every day. I have found a new concept called circular economy that can develop and transform Kazakhstan. Because of that, I decided to choose this research question.

## Aims

The circular economy is a new promising economic paradigm. It brings many benefits to different countries, organizations, and communities. The purpose of this research paper is to indicate the perspectives of the circular economy in Kazakhstan and to find the advantages of switching from a linear economy to a circular economy as many worldwide organizations such as the United Nations (UN) support this economy. The first hypothesis is if Kazakhstan switches from a linear economy to a circular economy, it will increase countries economic growth. The second hypothesis is if Kazakhstan switches from a linear economy to a circular economy, it will eliminate the generation of waste and increase recycling and reduction in the country. The third hypothesis is if Kazakhstan switches from a linear economy to a circular economy, it will reduce the use of non-renewable resources. These hypotheses will help to find and analyze the future perspectives of the circular economy.

Today's manufacturing processes use natural resources from the environment as raw materials to create new goods that are ultimately dumped into the atmosphere. It has a beginning and an end and is a linear process (UNIDO, 2020). Limited raw supplies eventually run out in this system. As waste builds up, it either results in disposal costs or contamination. Furthermore, industrial procedures are frequently ineffective, which contributes to the continued depletion of natural resources. Over time, one approach to sustainable development has gained traction among economists, policymakers, and business people, and has also caught United Nations Industrial Development Organization's (UNIDO) attention (UNIDO, 2020). It's

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called the circular economy. The circular economy is a new, all-encompassing economic paradigm that strives to reduce waste and pollution, extend product life cycles, and facilitate the widespread sharing of natural and physical resources (UNIDO, 2020). It aspires to a competitive economy that generates ethical employment opportunities and limits resource use to the limits of the earth (UNECE, 2021). Netherlands, France, and Italy are the leaders in the race to establish a circular economy.

One of the most ambitious governments in Europe is the Dutch government, which is working to create a circular economy. It aims to become a country whose economy is 100% built on circularity by 2050 (Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs) [3]. The first country to forbid the destruction of unsold non-food items was France. In France, businesses are required to recycle, reuse, or donate their unsold goods, even food (Ministry for Ecological and Solidary Transition) [4].

One of the most promising theories that strive to preserve the value of building components and structures for as long as possible is the circular economy, which is used in the construction industry in emerging economies (UNIDO, 2020). With annual growth in projects, Kazakhstan's construction industry is expanding quickly (UNIDO, 2020). In response to growing worries about preserving and recovering the value of building resources and structures as well as minimizing garbage from construction and demolition, a novel business model concept known as the Circular Economy (CE) is emerging in the construction sector. The study focusing on Almaty predicted that a circular economy could provide utilization of building materials with low carbon trace and optimization of the energy use could decrease current energy losses by more than 20% [5]. Residential building renovation and insulation enhancement can reduce the heat demand by up to 45%. The stakeholders in Kazakhstan's building industry have a lot of opportunities to keep implementing the CE principles into their procedures. In a circular economy, businesses save building materials for reuse or disposal.

Moving towards a more circular economy has an approach to stopping plastic pollution (UNIDO, 2020). Plastic brings many benefits. To develop a circular economy, some harmful products currently available on the market need to be eliminated. The plastics industry is striving to transform the traditional linear economy – where plastics are typically disposed of at the end of their service life – into a circular plastics economy. Plastic never ends up as waste or pollution in the emerging economy of plastics. The plastics circular economy is a sustainable model where plastics remain in circulation longer and is reused and recycled at the end of their life span [6]. The Republic of Kazakhstan's Ministry of Ecology, Geology, and Natural Resources (MEGNR RoK) estimates that the country produces between 4.5 million and 5 million tonnes of municipal solid waste (MSW), including plastic garbage, each year [7]. To develop and stimulate the use of green technologies in RoK, a 'green taxonomy' related to the circular economy has been developed and approved [7]. The classification (taxonomy) of 'green' projects to be financed through 'green' bonds and 'green' loans include the category of sustainable use of water and plastic [7]. For instance, threshold indicator - recycling of collected secondary raw materials (plastic, coal, etc) at least 80%. Besides, the Kazakhstan Waste Management Association sets an ambitious task to increase the share of recycled plastic by 40 percent by 2030 by implementing a circular economy [7]. A circular economy is both reparative and regenerative by design. In a "closed loop" system, materials flow continuously as opposed to being utilized only once before being discarded. In the case of plastic, this entails maintaining the economic worth of plastics while preventing their escape into the environment.

In conclusion, the circular economy is a crucial and essential strategy for achieving the nation's sustainable development goals. A good substitute for the linear economy is the circular economy. Resources can be used more effectively and efficiently, and the unfavorable effects of the product life cycle on the environment, the economy, and society can be reduced, by maximizing the value of resources throughout the life cycles of the products that include them. Because of this, the circular economy offers a straightforward answer that meets current policy goals. There is tremendous scope for increasing the share of the circular economy in the national economy. Further ambitious

efforts are needed to stimulate a systemic transition to a sustainable society and circular economy in Kazakhstan. The circular economy is an important driver for cutting greenhouse gas emissions, respecting the planetary boundaries, stopping plastic pollution, developing the construction industry as well as reaching the UN Sustainable Development Goals.

## Methods

I researched circular economy. I chose a topic that interests me and can have a significant contribution to Kazakhstan. To decide on the research design that is most appropriate for my research question, I choose these research designs: a survey, interview, and literature review. I conducted a literature study to better understand the discussions and studies that have already been conducted on a certain topic and to convey my findings in a written report. Conducting a literature review helped me build my knowledge in the field of circular economy. The first thing that was taken into account was analyzing secondary sources that were a good foundation for further research. To identify the term circular economy, I turned to secondary sources of information. To avoid prejudice and the use of biased opinions about my research question, I used credible sources such as scholarly books, academic journal articles, government reports, United Nations materials. I used a book written by recognized experts in research methodology to provide a comprehensive overview of research methods and their application in various fields. Examples of such a book include "The Upcycle" Peer-reviewed journal articles are considered to be the most credible secondary sources of research methodology. These articles typically present the latest research findings, innovations, and advances in research methodology. For my research I used Google Scholar peer-reviewed articles about the circular economy. Besides, I used credible UN sources. For instance, I found out that the circular economy is a new, all-encompassing economic paradigm that strives to reduce waste and pollution, extend product life cycles, and facilitate the widespread sharing of natural and physical resources (UNECE, 2021). Furthermore, it aspires to a competitive economy that generates ethical employment opportunities and limits resource use to the limits of the earth. (UNIDO, 2020). I used government reports to find quantities statistics about the circular economy in Kazakhstan. It was a report that indicates the accuracy of the information as well as accurate statistics. The sources are reputable, peer-reviewed, and published by recognized experts in this field.

During the period of research one of the qualitative research methods – was the interview. I have conducted several interviews as a primary source. I used this method to gather rich information and draw more detailed conclusions than other research methods, taking into consideration nonverbal cues, and off-the-cuff reactions. As the circular economy requires deep familiarization the interviews were conducted with professionals and students with a passion for the green economy. The interview provides a great opportunity to require complex questioning and considerable probing, thereby improving the quality of the information collected. Four main groups were interviewed:

- Civil engineer
- Ecologist
- Students with a passion for the green economy
- Teachers

My interview consisted of 5 questions that required open answers. The people I interviewed are representatives of completely different fields of activity. All of them provided answers for the study from different perspectives. A civil engineer and ecologist who worked in the past with research in the field of the circular economy gave advanced answers. Teachers and students who were enthusiastic about the green economy provided pertinent responses with fewer pieces of evidence. All these people are from Kazakhstan. Each interview lasted for 5-10 minutes as it was enough to fully familiarize myself with a person's position. As I expected, all interviewees gave full answers and expressed personal opinions.

I surveyed 51 people to use a quantitative method of research. The

study design was used to swiftly gather information characterizing the traits of a sizable sample of interesting people. The survey contains 9 questions that identify an audience, the ages, the consequences of the linear economy, and the possibilities of the circular economy. The only and rather significant problem in conducting my research was finding people who know the term circular economy as the circular economy is a new paradigm in Kazakhstan. Despite making my task more challenging, this circumstance had no negative effects on my final product. I searched for professionals from the platform LinkedIn and wrote them a letter of invitation in which I described my research paper.

## Results and Discussion

Over time, one approach to sustainable development has gained traction among economists, policymakers, and people in business, and has also caught United Nations Industrial Development Organization's (UNIDO) attention (UNIDO, 2020). It's called the circular economy. The circular economy is a new, all-encompassing economic paradigm that strives to reduce waste and pollution, extend product life cycles, and facilitate the widespread sharing of natural and physical resources. It aspires to a competitive economy that generates ethical employment opportunities and limits resource use to the limits of the earth (UNECE, 2021). To research the field of circular economy I took various interviews and a survey. The information gleaned from secondary sources was all beneficial and enabled consideration of various viewpoints. The outcomes for gathering primary data are pretty pleasing. Considering that diverse individuals were interviewed and took the survey, there were numerous similarities among the answers. All respondents are well aware of the relevance of this problem and have a rough idea of the circumstances in Kazakhstan. To collect useful and relevant ideas on the given topic, I took a survey from 51 respondents. The survey has nine questions. To start with, 68.6% of respondents are students of age 12-18, and 13.7% of respondents are 19-25 years old adults, other respondents the age of -55+.

To the question "How does the linear economy affect Kazakhstan?" 54.9% of people responded "negatively". This suggests that a linear economy has disadvantages. According to my literature review, today's manufacturing processes use natural resources from the environment as raw materials to create new goods that are ultimately dumped into the atmosphere. It is a linear process with a start and end. Limited raw supplies eventually run out in this system. As waste builds up, it either results in disposal costs or contamination. Furthermore, industrial procedures are frequently ineffective, which contributes to the continued depletion of natural resources. The fact that many respondents indicated that the linear economy has a negative impact on the environment, consumption patterns, resource price volatility, disruptions in the supply of raw materials, business losses, and waste management-related costs is an important implication of these findings. It shows that economics needs improvement in fields.

To the question, "Do you know about the circular economy", 60.8% of respondents answered "Yes". The results lead to the conclusion that the majority of respondents know the terms of the circular economy. To know the opinions of people about the circular economy, this question was asked. Most of the survey takers chose the positive impacts of the circular economy on the world. It makes the world more eco-friendly, more just and inclusive, sustainable. These findings demonstrate that the circular economy aims to make the world a better place. The question suggests whether the circular economy affects positively or negatively. According to the diagram, 84.3% answered "positively". The result now provides evidence that the circular economy is an important economic paradigm in Kazakhstan that leads to positive changes in the economy.

The results of the first six aspects are substantially better than the four aspects. From these results, it is clear that 60,8% think that the circular economy can bring reducing waste, and 66.7% think it can reduce carbon dioxide emissions, and energy losses. According to the literature review, the study focusing on Almaty predicted that a circular economy could provide utilization of building materials with low carbon trace and optimization of the energy use could decrease current energy losses by more than 20% [7].

In the question "What sectors/industries might be affected by the circular economy in Kazakhstan?" the choice of the recycling industry has gained the most answers. 72.5% of respondents chose this option. This result ties well with the literature review wherein the plastics circular economy is a sustainable model where plastics remain in circulation longer and is reused and recycled at the end of their life span [6]. Kazakhstan Waste Management Association sets an ambitious task to increase the share of recycled plastic by 40 percent by 2030 by implementing a circular economy. This approach can change the plastic industry in Kazakhstan in a positive way. To collect useful and relevant ideas about the circular economy, respondents were asked the same questions in the interview. To start with, every respondent in the interview is aware of the term circular economy. The results from the interviews were useful and helped me to come up with the main features of the given research question.

### There are some key moments from the taken interviews

On the first question "Can you explain what a circular economy is and why it's important?" about the term the circular economy and its importance, the answers were similar: with the help of reuse, repair, renovation, recycling, and other methods, the circular economy attempts to keep resources in use for as long as feasible. A circular economy is a type of economy that aims to utilize resources as efficiently as possible while minimizing waste. It is important because it offers a solution to the challenges of resource depletion, environmental degradation, and climate change, and provides a more sustainable and resilient economic system, and green jobs.

To the question "How does Kazakhstan currently approach the concept of circular economy, and what steps has been taken to promote this approach?" all responses mentioned that Kazakhstan recently started to promote this approach. All respondents gave examples of approaches. For instance, the government has established a Circular Economy Development Fund, which provides financing and technical assistance to circular economy projects. In 2019, Kazakhstan adopted a "Green Economy" concept that includes the development of circular economy practices. Two respondents gave the same examples. In 2020, Kazakhstan's Ministry of Ecology, Geology, and Natural Resources developed a roadmap for the transition to a circular economy by 2050 (Qazaqstan 2050 strategy), which includes measures to promote waste reduction, improve resource efficiency, and support the development of circular business models.

The next question: "How do circular economy practices in Kazakhstan compare to those in other countries, and what lessons can be learned from international examples?". According to the answers, respondents said that Kazakhstan is still in the early stages of developing circular economy practices compared to other countries. A large number of ideas to combat EU countries, and Asian countries are examples. For instance, the EU's policy measures such as Extended Producer Responsibility could be useful for Kazakhstan's transition towards a circular economy, taking into account our situation with good producers. Interviewed people gave the same examples of the countries that implement the circular economy as in the literature review: Netherlands, France, Japan, and Italy.

To the question "What opportunities do circular economy practices offer for job creation and economic growth in Kazakhstan?", opinions are similar. 5/5 of the circular economy can lead to the development of new industries and business models and particularly the creation of new jobs in the areas of waste management, recycling, and renewable energy (2 male 3 female).

## Conclusion

In conclusion, the study sought to examine Kazakhstan's viewpoints on the circular economy and evaluate the potential advantages of switching from a linear economy to a circular economy. The report offers insights into the prospects of the circular economy in Kazakhstan through the examination of foreign precedents and the findings of surveys and interviews with stakeholders in Kazakhstan. According to the first theory, Kazakhstan's economy would grow faster if it switched to a circular economy. The study's findings are consistent with this hypothesis since a circular economy encourages environmentally

friendly methods of production and consumption, which can result in greater economic efficiency and cost savings. In industries like recycling, repair, and remanufacturing, the circular economy can also generate new business prospects and employment opportunities. The second theory aimed that Kazakhstan's shift to a circular economy would stop trash production and boost recycling and waste reduction. The study's conclusions imply that the circular economy can dramatically lower waste and encourage more environmentally friendly trash disposal techniques. Resources can be save and environmental pollution can be decreased by recycling and reusing materials. The third hypothesis stated that switching to a circular economy in Kazakhstan would reduce the use of non-renewable resources. The study's findings support this hypothesis, as a circular economy prioritizes the use of renewable resources and promotes the sustainable use of natural resources. This can help reduce the country's dependence on non-renewable resources and promote a more sustainable future.

The circular economy in Kazakhstan has good prospects, which is the answer to the primary research question, "What are the perspectives of the circular economy in Kazakhstan?" Increased economic growth, decreased waste generation, decreased plastic pollution, increased recycling, decreased use of non-renewable resources in construction, preservation of the value of building components and structures, creation of new green decent jobs, and provision of a more sustainable and resilient economic system are just a few of the advantages that a country may experience from making the transition to a circular economy. Overall, Kazakhstan's views on the circular economy are favorable, and there is much potential for the nation to gain from implementing the ideas behind it. However, in order to drive the essential changes toward a more sustainable future, the successful implementation of circular economy principles would necessitate collaborative efforts from all stakeholders, including governments, industry leaders, and consumers.

The research has influenced my perspective on the circular economy in Kazakhstan, as it highlights the potential for sustainable economic growth and reduced environmental impact through circular economy practices. The study's findings demonstrate the importance of promoting circular economy principles at all levels, from policymakers to consumers. In the beginning, I thought that the circular economy model do not have a strong perspective on Kazakhstan. At the end of my research, I found out that the circular economy is a promising paradigm for Kazakhstan that can develop many fields in the country. In a research project, it is important to be open to feedback and make corrections as necessary to ensure the accuracy and validity of the findings. The research project's biggest challenge may be collecting accurate and representative data from a diverse range of stakeholders. It can be challenging to ensure that the data collected is unbiased and reflects the true perspectives and experiences of the participants. Additionally, ensuring the data is analyzed correctly and the conclusions are accurate is another critical aspect of the research project. In a perfect world, all stakeholders in Kazakhstan would be fully engaged in promoting and implementing circular economy practices. Policymakers would prioritize sustainability and circular economy principles in their decision-

making, industry leaders would invest in circular supply chains and sustainable production practices, and consumers would make environmentally conscious purchasing decisions. This would lead to a more sustainable and prosperous future for Kazakhstan and the world. Further research could explore the specific challenges and opportunities for circular economy implementation in different regions of Kazakhstan. Additionally, investigating the potential barriers to circular economy adoption and identifying strategies for overcoming these barriers would be valuable. Moreover, conducting a more extensive survey or interview with a larger number of experts could provide a more comprehensive understanding of the perspectives of the circular economy in Kazakhstan.

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## Authenticity Declaration

I declare that the work in this research project is my own and is authentic. All resources and sources are acknowledged and cited, where sources and resources of other people have been used.

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