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# Human Capital Management Based on the Principles of Green Economy and the Creation of Green Jobs for Sustainable Territorial Development

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**Abstract:** As a result of the actualization of sustainable development and the strengthening of the role of green responsibility at all levels of the economy, there are significant changes in modern management practices to improve long-term economic, social, and environmental indicators of territorial development through the introduction of green technologies. The purpose of the study is to determine the possibilities of managing human capital based on the principles of a green economy and creating green jobs for sustainable territorial development in the Republic of Kazakhstan. Using the example of the Akmola region, Kazakhstan, quantitative indicators of green jobs in the fields of activity related to green technologies are determined, an expert survey is conducted, and a SWOT analysis of the strengths and weaknesses of creating green jobs in various sectors of the economy is carried out. It is concluded that green human capital management focuses on the introduction of environmentally friendly green technologies, forms the social foundation of high ecological awareness and proper skills of eco-innovation work of employees, and acts as a factor in the growth of sustainable territorial development.

**Keywords**: sustainable development; human capital; green human capital management; green jobs; green technologies.

**JEL Classification**: E24; O15; J24; Q01; R11.

## Introduction

Environmental protection and economic territorial development (Bantserova and Kasimova 2023, 939), the development of human capital (Balova *et al.* 2021, 1269) and its management based on the principles of the green economy (Tatibekova *et al.* 2022, 2002), and the creation of green jobs and the introduction of environmentally friendly green technologies (Nardin and Nardina 2021, 1242) are global trends that have a chance to help solve problems related to environmental degradation resulting from expansive human actions (Amui *et al.* 2017, 308). Until now, humanity has thought little about the consequences of the intensive use of natural resources (Mukhlynina *et al.* 2018, 633). This implies that actions must be taken by the modern generation so that future generations can live healthy life in favorable conditions.

The task is to create solutions that will not remain just a concept but will be used in practice. Practice shows that actions and initiatives on the ground determine the form and nature of global changes (Kashina *et al.* 2022, 2413) Environmental knowledge is the basis for understanding environmental problems (Dao *et al.* 2011, 63), and human capital must meet the needs for the development and elaboration of certain strategies of enterprises and organizations regarding modern challenges (Unsworth *et al.* 2021, 1). Therefore, the concept of human capital and its management based on the principles of the green economy (green management) is

considered a new approach to solving environmental problems (Lawler and Worley 2012, 265), since human capital plays a key role in achieving sustainable development through the transfer of environmental knowledge, green practices and technologies, and environmental innovations (Yong *et al.* 2019, 364).

The purpose of the article is to determine the possibilities of human capital management based on the principles of a green economy and the creation of green jobs for sustainable territorial development in the Republic of Kazakhstan.

The purpose of the study provides for the solution of the following tasks:

- systematization of basic terms, concepts, and approaches to green human capital management and definition and design of the organizational and economic content of green human capital management as a modern management practice;
- quantitative analysis of the creation of green jobs as one of the main functions of green human capital management in areas of activity related to green technologies (based on the example of the Akmola region, Kazakhstan);
- SWOT analysis of the strengths and weaknesses of creating green jobs in various sectors of the economy (based on the example of the Akmola region).

## 1. Literature Review

A significant amount of scientific research has been devoted to the issue of human capital and its management based on the principles of the green economy (green management).

Thus, E. Bombiak (2019) defines green human capital management as a systematic, planned alignment of ordinary human resources with the practices of managing the environmental goals of an organization. According to R. Chaudhary (2019), green human capital management includes the overall impact on the effectiveness of an organization by: 1) the selection of employees who are sufficiently familiar with the aspects of environmental management in the organization (green hiring); 2) provision of environmental pieces of training for members of the organization to participate in environmental events to increase environmental awareness (green training and participation); 3) provision of non-monetary and monetary compensation to members of the organization for based on their environmental achievements (green efficiency and compensation management).

Green human capital management is a practice that helps to create a green workforce that can both perceive and appreciate the green culture in its organizations. Green innovation can apply its green goals to the entire personnel management process in the context of recruitment, selection, training, compensation, growth, development, and preservation of human resources (Guerci *et al.* 2016, 129).

Green human capital management concerns all activities related to the development, implementation, and maintenance of a system aimed at preserving green employees in the organization (Martirosyan *et al.* 2022; Tang *et al.* 2018, 31). The transformation of ordinary workers into green is the responsibility of personnel management, and its goal is to achieve environmental goals and a significant share in environmental sustainability (Hooi *et al.* 2021, 763). Green human capital management is also responsible for raising awareness, informing, and establishing interaction between employees (Khoruzhy *et al.* 2022), especially on environmental issues: through the formation of environmental policy, employees are oriented to fulfill their environmental responsibilities (Shah 2019, 771).

Green human capital management contributes to environmental protection and the implementation of a sustainable development strategy in organizations (Garnov *et al.* 2022), which can positively affect the training and recruitment of employees and their well-being, improving organizational performance and health (Ren *et al.* 2018, 769). It improves the level of organizational commitment of employees, their environmental behavior, and the environmental performance of the organization (Roscoe *et al.* 2019, 737). In the long term green human capital management positively, together with other factors, affects the environmental and financial performance of green entrepreneurship organizations (Severo and De Guimarães 2022) and other business entities (Jabbour and De Sousa Jabbour 2016, 1824). The support of senior management and environmental orientation has a positive impact on the green management of human capital of organizations, companies, and firms (Yusliza *et al.* 2019, 2015).

One of the main functions of green human capital management of economic entities is the creation of green jobs (Dumont *et al.* 2017, 613).

Green jobs (green-collar jobs) are environmentally friendly jobs that can arise in any sector of the economy, considering the principles of sustainable development (Rayner and Morgan 2018, 56; Zelenko *et al.* 2021, 207). According to (Kato *et al.* 2009, 183), green jobs include positions at different levels, the tasks of which include caring for the environment. This concern lies in the economical and rational use of material

resources (Sharma *et al.* 2021, 301). First of all, these are works related to the sector of public transport, renewable energy sources, construction, and waste management (Sharma *et al.* 2022, 419). Green jobs also include positions at enterprises that participate in social and environmental responsibility programs (Chreif and Farmanesh 2022). Their heyday is associated with the growing belief that climate change is the result of human activity, so its inhibition requires economic changes that ensure the preservation of environmental well-being and the creation of new jobs for the unemployed and those working in sectors that currently contribute most to global warming, such as the automotive industry or energy production *(*Syahidun and Nawangsari 2022, 154; Umrani *et al.* 2020, 50*).*

## 2. Methods

### 2.1. Research Design

The data were collected in the period from September 15 to November 15, 2022, by conducting both a field study (at enterprises and organizations of the Akmola region) and a desk study (based on the Alikhan Bokeikhan University, Eurasian National University named after L.N. Gumilyov, and Kyrgyz-Russian Slavic University).

A qualitative and quantitative approach was chosen for the study.

The work was carried out in the context of the impact of human capital on the development of the economy of territories and green technologies. Since Kazakhstan is a country that actively implements green technologies and at the same time occupies a significant territory, we clarify that the focus of our research is focused on analyzing the situation in the Akmola region as a region surrounding the capital of Kazakhstan – Astana – and, therefore, of important socio-economic importance.

### 2.2. Selection of Experts

According to the purpose of the research through the Google.com search engine, we selected web pages of enterprises and organizations (state, commercial, NGOs) using keywords (green technologies, green jobs, etc. related to the investment of human capital in the development of the territorial economy and green technologies). Based on the sample obtained, the selection of an expert pool from the employees of these enterprises and organizations was carried out according to such parameters as (I) a green workplace and (II) work experience in the position held for at least 5 years.

On the one hand, green jobs were identified as jobs that were created to introduce green technologies (for example, backyard sewage treatment plants and solar panels) and, on the other, as positions created for training and promotion in the use of existing green technologies (for example, tourism services or training of consultants in the field of green jobs, green technologies, etc.).

The expert pool consisted of 71 experts who met the specified criteria. They were sent e-mail messages indicating the purpose and program of our research. Thus, experts who meet the specified criteria and agreed to participate in the study were selected and provided all the information necessary for the study.

### 2.3. Data Collection

The field study consisted in analyzing the current situation with the availability of green jobs at enterprises and organizations of the Akmola region related to the introduction of green technologies and in-depth interviews with the experts. In-depth interviews were used for SWOT analysis (strengths and weaknesses) of green jobs in the Akmola region, depending on the industry affiliation of the enterprise (organization). The identification of strengths and weaknesses is, on the one hand, the basis for taking measures that take advantage of the opportunities that are undoubtedly numerous environmental initiatives undertaken in the region, with the support of funds allocated for this purpose. On the other hand, the formulation of strengths and weaknesses allows for minimizing the risks that arise.

The interviewer introduced themself at the beginning of the interview, explained the purpose of the study, and presented open-ended questions that were outlined by us to clarify views and opinions on the research problem. The average duration of each interview was 25-30 minutes. The received interview recordings were transcribed during the field study using the service zapisano.org.

The desk study was aimed at a quantitative analysis of green jobs (in the sectoral structure, in the context of individual districts) and was carried out using corporate reports provided by the experts by e-mail.

Several researchers participated in information processing. After that, a discussion was held on each issue, and the results agreed upon by all participants of the study were recorded in the final document. The triangulation process allowed us to increase the reliability of the interview data, as to whether they accurately reflect the state of green jobs, and to improve the quality of the information received.

## 3. Results

Based on the results of a field study (in-depth interviews), green jobs were identified in the fields of detail related to green technologies in the Akmola region (Table 1).

Table 1. Green jobs in the industry structure

| No. | Industries | % |
|---|---|---|
| **Non-governmental sector** | | |
| 1 | NGOs | 81.5 |
| 2 | Consulting, training, and other services in the field of green technologies | 23.1 |
| 3 | Technical services | 29.2 |
| 4 | Mechanical engineering | 13.1 |
| 5 | Food industry | 43.3 |
| 6 | Transport | 29.2 |
| 7 | Ecological construction | 35.4 |
| 8 | Other enterprises using environmental solutions | 11.1 |
| 9 | Development and maintenance of green spaces | 40.5 |
| 10 | Ecotourism | 24.3 |
| 11 | Organic agriculture and agricultural production of renewable energy | 22.9 |
| 12 | Renewable energy sources | 25.0 |
| **Public sector** | | |
| 13 | Energy management | 26.5 |
| 14 | Wastewater management | 27.8 |
| 15 | Municipal and industrial waste management | 54.3 |
| 16 | Forest and nature management | 35.4 |
| 17 | Environmental policy, environmental monitoring | 10.8 |

As the results of in-depth interviews have shown, NGOs have the largest share of green jobs among the surveyed subjects (81.5%). In other industries, green positions account for 10.8 to 54.3% of the total number of positions.

Further research has shown that state institutions, taking an active part in shaping the environmental policy of the region, influence the formation of new green jobs (Table 2).

Table 2. Green jobs in the public sector in selected areas

| No. | Districts | Number |
|---|---|---|
| 1 | Akkol district with Stepnogorsk | 85 |
| 2 | Arshalynsky district | 36 |
| 3 | Astrakhan district | 41 |
| 4 | Atbasar district | 20 |
| 5 | Bulandynsky district | 63 |
| 6 | Burabay district | 42 |
| 7 | Egindykolsky district | 38 |
| 8 | Enbekshildersky district | 9 |

| No. | Districts | Number |
|---|---|---|
| 9 | Yereymentausky district | 39 |
| 10 | Esilsky district | 6 |
| 11 | Zhaksynsky district | 63 |
| 12 | Zharkainsky district | 30 |
| 13 | Zerendinsky district with Kokshetau | 192 |
| 14 | Korgalzhynsky district | 25 |
| 15 | Sandyktau district | 17 |
| 16 | Shortandinsky district | 23 |
| 17 | Tselinograd district with Astana | 374 |

Thus, the majority of people in green positions in the public sector are employed in the Tselinograd district with Astana, the Zerendinsky district with Kokshetau, the Akkol district with Stepnogorsk, and the Bulandynsky and Zhaksynsky districts.

The NGO sector was also analyzed (Table 3).

Table 3. Green jobs in NGO organizations in some districts of the Akmola region

| No. | Districts | Number |
|---|---|---|
| 1 | Akkol district with Stepnogorsk | 9 |
| 2 | Arshalynsky district | 10 |
| 3 | Astrakhan district | 12 |
| 4 | Atbasar district | - |
| 5 | Bulandynsky district | - |
| 6 | Burabay district | - |
| 7 | Egindykolsky district | - |
| 8 | Enbekshildersky district | - |
| 9 | Yereymentausky district | - |
| 10 | Esilsky district | - |
| 11 | Zhaksynsky district | - |
| 12 | Zharkainsky district | - |
| 13 | Zerendinsky district with Kokshetau | 27 |
| 14 | Korgalzhynsky district | 20 |
| 15 | Sandyktau district | - |
| 16 | Shortandinsky district | 10 |
| 17 | Tselinograd district with Astana | 221 |

In general, the analysis showed that almost every third of employees is employed in a green workplace in the employment structure of public sector enterprises and NGOs.

Further, based on the results of a desk study, an analysis of strengths and weaknesses (strategic information) in the development of green jobs in the Akmola region was carried out using SWOT analysis.

Table 4. SWOT analysis of green jobs in Akmola region (public sector, NGOs, green labor market)

| Strengths | Weaknesses |
|---|---|
| **Public sector** | |
| a high percentage of employees employed under an employment contract, for an unlimited period, full-time,<br>high level of education of people employed in green jobs,<br>high environmental awareness of public sector employees,<br>great activity of employers in the organization of employee training | the high cost of modernizing state-owned enterprises,<br>lack of public awareness of the benefits and barriers associated with the introduction of green technologies,<br>low efficiency of campaigns to promote green economy ideas,<br>high cost of employee training |
| **NGOs** | |
| readiness for ideological and voluntary actions, meaning that if such a social need arises, such activities will be carried out,<br>ample opportunities for raising funds for activities,<br>privileges in the field of activity (attraction of external sources of financing, media interest, political support),<br>employees with a high level of education | low level of technological innovation in the field of sustainable development,<br>low level of activity of employers in continuing education,<br>the need for large expenditures on modernization and development of human capital |
| **Green labor market** | |
| a significant degree of employment stability in green workplaces – labor resources in such positions are valuable human capital,<br>wide training offer on the market,<br>creating the competitiveness of enterprises based on green technologies, environmental products, and the company's image,<br>high ability to expand the scope of activities by expanding the range of products and territories,<br>relatively high demand growth rates,<br>high awareness of a significant group of entrepreneurs about the need for measures to introduce green technologies | a small share of green jobs in the structure of enterprises,<br>a small proportion of people working in key green jobs and having a higher technical education,<br>the low percentage of companies hiring employees involved in continuing education,<br>low awareness of the need to improve the quality of labor resources,<br>low ability to expand the scope of activity by acquiring new audiences for the products offered,<br>low level of implementation of innovative green technologies,<br>lack of prospects for the introduction of green technologies |

## 4. Discussion

As the results of in-depth interviews have shown, the majority of green jobs in the employment structure of the Akmola region are generated by municipal and industrial waste management, followed by the food industry and the industry engaged in the development and maintenance of green zones (natural parks and forestry, which were qualified as forest and natural resources management, are excluded from this group – here the share of green places concerning the total number of jobs is slightly more than 35%). The lowest percentage of green jobs is observed in state institutions engaged in environmental policy and monitoring. This is a natural trend due to the organizational structure and competence of these subjects. The low percentage of green positions in mechanical engineering can be considered alarming. These results are largely consistent with the data obtained earlier (Chreif and Farmanesh 2022; Kato *et al.* 2009, 183).

We concluded that today, organic agriculture and agricultural production of renewable energy sources in Kazakhstan are not the main sources of potential for the development of green jobs, although they occupy an important place. Only one in five jobs is green in this sector. Although researchers (Babugura 2020, 108) conclude that the creation of green jobs in agriculture is an opportunity to promote gender equality and empower women in a sector covered by serious gender inequality. This is a sector in which women make up the majority of the workforce. We believe that there will be a potential for creating green jobs due to the development of this sector in the future.

The following industries are moderately green: water supply and sewerage, energy, and renewable energy sources. According to interviews, every fourth employee works in a green position.

The activities of NGOs are primarily related to environmental education and actions to promote an environmentally efficient lifestyle. The activity of NGOs engaged in monitoring the causes of environmental degradation and developing plans for the restoration of destroyed territories, as well as attracting funding sources for environmental political activities, was observed, which is consistent with the results (Dumont *et al.* 2017, 613).

In addition, there are organizations in the region with recognizable brands engaged in the dissemination of best practices following the principles of sustainable development.

The analysis suggests that about 10% of organizations in the NGO sector, given the small number of competitors and high growth rates of demand for the services offered, have a strong position in the market and can represent a competitive force for the corporate sector. This result is associated with consulting and training in environmental activities, including waste separation and disposal activities (Zelenko *et al.* 2021, 207). The fashion for a healthy and eco-friendly lifestyle suggests that the demand for services related to this will grow, and the development of a particular subject will depend on this process (Boas Berg *et al.* 2018, 33; Tang *et al.* 2018, 31).

The analysis of the current state of employment of research subjects in quantitative terms showed that the largest number of green positions is in the construction industry (904 positions) and the public sector, in the field of environmental policy and environmental monitoring (371 positions out of 3,272), and the smallest is in renewable energy sources (wind power plants – seven positions).

The experts noted that the main activity of state institutions in the field of green technology implementation is focused on waste separation and waste recycling. The incentive for activity in this area is mainly the high environmental awareness of people working in green workplaces. As a rule, highly qualified specialists work in the public sector and actively expand their knowledge by attending training.

The use of environmentally friendly resources and solutions in the region is primarily influenced by campaigns to promote green economy ideas, financing environmental investments, as well as the development of green public procurement. The most serious obstacles to the implementation of environmental policy are the lack of financial resources for the modernization of subjects. Thus, state institutions primarily expect financial support. The training organized for people holding green positions is most often funded by the organizations themselves or their employees, and the most useful are seminars on waste management and environmental standards.

Also, according to the respondents' statements, farmers, operators of machinery and equipment, builders, and ordinary workers using recycled materials most often work in green workplaces. To a lesser extent, these are environmental protection specialists and engineers of technical sciences. The development potential of the studied enterprises is based mainly on the specifics of a company's activities, the image, and the attractiveness of the price of the products offered. The development potential stated by the respondents allows the research subjects to compete, first of all, in local and regional markets. To a much lesser extent, the offer is aimed at Russian and sometimes foreign audiences.

The enterprises included in the study can be defined as representing a relatively low level of innovation. Only every fifth company participating in the study is actively involved in the implementation of environmentally friendly solutions.

## Conclusion

Green human capital management forms the social foundation of high ecological awareness and proper skills of eco-innovation work of employees and management, creativity, and proper attitude to solving ecological and economic problems of territories.

The article presents a quantitative analysis of the creation of green jobs in the Akmola region. The SWOT analysis allowed us to identify strengths and weaknesses in the development of green jobs in the Akmola region and also showed promising areas of activity, such as information, education, and implementation of developed environmental initiatives and the introduction of environmentally friendly (green) technologies.

## Credit Authorship Contribution Statement

**Gulmira Rakhimzhanova**: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft.
**Aigul Maidyrova**: Supervision, Validation, Writing – review and editing.
**Ainura Kocherbaeva**: Project administration, Data curation, Validation, Writing – review and editing.

## Declaration of Competing Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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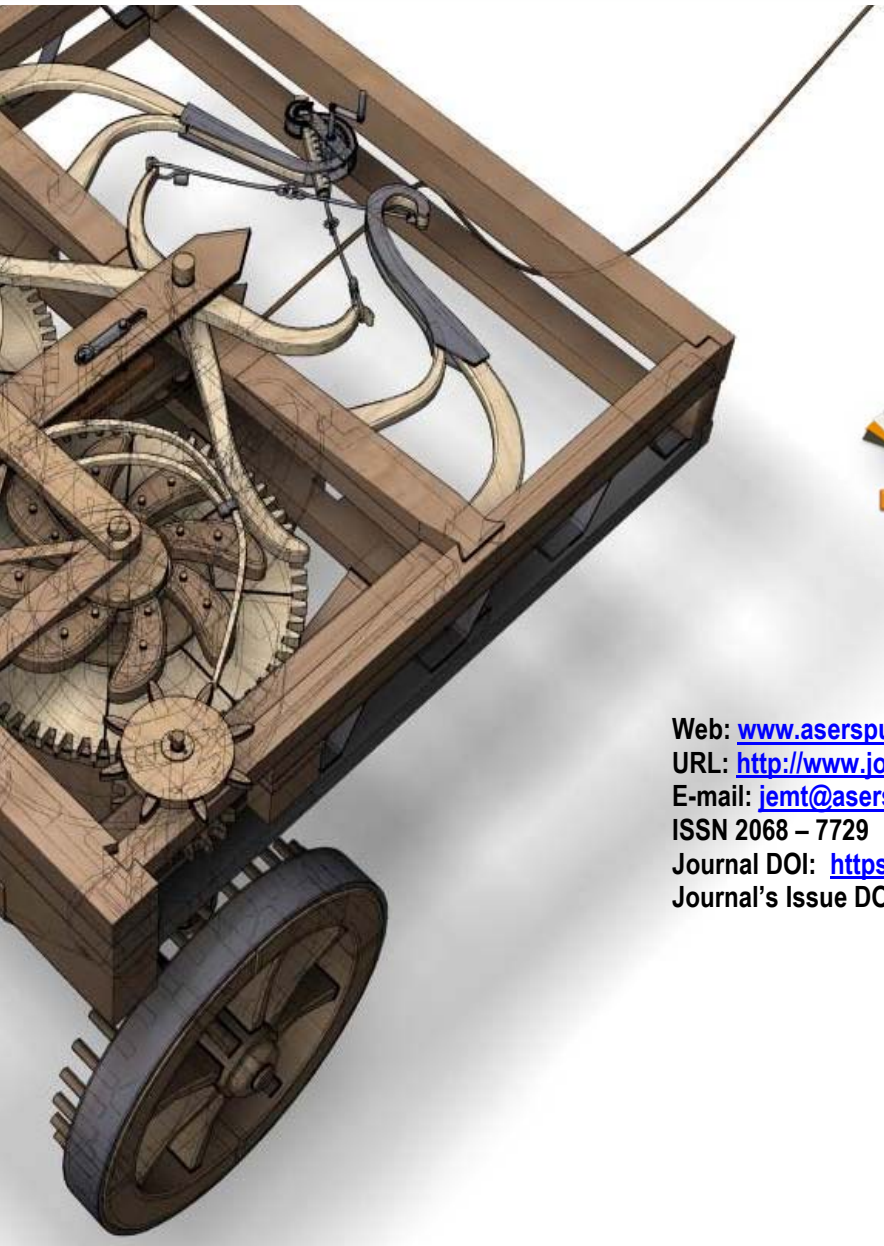

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