Digitalisation and sustainable employment as a factor of agricultural development

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Abstract. In recent years, the attention of researchers has focused on sustainable development issues in labour and employment. Of particular concern are the negative trends of unsustainable employment in the agricultural sector. The study aims to conduct a comparative assessment of the sustainability of digital and non-digital forms of employment in agriculture. The empirical basis was a nationwide sociological survey of citizens (N = 3,890) conducted in June–September 2023. The results revealed a difference in employment conditions between two segments of agricultural workers: 'digital' and 'non-digital'. Those working in the digital segment are more likely to be satisfied with their working conditions, have higher labour income and more flexible working hours. The results obtained allow us to formulate the hypothesis that digital employment is more sustainable than non-digital employment. It is concluded that it is viable to implement a set of measures aimed at increasing the sustainability and attractiveness of work in agriculture through the transformation of working conditions, the system of professional training, attraction and retention of personnel. Digital workers can act as drivers of current and future transformations in agricultural industry, so it is essential to promote a systematic increase in the sustainability of their employment.

1 Introduction

Sustainability is one of the key characteristics of modern living conditions, including labour relations. The problems of paid labour and employment have relatively recently become one of the vectors of discussion on sustainable development of the future world [1]. Unfortunately, the dynamics of the Russian economy indicators for the last 25 years demonstrates persistently negative trends in the sphere of agricultural labour supply [2]. The number of people employed in agriculture has decreased by 38.5% over the last 20 years, according to Rosstat [3]. There is an outflow of young people from rural to urban areas, the quality of labour force is inferior to the characteristics of human capital in other sectors of the economy. The Ministry of Agriculture estimates the staff shortage in the agro-industrial complex at the level of 200 thousand people, but according to expert estimates the shortage of personnel is more extensive [3]. Specialists note the following basic reasons for the identified problems: 1) disparity of purchase prices for agricultural products, entailing low profitability of agricultural production (profit is concentrated in the final link of the agro-
In the context of sanctions policy and unstable geopolitical situation, food security issues are priorities for national development. Agriculture is actively invested, mechanised and automated, and the digital transformation of the industry is gaining momentum. The introduction of digital technologies in agro-production actualises the problem of sustainability of digital forms of employment.

Despite an extensive body of theoretical and practical research, the literature has not developed a unified approach to defining sustainable employment. The substantive interpretation of the concept is formulated on the basis of the semantic opposition of the terms sustainability/unsustainability. Employment that does not show signs of unsustainability is considered sustainable. A search is underway for sustainable employment criteria, but their analysis is difficult due to the fact that foreign and Russian researchers identify criteria based on one or another understanding of sustainable employment, conditioned, among other things, by the national specifics of the labour sphere. Differences are found both in the number of criteria identified and in the possibility of their use in different national contexts.

In the Russian scientific discourse, sustainable employment refers to work that meets the following criteria: open-ended employment contract, standard working hours (full working day, normal working week), provision of labour and social guarantees provided by the Labour Code of the Russian Federation. In general, A.M. Dumont and P.V. Baret identify sustainable employment based on the analysis of the criteria of form (features of registration of labour relations) and conditions of employment. The same approach is found when analysing sustainability in the agricultural industry. Along with the characteristics of the employment contract, researchers identify nine dimensions of working conditions that contribute to employment sustainability in agriculture: autonomy and level of control, income and social benefits, job security, political experience at work; working time; intrinsic benefits of work; work-related discomfort; occupational health; and competence.

There is growing recognition in society and academia of the importance of understanding the impact of digital technologies on efforts to sustainably transform the agro-industrial sector of the economy, including the creation of sustainable, digitally-intensive jobs to attract professionals with advanced digital competencies that can become a driver for the successful implementation of digitalisation in the sector. To realise the task at hand, it is necessary to identify the characteristics of working conditions that contribute to the growth of attractiveness and sustainability of employment in the agricultural industry for professionals with advanced digital competencies.

The authors are interested in the research question about the possibility of increasing the sustainability and attractiveness of employment in the agro-industrial sector with the help of digital technologies, thus contributing to solving the human resources problem. In our opinion, the creation of digital workplaces with flexible working hours and workspaces can be an important factor in neutralising the negative effects of unsustainable employment in agriculture.

The aim of our study is to make a comparative assessment of the sustainability of digital and non-digital forms of employment in agriculture.
2 Materials and methods

The methodological basis of the research was the system of indicators of sustainability/non-sustainability of labour conditions proposed by V.N. Bobkov et al.: type of employment registration; unstable employment conditions; unstable employment situation; dissatisfaction with employment and its conditions [13]. The main analytical method was the method of comparing sustainability indicators in the digital and non-digital segment of employed agricultural workers.

The term ‘digital employment’ is used in the context of describing the digital transformation of the economy without substantive clarification of its nature. The understanding of the essence and definitions of ‘digital employment’ is very fuzzy, the semantic ‘load’ is quite diverse [14, 15]. Therefore, the methodological basis for determining the level of digitalisation of employment was the results of an expert survey of Russian HR managers of major commercial organisations and doctors of science in the field of labour economics, population and demography [16]. The main part of the expert community interprets digital employment ‘broadly’, relying on the specifics of the organisation of the labour process.

The empirical materials of the research are based on the generalisation of the results of the sociological all-Russian survey of citizens. The survey was conducted from June 2023 to September 2023. The survey involved citizens of working age who at the time of the survey were employed or had at least one month of work experience in the previous 12 months. A hybrid survey technology was used: face to face survey, online survey (snowball sampling), leaflets with a QR code distributed among the target audience in different institutions.

The survey was carried out with the help of Google Forms, the data were processed in Excel and SPSS. The survey was attended by 3,890 people (N = 3,890), 6.0% of all respondents being employed in agriculture.

3 Research findings

The results of the answers of respondents employed in agriculture revealed a fairly wide penetration of digitalisation into labour activity. 14.1% of agricultural workers are employed in the digital employment segment. The criterion for defining digital employment in the study was employment using information and communication technologies (ICT) in work for more than 70% or all working hours. Given the development and introduction of automation in the labour processes in all professional spheres, including agriculture, it can be assumed that the share of employment digitalisation in agricultural sector is higher.

Statistics of respondents’ answers demonstrate that digital workforce are less likely to overwork. They are more free in choosing the mode of work (Fig. 1).
Among those employed under flexible working conditions, set by the employer, as well as on the employee's initiative, the share of digital workers is higher than the share of non-digital workers. Among workers in the non-digital employment segment, the share of workers with rigid working hours, where working hours are set by the employer and do not change, is higher and makes up 46.1%, while among digital workers it accounts for 44.4%.

Workers in the digital employment segment on average have higher labour income (Fig. 2). The share of employees in the digital employment segment with an average monthly income of more than 50,000 rubles is higher than similar income indicators among respondents with non-digital employment.

The survey results showed that digital workers are more often satisfied with their working conditions (Fig. 3). If we add up the answers ‘no’ and ‘rather no than yes’ to the question “Can you say you are satisfied with your job?”, there are 2.5 times more dissatisfied with their jobs among respondents working in the non-digital employment segment than among digital workers.
Interesting results were obtained about the length of the working week among digital and non-digital workers. Thus, the study showed that in the group of respondents employed in the digital employment segment, standard employment prevails (employment of no more than 40 hours per week) and this share equals to 57.1%, which is 11 percentage points more than the share of standard employment among non-digital workers. Overemployment is slightly higher among non-digital workers, of which 32.9% point out that they work more than 40 hours per week, while the proportion of digital workers who are overemployed is lower and accounts for 29.1%.

4 Conclusion

The study reveals a difference in employment conditions between two segments of agricultural workers: digital and non-digital. Those working in the digital segment are more likely to be satisfied with their working conditions, have higher labour income and more flexible working hours. The results allow us to formulate the hypothesis that digital employment is more sustainable than non-digital employment.

The digital transformation of agriculture is inevitably accompanied by the digital transformation of agricultural labour functions, and demand for digital competencies is forming. Competing for personnel, it is important to ensure the increase in employment sustainability, especially in the group of digital workers who are the drivers of the industry’s development.

Sustainable development of the agricultural sector is possible through the intensification of technological and digital transformation of the industry on the basis of a systemic management impact on technological and social resource components. The work with personnel on the residual principle is a barrier to the growth of industry efficiency. In the authors’ opinion, it is advisable to expand the current list of projects designed for digital transformation in the agrarian sector: ‘Digital Technologies in Agro-industrial Complex Management’, ‘Digital Land Use’, ‘Smart Field’, ‘Smart Garden’, ‘Smart Greenhouse’, ‘Smart Farm’. We propose to launch a project aimed to support staffing for the digital transformation of the agro-industrial complex, the task of which is to increase the sustainability and attractiveness of work in agriculture through the transformation of working conditions, the system of professional training, attraction and retention of personnel.

We consider it promising to conduct further research into the processes of digitalisation of employment in agriculture, as well as the level of competitiveness of employment conditions by sustainability indicators. It is relevant to develop new approaches to the scientific organization of agrarian labour taking into account modern digital transformation of the industry.

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References


