

University of Belgrade
Faculty of Political Science

Master Academic Studies
Module: Peace, Security, and Development

Master's Thesis
The Structural Labor Market Gap in Serbia's Raspberry Sector:
Temporary Migration as a Solution

Mentor: Prof. Dr. Natalija Perišić
Student: Miodrag Milošević

Belgrade, September 2026

Abstract

This thesis analyzes the labor market gap in raspberry production in Serbia and examines how long-term structural changes on the labor supply side have contributed to its formation and persistence. The theoretical framework is based primarily on dual labor market theory, while cumulative causation theory complements the explanation of the long-term persistence of migration processes and their consequences for areas of origin. The research is designed as a case study of raspberry production in Serbia, linking processes at the macro, meso, and micro levels. The empirical analysis is based on secondary statistical data, academic and institutional literature, and a quantitative and qualitative content analysis of 60 media articles on seasonal work in raspberry production published between 2015 and 2025.

The findings show that the contemporary shortage of seasonal labor cannot be explained by a single isolated factor or solely by changes in the scale of production. Long-term rural-to-urban migration processes and emigration have gradually reduced the demographic and labor base of rural areas, while changes in employment patterns, economic alternatives, and the position of traditional categories of the reserve labor force have simultaneously reduced the availability of the remaining population for seasonal agricultural work. At the level of family farms, these changes have been manifested through a decline in the size of the family labor force and constraints on farms' own labor capacities, accompanied by more intensive engagement of the remaining family members and the significant role of seasonal labor during harvesting. The analysis of the development of the gap shows that the expansion of production until 2020 may have contributed to its intensification, but that its persistence even after a significant decline in the area under raspberries cannot be explained solely by changes in labor demand. Linking the findings across all three levels points to a deeper mismatch between the needs of labor-intensive production and the labor base on which it has traditionally relied, which is why the observed problem is defined as a structural labor market gap.

Based on the identified mechanisms and constraints, four possible directions of public policy are considered: temporary labor migration, improvement of seasonal working conditions, labor-saving mechanization, and increasing the self-reliance of farms. The findings indicate that none of these approaches can independently eliminate the structural causes of the gap, but that combining them can contribute to adapting production to changed labor market conditions.

List of Abbreviations, Tables, and Figures

Abbreviations

3D	Dirty, Dangerous and Difficult
AWU	Annual Work Unit
COVID-19	Coronavirus Disease 2019
EUR	Euro
FAO	Food and Agriculture Organization of the United Nations
LSP	Low-Skilled Pilot Project
NELM	New Economics of Labor Migration
OECD	Organisation for Economic Co-operation and Development
RSD	Serbian Dinar
RTS	Radio Television of Serbia
SAWP	Seasonal Agricultural Worker Program
SAWS	Seasonal Agricultural Workers Scheme
SORS	Statistical Office of the Republic of Serbia
USD	United States Dollar

Figures

<i>Figure 1 . Area under Raspberries by Municipality in Serbia, 2012 and 2023</i>	<i>23</i>
---	-----------

Charts

<i>Chart 1 . Average Annual Raspberry Purchase Prices in Serbia (2015-2025).....</i>	<i>27</i>
--	-----------

Tables

<i>Table 1 . Annual Work Units (AWU) by Category of Labor Engaged on Family Farms in the Previous Two Agricultural Censuses.....</i>	<i>49</i>
<i>Table 2 . Changes in Labor Force and Area under Raspberries in Selected Municipalities, 2012-2023</i>	<i>52</i>
<i>Table 3 . Trends in Raspberry Production, Daily Wages, and Labor Shortages, 2015-2025.....</i>	<i>56</i>
<i>Table 4 . Prevalence of Labor Shortage Indicators and Producer Responses Across the Three Phases, 2015-2025</i>	<i>58</i>
<i>Table 5 . Comparative Overview of Temporary Labor Migration Programs Across the Analyzed Dimensions</i>	<i>66</i>

Table of Contents

Abstract	II
List of Abbreviations, Tables, and Figures	III
Table of Contents	III
Introduction	1
I. Theoretical-Methodological Approach.....	3
1. Literature Review	3
2. Theoretical Framework	5
2.1. Dual Labor Market Theory.....	6
2.1.1. Theoretical Foundations and the Structure of the Labor Market	6
2.1.2. International Dimension of Dual Labor Market Theory	9
2.2. Mechanisms of Cumulative Causation.....	12
2.2.1. Migrant (Social) Networks.....	13
2.2.2. Culture of Migration	14
2.2.3. Relative Deprivation	14
2.2.4. Migrant Syndrome as a Consequence of Cumulative Causation	15
3. Methodology	16
3.1. Case Study: The Raspberry Sector in Serbia.....	16
3.2. Content Analysis	17
3.3. Comparative Analysis of Temporary Labor Migration Programs	18
3.4. Theory-Informed Analysis of Public Policies	19
II. The Raspberry Sector and Its Labor Market Gap	20
4. Raspberry - Serbia's "Red Gold"	20
4.1. Agriculture and Fruit Growing as Pillars of Serbia's Economy and Rural Development.....	20
4.2. Development of Raspberry Production and Serbia's Position in Global Production.....	21
4.3. Economic Importance of Raspberry Production in Serbia.....	23
4.4. Importance of Raspberry Production for Rural and Local Development in Serbia	24
5. The Labor Problem in Raspberry Production	26
5.1. Production Challenges and the Shortage of Seasonal Labor.....	26
5.2. Persistence of the Labor Shortage Problem	28
5.3. Application of Dual Labor Market Theory to Seasonal Work in Raspberry Production	29
III. Formation and Persistence of the Labor Market Gap.....	32
6. Macro Level: Structural Changes on the Labor Supply Side.....	32
6.1. Migration Processes and Rural Depopulation	32

6.1.1. Rural-to-Urban Migration	33
6.1.2. Urban Emigration.....	34
6.1.3. Rural Emigration.....	36
6.1.4. Cumulative Causation and the Long-Term Consequences of Migration.....	38
6.2. Transformation of the Reserve Labor Force in Rural Serbia	40
6.2.1. Changes in the Economic Alternatives of the Reserve Labor Force	41
6.2.2. Changes in the Position of Individual Categories of the Reserve Labor Force.....	42
7. Meso Level: Changes in the Organization of Labor in Agricultural Production	47
7.1. Organization of Labor on Family Farms.....	48
7.2. Decline in Family Labor on Family Farms	49
7.3. Changes in the Engagement of Seasonal Labor	51
7.4. Dependence of Raspberry Production on Seasonal Labor	53
7.5. Synthesis of Labor Force Changes and Their Significance for Raspberry Production	54
8. Micro Level: Development of the Labor Market Gap in Raspberry Production	55
9. Synthesis of Findings: The Structural Character of the Labor Market Gap in Raspberry Production.....	59
IV. Policy Responses to the Structural Labor Market Gap	61
10. Temporary Labor Migration Program.....	62
10.1. Comparative Analysis of Temporary Labor Migration Programs	62
10.2. Possibilities for Implementing a Temporary Labor Migration Program in Serbia	67
10.3. Proposed Model of a Temporary Labor Migration Program	70
10.4. Limitations and Risks of the Proposed Program	74
11. Program for Improving Working Conditions in Raspberry Production.....	76
11.1. Reform of Seasonal Employment as the Starting Point of the Program	77
11.2. Directions for Further Improving Seasonal Working Conditions.....	78
12. Labor-Saving Mechanization	79
12.1. Potential for Mitigating the Structural Labor Market Gap.....	79
12.2. Possibilities and Limitations of Applying Labor-Saving Mechanization in Serbian Raspberry Production	81
13. Program for Increasing Farm Self-Reliance in Raspberry Production	84
13.1. Extending the Harvesting Season as a Way of Expanding the Model	85
14. Possibilities for Combining the Proposed Programs.....	87
Conclusion.....	89
Bibliography.....	94
Appendices	103

Introduction

Raspberry production occupies an important position in Serbian agriculture, both because of its export significance and because of its role in generating income for agricultural farms and supporting the development of rural areas, particularly in Western Serbia and the Šumadija region. At the same time, it is a labor-intensive form of production whose labor requirements become particularly pronounced during harvesting, when available family labor is often insufficient and additional seasonal labor must be engaged. However, over the past decade, securing a sufficient number of seasonal workers has become one of the significant constraints on raspberry production. The persistence of this problem, despite rising daily wages and changes in the scale of production, raises the question of whether the labor shortage can be explained solely by changes in labor demand and temporary labor market fluctuations, or whether it is associated with deeper changes in the labor base on which raspberry production has traditionally relied.

Building on this, the thesis does not view the shortage of seasonal labor merely as a current shortage of workers, but seeks to explain the long-term processes that have changed the size and availability of the labor force on which raspberry production has traditionally relied. Particular attention is given to migration processes, changes in employment patterns, economic alternatives, and the position of traditional categories of the reserve labor force, and to their consequences for the labor capacities and organization of work on family farms. Accordingly, the central research question of the thesis is: how have long-term structural changes on the labor supply side contributed to the formation and persistence of the labor market gap in raspberry production in Serbia, and what public policy options arise from the structural constraints shaped by these changes?

The research findings show that the contemporary labor market gap in raspberry production cannot be explained by a single isolated process or solely by changes in the scale of production. Long-term migration processes have gradually reduced the demographic base from which agricultural labor has traditionally been recruited, while changes in employment patterns, economic alternatives, and the position of traditional categories of the reserve labor force have altered the availability of the remaining population for seasonal agricultural work. At the level of family farms, these changes have constrained farms' own labor capacities, while seasonal labor has remained an important additional source of labor. Linking these processes points to a deeper mismatch between the needs of labor-intensive production and

the labor base on which it has traditionally relied, which is why the gap is defined in this thesis as structural.

Building on the nature of the problem established in this way, the thesis also considers public policy options for mitigating it. Since the long-term structural processes that have changed the size and availability of the domestic labor force cannot simply be reversed, possible responses are directed toward adapting production to changed labor market conditions. Particular attention is given to temporary labor migration as a possible way of expanding the supply of seasonal labor. However, given the limitations of this approach and the multidimensional character of the identified gap, the thesis also considers improvements in seasonal working conditions, labor-saving mechanization, and measures aimed at increasing farm self-reliance.

The theoretical framework of the thesis is based on dual labor market theory and cumulative causation theory. Together, they provide the basis for linking the position of seasonal work in raspberry production with long-term changes in the labor base of rural Serbia. Building on the research problem and theoretical assumptions, the initial research design formulated a main hypothesis and three sub-hypotheses, which are presented in the theoretical-methodological part of the thesis.

Methodologically, the thesis is designed as a case study of raspberry production in Serbia, combining multiple methods and data sources. The empirical analysis is based on secondary statistical data, academic and institutional literature, and a quantitative and qualitative content analysis of media articles on seasonal work in raspberry production from 2015 to 2025. The policy analysis combines a theory-informed approach with a comparative analysis of selected temporary labor migration programs.

The thesis is organized into four parts. The first presents the literature review, theoretical framework, and methodology. The second examines the raspberry sector and establishes the existence of the labor market gap. The third analyzes its formation and persistence at the macro, meso, and micro levels and brings these findings together to establish its structural character. The fourth develops public policy responses to the identified gap and considers possibilities for combining them.

I. Theoretical-Methodological Approach

The theoretical and methodological approach of this thesis is structured around the following central research question: **How have long-term structural changes on the labor supply side contributed to the formation and persistence of the labor market gap in raspberry production in Serbia, and what public policy options arise from the structural constraints shaped by these changes?**

Building on the research problem and theoretical assumptions, the initial research design formulated the following main hypothesis and three sub-hypotheses:

H: Long-term structural changes on the labor supply side in the rural areas of Serbia lead to the formation of a structural labor market gap in raspberry production through a decline in overall labor availability and growing dependence of production on hired seasonal labor.

H1: Migration-driven depopulation of rural areas, through rural-to-urban migration and emigration, reduces the supply of seasonal and family labor in raspberry production.

H2: The transformation of the employment structure in rural areas, including a shift toward non-agricultural, informal, and more socially desirable forms of employment, reduces the availability of family and seasonal labor for work in raspberry production.

H3: A decline in family labor on agricultural farms increases the need for hired seasonal labor, thereby increasing effective demand for seasonal labor and deepening the structural labor market gap in raspberry production.

1. Literature Review

The literature review covers studies that are most relevant to understanding the theoretical, empirical, and policy dimensions of the seasonal labor gap in raspberry production in Serbia. The literature can be grouped into five interconnected areas: theoretical approaches to labor market segmentation and migration, research on raspberry production and seasonal labor shortages, studies on migration and changes in the rural labor base in Serbia, literature on the organization of labor on family farms, and literature on possible public policy responses to labor shortages in agriculture. Considering these areas together

makes it possible to connect existing knowledge with the research problem of this thesis and to define more precisely the gap that this research seeks to address.

The theoretical foundation of the research is primarily provided by the literature on dual labor market theory, with Michael Piore's *Birds of Passage* (1979) occupying a central position as the starting point of the thesis's theoretical framework for understanding labor market segmentation, the position of seasonal jobs, and their relationship with domestic and migrant labor. This approach is complemented by Piore's other work (1986; 2014), as well as by the literature on the cumulative causation of migration, particularly the work of Massey (1990) and Massey et al. (1993), which makes it possible to examine the long-term persistence of migration flows and their consequences for areas of origin. The complementarity of different approaches to the study of migration is further emphasized in more recent literature (de Haas 2007; 2012; de Haas, Castles, and Miller 2020). Together, these theoretical traditions provide a basis for linking the characteristics of the seasonal labor market with long-term changes in the labor base of rural areas.

The second group of studies concerns the economic, production, and developmental characteristics of raspberry production in Serbia. Among these studies, Kljajić (2025) stands out in particular by providing a comprehensive overview of the importance, structure, and development prospects of raspberry production, including the problems that constrain its further development. The importance of raspberry production for family farms and rural development is also examined by Dimitrijević and Ceranić (2011). Petrović et al. (2017) point to difficulties in securing a sufficient number of workers during the time-limited harvesting period, while Marković et al. (2017) view the shortage of seasonal labor as a longer-term constraint on raspberry and fruit production. This literature provides an important empirical basis for establishing the significance and existence of the labor shortage problem, but its long-term structural causes are not its primary subject of investigation.

Another important group consists of studies dealing with migration and demographic changes in Serbia and their consequences for rural areas and agriculture. The historical development and long-term continuity of migration from Serbia are examined by Stanković (2014), Grečić (2017), and Rašević (2016), whose work provides an important basis for understanding the scale, structure, and changes in migration flows over time. Particularly significant are findings pointing to the long-term emigration of younger and working-age populations from rural areas, as well as the consequences of these processes for depopulation, population aging, and the decline in the labor potential of rural areas. Bogdanov and Babović

(2014) link these demographic changes more directly to agricultural farms and the availability of labor in agriculture. This literature provides a basis for connecting long-term migration and demographic changes with contemporary difficulties in securing labor in agriculture.

A separate group consists of literature on the organization of labor and changes in the labor capacities of family farms in Serbia. Božić and Munćan (2007; 2015) examine the structure of the labor force on farms and different forms of engagement of family, permanent, and seasonal labor, while Bogdanov and Babović (2014) devote particular attention to the role of family labor and the relationship between the engagement of seasonal labor and farm size and the labor intensity of production. The 2012 and 2023 Agricultural Censuses provide an important empirical basis for tracking changes in the number of persons engaged and the volume of work on family farms. More recent studies by Popović (2025) and Krstić and Žarković (2025) provide additional insight into the contemporary structure of agricultural farms and the labor force engaged on them. This literature and these statistical sources make it possible to track changes in the labor capacities and organization of work on family farms.

The final group consists of literature on possible public policy responses to labor shortages in agriculture. Ryan (2023) and Martin (2020) examine different ways of adapting agricultural production to limited labor availability, including the engagement of migrant workers, improvements in working conditions, and the application of labor-saving mechanization. Research on existing programs and their institutional arrangements provides a particular basis for considering temporary labor migration programs, with Martin (2006), Preibisch (2010), and Consterdine and Samuk (2015) standing out in this respect. Domestic literature on the position of seasonal workers and the existing legal framework (Končar 2022; Kovačević 2023) is relevant for considering possibilities for improving seasonal working conditions, while Veljković et al. (2024) offer a model for adapting the scale of raspberry production to the available labor capacities of family farms. Together, this literature provides a basis for considering different and mutually complementary public policy responses to the shortage of seasonal labor in raspberry production.

2. Theoretical Framework

International migration represents a complex social phenomenon that cannot be fully explained by a single theoretical approach. Different migration theories vary according to

their level of analysis, spatial scope, temporal perspective, the relationship between individual agency and structural conditions, as well as according to whether they emphasize the causes or consequences of migration (Massey 1990, 3-4). De Haas (2012, 12) emphasizes that migration theories should not be viewed as mutually opposed, but rather as approaches that explain different dimensions of the same phenomenon. Massey et al. (1993, 433) further point out that the individual, household, and structural dimensions of migration are not mutually exclusive, but can be understood as interconnected levels of analysis. Building on this understanding, the theoretical framework of this thesis is based on a combination of dual labor market theory and cumulative causation theory.

In this thesis, dual labor market theory represents the primary theoretical framework for understanding the position of seasonal work in raspberry production, the characteristics of the labor force on which such jobs have traditionally relied, and the mechanisms that may limit the filling of such jobs by domestic labor. Its international dimension makes it possible to connect these processes with migration movements, while cumulative causation theory complements this explanation by identifying the mechanisms through which migration flows, once established, are maintained and reproduced. Additional justification for applying dual labor market theory is provided by Nikolić and Maksimović (2024, 67), who identify it as a particularly relevant approach for examining the effects of migration movements on the labor markets of Western Balkan countries, with particular reference to Serbia. Nevertheless, Paunović et al. (2005, 20) warn that the complexity of Serbia's labor market cannot be fully captured by a simple dual division. Dual labor market theory is therefore not used in this thesis as a comprehensive model of Serbia's labor market, but as an analytical framework for understanding the position of seasonal work in raspberry production.

2.1. Dual Labor Market Theory

2.1.1. Theoretical Foundations and the Structure of the Labor Market

Dual labor market theory developed within the broader theoretical tradition of labor market segmentation, which emerged in response to the limitations of the neoclassical approach in explaining the functioning of the labor market. Unlike neoclassical theory, which views the labor market as a unified system based on the relationship between supply and demand, the segmented labor market approach starts from the assumption that it is divided into several distinct segments with different rules of operation (Taubman and Wachter 1986, 1183).

Several variants of dual labor market theory have developed within the literature on labor market segmentation, making it difficult to speak of a single theory or of fully consistent positions among its authors (Wachter 1974, 638). Despite these differences, these variants share a historically grounded critique of neoclassical labor market theory (Cain 1975, 16), as well as a division of the labor market into primary and secondary segments, with a limited number of jobs in the primary segment (Dickens and Lang 1985, 801). Given these differences, this thesis will primarily draw on the formulation developed by Michael J. Piore, most fully presented in his work *Birds of Passage* (1979). Contributions by other authors who developed dual labor market theory will also be used to elaborate and supplement particular elements of Piore's theoretical framework.

Dual labor market theory starts from the assumption that the labor market is not a homogeneous whole, but is divided into two basic segments: primary and secondary (Doeringer and Piore 1970, 271-272). The primary segment includes higher-quality jobs characterized by higher wages, better working conditions, greater employment security, and opportunities for professional advancement (Doeringer and Piore 1970, 271-272; Dickens and Lang 1985, 792). By contrast, the secondary segment consists of jobs with low wages, unfavorable working conditions, limited opportunities for advancement, and a high degree of employment insecurity (Doeringer and Piore 1970, 271-272; Piore 1979, 17).

The division of the labor market into primary and secondary segments derives from the concept of economic dualism, according to which capitalist economies contain differences between capital-intensive and labor-intensive production. Differences in the organization of production are also reflected in the position of workers, thereby creating labor market segmentation (Piore 1979, 36-37; Massey et al. 1993, 442-443). The primary segment is largely protected by institutional mechanisms from the instability and uncertainty characteristic of the free market, while the secondary segment assumes the role of a kind of buffer that absorbs market fluctuations (Piore 1986, 31). At the same time, the number of jobs in the primary segment is limited, meaning that access to higher-quality employment is not equally available to all workers (Wachter 1974, 639).

Whether a job belongs to the primary or secondary segment does not depend exclusively on the sector or occupation, since the same occupation may belong to different labor market segments under different circumstances (Piore 1979, 18; Doeringer and Piore 1970, 272). Job characteristics, employment conditions, and the institutional environment in which work is performed are therefore particularly important for distinguishing between the

two segments (Uys and Blaauw 2006, 250-251). At the same time, the existence of the secondary segment is not a temporary phenomenon, but a persistent component of labor market functioning in developed economies (Taubman and Wachter 1986, 1196). Institutional interventions can improve working conditions and enable some jobs to move into the primary segment, but this does not eliminate the secondary segment; rather, it changes its size and structure (Piore 1979, 41, 45-47).

One of the key propositions of dual labor market theory is that work is not exclusively a source of income, but also has a social dimension because employment constitutes an important part of an individual's social identity. The attractiveness of a particular job is therefore determined not only by the level of wages, but also by the social status associated with it. Jobs in the secondary segment often carry lower social prestige, meaning that their unattractiveness arises not only from working conditions but also from the social status assigned to them. Accordingly, improvements in the material conditions of work are not always sufficient to substantially increase domestic workers' interest in such jobs (Piore 1979, 31, 53, 80; Massey et al. 1993, 441).

Typical jobs in the secondary segment involve simple, physically demanding, and labor-intensive activities, among which Piore (1979, 57-58) cites construction, service, and agricultural wage-labor jobs as illustrations. In addition, the secondary segment is characterized by temporary, informal, precarious, and unstable forms of employment, engagement through subcontracting, jobs with low skill requirements, and so-called 3D jobs (dirty, dangerous, and difficult), that is, jobs characterized by difficult working conditions and low social status (Piore 1979, 40; Doeringer and Piore 1970, 272; de Haas, Castles, and Miller 2020, 53, 276). It is precisely in such jobs that shortages of domestic labor most commonly occur, since the local population tends to seek more stable and socially prestigious employment (Piore 1979, 27). In accordance with dual labor market theory, the simultaneous existence of unemployment and available jobs in the secondary segment does not represent a contradiction (Wachter 1974, 639-640).

Although dual labor market theory begins with the basic division into primary and secondary segments, Piore's approach does not exclude the possibility of further internal differentiation within them (Doeringer and Piore 1970, 274-276; Piore 1972, 2-6). Such differentiation is particularly relevant given the complexity of Serbia's labor market identified by Paunović et al. (2005, 20). On this basis, the secondary segment should not necessarily be viewed as a homogeneous category either. Uys and Blaauw (2006, 251-254)

point to different levels of segmentation between more formal and more informal forms of employment, while Hudson (2007, 288) distinguishes low-paid formal jobs from informal and illegal forms of employment. Jobs within the secondary segment can therefore differ according to their degree of formalization, stability, and institutional protection.

Although most domestic workers avoid such jobs, certain categories of the population nevertheless accept them. Piore (1979, 87; 1986, 24) identifies among these groups peasants, housewives, young people and students, and pensioners. These groups constitute what can be understood as the traditional reserve labor force for secondary-segment jobs. A common characteristic of these groups is that secondary jobs represent a supplementary source of income or a temporary activity, while their social status is determined primarily by other life roles, such as their own farm, family, education, or pensioner status (Massey et al. 1993, 443; Piore 1979, 87-89). However, when an economy develops a chronic need for a large volume of cheap labor, these categories of the domestic population are no longer sufficient to meet demand because of their geographical and demographic limitations, leading employers to turn to international migrants (Piore 1986, 24).

2.1.2. International Dimension of Dual Labor Market Theory

While the previous section focused on the internal structure of the labor market and the characteristics of its segments, the international dimension of dual labor market theory explains how this very structure generates international migration flows. In *Birds of Passage*, Piore (1986, 23) extends dual labor market theory to the international dimension and thereby introduces it into the field of migration studies. Within this framework, international migration of workers from underdeveloped regions to low-paid sectors of developed industrial economies is viewed as a structural phenomenon, rather than exclusively as the result of individual migrant decisions (Piore 1986, 23; 2014, 2).

Piore (1979, 12) explicitly states that dual labor market theory was not developed with the aim of explaining all forms of international migration, excluding from its analytical framework short-distance cross-border migration and migration of agricultural workers. However, he later applies the basic mechanisms of the theory to examples of agricultural migration, particularly through the process of replacement migration (Piore 1979, 130-133). Later research further shows that dual labor market theory is also applied in analyses of labor markets and labor migration in agriculture (Hoggart and Mendoza 1999; Rye and Scott 2018; Finlayson et al. 2025).

The central proposition of the international dimension of dual labor market theory is that developed industrial countries have a persistent and structural need for cheap and flexible labor, which represents a key driver of international migration (King 2012, 16; de Haas, Castles, and Miller 2020, 53). This need arises from demand for workers willing to perform jobs in the secondary segment of the labor market that the domestic population generally rejects because of their low social status (Piore 1979, 26-27). Demand for migrant labor therefore represents the principal pull factor of international migration (King 2012, 16), while push factors are considered insufficient to explain migration if there is no structural demand for migrants in developed countries (Massey et al. 1993, 440-441).

Unlike the common understanding of migration as permanent relocation, Piore (1979, 50-51, 95) argues that labor migration is fundamentally temporary in character. Migrants most often go abroad with the intention of achieving a predetermined financial objective and subsequently returning to their country of origin, which is why their social identity remains strongly tied to their home community. For this reason, temporary migrants perceive jobs in the secondary segment of the labor market differently from the domestic population, since their social status is not determined by the position they occupy in the destination country, but by how they are evaluated in their home community (Piore 1979, 54). Differences in living standards mean that even lower wages earned abroad may represent substantial progress relative to conditions in the country of origin, while work abroad and remittances bring migrants status and prestige in their home environment (Massey et al. 1993, 442). Since migrants view migration as temporary, they are considerably less affected by limited opportunities for advancement and employment insecurity in the secondary segment (Piore 2014, 3).

Piore (1979, 58, 130-132) emphasizes that intensive emigration from less developed agrarian areas of migrant origin contributes to the declining social prestige of traditional agricultural jobs, which over time are rejected not only by returning migrants but also by members of the domestic population who have never left the country of origin. Under such circumstances, these regions experience labor shortages in jobs belonging to the secondary segment of the labor market, which further encourages international migration (Piore 1979, 58). The resulting shortage is filled by migrants from even poorer regions, for whom the same jobs represent social and economic advancement relative to the opportunities available in their country of origin, thereby creating a process of replacement migration (Piore 1979, 58).

In addition to the structural factors that encourage international migration, Piore also points to the importance of institutional mechanisms that connect labor supply and demand. Formal recruiters play an important role in this process by linking countries of origin and destination countries and facilitating labor mobility. Piore emphasizes that labor, as a rule, does not display a strong tendency toward emigration before an organized recruitment process begins. The presence of formal recruiters helps explain why some regions become major sources of emigration while others with similar economic, demographic, and social characteristics do not. Employers and their representatives, state institutions, and private employment agencies may all perform the role of formal recruiters (Piore 1979, 19-24; Massey et al. 1993, 459). However, once migration flows become established, limiting or stopping them becomes extremely difficult (Piore 1979, 19, 26). Over time, the maintenance of migration flows increasingly relies on social ties between migrants at destination and potential migrants in the place of origin, through which information about employment is transmitted, recruitment is organized, and assistance in finding work is provided (Piore 1979, 19, 104). Although Piore does not develop migrant networks as an independent theoretical concept, he clearly recognizes their importance for sustaining migration flows.

Piore explains the development of international migration from rural areas of developing countries as a gradual process unfolding through three interconnected stages. The first stage involves rural-to-urban migration of the agricultural population within the country of origin, which provides the basis for later international migration. In the second stage, rural-to-urban migrants or their descendants, who aspire to attain middle-class status but face limited opportunities for further social mobility in the country of origin, emigrate to the industrial centers of developed countries. Finally, in the third stage, direct emigration occurs from rural areas to developed countries. Such a development becomes possible because migrants from the preceding stage establish migrant networks and institutional ties connecting rural areas in the country of origin with the destination country, thereby facilitating the international migration of the rural population (Piore 1979, 137-140).

Although Piore starts from the assumption that labor migration is primarily temporary in character, he recognizes the possibility that temporary migrants may eventually settle permanently in the destination country. As their stay becomes longer, their initial orientation toward the country of origin may weaken, while their expectations and aspirations become increasingly shaped in relation to the receiving society. As a result, migrants, and especially

their descendants, may become less willing to accept jobs in the secondary segment of the labor market, which may create a need for new inflows of migrant labor (Piore 1979, 95-98).

Although dual labor market theory was originally developed to explain migration to developed industrial economies, its basic mechanisms are also applied to contemporary migration flows between countries of the Global South. In such cases, relative differences in levels of economic development and wages can produce a similar pattern: workers from less developed countries migrate to other countries of the Global South that are economically more developed than their countries of origin and take up low-paid and socially undesirable jobs abandoned by domestic workers, but which represent relative economic advancement for migrants (Rye and Scott 2018, 932-933; Finlayson et al. 2025, 11). Dual labor market theory, however, primarily explains structural demand for migrant labor in destination countries, while cumulative causation of migration provides a more detailed account of the mechanisms through which migration flows, once established, are maintained and reproduced.

2.2. Mechanisms of Cumulative Causation

Unlike dual labor market theory, which focuses primarily on the macro level and on demand for migrant labor in destination countries, cumulative causation theory emphasizes social processes in communities and countries of origin that contribute to the maintenance and expansion of migration flows (de Haas 2007, 41). The theory of cumulative causation was first developed by Gunnar Myrdal in 1957 and was later further elaborated in the field of international migration by Douglas Massey (Massey 1990, 4-5; Castles, de Haas, and Miller 2014, 31-44). The theory starts from the assumption that migration becomes self-sustaining and self-reinforcing, so that one migration flow gradually creates conditions for further migration (Massey et al. 1993, 451, 461; Castles, de Haas, and Miller 2014, 44). The cumulative character of this process arises because migration progressively changes the social conditions in communities of origin, thereby shaping the context in which subsequent migration occurs (Massey et al. 1993, 451).

Cumulative causation theory represents a logical continuation of some of Piore's arguments, since Piore (1979, 19, 104) recognizes the importance of social ties in sustaining already established migration flows, while Massey et al. (1993, 451-452) systematizes this process through the concept of cumulative causation. Within this theory, the self-sustaining character of migration flows is explained through several interconnected mechanisms, among which migrant networks, relative deprivation, and the culture of migration are particularly

important (Massey et al. 1993, 448-461), while the broader consequences of their cumulative effects can be understood through the concept of the migrant syndrome (de Haas 2007, 40-45). These concepts should not necessarily be understood as intrinsic components of cumulative causation theory, but rather as mechanisms through which the cumulative character of migration can be explained.

2.2.1. Migrant (Social) Networks

Migrant networks are formed through social relationships between people in countries of origin and destination, including migrants, returnees, and those who have not migrated, with these relationships commonly based on family, friendship, or shared community background (Massey et al. 1993, 448-449). As a form of social capital, they provide access to information, employment, and various forms of assistance in the destination country, thereby facilitating migration (Massey et al. 1993, 448; de Haas, Castles, and Miller 2020, 65). Although Piore (1979, 19, 104) does not develop migrant networks as an independent theoretical concept, he recognizes the same mechanism through the importance of family, friendship, kinship, and community ties for the maintenance and further expansion of migration flows.

The first migrants who move to a new destination generally lack established social ties, which makes the costs and risks of their migration considerably greater (Massey et al. 1993, 449). For this reason, the first migrants are most often lower-middle-class individuals, who have greater financial resources available to cover migration costs (Massey 1990, 8). As migrant networks develop, the costs and risks of migration gradually decline, allowing migration flows to encompass an increasingly broad segment of the population, particularly lower-income persons and those from rural areas (Massey et al. 1993, 450, 461). Migrant networks thereby facilitate the transition from the second to the third stage of Piore's migration process by making international migration more accessible to the rural population as well.

The mechanism described above demonstrates the connection between migrant networks and cumulative causation, since the expansion of migrant networks reduces the costs and risks of migration, thereby increasing the likelihood of further migration. At the same time, new migration contributes to the further expansion of migrant networks, which in turn further facilitates subsequent migration, creating a self-sustaining process of cumulative causation (Massey et al. 1993, 448-450; Rye and Scott 2018, 936).

2.2.2. Culture of Migration

A culture of migration develops when migration becomes a widespread phenomenon within a particular community, since over time it affects the attitudes, expectations, and life goals of its population. The experience of living and working in more developed societies changes migrants' aspirations, encourages the pursuit of greater social mobility and the adoption of new consumption patterns, and thereby makes migration an increasingly desirable strategy for social and economic advancement. As migration becomes more frequent, it gradually becomes embedded in the social norms and values of the community of origin. Going abroad becomes a common way of achieving a better standard of living and higher social status, particularly among younger generations (Massey et al. 1993, 452-453; Castles, de Haas, and Miller 2014, 44, 72).

Within the process of cumulative causation, the culture of migration is further reinforced through the experiences of previous migrants. Return migrants demonstrate the economic success achieved abroad, thereby encouraging migration aspirations among those who have not yet emigrated (Piore 2014, 4). Such changes are particularly significant among young people in rural areas, where traditional activities, including agriculture, become less desirable, while aspirations toward life outside rural areas increase (de Haas 2007, 45; 2012, 11; Castles, de Haas, and Miller 2014, 72). These changes in values and aspirations build on Piore's (1979, 58, 131) observations that international migration contributes to declining interest among the local population in traditional agricultural jobs, thereby creating conditions for the continuation of migration flows and the deepening of labor shortages in agriculture.

2.2.3. Relative Deprivation

The concept of relative deprivation is most commonly associated with the New Economics of Labor Migration (NELM), but it has also been used to explain one of the mechanisms through which cumulative causation operates. Relative deprivation is based on the proposition that the decision to migrate depends to a considerable extent on comparing one's own economic position with that of other members of the community (Massey et al. 1993, 458; de Haas, Castles, and Miller 2020, 55). When some families substantially improve their incomes through migration, other households in the local community may begin to experience relative deprivation. This encourages them to migrate as well in order to reduce perceived differences in living standards, thereby creating a process of cumulative causation

(Massey et al. 1993, 451-452; Massey 1990, 13-14). Assessing success in relation to the community of origin, as an indicator of relative wealth or poverty, is complementary to Piore's view that migrants evaluate their social status in relation to the community of origin rather than the destination community (de Haas, Castles, and Miller 2020, 55).

Although poorer households are often the most strongly motivated to migrate, their limited financial resources and the high costs of migration represent a significant barrier, meaning that migration becomes more accessible only with the development of migrant networks that reduce its costs and risks. Until then, it is relatively deprived individuals and families who are better off economically that are more likely to migrate (Massey et al. 1993, 451; Massey 1990, 13-14). The effects of migrant networks and relative deprivation reinforce one another, since networks facilitate the realization of migration intentions, while feelings of relative deprivation increase the motivation to migrate (de Haas, Castles, and Miller 2020, 69).

2.2.4. Migrant Syndrome as a Consequence of Cumulative Causation

The concept of the migrant syndrome points to the broader consequences of cumulative migration processes for communities of origin, in which migration represents a process of labor and human-capital outflow from developing countries, particularly from their rural areas (de Haas 2007, 42-43). According to this understanding, migration creates a vicious circle in which underdevelopment encourages further emigration, while emigration in turn further deepens the underdevelopment of the country of origin. Such communities may become dependent on remittances and increasingly oriented toward migration, thereby further encouraging the reproduction of migration flows (de Haas, Castles, and Miller 2020, 335). Piore (2014, 4) identifies one visible manifestation of such processes in rural communities where the economic success of migration becomes visible through large residential houses that at the same time remain unoccupied for much of the year.

While the literature most commonly emphasizes the problem of the outflow of highly educated workers (brain drain), for developing countries the departure of younger and working-age populations predominantly from rural areas, known as brawn drain, may be particularly significant (de Haas 2007, 43). This form of migration can reduce the availability of labor in local economies, which may represent a substantial constraint for agriculture and other labor-intensive activities.

On the basis of the theoretical propositions presented above, dual labor market theory and cumulative causation theory can be viewed as a complementary framework for analyzing the position of seasonal raspberry harvesting in the labor market and the processes that influence the availability of labor for performing it. Dual labor market theory makes it possible to examine the position of seasonal harvesting and the traditional sources of labor for jobs in the secondary segment, while cumulative causation theory explains how migration flows are maintained and expanded, while at the same time transforming communities of origin and the availability of their labor force.

3. Methodology

This research combines several methods to examine the structural processes associated with the formation and persistence of the labor market gap in raspberry production and possible policy responses. The overall research design is a case study of raspberry production in Serbia, supported by statistical data, academic and institutional literature, and content analysis of media articles. The policy section additionally uses comparative analysis of temporary labor migration programs and a theory-informed approach to the analysis of possible policy responses.

3.1. Case Study: The Raspberry Sector in Serbia

The main research design of the thesis is a case study of raspberry production in Serbia. This approach allows the labor shortage to be examined within a clearly defined sector, while also connecting it with broader changes in labor supply, agricultural employment, and rural areas. The study also has a longitudinal dimension, since different parts of the analysis cover changes over time and combine statistical data, academic and institutional literature, and content analysis.

Raspberry production was selected because of its economic importance, its role in rural areas, and its strong dependence on labor. Production is especially concentrated in Western Serbia and the Šumadija region and is largely based on family farms, while harvesting requires a large amount of work in a short period and often creates a need for additional seasonal workers. These characteristics, together with the persistent difficulties in finding enough seasonal labor, make raspberry production a suitable case for examining how long-term changes in the labor base are connected with current labor shortages.

The case is examined at three connected levels. At the macro level, the analysis focuses on migration and changes in the traditional sources of reserve labor force. At the meso level, it examines how these changes are reflected in the labor capacities and organization of family farms. At the micro level, it analyzes the development of the labor market gap and its relationship with changes in the scale of raspberry production. Agriculture therefore provides the broader context, while raspberry production remains the main case through which these processes are examined.

3.2. Content Analysis

In the empirical part of the thesis, a mixed quantitative-qualitative content analysis of media articles dealing with seasonal labor in raspberry production in Serbia is applied. The corpus consists of articles published on the portals RTS, N1, Nova S, Danas, Blic, Večernje novosti, Telegraf, Kurir, and AgroKlub between 2015 and 2025. The sample includes different types of media, including public service, news and analytical, commercial, tabloid, and specialized agricultural portals.

The texts were collected using key terms such as “raspberry,” “raspberry pickers,” “daily wage,” “labor shortage,” and “seasonal workers.” Articles were included if they contained information on the availability or sufficiency of seasonal labor and/or the daily wages offered to raspberry pickers, while articles dealing exclusively with unrelated topics such as purchase prices, exports, and producer protests were excluded. The resulting purposive corpus of 60 articles was designed to examine reported changes in the availability, cost, and manifestations of seasonal labor shortages over time rather than to represent all media reporting on raspberry production.

For each article, the coded categories included labor availability and interest in seasonal work, the amount and assessment of daily wages, stated causes and consequences of labor shortages, the workforce groups represented, the actors making the statements, and the tone of reporting. With the exception of the amount of daily wages, categories were coded according to their presence in each article and were not mutually exclusive, allowing their frequency and distribution across years and different phases of the observed period to be examined. The complete coding matrix, including the information recorded for each article and the assigned codes, is provided in Appendix A.

The analysis is not used to estimate the actual magnitude of the labor shortage or the number of missing workers, since media articles do not provide a systematic measure of labor supply and demand and the purposive corpus does not allow code frequencies to be interpreted as estimates of the prevalence of labor shortages in raspberry production as a whole. Instead, its longitudinal structure is used to examine the persistence and changing manifestations of reported labor shortages between 2015 and 2025, including their relationship with reports of sufficient labor availability, daily wages, and producers' responses. The findings are interpreted together with statistical data and academic literature as an auxiliary empirical source for examining the development of the labor shortage and its relationship with broader changes in labor supply, production, and the organization of work.

3.3. Comparative Analysis of Temporary Labor Migration Programs

A comparative analysis is used in the policy section of the thesis to examine institutional approaches to temporary labor migration and to support the development of a program adapted to seasonal employment in Serbia's raspberry sector. The analysis focuses on three purposively selected programs: the Canadian Seasonal Agricultural Worker Program (SAWP), the British Seasonal Agricultural Workers Scheme (SAWS), and the Canadian Low-Skilled Pilot Project (LSPP). These cases were selected because they are sufficiently documented and exhibit relevant differences in institutional organization. Programs from other countries are used as supplementary examples of specific institutional arrangements.

The selected programs are compared through four dimensions: (1) institutional organization and recruitment; (2) access to the program and mechanisms for controlling the volume of foreign labor; (3) temporariness, seasonality, circularity, and workers' mobility; and (4) workers' position, protection, and the distribution of costs and responsibilities. The purpose is not to rank the programs according to their overall success, but to identify institutional characteristics, advantages, limitations, and design choices relevant to the Serbian context.

The analysis is theoretically informed by dual labor market theory, particularly Piore's explanation of structural demand for migrant labor in secondary labor market segments. The comparative findings are subsequently assessed in relation to Serbia's legal, institutional, labor market, and migration context in order to identify institutional elements potentially applicable in Serbia and formulate a temporary labor migration model adapted to the conditions of raspberry production and the identified labor market gap in Serbia.

3.4. Theory-Informed Analysis of Public Policies

In the policy section, the thesis uses a theory-informed approach to examine possible responses to the labor shortage in raspberry production. The theories used in the thesis, especially dual labor market theory, do not provide direct policy solutions, but help identify the mechanisms behind the problem and where policy intervention may be possible. The proposed measures are therefore developed by combining theoretical insights with the findings of the empirical analysis, the literature on labor shortages in agriculture, and the relevant institutional and sectoral context in Serbia.

The analysis considers four main policy options: temporary labor migration, improvement of seasonal working conditions, labor-saving mechanization, and increasing the self-reliance of farms. Particular attention is given to temporary labor migration as a possible way of expanding the supply of seasonal labor. Given the limitations of this approach and the multidimensional character of the identified labor market gap, the analysis also considers the other three policy options, which address different dimensions of the problem. The institutional design of the temporary labor migration program is examined through a more detailed comparison of existing international programs, while the remaining options are analyzed through theoretical insights, empirical findings, and relevant domestic and international literature.

II. The Raspberry Sector and Its Labor Market Gap

4. Raspberry - Serbia's "Red Gold"

4.1. Agriculture and Fruit Growing as Pillars of Serbia's Economy and Rural Development

Agriculture represents one of the important sectors of Serbia's economy, with a significant role in the national economy, rural development, and job creation (Korhecz et al. 2025, 206). During the twenty-first century, agriculture has retained relatively high importance for the Serbian economy compared with developed economies, which has also been reflected in a higher share of agricultural employment than in European Union countries (Arandarenko 2011, 25). According to World Bank (2019, 7), around 17.4% of the population was employed in agriculture, while the sector accounted for 5.4% of the value of total exports, including primary agricultural products and processed goods. The importance of agriculture is particularly evident in foreign trade, since Serbia is the only Western Balkan country to record an export surplus in trade in agricultural and food products (Gligorov et al. 2011, 38). Fruit accounts for around 20% of total agricultural exports (FAO 2020, 14), with berries, led by raspberries, occupying a particularly important position (Keserović 2025, 66).

Agriculture is closely connected with the rural areas of Serbia, since it represents the dominant activity of rural households and an important component of local labor markets. Agricultural employment is particularly pronounced among the rural population, while labor for agricultural production is recruited predominantly from rural areas themselves (Bogdanov and Babović 2014, 24, 68). For a large number of households, agricultural production represents an important source of income (Korhecz et al. 2025, 222), with the dominant production model based on family farms. At the same time, labor market changes and demographic trends represent a growing challenge for agricultural production. Since agricultural production depends to a large extent on labor from rural areas, a decline in the rural population also means a reduction in the pool of potential agricultural workers (Korhecz et al. 2025, 221). Preserving the labor force is therefore one of the important preconditions for the sustainability of agricultural production and rural development (Popović 2025, 729-730).

Within the agricultural sector, fruit growing occupies a particularly important position and ranks among the most profitable branches of agricultural production (Kljajić 2025, 11). Its importance is also reflected in its contribution to rural development through the creation of employment and the development of processing and transport infrastructure, thereby contributing to population retention in rural areas (Kljajić 2025, 9-10). Compared with other branches of agriculture, particularly arable farming, fruit growing is several times more labor-intensive and often depends on seasonal labor (Urošević et al. 2011, 79-80). At the same time, the value of fruit production per unit of area can be 10 to 15 times higher than that of wheat or maize production (Kljajić and Vuković 2014, 445).

Serbia has favorable natural conditions for the development of fruit production, which are particularly pronounced in Western Serbia and Šumadija, where orchards are also most widely represented (Kljajić 2025, 7-8). Within fruit production, berries occupy a particularly important position, with production in Serbia primarily including strawberries, raspberries, blackberries, blueberries, and currants (Kljajić et al. 2023, 92; Kljajić 2025, 11). In terms of its share among fruit crops, raspberry ranks fourth, accounting for 9.7% of the total area under fruit, behind plum (37%), apple (13.8%), and sour cherry (9.8%) (Kljajić 2025, 8-9). Nevertheless, Kljajić and Vuković (2014, 451) identify raspberry as the most profitable fruit crop in Serbia. Its importance for Serbian agriculture and rural areas therefore considerably exceeds its share in the total area under fruit, which is why raspberry is today regarded as the most important berry crop in Serbia.

4.2. Development of Raspberry Production and Serbia's Position in Global Production

The development of raspberry's position as one of the most important fruit crops in Serbia was not accidental, but rather the result of a long historical process, favorable natural conditions, and adaptation to the demands of the international market. Raspberry (*Rubus idaeus* L.) originates from Asia, while it appeared in Serbia around 1880, when it was cultivated primarily for its medicinal properties (Kljajić et al. 2022, 93; 2023, 92). More significant development of commercial production began after the First World War, while during the 1970s, with the intensification of production, raspberry developed into one of Serbia's most important export products (Kljajić and Subić 2022, 32; Veljković et al. 2025, 183; Kljajić and Vuković 2014, 452). Mass production in the late twentieth and early twenty-first centuries (Kljajić and Subić 2022, 32) contributed to raspberry production having a

significant impact on the development of Serbia's economy and rural areas (Kalanović-Bulatović et al. 2015, 1019).

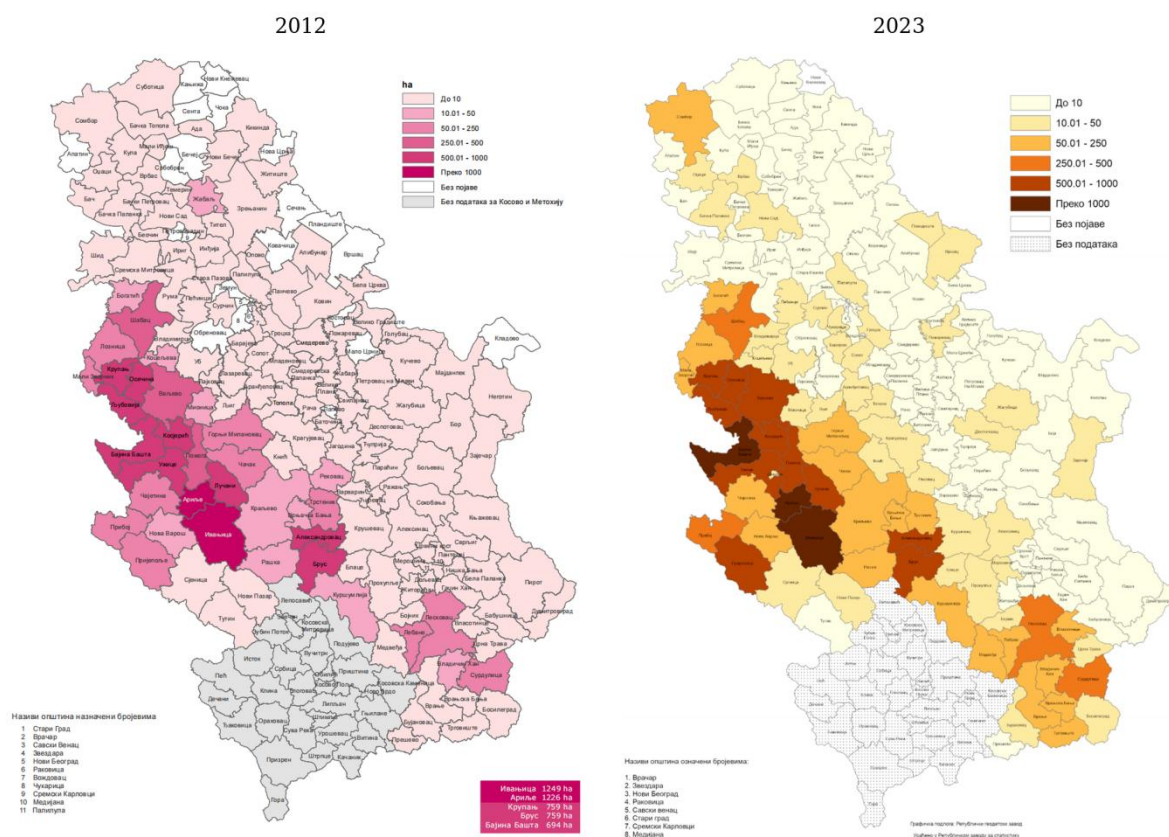
The development of raspberry production in Serbia was shaped not only by historical circumstances, but also by exceptionally favorable natural conditions that enabled its intensive expansion. Particularly important are the favorable climate and soil, which support high yields per hectare, while the decades-long tradition of production in certain parts of Serbia contributed to the development of a distinct “culture of raspberry cultivation,” which became part of the local rural identity (Kljajić and Subić 2022, 33; Kljajić and Vuković 2014, 453). These foundations also supported the development of high-quality Serbian raspberries, with the Arilje area standing out in particular, where producers, after achieving very high yields (Kljajić et al. 2025, 528), turned their attention toward further improving fruit quality. As a result of this development, “Arilje Raspberry” became synonymous with quality, while raspberries produced in this area also received a geographical indication (Zarić et al. 2013, 361-363; Kljajić et al. 2023, 97).

Although raspberry is one of the most important fruit crops in Serbia, its plantations occupy a relatively small share of total agricultural land. Raspberry is cultivated on around 20,000 ha in Serbia (Kljajić 2025, 49-50), representing only about 0.6% of Serbia's total agricultural land. Although it occupies a relatively small share of agricultural land in spatial terms, the importance of raspberry production far exceeds its share in the use of land resources, as confirmed by Serbia's position among the world's leading raspberry producers and exporters. Europe accounts for approximately 65-70% of total global raspberry production, with more than 70% of European production coming from Russia, Serbia, and Poland (Sredojević et al. 2013, 64; Kljajić et al. 2023, 94). Between 2012 and 2021, Serbia produced an average of around 100,000 tons of raspberries annually, ranking third in the world behind Russia and Poland (Kljajić and Subić 2022, 33). Although Serbia's relative share has gradually declined as production has increased in other countries, it remains one of the world's most important producers, accounting for approximately one-fifth of global production according to more recent estimates (Kljajić et al. 2025, 523, 525).

Raspberry production in Serbia is highly regionally concentrated and takes place predominantly in Western Serbia and Šumadija, which account for 84.2% of total national production (Kljajić 2025, 44). Although raspberry production has gradually expanded into other parts of the country in recent years, the results achieved in those regions still do not reach the production levels characteristic of Western Serbia and Šumadija. Within this

production area, the Zlatibor, Moravica, Raška, Kolubara, and Mačva districts stand out in particular (Kljajić et al. 2023, 95-97), while among individual municipalities, Ivanjica and Arilje occupy a particularly important position, representing the core of Serbia's raspberry sector because of the greatest concentration of plantations and a long tradition of production. According to the 2023 Agricultural Census, raspberry plantations covered 2,041 ha in Ivanjica and 1,567 ha in Arilje (SORS 2024, 4). The spatial concentration of production and differences in the distribution of areas under raspberries in 2012 and 2023 are shown in the maps in Figure 1.

Figure 1. Area under Raspberries by Municipality in Serbia, 2012 and 2023



Source: Keserović et al. (2014, 74); Keserović (2025, 69)

4.3. Economic Importance of Raspberry Production in Serbia

One of the most important indicators of the economic importance of raspberry production in Serbia is its strong export orientation. In this respect, frozen raspberries represent one of the most important products in Serbia's foreign trade (Zarić et al. 2013, 360), the country's most important fruit export (Kljajić and Subić 2022, 31), and one of its most important agro-industrial export products (Kljajić 2017, 51). Serbia exports between 90% and

97% of its total raspberry production to international markets (Wróblewska et al. 2019, 73), with as much as 98% of exports taking the form of frozen raspberries (Keserović 2025, 66).

A consequence of this strong export orientation is the high export revenues generated by frozen raspberry exports. Based on data from the Statistical Office of the Republic of Serbia, the average annual value of frozen raspberry exports between 2015 and 2025 amounted to USD 290.8 million (SORS 2026). In 2021, frozen raspberry exports reached a peak value of USD 426.1 million, accounting for as much as 41.7% of the total value of fruit exports from Serbia (SORS 2026). At the same time, raspberries account for approximately 10% of the total value of Serbia's food exports (Veljković et al. 2025, 183). Owing to this high export value, raspberry production generates a significant net foreign-exchange effect (Dimitrijević and Ceranić 2011, 171; Veljković et al. 2025, 183; Nedeljković et al. 2024, 3239).

The European Union represents the dominant export market for Serbian frozen raspberries, receiving around 80% of total exports (Kljajić and Subić 2022, 32; Veljković et al. 2025, 187). The most important buyers are Germany, France, and Belgium (Kljajić 2017, 50). At the same time, the international market is characterized by intense competition, with the competitiveness of an agricultural product being determined primarily by quality, price, and reliability of supply (Kljajić 2017, 49). Poland represents Serbia's main competitor on the European market (Kljajić 2017, 51), while Chile and China are major competitors on the international market (Kljajić et al. 2023, 101; Veljković et al. 2025, 188).

The long-standing economic importance of raspberry production is also illustrated by the fact that, at a 2016 presentation of the journal *Macroeconomic Analyses and Trends*, the performance of the information and communication sector was, among other things, compared with the raspberry sector (Nikolić 2023b, 86). These indicators support Kljajić's (2025, 39) assessment that, owing to favorable natural conditions, a long tradition of production, and strong export potential, raspberry has developed into one of Serbia's strategically most important agricultural products.

4.4. Importance of Raspberry Production for Rural and Local Development in Serbia

Rural development in Serbia is inseparably linked to the development of agriculture, since most agricultural activity takes place in rural areas (Pejanović et al. 2017, 1621). This

connection is further supported by the fact that as much as 96% of the population engaged in agriculture lives in rural areas, with their households playing an important role in sustaining rural life and village development (Gligorov et al. 2011, 37). The development of agriculture therefore affects not only the volume and value of agricultural production, but also represents one of the key factors in the economic and social development of rural areas.

Within agriculture, raspberry production stands out as an activity of particular importance for rural development, which is why some authors also attribute to it a potentially strategic role in the development of rural areas of Serbia (Sredojević et al. 2013, 63). In addition to its significant contribution to the national economy, its importance is particularly pronounced in Western Serbia and Šumadija, where it represents one of the key factors of rural development, especially in the municipalities of Ivanjica, Arilje, and Valjevo (Kljajić et al. 2025, 530). Family farms account for as much as 99.9% of total raspberry production in Serbia, confirming their dominant role in this production sector (Božić and Munćan 2007, 228). The contribution of raspberry production to rural development is not exclusively economic, but also encompasses social and environmental dimensions (Kljajić et al. 2025, 534-536).

For many households in Serbia, raspberry production represents an important source of income, while its profitability can play a significant role in their economic survival (Kljajić et al. 2023, 93) and contribute to reducing poverty in rural areas (Dimitrijević and Ceranić 2011, 163). Production is predominantly carried out on small family farms, with an average size of 0.26 ha (Keserović 2025, 66). At the same time, many households cultivate raspberries alongside primary employment in other activities (Kljajić et al. 2025, 520), using income from raspberry production as a supplementary source of income, while more than 50% of the total area under raspberry plantations is owned by persons employed outside agriculture (Dimitrijević and Ceranić 2011, 169; Veljković et al. 2024, 177).

The importance of raspberry production extends beyond individual family farms and is reflected in its contribution to the development of the broader rural community. Raspberry production generates income for all participants in the production chain, while simultaneously encouraging employment and greater participation of the population in rural areas, thereby contributing to the sustainability of rural life (Kljajić 2025, 80). The development of raspberry production has also encouraged the growth of an entire chain of related activities, from the organization of purchasing and processing to the storage and transportation of raspberries (Dimitrijević and Ceranić 2011, 168; Kljajić et al. 2025, 520;

Kalanović-Bulatović et al. 2015, 1018). Because of the sensitivity and perishability of the fruit, raspberry production depends heavily on the efficient organization of logistics and cold-storage facilities, which handle the purchasing, processing, storage, and marketing of raspberries on domestic and international markets (Kljajić 2025, 12; Zarić et al. 2013, 362; Veljković et al. 2024, 176). At the same time, raspberry production stimulates demand for fertilizers, plant-protection products, agricultural machinery, irrigation systems, and transport services, thereby contributing to the development of related economic activities and further strengthening the economic effects of raspberry production in rural areas (Dimitrijević and Ceranić 2011, 168; Martin 2020, 2).

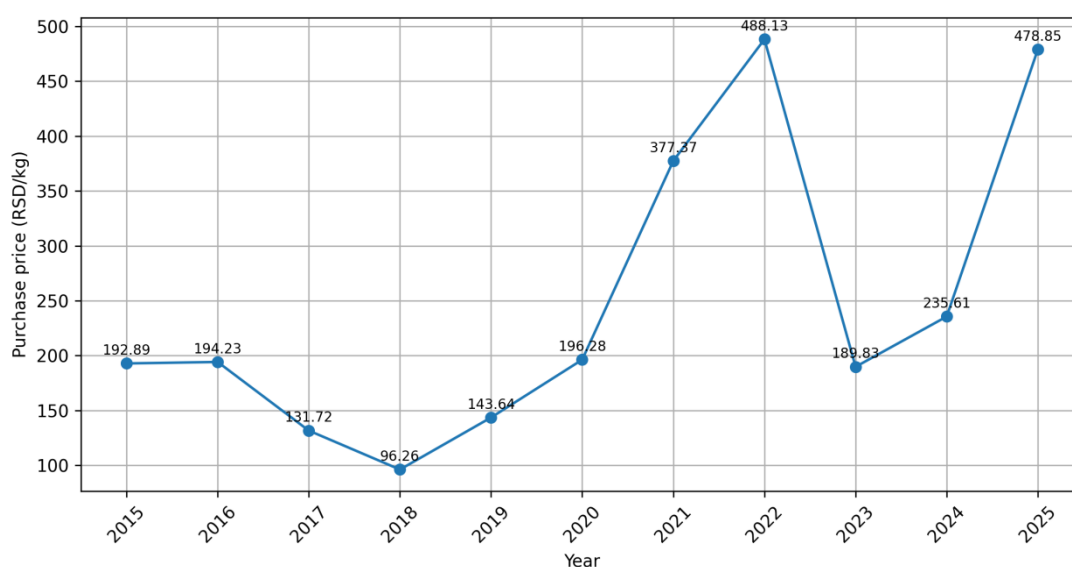
However, despite the considerable importance of raspberry production for family farms, local economies, and rural development, its further development and sustainability face numerous constraints, among which the problem of securing sufficient labor is of particular importance.

5. The Labor Problem in Raspberry Production

5.1. Production Challenges and the Shortage of Seasonal Labor

Raspberry production faces numerous challenges that affect its sustainability and further development. These challenges include unfavorable agroecological conditions, economic and market uncertainties (Leposavić 2023, as cited in Keserović 2025, 67), as well as problems in the organization of production that may limit its efficiency and competitiveness (Kljajić 2025, 82). Among the agroecological challenges, unfavorable weather conditions, diseases, and pests stand out as factors that can negatively affect yields and fruit quality (Kljajić 2025, 81). In addition to the significant initial investments required to establish plantations and the continuous costs of maintaining them (Ivanović and Gogić 2013, 321-323), producers have in recent years also faced significant increases in the prices of energy, mineral fertilizers, and other inputs used in agricultural production, with these costs further increasing as a result of the COVID-19 pandemic and the outbreak of the war in Ukraine (Nikolić 2023a, 135-137). At the same time, producers' operations are complicated by pronounced uncertainty in purchase prices, while volatility in the international market further increases production risk (Veljković et al. 2024, 177; Kljajić 2025, 13). The pronounced fluctuations are also reflected in trends in average raspberry purchase prices in Serbia from 2015 to 2025, shown in Chart 1.

Chart 1. Average Annual Raspberry Purchase Prices in Serbia (2015-2025)



Source: Kljajić (2025, 56)

Securing a sufficient number of seasonal workers occupies a particularly important place among these challenges, owing to the highly labor-intensive nature of raspberry production. Fruit production generally requires several times more labor per unit of area than arable farming, while raspberry stands out as one of the most labor-intensive crops within fruit production itself (Nedeljković et al. 2024, 3235; Kalanović-Bulatović et al. 2015, 1018). Wróblewska et al. (2019, 76) report that raspberry production has been identified as the most labor-intensive horticultural crop per hectare. The gradual ripening of the fruit and the labor-intensive nature of harvesting require substantial additional seasonal labor, whose costs may account for between 45% and 70% of total production costs (Veljković et al. 2024, 179; Wróblewska et al. 2019, 76). The scale of additional labor required is also indicated by the estimates of Dimitrijević and Ceranić (2011, 168), according to which raspberry production in Serbia required the engagement of around 21,000 additional workers annually, as well as Ivanović and Gogić (2013, 323), who several years later estimated a need for approximately 22,500 workers during harvesting.

Numerous authors point to difficulties in securing a sufficient number of seasonal workers. Since harvesting must be carried out within a short period, producers often find it difficult to mobilize the required workforce at the appropriate time (Petrović et al. 2017, 2). Kljajić (2025, 82) points to growing difficulties in finding enough seasonal workers in raspberry-producing areas across Serbia, which increasingly affects the ability of producers to carry out the harvest, while Marković et al. (2017, 568-570) and Veljković et al. (2025, 186)

point to the same problem. The significance of the problem is also indicated by its connection with changes in the scale of production, since Kljajić and Subić (2022, 32) identify labor shortages, together with low prices and the unprofitability of production, among the reasons for the reduction in the area under raspberries. Accordingly, Kljajić (2025, 83) classifies labor shortages among the key weaknesses of contemporary raspberry production in Serbia.

Although there is a high degree of agreement among authors regarding the existence of the shortage of seasonal labor, explanations of its causes are not uniform. The literature identifies demographic changes and rural depopulation (Bogdanov and Babović 2014, 26), migration of the young working-age population (Popović 2025, 735), and reduced interest among the local labor force in harvesting work (Kljajić 2017, 47) as possible explanations. These factors point to the complexity of the phenomenon and suggest that labor shortages cannot be explained by a single cause, but rather by the operation of several interconnected processes. However, before considering these possible causes, the nature of the problem itself and the extent to which it can be attributed to temporary market circumstances remain open questions. It is therefore necessary first to determine whether these are occasional difficulties characteristic of individual production seasons or a problem that persists over a longer period.

5.2. Persistence of the Labor Shortage Problem

The longer-term character of the problem in the broader context of Serbia's labor market is indicated by Reljanović (2023, 131-132), who notes that labor shortages have been present for a number of years and have become particularly pronounced since 2018. That the problem is long-standing and directly present in agriculture is also confirmed by the findings of Rašević (2016, 75-77, 87), who already in the mid-2010s pointed to a decline in the available labor force and the resulting situation in which part of the ripe fruit and vegetables remained unharvested. Its continued presence in agriculture is also indicated by FAO (2020, 122), according to which labor shortages have reached serious proportions in certain regions and are not limited only to periods of peak seasonal agricultural activity. The persistence of the problem directly in raspberry production is also indicated by the results of the content analysis for the period from 2015 to 2025. The shortage of seasonal workers appears in the analyzed media content in every individual year of the observed 11-year period and was explicitly recorded in 44 of the 60 articles analyzed. The continuous presence of the problem over 11 consecutive seasons indicates that difficulties in securing labor cannot be viewed merely as an isolated phenomenon characteristic of individual years.

The persistence of the problem becomes even more significant when considered alongside trends in daily wages for raspberry harvesting. The content-analysis data show that the average nominal daily wage increased substantially during the observed period, from approximately RSD 1,813 in 2015 to RSD 4,955 in 2025, while the shortage of seasonal workers continued to appear year after year. The increase in the nominal price of labor during the observed period was therefore not accompanied by the disappearance of difficulties in securing raspberry pickers.

The findings presented confirm that the shortage of seasonal labor in raspberry production has persisted over a longer period despite a substantial increase in nominal daily wages. This problem assumes additional significance in the broader context of Serbia's labor market, where Medić et al. (2022, 12) point to the simultaneous presence of a large number of unemployed persons actively seeking work and labor shortages identified by employers as one of the key problems. Such a finding is consistent with dual labor market theory, according to which the simultaneous existence of unemployment and available jobs in the secondary segment does not represent a contradiction, since unemployed domestic workers are generally unwilling to accept secondary-segment jobs (Wachter 1974, 639-640; de Haas, Castles, and Miller 2020, 54). This raises the question of whether seasonal raspberry harvesting possesses the characteristics of jobs in the secondary segment of the labor market.

5.3. Application of Dual Labor Market Theory to Seasonal Work in Raspberry Production

Starting from the theoretical proposition that the same occupation may belong to different segments of the labor market under different circumstances (Piore 1979, 18; Doeringer and Piore 1970, 272), and that job characteristics and the conditions under which work is performed are particularly important for distinguishing between these segments (Uys and Blaauw 2006, 250-251), it is necessary to examine the extent to which the characteristics of seasonal raspberry harvesting correspond to jobs in the secondary segment.

Agricultural wage labor is already identified within dual labor market theory as one of the typical examples of jobs in the secondary segment (Piore 1979, 57-58). This positioning is further supported by the characteristics of contemporary agricultural work, which the literature describes as physically demanding, involving long working hours and pronounced seasonality (Consterdine and Samuk 2015, 14), while Piro and Sanò (2017, 294) associate agricultural jobs with the characteristics of 3D jobs. In Serbia, these characteristics are

accompanied by relatively lower wages and a high level of informal employment. During the 2018-2022 period, officially registered average net salaries in agriculture were around 15% lower than the overall average, while informally employed workers accounted for 51.84% of total agricultural employment in 2023 (Korhecz et al. 2025, 211, 215). Although these characteristics correspond to the features of the secondary segment, the position of seasonal raspberry harvesting cannot be inferred solely from the position of agricultural work as a whole, but requires consideration of the characteristics of the specific job.

The characteristics of secondary employment are also directly present in seasonal raspberry harvesting. Its pronounced seasonality is particularly evident in Serbia, where harvesting lasts approximately 25-40 days (Kljajić and Subić 2022, 37; Veljković et al. 2024, 179). Such pronounced seasonality is also significant from the perspective of employment security, since seasonal work, because of the characteristics inherent in this form of engagement, is classified among precarious forms of work (Končar 2022, 473). King et al. (2021, 8) include raspberries among crops characterized by long and intense daily rhythms of physically demanding work. Pronounced seasonality and the physical demands of harvesting therefore correspond to the characteristics that dual labor market theory associates with temporary, unstable, demanding and labor-intensive jobs in the secondary segment.

On the basis of these characteristics, it can be concluded that seasonal raspberry harvesting represents a job in the secondary segment of the labor market. In this context, the finding of Kljajić (2017, 47) is also significant, as she points out that Serbia has a low-skilled and less-educated labor force that could meet the labor requirements of raspberry production during harvesting, but that the local labor force is not interested in performing this work. Such a finding corresponds to the theoretical assumption that labor shortages in the secondary segment do not necessarily arise from the absence of potential workers, but from their unwillingness to accept jobs with the characteristics of secondary employment.

Nevertheless, identifying the secondary character of seasonal raspberry harvesting does not fully determine its position in the labor market, since, as shown in the theoretical framework, the secondary segment itself is not a homogeneous category. In the context of agricultural work, Rye and Scott identify four characteristics on the basis of which jobs within the secondary segment can be further differentiated: duration of employment, including its seasonal character, degree of informality, method of worker engagement, and form of remuneration. The combination of these characteristics makes it possible to distinguish relatively more desirable from less desirable jobs within the secondary

agricultural labor market (Rye and Scott 2018, 933). The pronounced seasonality of raspberry harvesting clearly corresponds to one of these dimensions, while its position according to the other characteristics cannot be determined with equal precision on the basis of the available data. The limited possibility of positioning raspberry harvesting more precisely within the secondary segment does not, however, call into question its secondary character, which follows from the previously identified characteristics of the job itself.

Having established the position of seasonal raspberry harvesting within dual labor market theory, it is also necessary to specify how the previously identified labor shortage will be referred to in this thesis. De Haas, Castles, and Miller (2020, 54) use the term gap precisely in the context of explaining dual labor market theory. Malkowska and Drela (2024, 662) define a labor shortage as a mismatch between the demand for workers and their supply, while using the term labor gap interchangeably with it. The two terms will be used in the same way in this thesis. A structural gap is not viewed as a separate or more severe form of labor shortage, but as a gap in whose formation and persistence structural characteristics and processes in the labor market play a significant role. Establishing its structural character therefore requires more than simply identifying a mismatch between the demand for workers and their supply; it is also necessary to examine the nature of the processes that create and sustain that mismatch.

The fact that seasonal raspberry harvesting belongs to the secondary segment of the labor market does not, however, by itself demonstrate that the secondary nature of the job is the cause of the identified gap, nor does it exclude the possibility that other causes are at work. Such a conclusion would be particularly problematic given that the basic secondary characteristics of seasonal harvesting are long-standing, whereas the labor shortage has become particularly pronounced over the past decade. Explaining the gap therefore requires examining broader structural processes that have over time changed the size and availability of the categories of labor that traditionally constitute sources of labor supply for jobs in the secondary segment of the labor market. Particular attention will be given to migration processes and the transformation of the traditional reserve labor force as processes especially relevant to changes in the supply of seasonal labor in raspberry production.

III. Formation and Persistence of the Labor Market Gap

6. Macro Level: Structural Changes on the Labor Supply Side

To explain the contemporary labor market gap in raspberry production, it is first necessary to examine the long-term structural changes that have shaped the supply of labor in the rural areas of Serbia. Particular attention will be given to two interconnected macro-level structural processes. The first consists of migration processes, which, through rural-to-urban migration and emigration, gradually changed the demographic basis of the labor market by reducing the number of potential workers in rural areas. The second consists of changes in the employment patterns of the population that remained in these areas, which gradually transformed the traditional reserve labor force for jobs in the secondary labor market.

Although interconnected, these processes affect different dimensions of labor supply. Migration processes primarily change who participates in the labor market, while the transformation of the reserve labor force changes the way in which the remaining population participates in the labor market, that is, its availability for seasonal agricultural work. Since the secondary character of seasonal raspberry harvesting is not in itself sufficient to explain the labor gap, it is necessary to examine the long-term structural processes that have changed the size and availability of the traditional reserve labor force. Examining these two processes together makes it possible to determine how long-term changes on the labor supply side created the structural conditions in which the contemporary labor market gap in raspberry production developed.

6.1. Migration Processes and Rural Depopulation

In the international dimension of dual labor market theory, Piore (1979, 137-140) does not view the development of international migration as a single event, but as a gradual process that unfolds through several interconnected stages. According to his understanding, international migration is preceded by internal migration from rural to urban areas, followed by the emigration of the urban population, and only subsequently by the development of direct emigration from rural areas. This developmental pattern largely corresponds to the historical development of migration flows in Serbia after the Second World War, which is why the analysis will distinguish between rural-to-urban migration, urban emigration, rural emigration, and contemporary migration patterns. Their long-term persistence and

reproduction through established migrant networks will then be explained through the application of cumulative causation theory.

6.1.1. Rural-to-Urban Migration

After the Second World War, Yugoslavia faced pronounced rural overpopulation, unemployment, and a large share of unskilled labor in agriculture. Post-war population growth, particularly in economically underdeveloped areas, further increased the pressure on employment opportunities in rural areas (Gábrity Molnár 1997, 109-110). At the same time, rapid industrialization created a growing demand in urban centers for less-skilled labor, which directed the rural population toward cities (Gábrity Molnár 1997, 110), where they left agricultural production and the traditional way of life (Petricić et al. 2012, 8). In addition to economic factors, migration was also encouraged by state policies, primarily measures involving collectivization and the relocation of the agricultural population (Medić et al. 2022, 97). These migration flows represented the first stage of Piore's migration process, in which internal migration creates the basis for the subsequent development of international migration.

The scale of rural-to-urban migration permanently changed the demographic and economic structure of Serbia. According to the 1948 census, as many as 73% of the population lived in rural areas, while between 1953 and 1981 the urban population tripled (Petricić et al. 2012, 8-9). At the same time, the share of the agricultural population declined from 67.2% in 1948 to only 19.9% in 1981 (Gábrity Molnár 1997, 110). As a result of these processes, territorial polarization emerged between urban centers, which experienced demographic and economic growth, and rural areas, which gradually lost population and development momentum (Petricić et al. 2012, 8). Rural-to-urban migration therefore represented not merely a change in place of residence, but marked the beginning of a long-term redistribution of the working-age population between Serbia's rural and urban areas.

Rural-to-urban migration represented the dominant form of spatial population mobility until the mid-1960s. During this period, international migration was limited, since the post-war communist regime largely restricted the free international movement of the population, while the few exceptions were predominantly politically motivated (Rašević 2016, 39). However, the economic reforms of 1965 led to increased market competition and reductions in surplus employment in socialist enterprises, as a result of which domestic industry was no longer able to absorb new waves of rural labor (Stanković 2014, 7-8, 94). This exhausted the capacity of the existing model to address surplus labor through internal

migration and created the conditions for the next stage: the emigration of the urban population to the industrial centers of developed countries. The opening of employment opportunities abroad did not replace rural-to-urban migration but supplemented it with a new direction of mobility toward the developed countries of Western Europe (Bajić-Hajduković and Bernard 2023, 85).

6.1.2. Urban Emigration

The Yugoslav state's changing approach to international migration began in the early 1960s, alongside changes that gradually limited the ability of the domestic economy to absorb the available labor force. Faced with rising unemployment, rural overpopulation, and limited employment opportunities, the Yugoslav leadership began to view temporary economic emigration as a safety valve for alleviating pressures on the domestic labor market (Gábrity Molnár 1997, 110; Petrić et al. 2012, 10). The institutional framework was established through the opening of the borders in 1961 and the formal legalization of emigration in 1963, making Yugoslavia the first socialist country to allow its citizens this form of international labor mobility (Gábrity Molnár 1997, 110; Grečić 2017, 43). The state thus shifted from restricting international movement to institutionally facilitating it. Although this role of the state is not central to Piore's model, it shows that the transition from rural-to-urban migration to the phase of international emigration in Yugoslavia was also shaped by specific institutional circumstances.

According to dual labor market theory, international migration primarily results from structural demand for labor in developed countries rather than exclusively from economic difficulties in countries of origin. After the Second World War, rapid industrialization and economic growth in Western European countries created strong demand for workers in jobs that the domestic population was unwilling to accept, leading to the development of temporary foreign worker programs (Martin 2006, 29; Stanković 2014, 6, 15). In this context, Germany, France, and other Western European countries viewed Yugoslavia as a significant source of cheap labor (Piore 1979, 25), and included Yugoslav workers in temporary foreign employment programs (Stanković 2014, 15; Bobić and Babović 2013, 214-215). This is also supported by empirical research showing that Yugoslav labor emigration largely consisted of unskilled workers employed as guest workers in Western European countries (Bajić-Hajduković and Bernard 2023, 79). Mass emigration from Yugoslavia therefore cannot be explained solely by surplus labor in the country of origin, but also by the structural demand

of Western European labor markets and organized recruitment mechanisms (Piore 1979, 19-26; OECD 2022, 22).

Yugoslavia concluded bilateral agreements on the temporary employment of workers with Austria and France in 1965, followed by an agreement with the Federal Republic of Germany in 1968, as well as agreements with other Western European countries (Grečić 2017, 44). Most emigrants from Serbia went precisely to countries with which such agreements had been concluded, and according to the 1971 census, around 80% of international migrants were in Austria, the Federal Republic of Germany, and France (Stanković 2014, 95). Bilateral agreements and guest worker programs thus represented an institutional mechanism linking the structural demand of Western European labor markets with Yugoslavia's surplus labor force.

In accordance with the second stage of the migration process described by Piore, the first significant waves of international emigration did not originate directly from rural areas, but primarily from urban areas. This pattern is confirmed by Baučić's analysis of workers who left Yugoslavia for employment in the Federal Republic of Germany between 1965 and 1968. Of these workers, 54% came from urban settlements, although only 28% of the population lived in such settlements according to the 1961 census. In Serbia proper, this share was even higher, amounting to 83% (Baučić 1970, 28, 39). Baučić (1970, 41) concludes that, in its initial phase, the process of international employment begins in urban settlements and then gradually spreads through mixed settlements to rural settlements.

Baučić's (1971, 130) research shows that many workers who emigrated from urban settlements had moved from villages to cities shortly before going abroad. This finding corresponds to Piore's pattern of prior rural-to-urban migration, as well as to the concept of stepwise migration, in which international emigration is preceded by internal migration from rural to urban areas (Piore 1979, 139-140; Castles, de Haas, and Miller 2014, 6). Piore (1979, 137-140) associates the urban origin of the first international migrants with aspirations toward higher social status, but also with the greater availability of information, financial resources, and infrastructure necessary for international migration in urban centers. By establishing connections between the country of origin and the destination country, the first urban emigrants created the basis for the later participation of the rural population in international migration flows (Piore 1979, 137-140).

The selectivity of the first international migrants can be further explained through the migrant network and relative deprivation approaches. The relative deprivation approach shows that, although poorer households may be strongly motivated to migrate, the high costs of migration constrain their opportunities, which is why relatively deprived individuals and families who are better off tend to predominate among the first migrants (Massey 1990, 13-14; Massey et al. 1993, 451). At the same time, because migrant networks are still underdeveloped and the costs and risks of migration are high, the first migrants are most often individuals from the lower-middle strata, predominantly from urban areas, who have greater financial resources available to undertake migration (Massey et al. 1993, 449; Massey 1990, 8). Both approaches thus complement Piore's explanation of the selectivity of the first international migrants. As the migration process develops, these initial barriers gradually decline, creating the conditions for its expansion to the rural population.

6.1.3. Rural Emigration

The expansion of international emigration from the urban to the rural population corresponds to the third stage of the migration process described by Piore (1979, 139-140). Baučić (1971, 132) also identifies this development of the migration process, noting that as it expanded, the participation of the population from rural settlements increased, while the employment service in Yugoslavia sought to include unskilled workers from rural and previously less affected areas in international employment. This process was particularly pronounced in Serbia, where the majority of migrants in this period originated from rural areas, while during the 1970s employment abroad became widespread among the peasant population (Bajić-Hajduković and Bernard 2023, 85). This was also facilitated by the fact that agricultural workers gradually and in large numbers joined unemployed industrial workers on the "guest worker path," as domestic industry was no longer able to absorb them (Stanković 2014, 7).

With the formation of migrant networks, international emigration gradually became accessible to the population of rural areas as well. The connections established by the first migrants between the country of origin and the destination country reduced the costs, risks, and uncertainty of international migration, enabling people who had previously lacked the necessary economic and social resources to participate in migration flows (Massey et al. 1993, 448-450). This mechanism can also be observed in Yugoslav migration flows: Baučić (1970, 70-71) notes that relatives, friends, and acquaintances who were already working abroad

provided potential migrants with information, helped them find employers, and facilitated their adjustment to new living and working conditions.

While migrant networks facilitated international emigration by reducing its costs and risks, relative deprivation explains why an increasing number of people from rural areas were willing to take advantage of this opportunity. As the households of the first emigrants achieved substantially higher incomes through remittances, a sense of relative deprivation developed among other members of the community, further strengthening their motivation to participate in international migration (Massey 1990, 13-14; Massey et al. 1993, 451-452). A similar pattern is confirmed by sociological research on rural Serbia, according to which peasants of middle economic standing in Eastern Serbia often went abroad for work precisely in order to surpass the wealthiest households in their local community in material terms (Bajić-Hajduković and Bernard 2023, 84).

The scale of rural emigration can also be clearly observed in empirical data. Baučić (1971, 133) estimates that, of approximately 650,000 Yugoslav workers employed in European countries at the end of 1970, around three quarters, or approximately 487,000, were directly or indirectly connected to rural areas. In Serbia, more than 70% of emigrants who left the country between 1971 and 1990 originated from non-urban settlements (Rašević 2016, 43). Taken together, these data confirm Piore's third stage of the migration process, in which international emigration was no longer limited to the urban population but had also spread extensively to the rural areas of the country of origin.

The consequences of rural emigration were reflected not only in population decline but also in changes in its age and labor structure. Since emigrants were predominantly younger and working-age individuals, international migration led to a loss of manual labor capacity (brawn drain), thereby reducing the availability of workers in rural areas, particularly in agriculture and other labor-intensive activities (de Haas 2007, 43). In the context of Serbia, Stanković (2014, 9) further emphasizes the significance of the loss of physical labor, pointing out that the attention of the domestic professional community and the wider public is primarily focused on the emigration of highly educated people (brain drain), although, in his assessment, the migration of manual labor produces even more damaging consequences for the country's economic and demographic situation. Rural emigration therefore represented not only a continuation of the migration process but also a lasting weakening of the demographic and labor base on which agricultural production in Serbia's rural areas depended.

6.1.4. Cumulative Causation and the Long-Term Consequences of Migration

The 1973 oil shock and the growing perception that international migration had become difficult to control led Western European countries to gradually terminate temporary foreign worker programs, mainly between 1974 and 1980 (Martin 2006, 14; Grečić 2017, 44; OECD 2022, 22). However, the end of organized international recruitment did not mark the end of the migration process. Although guest worker programs were designed to be temporary, a large number of workers who emigrated in the late 1960s and early 1970s remained in the destination countries (Martin 2006, 10; OECD 2022, 22), while Yugoslav workers temporarily employed abroad spent an average of 11 years there (Stanković 2014, 9). Piore (1979, 19, 104) points out that once a migration flow has been established, restricting it becomes very difficult, while ties between migrants and the population in the country of origin assume an increasingly important role in transmitting employment information and recruiting new migrants. It is precisely this transformation of the migration process, in which migration gradually begins to sustain itself through its own social mechanisms, that is explained in greater detail by the theory of cumulative causation.

A cumulative perspective on the migration process is closely related to the migrant network approach (Massey et al. 1993, 453). Once established, migrant networks enabled each new instance of emigration to further facilitate subsequent departures, as a result of which migration flows gradually became less dependent on the initial economic and institutional incentives (Massey et al. 1993, 449-450). Baučić (1970, 71) observes a similar mechanism in Yugoslav migration flows, pointing out that a larger number of people from a particular area already working abroad also means more direct information for new potential migrants, thereby further encouraging the spread of migration from that area.

Although emigration temporarily slowed during the 1980s as a result of more restrictive immigration policies in Western European countries (Stanković 2014, 94), previously established migration destinations retained their long-term importance. Several decades after the guest worker period, in 2011 the largest number of migrants from Serbia were still located in Germany, Austria, and Switzerland, which together accounted for 53.7% of the total migrant population (Rašević 2016, 23). Marjanović (2015, 8) largely associates the long-term attractiveness of these destinations, particularly for migrants with medium and lower levels of qualifications, with previously established and well-developed migrant networks, which facilitate the departure and integration of new migrants.

The cumulative character of the migration process, however, does not operate solely through the expansion of migrant networks. As international migration becomes increasingly widespread, it gradually changes the social context in the country of origin as well, including the norms, values, and life goals of the population (Massey et al. 1993, 452-453). In the case of Yugoslav guest workers, the results of working abroad became directly visible to the local population during migrants' frequent visits to their places of origin, when they brought back savings and goods acquired abroad, as well as through the construction of large family houses and the purchase of agricultural machinery, which represented symbols of migrants' social recognition and success (Bajić-Hajduković and Bernard 2023, 77, 84). Such visibility of economic and social success contributed to the development of a culture of migration, while the effects of relative deprivation can also be recognized, since the improved position of migrant households could increase feelings of relative deprivation among those who had not migrated (Massey 1990, 13-14; Massey et al. 1993, 451-453). As such patterns spread, migration gradually became a socially accepted strategy for economic and social advancement, while traditional patterns of life and work in rural areas became less desirable (de Haas 2007, 45; 2012, 11). Once established, the culture of migration further contributed to the reproduction of migration flows by becoming embedded in the values and expectations of the community of origin (Massey et al. 1993, 452-453).

The long-term interaction of migrant networks, relative deprivation, the culture of migration, and other cumulative effects can lead to the development of what the literature refers to as the migrant syndrome, in which society becomes strongly oriented toward migration and dependent on remittances, while its local development potential weakens (de Haas, Castles, and Miller 2020, 335). In the Yugoslav context, Barać, Živojinović, and Ćuković (2024, 33) associate the migrant syndrome with changes in cultural ideals and ways of life, specifically with the formation of living standards whose achievement becomes associated with emigration from the existing, most often rural, environment. The authors assume that this process encouraged chain migration and contributed to the gradual "dying out" of villages. The long-term persistence of an orientation toward emigration is also indicated by contemporary research, according to which around 70% of young people in Serbia express a desire to emigrate (Rolandi and Elia 2019, as cited in Bajić-Hajduković and Bernard 2023, 93). The significance of migration and remittances in contemporary Serbia is also demonstrated by the fact that remittances exceed EUR 3 billion annually and account for around 15% of gross domestic product (Bajić-Hajduković and Bernard 2023, 80-81).

The consequences of these decades-long migration processes are particularly pronounced today in the rural areas of Serbia. The scale of their demographic decline is indicated by the fact that between 2002 and 2022 the rural population decreased by 22.8%, or by around 740,000 people, while the urban population declined by 11.3% over the same period (Institut ekonomskih nauka 2025, 24). The long-term emigration of younger and working-age people, together with the simultaneous aging of the remaining population, has led to rural depopulation, a decline in the agricultural population, and a weakening of the development potential of rural areas (Grečić 2017, 36; Nikolić and Maksimović 2024, 76; Petrić et al. 2012, 7, 10-11; Rašević 2016, 16), which is why some authors describe contemporary demographic trends using terms such as demographic devastation, demographic extinction of villages, and advanced demographic aging (Stanković 2014, 99). Among the manifestations of this process, Stanković (2014, 7) also identifies an increase in the number of elderly households and abandoned or insufficiently cultivated agricultural land. At the same time, around 15% of villages have already become completely depopulated, while more than one thousand villages have fewer than 100 inhabitants (Pejanović et al. 2017, 1626).

The effects of these demographic processes extend directly to agriculture. Medić et al. (2022, 64) point out that international demand for workers, which encourages emigration, particularly affects agriculture in countries of origin. This pattern is clearly evident in Serbia, since younger and working-age people represent the main labor potential of agriculture, while their departure further complicates the generational renewal of farms the continuation of agricultural production (Bogdanov and Babović 2014, 26; Popović 2025, 735). Labor-intensive agricultural sectors that depend heavily on the availability of seasonal labor are particularly affected, which is why the outmigration of the population from rural areas today represents one of the more serious threats to the development of raspberry production in Serbia (Kljajić 2025, 83-84). International migration therefore represents one of the long-term structural processes that, by reducing the demographic and labor base of rural areas, contributed to creating the conditions for the emergence of the contemporary labor market gap in raspberry production.

6.2. Transformation of the Reserve Labor Force in Rural Serbia

The previous section showed that long-term migration processes, through rural-to-urban migration and emigration, led to a gradual decline in the population of Serbia's rural

areas and thereby narrowed the potential labor base. However, migration processes provide only part of the explanation for long-term changes on the labor supply side, because they show how the number of potential workers in rural areas declined, but not how the availability of the population that remained in these areas for seasonal work changed. To gain a more complete understanding of changes on the labor supply side, it is therefore necessary to examine how long-term changes in the way the remaining population participated in the labor market affected its availability for seasonal agricultural work.

From the perspective of dual labor market theory, the traditional source of domestic labor for jobs in the secondary segment consists of social groups for whom such jobs most often serve as a temporary or supplementary source of income. Piore (1979, 87-90; 1986, 24) includes peasants, housewives, young people and students, and pensioners in this reserve labor force, as their social status is not primarily determined by their position in the labor market, but by other roles in life. This position makes these categories particularly relevant to the analysis of the domestic labor supply for seasonal agricultural work such as raspberry harvesting. A similar pattern also existed in European agriculture, which traditionally relied on a flexible local reserve labor force (Rye and Scott 2018, 929).

The following analysis will therefore examine how long-term changes in employment patterns and economic alternatives, as well as changes in the position of individual categories of the reserve labor force, affected their availability for seasonal agricultural work.

6.2.1. Changes in the Economic Alternatives of the Reserve Labor Force

Changes in the economic alternatives available to the reserve labor force in Serbia took place within the broader transformation of the labor market that accompanied the transition from a socialist to a market economy. During the 1990s and early 2000s, under conditions of reduced opportunities for formal employment and economic hardship, informal and flexible employment became an important income-generating strategy for a significant part of the population (Končar 2022, 479, 481-482). Such jobs were typically poorly paid, seasonal or occasional, and characterized by poor health and safety conditions (Paunović et al. 2005, 4). The significant presence of informal employment continued into the early twenty-first century, under the influence of privatization and subsequently the consequences of the 2008-2009 financial crisis (Končar 2022, 479, 484). By the beginning of the second decade of the twenty-first century, the dual structure of Serbia's labor market had become clearly pronounced: the primary segment remained relatively limited, while the secondary segment

encompassed a broad range of private-sector, self-employed, industrial, service, and agricultural employment (Arandarenko 2010, 71). Thus, alongside seasonal agricultural work, the range of other income-generating opportunities available to the reserve labor force gradually expanded.

The fact that many of the new economic alternatives belonged to the secondary segment does not, however, mean that they were equally unfavorable as seasonal agricultural work. The secondary segment is not homogeneous, but encompasses differently positioned jobs between which mobility is possible (Uys and Blaauw 2006, 251-254; Hudson 2007, 288). From the workers' perspective, differences between such jobs can be significant because, as follows from Piore's (1979, 33-35) argument, workers within the secondary segment also seek to improve their employment and social position. If, by moving to another job, a worker obtains better working conditions, greater stability, higher earnings, or a more favorable social position, such movement may represent a relative improvement in their position even though they remain within the secondary segment. This represents horizontal mobility within the secondary segment rather than vertical mobility toward the primary segment of the labor market. Končar (2022, 490) also identifies such movement among seasonal female agricultural workers in Serbia, who engage in other jobs outside seasonal agricultural work, such as cleaning and elderly care.

Changes in employment patterns in Serbia also indicate the practical significance of the expansion of economic alternatives. Informal employment increased substantially between 2002 and 2007, and remained an important feature of Serbia's labor market in the following years (Krstić and Sanfey 2008, 8, 10; Gligorov et al. 2011, iii). Of particular importance is the fact that surplus and underutilized labor from family farms increasingly found employment outside the farm (Božić and Munćan 2015, 116). At the same time, agricultural employment continued to decline, while new jobs were created mainly in the service and construction sectors (Vidovic et al. 2020, 25). Although the share of informal employment subsequently declined (Vidovic et al. 2020, 25; Korhecz et al. 2025, 215), its earlier expansion and the decline in agricultural employment indicate that, during the period under consideration, opportunities to earn income outside traditional seasonal agricultural work became increasingly important, while part of the traditional reserve labor force actually made use of these opportunities. How these changes affected individual categories of the reserve labor force will be examined in greater detail below.

6.2.2. Changes in the Position of Individual Categories of the Reserve Labor Force

The changes described above did not affect all categories of the reserve labor force in the same way, but their impact differed depending on social position, age, family role, and available employment opportunities. For this reason, the following analysis will separately examine the changes affecting individual social groups that Piore identifies as the traditional reserve labor force for jobs in the secondary labor market.

Among the social groups that Piore identifies as the traditional reserve labor force for jobs in the secondary labor market, housewives occupy a particularly important position. Their role stems from the fact that their social status is not primarily determined by their position in the labor market, but by family and household responsibilities (Piore 1979, 88-89), which allows them to take on seasonal and occasional jobs as a form of supplementary employment. In the rural areas of Serbia, women represented an important part of the agricultural labor force and were particularly represented in informal and seasonal work, including the harvesting of agricultural products (Končar 2022, 466, 486-487). Their engagement in agriculture often represented additional work alongside household responsibilities (Končar 2022, 471), while Kuzminac (2023, 245) points out that women's work in agriculture within the household was largely associated with a lack of other employment opportunities. The importance of available alternatives is also highlighted by Končar (2022, 487), who associates the greater representation of women in seasonal work with their more difficult position in the labor market, while men more often avoid such jobs because they have a greater number of other employment opportunities. The changing position of women as a traditional source of reserve labor force can be viewed through two interconnected directions: the expansion of their economic alternatives and the long-term change in their social and economic position.

The first direction of change involved the gradual expansion of economic alternatives outside agriculture. Bogdanov and Babović (2014, 25) point out that the development of the informal labor market opened up greater employment opportunities for women in Serbia in low-skilled jobs in the tertiary sector, particularly in services, to which some women previously engaged in agriculture also moved (Gligorov et al. 2011, 4). Although women are increasingly leaving agriculture, they are less likely to leave the informal sector (Drobnjaković and Panić 2024, 654). These changes therefore did not necessarily imply women's transition into the primary segment, but rather expanded their choices among different forms of secondary employment.

The second direction of change in women's position was associated with their gradual emancipation, rising levels of education, and greater participation in the formal labor market. This process in Yugoslavia began as early as the period following the Second World War, when the institutionalization of gender equality was accompanied by efforts to increase women's social, economic, and political role, as well as by improvements in their literacy and education, and continued with the development of new feminist movements during the 1970s (Pantelić 2025, 370, 372-375). The significance of these processes from the perspective of dual labor market theory stems from the fact that they changed the social and economic position on which women's traditional role as one of the sources of reserve labor force for jobs in the secondary segment was based. Massey et al. (1993, 443) point out that women traditionally accepted unstable and lower-paid jobs as a temporary source of supplementary income, while their increasing participation in the labor market led them to increasingly view employment as a permanent professional activity that provided them not only with income but also with social status. Similarly, Piore (2014, 7) states that women who primarily viewed themselves as housewives were willing to accept unstable jobs without opportunities for advancement, while changes in their aspirations and the greater availability of permanent jobs carrying social status altered this pattern of labor market participation.

This transformation of women's position continued in contemporary Serbia, where the processes of emancipation, education, and transformation of women's employment structure are associated with a decline in their participation in household work and agriculture, increased participation in formal employment, and greater mobility (Drobnjaković and Panić 2024, 650, 653). More broadly, changes in women's position were also reflected in the fact that women leave rural areas more often than men, while they leave family farms earlier and are more likely to do so permanently (Bogdanov and Babović 2014, 25; FAO 2020, 115). Of particular importance is the fact that women's rural-to-urban migration and the transformation of their work from family labor to paid employment are pronounced precisely in municipalities such as Arilje, Požega, Ivanjica, Užice, and Čačak (Drobnjaković and Panić 2024, 650, 656-660), which belong to the area of concentrated raspberry production in Serbia. Viewed from the perspective of dual labor market theory, these changes reduced women's availability for agricultural work in rural areas, expanded their economic alternatives, and changed the social and economic position on which the traditional role of housewives as a reserve labor force for jobs in the secondary labor market was based.

In addition to housewives, Piore also includes peasants among the traditional sources of reserve labor force for jobs in the secondary labor market. This category consists of people who live on the land, often own it, and primarily define their social position through agriculture, while employment outside agriculture most often represents a temporary or supplementary source of income (Piore 1979, 87-88). Migration processes analyzed in the previous section are particularly important for understanding the changing position of this category in Serbia. Following decades of rural-to-urban migration, farmers whom domestic industry was no longer able to absorb also joined international emigration flows (Stanković 2014, 7), while Bajić-Hajduković and Bernard (2023, 78) characterize labor emigration during the socialist period as predominantly involving peasants with low levels of qualifications and skills. The scale of the transformation of this social group is evident in the sharp decline in the share of the agricultural population in Serbia, which fell from 42.7% to 17.3% of the total population between 1971 and 1981 alone (Stanković 2014, 38). This change indicates the gradual narrowing of one of the traditional sources of reserve labor for the secondary labor market.

The impact of migration processes on this category of the reserve labor force, however, did not end with the departure of part of the agricultural population. Contact with the urban way of life changed migrants' attitudes toward agriculture, which was also evident among return migrants, who aspired to an urban way of life and employment in non-agricultural activities (Stanković 2014, 8-9; Bajić-Hajduković and Bernard 2023, 85). This change in return migrants' attitudes toward agriculture can be viewed as one expression of the previously described culture of migration. Migration therefore transformed this category of the reserve labor force not only through the departure of some of its members, but also through changes in their aspirations after returning.

However, the influence of the culture of migration on attitudes toward agriculture was not limited to the population that directly participated in migration. Piore (1979, 58, 130-133) points to a similar process, according to which intensive emigration from less developed agrarian areas contributes to a decline in the social status of traditional agricultural jobs, as a result of which these jobs are gradually rejected not only by return migrants but also by people who have never migrated. Migration therefore not only reduced the number of farmers as a traditional source of reserve labor force, but could also weaken attachment to agriculture among those who never migrated.

Young people and students represent a distinct category of reserve labor force in dual labor market theory. Their social position is primarily determined by family and education, while occasional employment most often represents a temporary source of income that can, among other things, be used to finance their education (Piore 1979, 89). However, their availability for work gradually changed with the extension of formal education, which requires increasing amounts of time and delays their entry into the labor market (Massey et al. 1993, 443). In rural areas, their availability may be further limited by migration to educational and economic centers for schooling and the pursuit of better employment opportunities (Rye and Scott 2018, 929).

In addition to changes in their availability for work, young people's attitudes toward traditional agricultural jobs also changed. Piore (1979, 58, 130-133) shows that emigration and the development of new employment opportunities can lead to a generational shift in values, in which older generations continue to accept traditional agricultural jobs, while younger generations reject them because of their low social status, even under conditions of high unemployment and rising wages. Piore's argument is particularly relevant to Serbia, where young people are discouraged from engaging in agriculture by its unpopularity, hard work, low profitability, and limited opportunities for social life (Janačković and Dimitrijević 2024, 365-377). Traditional seasonal agricultural jobs could therefore become less attractive relative to other employment opportunities, reducing young people's willingness to direct their available labor toward this type of work.

Pensioners represent another category that Piore (1986, 24, 32) includes in the reserve labor force for jobs in the secondary labor market, since their social position and primary source of income are no longer directly tied to employment, allowing them to take on occasional jobs as a supplementary form of engagement. In the rural areas of Serbia, the role of the older population becomes even more important due to the declining number of younger people remaining in agriculture, which often forces older people to continue working on farms beyond the usual working age (FAO 2020, 64). At the same time, the agricultural labor force is characterized by pronounced aging: according to the 2023 Agricultural Census, more than 50% of those employed in agriculture were over the age of 55, compared with 22.85% in the economy as a whole (Korhecz et al. 2025, 213-214). Aging, however, limits the labor potential of this category, since older people have less energy (Korhecz et al. 2025, 213), which is particularly significant for seasonal agricultural jobs that are physically demanding and involve full-day work (Končar 2022, 489). Pensioners and the older population therefore

remain a potential source of reserve labor force in agriculture, but aging gradually limits their availability for physically demanding seasonal work.

The gradual decline in the availability of traditional categories of the reserve labor force raises the question of how the reduced supply of domestic labor might be compensated for. Dual labor market theory identifies the employment of international migrants as one possible response to the insufficient availability of domestic labor (Piore 1986, 24). Serbia, however, has traditionally been a country of emigration and still has a predominantly emigratory character, although in recent years signs of a gradual transformation toward becoming a migrant-receiving country have begun to emerge (Rašević 2016, 95). This is also indicated by the rapid growth in the number of foreign workers in the domestic labor market (Reljanović 2023, 132). Although the scale of their employment has so far remained limited, the possibility of greater employment of foreign workers in seasonal jobs in raspberry production will be examined in greater detail within the temporary labor migration program.

Taken together, the processes analyzed above indicate that the traditional labor reserve for jobs in Serbia's secondary labor market has changed significantly over the past several decades. Long-term migration reduced the population of rural areas, while among the population that remained, employment patterns, available economic alternatives, and the position of individual social groups identified by dual labor market theory as reserve labor changed. These changes did not affect all categories of the reserve labor force in the same way, but they contributed to a gradual decline in the availability of domestic labor for seasonal agricultural work. The implications of such macro-level changes for the labor market gap in raspberry production are reflected in the way they change the labor capacities and organization of work on agricultural farms. Therefore, to understand the connection between the decline in the size and availability of traditional sources of labor and difficulties in securing raspberry pickers, the analysis must move to the meso level and examine how the macro-level changes described above are reflected in the availability of family labor and farms' need to engage additional seasonal labor.

7. Meso Level: Changes in the Organization of Labor in Agricultural Production

Family farms represent the level at which broader demographic and social changes on the labor supply side are reflected in the concrete possibilities for organizing agricultural

production. At this level, changes in the availability of family labor and the engagement of seasonal workers are of particular importance. Examining these changes makes it possible to determine how the previously analyzed changes on the labor supply side affected the labor capacities of farms and their ability to secure the labor required for raspberry production.

7.1. Organization of Labor on Family Farms

Family farms represent the most important and numerous organizational units of agricultural production in Serbia (Božić and Munćan 2015, 107). According to the 2023 Agricultural Census, 508,325 agricultural holdings were registered in Serbia, of which as many as 99.6% were family farms (Popović 2025, 729; SORS 2024, 2). The dominance of family farms is also reflected in the structure of the agricultural labor force, since more than 98% of the total agricultural labor force is engaged on this type of farm (Bogdanov and Babović 2014, 38; Stevanović and Milanović 2014, 230). This organizational structure is particularly important for the subject of this thesis, since family farms accounted for as much as 99.9% of total raspberry production in Serbia in the early 2000s (Božić and Munćan 2007, 228). Changes in their labor capacities are therefore particularly important for understanding the organization of labor in raspberry production.

The labor force engaged on family farms can be divided into family labor, permanent employees, and seasonal labor, including contract labor (Božić and Munćan 2015, 109). Family labor accounts for the largest share of labor on family farms and includes farm holders and members of their families, and in some cases extended family members (Popović 2025, 731). The dominance of this form of labor is also evident in the data from the latest Agricultural Census, according to which farm holders and members of their families together account for around 98% of the agricultural labor force, while permanent employees account for only around 2% (Krstić and Žarković 2025, 19). Agricultural production on family farms in Serbia therefore relies primarily on family labor, while permanently employed hired labor plays a considerably smaller role.

In addition to permanent labor, seasonal labor represents an additional source of labor on family farms (Božić and Munćan 2015, 115). The extent of its engagement largely depends on farm size and the labor intensity of agricultural production (Bogdanov and Babović 2014, 40). The need for additional labor is particularly pronounced in Western Serbia and Šumadija, where, despite a larger number of farm members compared with other regions, a significant number of workers are engaged during seasonal peaks in production,

primarily due to the labor-intensive character of agricultural production in this region (Bogdanov and Babović 2014, 54). This form of work organization is particularly important for raspberry production, which relies heavily on the engagement of seasonal labor, especially during harvesting (Kljajić et al. 2017, 63; Veljković et al. 2025, 186).

7.2. Decline in Family Labor on Family Farms

The predominant reliance of family farms on family labor makes their production directly dependent on the availability of labor within the farms themselves. However, the labor capacity available to agriculture in Serbia has shown a long-term declining trend (Stevanović and Milanović 2014, 229, 233). More specifically, the number of household members has declined over the long term, which Bogdanov and Babović (2014, 36) associate with intensive migration from rural areas. According to the 2012 Agricultural Census, 1,416,349 persons were engaged on family farms (Bogdanov and Babović 2014, 30), while according to the 2023 Census, their number had declined to 1,134,245 (SORS 2023), representing a decrease of approximately 19.9% between the two censuses. Moreover, a decline was recorded across all categories of labor on family farms (Institut ekonomskih nauka 2025, 49).

The decline in the number of persons engaged was also accompanied by a decline in the volume of family labor in agricultural production. This volume can be measured using Annual Work Units (AWU), which represent the amount of human labor used in agricultural activity, with one unit corresponding to the work performed by one person working full time for one year (SORS 2024, 11). As shown by the data in Table 1, the number of AWU of family farm holders decreased from 283,551 in 2012 to 237,630 in 2023, or by 16.2%, while an even greater decline was recorded among family members, from 303,782 to 219,071 AWU, or by 27.9% (SORS 2012; 2023). These data show that between the two censuses, not only did the number of persons engaged on family farms decline, but so did the total volume of their work in agricultural production.

Table 1. Annual Work Units (AWU) by Category of Labor Engaged on Family Farms in the Previous Two Agricultural Censuses

Category of labor force engaged on farms	Farm holders	Family members (and relatives)	Seasonal and hired labor under contract	Total
2012 (AWU)	283,551	303,782	29,428	646,283
2023 (AWU)	237,630	219,071	22,982	502,317
Change (%)	-16.20%	-27.86%	-21.90%	-22.28%

Source: SORS (2012; 2023). **Note:** Contract labor accounts for less than 0.01% of total AWU and is therefore not included.

The structure of the family labor force further links changes at the farm level with the transformation of individual categories of the reserve labor force analyzed in the previous chapter. The representation of women is particularly pronounced, and their traditional position within rural households was previously linked to Piore's category of housewives: in 2012, they accounted for as much as 62.9% of family members engaged on farms (Bogdanov and Babović 2014, 47). Older age groups are also strongly represented: according to the 2023 Agricultural Census, 44.7% of family farm holders were over the age of 65, while holders under the age of 35 accounted for only 5.13% (Popović 2025, 732; SORS 2024, 9). These data show that family labor in agriculture relies to a large extent on social groups whose changing size and availability for agricultural and seasonal work were analyzed in the previous chapter. This establishes a direct link between the structural processes analyzed above and changes in the labor base of family farms.

A decline in family labor was also recorded in Šumadija and Western Serbia, where its number decreased from 625,267 in 2012 to 525,141 in 2023, or by approximately 16.0%, while the volume of family labor declined from 270,193 to 235,570 AWU, or by approximately 12.8% (SORS 2012; 2023). Changes are also visible at the local level in the most important raspberry-producing areas. Among the five municipalities with the largest areas under raspberries according to the 2023 Agricultural Census—Ivanjica, Arilje, Bajina Bašta, Užice, and Prijepolje (SORS 2024, 4)—the number of family laborers declined between 2012 and 2023 in four municipalities, while an increase was recorded only in Užice. At the same time, the volume of family labor, expressed in AWU, increased in four of the five municipalities examined, while a decline was recorded only in Ivanjica (SORS 2012; 2023). This combination shows that the decline in the number of family laborers in most of

the municipalities examined was not accompanied by a decline in the total volume of their work; rather, a smaller number of engaged persons performed a greater volume of work.

7.3. Changes in the Engagement of Seasonal Labor

The analysis of changes in seasonal labor requires caution because of the limitations of the available statistical data. Due to the pronounced seasonality of agricultural work and the widespread practice of not formally registering seasonal workers, it is not straightforward to determine either their precise number or the extent of their individual engagement (Božić and Munćan 2015, 109). For this reason, agricultural censuses primarily record seasonal work through Annual Work Units (AWU), previously defined as a measure of the total volume of work performed. A change in AWU therefore does not directly indicate a change in the number of seasonal workers, but rather a change in the amount of work they performed. In addition, AWU data refer to agricultural production as a whole rather than specifically to raspberry production. The 2012 and 2023 Agricultural Censuses allow comparison of only two points in time, which means that changes during the intercensal period cannot be tracked on their basis. Despite these limitations, comparison of the two censuses makes it possible to determine the direction and scale of change in realized seasonal work between 2012 and 2023.

At the national level, agricultural census data show a decline in the volume of seasonal work between 2012 and 2023. The number of AWU of seasonal and contract labor on family farms decreased from 29,428 in 2012 to 22,982 in 2023, or by approximately 21.9% (SORS 2012; 2023; see Table 1). A decline was also recorded in Šumadija and Western Serbia, where the volume of seasonal work fell from approximately 12,300 to 10,900 AWU over the same period (SORS 2012; 2023). This regional trend is particularly important because raspberry production is strongly concentrated in Šumadija and Western Serbia, which account for 84.2% of total raspberry production in Serbia (Kljajić 2025, 44).

At the local level, however, the data for the five previously examined leading raspberry-producing municipalities show a different trend. In four of the five municipalities examined, the volume of seasonal labor increased between 2012 and 2023, while only Arilje recorded a slight decline of approximately 1% (SORS 2012; 2023; see Table 2). This finding shows that the national and regional decline in seasonal AWU did not affect the most important raspberry-producing areas uniformly. However, an increase in realized seasonal work in these municipalities does not in itself show that the available seasonal labor force was sufficient to meet producers' needs.

Table 2. Changes in Labor Force and Area under Raspberries in Selected Municipalities, 2012-2023

Municipality	Number of family labor force			AWU of family labor force			AWU of seasonal labor force			Area under raspberries (ha)		
	2012	2023	%	2012	2023	%	2012	2023	%	2012	2023	%
Census												
Ivanjica	19,261	17,851	-7.32	8,928	7,583	-15.06	459	635	+38.34	1,248	2,041	+63.54
Arilje	10,905	10,548	-3.27	3,265	4,662	+42.79	1,133	1,121	-1.06	1,226	1,567	+27.81
Bajina Bašta	13,543	12,712	-6.14	4,284	5,307	+23.88	229	446	+94.76	694	1,063	+53.17
Užice	16,955	18,052	+6.47	5,199	7,024	+35.10	226	353	+56.19	548	998	+82.12
Prijepolje	15,482	14,225	-8.12	4,532	4,894	+7.99	242	305	+26.03	146	958	+556.16

Source: SORS (2012; 2023). **Note:** AWU of seasonal labor does not include contract labor.

The limitations of statistical data in assessing the availability of seasonal labor can be partially overcome by combining them with findings that directly concern raspberry production. Petrović et al. (2017, 2) point out that during harvesting, producers often find it difficult to secure a sufficient number of seasonal workers within the required period, while Urošević et al. (2011, 80) identify securing sufficient seasonal labor as one of the key constraints on the further development of raspberry production. The results of the content analysis point to the same problem: references to shortages of seasonal workers were recorded in every year of the observed period from 2015 to 2025 and appeared explicitly in 44 of the 60 analyzed articles. These findings show that the realized volume of seasonal work recorded in the Agricultural Censuses should not be equated with sufficient availability of seasonal labor. The fact that more seasonal AWU were realized in 2023 than in 2012 in four of the five leading raspberry-producing municipalities is therefore not inconsistent with producers' difficulties in securing a sufficient number of workers for harvesting.

In interpreting these findings, it is also necessary to take into account the importance of seasonal labor for particular forms of agricultural production, especially given its relatively small share in total agricultural work. Stevanović and Milanović (2014, 236), for example, assess seasonal work in Central Serbia (Serbia excluding its autonomous provinces) as marginal, since in 2012 it accounted for only 4.3% of total AWU. However, its small share in total agricultural work does not necessarily imply that it is of little importance for particular forms of production. The importance of seasonal labor for raspberry production should therefore be assessed in relation to the availability of other sources of labor and the labor requirements of production itself.

7.4. Dependence of Raspberry Production on Seasonal Labor

The high degree of reliance of family farms on the labor of farm holders and their family members makes their sustainability dependent on the availability of family labor (Bogdanov and Babović 2014, 69). A decline in family labor can therefore increase farms' need for other sources of labor, while an expansion of production simultaneously creates a need for additional work. The previous analysis showed that the number of family laborers declined at the national and regional levels, as well as in four of the five leading raspberry-producing municipalities examined. Although these data cover agriculture as a whole and do not make it possible to determine what share of the decline directly relates to raspberry production, they indicate a narrowing of the broader family labor base on which this form of production also relies. At the same time, the area under raspberries expanded significantly between the two censuses (Kljajić 2025, 44-53).

The need for additional labor can be met in several ways. Part of the additional workload can be undertaken by the remaining household members, while seasonal workers are engaged for tasks that the family cannot perform on its own. Additional labor can also be secured through the engagement of foreign seasonal workers, while the need for human labor can be reduced through the use of labor-saving mechanization. In raspberry production, the importance of family and seasonal labor is particularly pronounced during harvesting, when the engagement of household members is often insufficient to meet production needs (Kljajić et al. 2022, 93). The findings of the content analysis also show that the engagement of foreign seasonal workers has emerged only in recent years as a response to shortages of domestic labor in raspberry production. Labor-saving mechanization appears even less frequently, in only three of the analyzed articles, all concentrated in a single year. These findings indicate that both solutions remained limited in the organization of labor in raspberry harvesting during the observed period.

Reliance on the remaining household members also has its limitations. A smaller number of members can perform a greater volume of work if they become more intensively involved in agricultural production, but family labor cannot be increased indefinitely in this way. Once the existing labor capacities of the household are no longer sufficient to perform the required tasks, additional labor must be secured from outside the family. Since other alternatives proved limited during the observed period, domestic seasonal labor remained the key source of additional labor from outside the household. Raspberry farms are therefore

highly dependent on the availability of domestic seasonal labor, particularly during harvesting. Labor availability may also influence producers' decisions about expanding production, since increases in cultivated area require them to take into account the amount of labor needed and available during harvesting. Insufficient labor availability may therefore constrain increases in the area under raspberries and the further expansion of raspberry production (Veljković et al. 2008, 12-13).

7.5. Synthesis of Labor Force Changes and Their Significance for Raspberry Production

Linking the previously analyzed changes in family and seasonal labor with labor requirements reveals different patterns at the national, regional, and local levels. At the national level, the decline in the number of family laborers between the two censuses was not accompanied by a greater volume of work performed by the remaining farm members. On the contrary, the volume of family labor expressed in AWU also declined, while the volume of seasonal labor simultaneously decreased by approximately 21.9%. However, these data alone do not show whether the lost labor needed to be replaced in agriculture as a whole, because it is not known how total labor requirements changed over the same period. The situation is different in raspberry production: the area under raspberries increased from 11,996 ha in 2012 to 19,016 ha in 2023, or by approximately 58.5% (Kljajić 2025, 44-53), thereby increasing labor requirements. The same direction of change was recorded in Šumadija and Western Serbia, the region in which, as previously shown, the largest share of raspberry production in Serbia is concentrated: between the two censuses, the number of family laborers declined by approximately 16.0%, the volume of family labor by 12.8%, while the volume of seasonal labor also decreased. Raspberry production thus expanded within an agricultural system in which, at both the national and regional levels, the number of family laborers, the volume of family labor, and the volume of seasonal labor were simultaneously declining.

At the local level, however, the relationship between changes in the labor force and production needs becomes more complex. In four of the five leading raspberry-producing municipalities examined, the number of family laborers declined, while in most municipalities the volume of work performed by the remaining farm members, as well as the volume of seasonal labor engaged, increased. This pattern shows that the decline in the number of family laborers was not necessarily accompanied by a decline in the total volume of work performed, but that in some areas part of the required labor was secured through

more intensive engagement of the remaining family and seasonal labor force. At the same time, the area under raspberries increased significantly in all of the municipalities examined, creating additional labor requirements. However, academic sources (Petrović et al. 2017, 2; Marković et al. 2017, 568-570; Veljković et al. 2025, 186) and the results of the content analysis, which directly concern raspberry production, show that producers continued to experience difficulties in securing a sufficient number of seasonal workers for harvesting. The increase in family and seasonal AWU at the local level therefore shows that a greater volume of work was realized from these sources, but does not necessarily mean that such engagement was sufficient to meet the labor requirements of raspberry production.

Of particular importance is the fact that labor shortages in raspberry production persist even under conditions of increased family and seasonal labor in the leading raspberry-producing areas. It is precisely at the local level that the gap between producers' labor requirements and their ability to meet those requirements becomes directly visible. However, because raspberry production was simultaneously expanding during the observed period, these findings do not yet make it possible to determine the extent to which increased labor requirements contributed to the intensity of the identified gap. For this reason, further understanding of the nature of this problem requires examining its development over time and its relationship with changes in the scale of raspberry production.

8. Micro Level: Development of the Labor Market Gap in Raspberry Production

The previous analysis showed that the effects of structural processes on the labor supply side are transmitted to raspberry production through changes in the organization of labor on agricultural family farms. The decline in the size and availability of the traditional labor base narrowed the labor capacities on which farms could rely, while the limited capacity of family labor increased the need to engage additional labor, primarily seasonal workers. In this way, the changes identified at the meso level represent mechanisms through which broader structural processes on the labor supply side can lead to a mismatch between the labor requirements of raspberry production and the available labor force. To further understand this gap, it is therefore necessary to examine how it developed over time and how its trajectory related to changes in the scale of raspberry production. Changes in the scale of production are relevant in this context because an expansion of production increases labor

requirements and can therefore contribute to the intensification of the gap, while a contraction may reduce them. Data on changes in raspberry area and production volume, daily wages, and the results of the content analysis (Table 3) make it possible to examine this period through three interconnected phases: the expansion of production from 2015 to 2017, the transitional period from 2018 to 2020, and the period of declining raspberry area after 2020. This periodization makes it possible to examine the relationship between changes in the scale of production and the development of the gap, and to determine the extent to which changes in production scale can explain its intensification and persistence during the observed period.

Table 3. Trends in Raspberry Production, Daily Wages, and Labor Shortages, 2015-2025

Year	Area under raspberries (ha)	Raspberry Production (t)	Labor Shortage (articles)	Average Nominal Daily Wage (RSD)
2015	16,211	97,165	2/4	1,813
2016	20,194	113,172	1/3	2,167
2017	21,861	109,742	4/5	2,130
2018	22,654	127,010	3/4	2,275
2019	23,249	120,058	4/5	2,110
2020	24,028	118,674	5/6	2,958
2021	20,807	110,589	6/7	3,571
2022	19,703	116,093	5/7	4,857
2023	19,016	98,674	3/3	4,417
2024	18,625	94,026	4/5	4,700
2025	—	—	7/11	4,955

Source: Kljajić (2025, 44-53); Content analysis (see Appendix A). **Note:** The "Labor Shortage" column shows the number of articles in which the corresponding code was recorded relative to the total number of articles analyzed for each year; Data on raspberry area and production volume for 2025 are not available.

The first phase, from 2015 to 2017, was characterized by strong expansion of production alongside still uneven availability of seasonal labor. The area under raspberries increased from 16,211 ha in 2015 to 21,861 ha in 2017, or by approximately 34.9%, while production increased from 97,165 to 109,742 tons. At the same time, labor shortages were recorded in 7 of the 12 articles analyzed from this period (58.3%), showing that difficulties in securing pickers were already present. However, unlike in the later phases, references to sufficient labor availability also appeared in 5 of the 12 articles (41.7%). This was particularly pronounced in 2015, when the sufficient labor code appeared in all four articles analyzed, while in two of them it appeared together with the labor shortage code. This pattern of findings indicates that labor shortages in this phase did not yet represent an equally

pronounced problem across all of the settings and circumstances examined. This is also consistent with the relatively stable movement of the average nominal daily wage, which increased from RSD 1,813 in 2015 to RSD 2,167 in 2016, before amounting to RSD 2,130 in 2017. The first phase should therefore not be viewed as a period without a labor market gap, but rather as a period in which the gap was already present, although it was not yet as pronounced as in subsequent years.

The period from 2018 to 2020 represented a **transitional phase** in which raspberry production reached its peak, while labor shortages became considerably more pronounced. Raspberry production reached a maximum of 127,010 tons in 2018, while the area under raspberries continued to expand until 2020, when it reached 24,028 ha, the highest level in the observed period. At the same time, the pattern of seasonal labor availability also changed. Labor shortages were recorded in 12 of the 15 articles analyzed from this period (80%), while references to sufficient labor appeared in only one article (6.7%). Unlike the previous phase, in which findings of shortages and sufficient worker availability still appeared alongside one another, labor shortages became the dominant characteristic of the analyzed content during this period. The change became particularly visible in 2020, when the average nominal daily wage increased from RSD 2,110 in the previous year to RSD 2,958, while in four of the six articles analyzed for that year the daily wage was described as high. The timing of this transitional phase also coincides with broader developments in Serbia's labor market: Reljanović (2023, 131-132) states that labor shortages became particularly pronounced from 2018 onward, while Vidovic et al. (2020, 17, 25) record labor shortages in certain sectors in 2019. The fact that the peak of the production cycle coincided with increasingly pronounced difficulties in securing workers distinguishes 2018-2020 as a turning point in the development of the labor market gap in raspberry production. At the same time, because its intensification occurred during a period of strong production expansion, this phase alone does not yet make it possible to separate the effects of the previously analyzed structural processes from the increased labor requirements generated by the expansion of production itself.

The intensification of labor shortages during the transitional period was also accompanied by the emergence of more concrete changes in the organization of labor and production, as shown by differences in the prevalence of individual content-analysis codes across the three observed phases (Table 4). While in the 2015-2017 period the content analysis recorded neither greater family involvement nor the reduction or abandonment of raspberry fields among the responses and consequences associated with labor shortages,

between 2018 and 2020 greater involvement of family members appeared in 5 of the 15 articles analyzed (33.3%), while the reduction or abandonment of raspberry fields appeared in 3 articles (20%). These changes should be viewed within the broader context of production conditions, since producers' decisions could have been influenced by factors other than labor availability. Nevertheless, their emergence precisely during a period of more pronounced labor shortages shows that the problem was no longer manifested only through difficulties in finding pickers and rising daily wages, but also through changes in the organization of labor and production.

Table 4. Prevalence of Labor Shortage Indicators and Producer Responses Across the Three Phases, 2015-2025

Indicator	2015–2017	2018–2020	2021–2025
Labor shortage	58.3%	80.0%	75.8%
Sufficient labor supply	41.7%	6.7%	6.1%
Daily wage perceived as high	41.7%	40.0%	66.7%
Greater involvement of family	0%	33.3%	30.3%
Reduction and abolition of raspberry fields	0%	20.0%	9.1%
Recruitment of migrants	8.3%	0%	42.4%
Labor-saving mechanization	0%	0%	9.1%

Source: Content analysis (see Appendix A). **Note:** Percentages represent the share of analyzed articles within each phase in which the corresponding code was recorded. Codes are not mutually exclusive. The analysis includes 12 articles for 2015-2017, 15 articles for 2018-2020, and 33 articles for 2021-2025.

After 2020, **the third phase** began, in which the area under raspberries declined but labor shortages remained pronounced. The area decreased from a maximum of 24,028 ha in 2020 to 18,625 ha in 2024, or by approximately 22.5%, while production, despite certain annual fluctuations, declined from 118,674 to 94,026 tons. Kljajić (2025, 52) directly identifies the shortage of seasonal workers during harvesting as one of the factors behind the decline in raspberry production in the 2022-2024 period. With the reduction in cultivated area, the previous growth in labor requirements resulting from the expansion of raspberry area came to an end. However, labor shortages continued to appear in 25 of the 33 articles analyzed from the 2021-2025 period (75.8%), while references to sufficient labor appeared in only two articles (6.1%). At the same time, the average nominal daily wage increased from RSD 3,571 in 2021 to RSD 4,955 in 2025, and in 22 of the 33 analyzed articles (66.7%) the

daily wage was described as high. In all 22 articles in which this assessment appeared, producers were represented as the main sources of information, which means that the finding largely reflects their perception of the cost of seasonal labor. The persistence of the gap under conditions of declining raspberry area shows that its continuation cannot be explained solely by the increased labor requirements that accompanied the previous expansion of production.

The persistence of labor shortages after 2020 was also accompanied by changes in the ways producers attempted to secure the labor they required. Greater involvement of family members appeared in 10 of the 33 articles analyzed (30.3%), showing that more intensive reliance on family labor, already present during the transitional period, remained one of the ways in which farms adapted. At the same time, the engagement of migrant workers became considerably more pronounced, appearing in 14 of the 33 articles (42.4%), compared with 1 of 12 articles (8.3%) in the 2015-2017 period and none during the transitional period. By contrast, labor-saving mechanization appeared in only 3 analyzed articles, all from 2021. Although these changes cannot in every analyzed article be attributed exclusively to labor shortages, in a significant number of them they are directly identified as consequences of shortages of domestic seasonal workers. The findings therefore indicate that in the third phase, alongside continued reliance on family labor, the search for workers outside the traditional domestic labor base became increasingly pronounced, while the substitution of human labor through mechanization remained considerably less represented in the analyzed content.

Examining the entire period shows that the intensity of labor shortages changed alongside changes in the scale of raspberry production, but that their persistence cannot be explained solely by those changes. During the initial expansion, the problem was already present; with the further expansion of production, it became increasingly pronounced; and after 2020, it persisted despite the decline in the area under raspberries. The expansion of production could therefore have contributed to the intensification of the existing gap, but its persistence after the reversal in the trend of raspberry area shows that changes in production scale are insufficient to explain its continuation.

9. Synthesis of Findings: The Structural Character of the Labor Market Gap in Raspberry Production

Bringing together the findings at the macro, meso, and micro levels makes it possible to explain how long-term changes on the labor supply side are connected with the

contemporary shortage of seasonal labor in raspberry production. At the macro level, migration processes gradually reduced the demographic base from which agricultural labor was traditionally recruited, while changes in employment patterns, economic alternatives, and the position of individual categories of the reserve labor force altered the availability of the remaining population for seasonal agricultural work. Although the nature and intensity of these changes differed across individual categories, taken together they contributed to a decline in the size and availability of traditional sources of domestic labor.

At the meso level, these changes affected the labor capacities of family farms. The decline in family labor narrowed the labor base on which production could rely, while farms sought to secure part of the required labor through more intensive engagement of the remaining family members and seasonal labor. However, this was not always sufficient to meet the labor requirements of raspberry production. The secondary character of harvesting does not in itself explain the emergence of the gap, but it helps explain why, under conditions of reduced availability of the traditional labor base, the seasonal labor required cannot simply be replaced by other sources of domestic labor. While the macro and meso levels explain constraints on the labor supply side, a full understanding of the gap also required consideration of changes in the scale of production, which altered labor requirements.

The micro-level analysis showed that the expansion of production could have contributed to the intensification of labor shortages, but could not explain their persistence. The gap persisted after 2020, when the area under raspberries declined significantly, showing that its continuation cannot be reduced solely to the increased labor requirements associated with the preceding expansion of production. Its persistence must be viewed in the context of the previously identified decline in the size and availability of traditional sources of labor and the limitations of the labor capacities of family farms. Bringing together the findings from all three levels therefore shows that long-term structural changes on the labor supply side contributed to the formation and persistence of this gap. On this basis, the previously identified gap can be defined as a structural labor market gap in raspberry production.

IV. Policy Responses to the Structural Labor Market Gap

In line with the findings of the theoretical and empirical analysis, this chapter considers possible public policies for mitigating the structural labor market gap in raspberry production. Since the previous analysis showed that long-term structural processes contributed to the formation and persistence of the gap, the proposed policies are not aimed at reversing these processes, but at mitigating their effects on raspberry production and adapting production to changed labor market conditions. Consideration of possible policy responses to the identified problem is consistent with the tradition of segmented and dual labor market theories, which, in addition to explaining the causes of labor market segmentation and related problems, have a pronounced practical orientation toward examining possibilities for their mitigation (Wachter 1974, 640; Taubman and Wachter 1986, 1183). Although dual labor market theory does not in itself prescribe specific public policies, its interpretation of migration processes points to directions in which appropriate measures may be developed (Piore 1986, 25). At the same time, possible responses to labor gaps differ across countries and sectors (Ryan 2023, 28; Berger and Piore 1980, 9-10), meaning that, depending on the specific case, one or more programs, or different combinations of available measures, may be applied (Ryan 2023, 31).

The literature considers several possible responses to labor shortages in agriculture. Among the options relevant to the case analyzed here, Martin (2020, 2) highlights the use of mechanization and the engagement of temporary migrants. At the same time, Lewis (1986, 31) points to other possible forms of adjustment under conditions of labor shortages, including reductions in production capacity and changes in technological processes. Labor shortages may also lead to a shift away from labor-intensive agricultural products toward other crops, as well as to the relocation of production to areas with greater labor availability (Martin 2020, 6; Ryan 2023, 31). The latter two forms of adjustment, however, are not the subject of the proposed programs, since their aim is to mitigate the labor market gap while preserving raspberry production and its role in Serbia's rural development, rather than abandoning or relocating it. Building on these possible forms of adjustment, as well as on the specific characteristics of raspberry production and the previously identified structural constraints on the labor supply side, particular attention in this thesis is given to a temporary labor migration program as a possible way of expanding the supply of seasonal labor. However, given the limitations of this approach and the multidimensional character of the identified gap, three

additional directions of public policy action are also considered: improving seasonal working conditions, applying labor-saving mechanization, and increasing the self-reliance of farms in organizing production. These approaches operate through different mechanisms, namely by increasing the supply of seasonal labor, increasing the attractiveness of seasonal work for domestic workers, reducing the need for human labor, and adapting production to the available labor capacities of farms. Their possibilities and limitations will therefore be considered separately.

10. Temporary Labor Migration Program

The previous analysis showed that the structural labor market gap in raspberry production is associated with the long-term decline in the availability of traditional categories of the reserve labor force. It is precisely under such circumstances that dual labor market theory identifies international migrants as an additional source of labor for meeting unmet labor demand (Piore 1986, 24). Reljanović (2023, 139) reaches a similar conclusion, arguing that, as a result of changes over the past decade, it is no longer possible to rely on the self-sufficiency of the domestic labor market and that it needs to be opened to foreign workers. This possibility is emerging in raspberry production in Serbia, since the content analysis found that during the 2021-2025 period, the engagement of migrants appeared more prominently as one of the responses to shortages of domestic seasonal labor. This raises the question of whether the engagement of temporary migrant workers could be developed into an organized program for mitigating the structural gap.

10.1. Comparative Analysis of Temporary Labor Migration Programs

Temporary labor migration programs in agriculture are implemented in different institutional forms, meaning that there is no single model for their organization. Differences concern the methods of worker recruitment, the roles of the state, countries of origin, and intermediaries, control over the scale of recruitment, the duration and repetition of employment, worker mobility, as well as the distribution of costs and mechanisms for worker protection. The following section therefore applies a comparative analysis of Canada's Seasonal Agricultural Worker Program (SAWP) and Low-Skilled Pilot Project (LSPP), as well as the British Seasonal Agricultural Workers Scheme (SAWS), while the experiences of other countries are used as supplementary examples of institutional arrangements. The aim of the comparison is to identify the advantages and limitations of different elements of these

programs and to distinguish arrangements relevant to designing a program adapted to raspberry production in Serbia. The comparison is organized around four key dimensions.

The first dimension concerns the institutional organization of temporary labor migration programs and worker recruitment. Canada's SAWP is based on bilateral agreements with Mexico and Caribbean countries, thereby directly involving countries of origin in the implementation of the program and the protection of the rights of their nationals (Preibisch 2010, 418). Bilateral organization also reduces the role of intermediaries in the recruitment process (Hennebry and Preibisch 2012, e29-e30), while the country of origin may appoint its officials to monitor the working conditions of its nationals in the destination country (Martin 2006, 29). By contrast, in the British SAWS, a limited number of operators played an important role by recruiting workers, monitoring conditions at employers' farms, and arranging transfers of workers between farms (Consterdine and Samuk 2015, 7; Martin 2006, 32). Canada's LSPP did not adopt the bilateral dimension of SAWP, which made it possible to recruit workers from a broader range of countries (Preibisch 2010, 410, 419, 422). Greater reliance on private agencies has been associated with cases of worker abuse and exploitation, as well as irregular stays by migrants when promised employment conditions and wages failed to materialize (Preibisch 2010, 425-426).

Experiences from other programs show that intermediation is not the only possible way of connecting migrants and employers. In Norway, migrant workers can be recruited directly without intermediaries (Rye and Scott 2018, 936), while many programs require employers to obtain a special permit or certificate to employ foreign workers (Martin 2006, 17-18). These examples show that the choice between bilateral cooperation, intermediary-based recruitment, and direct recruitment affects the distribution of responsibilities, the scope for institutional oversight, and the position of workers. A bilateral model can reduce dependence on unregulated intermediaries and involve the country of origin in program implementation, while greater reliance on private intermediaries can increase recruitment flexibility but requires stronger oversight mechanisms.

The second dimension concerns the conditions under which employers can access migrant labor and the mechanisms used to control the scale of its recruitment. One of the most commonly applied mechanisms is the labor market test, which assesses the availability of domestic labor before migrants are recruited (Martin 2006, 26-27). Under Canada's SAWP, an employer must demonstrate that they were unable to find domestic workers during the prescribed period (Hennebry and Preibisch 2012, e24). A similar test is also applied under the

LSPP (Preibisch 2010, 412-413). However, the effectiveness of this mechanism depends on how it is implemented, since employers and intermediaries interested in recruiting migrants may influence the process in ways that prevent available domestic workers from being identified (Martin 2006, 37).

Another form of control involves numerical limits on the scale of the program. The British SAWS operated under a system of annual quotas that changed over time (Consterdine and Samuk 2015, 4-5). Switzerland also applied quotas, together with a system of priority based on the origin of the available labor force (Martin 2006, 33-34). By contrast, Canada's SAWP and LSPP operated without numerical quotas (Hennebry and Preibisch 2012, e24; Preibisch 2010, 413). The comparison shows that labor market tests and quotas perform different functions: the former control the conditions for accessing migrant labor, while the latter limit the overall scale of the program, meaning that they can be applied as complementary mechanisms.

The third dimension of comparison concerns the time limits on employment and the mechanisms used to encourage the return and circularity of migrant workers. Under the British SAWS, a work permit allowed a stay of up to six months, with the possibility of repeated participation in the program after returning to the country of origin (Martin 2006, 31-32; Consterdine and Samuk 2015, 6). Under Canada's SAWP, seasonal employment may last for up to eight months (Hennebry and Preibisch 2012, e32; Martin 2006, 28). SAWP has also recorded a high rate of worker return to the country of origin, indicating a pronounced circular dimension of the program (Hennebry and Preibisch 2012, e32). Under the LSPP, a work visa could last for up to 24 months, while obtaining subsequent work permits was conditional on returning to the country of origin after the previous permit expired (Preibisch 2010, 412). The comparison thus shows that, despite differences in the permitted duration of employment, the programs analyzed combine time-limited employment with the possibility of repeated participation, thereby linking the temporary character of migration with circular repetition.

In addition to limiting the duration of employment, the programs analyzed also regulate the mobility of migrant workers during their stay in the destination country. Under SAWP, the possibility of changing employers is highly restricted, which increases workers' dependence on their employer (Hennebry and Preibisch 2012, e24-e25, e32). Similar restrictions existed under SAWS, where workers could not freely change employers, although operators could arrange their transfer between farms (Consterdine and Samuk 2015, 7-8). The

LSPP also tied the work permit to a specific employer, with very limited possibilities for transfer (Preibisch 2010, 412-413). Such restrictions can increase workers' dependence on their employer, which is why Hennebry and Preibisch (2012, e32) identify allowing workers to change employers as one possible improvement. The degree of worker mobility is therefore one of the issues that should be considered when designing a program, with a need to strike a balance between maintaining institutional control over employment within the program and protecting workers from excessive dependence on an individual employer.

The fourth dimension of comparison concerns the position of migrant workers, mechanisms for their protection, and the distribution of program costs. Under the British SAWS, employers were required to provide workers with employment, accommodation, and transportation, but cases of poor working and living conditions and worker exploitation were recorded, leading to calls for stronger oversight (Consterdine and Samuk 2015, 8-9). The Gangmasters Licensing Authority was established as a specific oversight mechanism tasked with preventing exploitation and monitoring compliance with employment standards (Consterdine and Samuk 2015, 7-8). The experience of SAWS also points to the importance of regular inspections and the ability of workers to lodge complaints about working and accommodation conditions (Consterdine and Samuk 2015, 25-26). Under SAWP, workers are covered by Canadian legislation, health insurance, and the possibility of acquiring pension rights (Ryan 2023, 9), while bilateral organization allows the country of origin to participate in protecting the rights of its nationals (Martin 2006, 29). The comparison therefore shows that the formal establishment of rights should be accompanied by mechanisms for their enforcement, including oversight of employers and intermediaries, complaint mechanisms, and institutional cooperation between the country of origin and the destination country. This form of cooperation can be linked to the idea of a triple-win situation, according to which labor migration programs should simultaneously benefit the destination country, the country of origin, and migrants themselves (Consterdine and Samuk 2015, 2; Grečić 2017, 38; de Haas, Castles, and Miller 2020, 333).

A higher degree of institutional regulation raises the question of program financing and the distribution of costs. SAWP represents a resource-intensive model, which is associated with its higher degree of regulation and the involvement of countries of origin in program implementation (Preibisch 2010, 424). Bilateral cooperation, however, makes it possible to transfer part of the administrative responsibilities to countries of origin and thereby reduce the costs borne by the destination country (Hennebry and Preibisch 2012, e24),

while workers contribute part of their earnings toward financing the program and transportation costs (Hennebry and Preibisch 2012, e32; Martin 2006, 28). Under SAWS, employers provided workers with accommodation and transportation (Consterdine and Samuk 2015, 8), while the experience of the LSPP shows that migration costs can represent a significant source of vulnerability when private agencies assume a larger role in recruitment (Preibisch 2010, 425-426). The experiences of these programs show that financing can be distributed among several actors, while the choice of institutional model affects who bears particular administrative and migration-related costs. More broadly, the sustainability of such programs requires stable financial and institutional support (Predojević-Despić 2021, 84).

The comparative analysis shows that a temporary labor migration program does not represent a single institutional model, but rather a set of arrangements governing worker recruitment, access to migrant labor, the temporariness and mobility of migrants, as well as their protection and the distribution of costs (Table 5). The experiences of the programs analyzed indicate that individual institutional arrangements can produce problems as well as advantages. A program for raspberry production in Serbia therefore cannot be based on the direct adoption of any one existing model, but rather on the selection and adaptation of their elements to domestic needs and institutional conditions.

Table 5. Comparative Overview of Temporary Labor Migration Programs Across the Analyzed Dimensions

Dimension	SAWP	SAWS	LSPP	Key Institutional Lesson
Institutional organization and recruitment	Bilateral model; involves the country of origin	Program operators	Greater role of private agencies	Different distribution of responsibilities and oversight
Access and control over volumes	Labor market test; no quota	Annual quota	Labor market test; no quota	Tests and quotas have different functions and can be combined
Temporariness and mobility	Limited duration; return requirement; employer change restricted	Limited duration; repeat participation allowed; mobility restricted	Potential pathway to regular permits; tied to employer	Circularity enables repeated engagement; tying workers to employers carries risk of dependency
Protection and costs	High regulation; bilateral safeguards; costs shared	Oversight and complaints mechanisms; employer obligations	Risks associated with private recruitment and migration costs	Need for oversight, protection of rights, and sustainable financing

10.2. Possibilities for Implementing a Temporary Labor Migration Program in Serbia

The possibility of implementing a temporary labor migration program in raspberry production would not necessarily require the establishment of an entirely new legal regime for the engagement of foreign seasonal workers. In Serbia, the 2018 Law on Simplified Work Engagement on Seasonal Jobs in Certain Activities established a special regime for seasonal work in agriculture, which also applies to foreign workers (Kuzminac 2023, 248). Their engagement does not require the issuance of a work permit, thereby exempting seasonal agricultural work from the standard procedure for employing foreign nationals (Reljanović 2023, 135). The existing framework therefore already removes one administrative barrier to the organized engagement of foreign raspberry pickers, meaning that the proposed program could be developed by building on the existing regime rather than by creating a parallel system of seasonal employment.

The existing institutional basis for implementing an organized program is considerably narrower than the legal basis and would require capacity building. In Serbia, part of such infrastructure is already provided by migration service centers, which offer migrants and potential migrants information on rights, safe migration, required permits, and opportunities for work and education (Grečić 2017, 46). Their network consists of seven centers, while the literature points to the need to expand the network and strengthen its capacities (Rašević 2017, 140-141; Predojević-Despić 2021, 78). These institutions could therefore form part of the existing program infrastructure, but they would not be sufficient for its implementation, which would require broader coordination among institutions responsible for employment, migration, and local program implementation.

The implementation of a temporary labor migration program in Serbia raises the question of whether a country that has traditionally been a source of emigration can simultaneously attract workers from abroad. The international dimension of dual labor market theory was primarily developed to explain structural demand for migrant labor in developed industrial economies, but its mechanisms do not imply that less developed countries cannot become destinations for labor migration. Piore (1979, 130-133) even shows that emigration of the domestic labor force can create gaps that are subsequently filled by migrants from even less developed settings. As an example, he cites Puerto Rico, where agricultural jobs abandoned by Puerto Rican workers following their migration to the continental United

States were taken over by migrants from Colombia. Lewis (1986, 34) similarly shows that countries traditionally characterized by labor emigration may later begin to rely on foreign workers when they face domestic labor shortages, including in rural areas.

This pattern is particularly relevant to Serbia, which has traditionally been a country of emigration and remains predominantly so (Grečić 2017, 43; Rašević 2017, 131), although the possibility of a gradual shift in migration flows and the strengthening of its role as a destination country has been noted (Rašević 2016, 95). The growing engagement of foreign workers points to a change in this role, while attracting labor from abroad is increasingly being considered as a response to shortages in the domestic labor market (Reljanović 2023, 132). Serbia therefore does not need to be viewed exclusively as a country of origin or transit, but also as a labor market in which demand for foreign labor is gradually emerging.

The mere possibility of engaging foreign workers, however, does not mean that Serbia will be able to attract a sufficient number of migrants. Its lower level of economic development, lower living standards and wages, as well as the proximity of more developed European labor markets, limit its attractiveness as a migration destination (Nikolić 2023b, 207-208; Nikolić and Maksimović 2024, 77). Nevertheless, experiences from raspberry production show that these obstacles do not rule out the possibility of engaging foreign seasonal labor. Kljajić (2017, 47) states that, due to insufficient interest among domestic workers in harvesting, workers from neighboring countries such as Romania and Bulgaria were occasionally engaged, while the findings of the content analysis indicate that during the 2021-2025 period the engagement of migrants increasingly appeared as one of the responses to shortages of domestic seasonal labor. These findings show that migrant labor can be engaged in raspberry production, but they do not resolve the question of whether such a source of labor could be sufficiently large and stable to meet the needs of an organized program. This is particularly important given that migrants with access to other employment opportunities may prefer more favorable jobs in other sectors (Ryan 2023, 26-27). For the program to function successfully, organized recruitment would therefore need to connect the labor needs of raspberry production with groups of workers for whom temporary migration to Serbia and seasonal employment in harvesting would represent a sufficiently favorable economic alternative.

The selection of potential countries of origin represents one of the key issues in organizing the program. Dual labor market theory suggests that temporary migrants often originate from less developed countries because lower-status jobs in the destination country

may represent economic and social advancement relative to the opportunities available in their home environment (Piore 1979, 54-58). In practical terms, wage differentials and geographical distance are particularly relevant: although wage differentials alone do not necessarily determine migration decisions, larger differentials can increase the incentive to migrate, while greater distance increases migration costs, which is especially important in the case of short-term seasonal employment (Perloff et al. 1998, 154-155, 163). On this basis, potential sources of labor can be considered through countries in the regional environment and more distant lower-income countries.

Geographical proximity and existing forms of regional mobility make the Western Balkan countries a logical first group of potential countries of origin. Countries in the region show increasing interest in developing circular labor migration and integrating their labor markets (Nikolić and Maksimović 2024, 67), while Serbia already attracts the largest number of migrants from other Western Balkan countries (OECD 2022, 20, 107). An additional institutional basis is provided by the Berlin Process, which envisaged facilitating worker mobility, and the Open Balkan initiative involving Serbia, Albania, and North Macedonia, aimed at creating a common labor market and simplifying access to employment (OECD 2022, 120; Reljanović 2023, 137). These arrangements, together with lower transportation costs, give regional recruitment significant practical advantages for short-term seasonal work.

The scale of migration between Western Balkan countries remains relatively limited, while potential migrants from the region show substantially greater interest in migrating to more developed countries than within the region (OECD 2022, 120). In addition, existing patterns of labor mobility in the Western Balkans show a strong orientation toward major urban centers (Ivanović 2021, 8), which may represent an additional limitation for recruitment into seasonal agricultural work in rural areas. The advantage of geographical proximity is therefore offset by the relatively small economic differences between Serbia and countries in the region, as well as by competition from more attractive European labor markets. Regional recruitment may represent the simplest institutional channel, but it is uncertain whether it alone could provide a sufficient number of seasonal workers.

An alternative source consists of more distant lower-income countries, including certain countries in Asia and Africa. Their potential advantage stems from larger differences in wages and living standards, as a result of which even relatively lower wages in the destination country may represent an economic improvement. The experience of North Macedonia, where almost half of foreign workers come from Turkey, shows that countries in

the region can also attract labor from beyond their immediate neighborhood (Nikolić and Maksimović 2024, 73). Greater distance, however, increases the costs and complexity of recruitment. Transportation costs represent a particularly important constraint in seasonal work, because the short duration of employment requires the earnings generated to be sufficient to offset migration costs (Perloff et al. 1998, 154). This constraint would be particularly relevant to raspberry production in Serbia, where harvesting lasts for a relatively short period, meaning that recruiting workers from very distant countries would require careful regulation of transportation, costs, and the minimum economic gain that a migrant could achieve during a single cycle. This constraint could be mitigated by extending the period of potential employment through other agricultural crops before and after the raspberry harvest or by extending the harvesting season itself, as discussed in the final program.

In addition to the organized recruitment of seasonal workers from regional or more distant countries of origin, certain categories of migrants already present in Serbia could represent a supplementary source of labor. Preibisch (2010, 408) points out that asylum seekers may represent a source of manual labor in agriculture, while Rašević (2016, 46) links the possibility of their engagement to structural labor shortages in Serbia, noting that they have already been employed in jobs avoided by the local labor force, including agriculture. This source could not replace organized recruitment from abroad, but it could represent a supplementary channel.

The possibilities considered do not suggest that the organized component of the program should be restricted in advance to a single country or region of origin. The selection of labor sources could be adjusted according to worker availability, recruitment costs, and the program's ability to provide workers with a favorable economic outcome. Diversification of countries of origin could reduce the program's dependence on labor availability from a single migration route, an issue also recognized in the experience of Canadian employers who sought to avoid dependence on workers from one country or national group (Preibisch 2010, 420).

10.3. Proposed Model of a Temporary Labor Migration Program

Building on the results of the comparative analysis, the recruitment of migrant workers should be organized through an institutionally controlled system, with a competent state body performing a central coordinating and regulatory role. Such an arrangement is also

consistent with the theoretical importance of formal recruiters in linking the supply of and demand for migrant labor (Piore 1979, 19-24). Bilateral cooperation with countries of origin would represent a desirable channel where mutual interest exists, since the involvement of the country of origin can reduce the role of unregulated intermediaries, distribute part of the responsibility for program implementation, and contribute to the protection of migrant workers (Hennebry and Preibisch 2012, e24, e29-e30; Martin 2006, 29). However, the program should not be made conditional on the existence of a bilateral agreement with every country of origin, as this could restrict the recruitment of workers from a broader range of countries. Where a bilateral channel is not available, operational recruitment tasks could be entrusted to a limited number of authorized private agencies, thereby retaining the flexibility of the intermediary-based model while facilitating oversight and reducing the risks of abuse recorded under the LSPP (Preibisch 2010, 425-426). The system could be supported by the existing network of migration service centers, whose role is to provide migrants with information and advice on rights, required permits, and employment opportunities (Grečić 2017, 46), while consideration should be given to opening an additional center in one of the municipalities within the main raspberry-producing area.

Access to the program and its scale should be linked to a prior assessment of the need for additional seasonal labor. Individual labor market testing for each producer, as applied in some programs, could be difficult to reconcile with the short and time-sensitive raspberry harvesting period. For the Serbian case, a pre-season assessment of overall labor requirements in the raspberry-producing area covered by the program would therefore be more appropriate, on the basis of which the competent body would determine the maximum number of migrant workers that could be engaged. A similar link between assessing the balance between labor supply and demand and determining quotas exists in North Macedonia (Kuzminac 2023, 250). A quota established in this way would allow the scale of the program to follow the labor market gap and the capacities of the institutions responsible for its implementation, while limiting the risk that migrant labor could displace domestic seasonal workers. In the initial phase, the program could be implemented as a geographically and numerically limited pilot project in one of the main raspberry-producing areas, allowing the competent institutions to gradually adapt to its implementation before any potential expansion.

The third element of the model concerns time limits on employment and the possibility of maintaining the circular character of migration. In considering the

temporariness of the program, however, it is necessary to distinguish between the time limit on seasonal work and a migrant's right to reside in Serbia, since these issues are regulated under different legal regimes. The work engagement of foreign seasonal workers in agriculture is regulated by the Law on Simplified Work Engagement on Seasonal Jobs, under which the same seasonal worker may be engaged by the same employer for no more than 120 working days per year (Radulović and Anđelković Đoković 2019, 9-10; Kovačević 2023, 15). The right of residence, however, is regulated separately by the Law on Foreigners and the relevant international regimes, meaning that the end of seasonal employment does not necessarily entail the termination of lawful residence in Serbia (Law on Foreigners, Arts. 39-40). The competent program body should therefore coordinate procedures related to the lawful entry and residence of workers with the authorities responsible for issuing the required visas and residence permits. Unlike the programs analyzed above, in which time limits on residence and return mechanisms formed the basis of temporariness, the possibility of directly transferring such a model to Serbia remains limited. For nationals of countries subject to visa requirements, some scope for preserving temporariness could exist through aligning short-term residence with seasonal employment, but such an arrangement would be less suitable for more distant countries of origin, since higher transportation costs require a sufficiently long period of employment for migration to be economically viable (Perloff et al. 1998, 154). The possibility of controlling return is even more limited for workers from the region, where existing processes of liberalizing cross-border movement and labor market access, including Open Balkan, facilitate cross-border mobility (OECD 2022, 120; Kuzminac 2023, 251-252). The program could therefore impose time limits on the employment it organizes, but it could not reliably ensure that migrants leave Serbia once that employment ends, which limits the possibility of establishing a strictly circular model.

The limited possibility of controlling residence also affects how the program can regulate the mobility of migrant workers. Rigidly tying a worker to a single producer would not necessarily ensure that the worker remains in the program, since a worker who continues to reside lawfully in Serbia may leave the program and, provided that the legal requirements are met, seek other employment. The possibility of leaving the program while remaining in the seasonal agricultural labor market is particularly relevant because the existing seasonal work regime allows foreign workers to be engaged without a work permit. The quota proposed above could therefore control the number of migrant workers engaged through the program, but not the total number of migrants lawfully participating in the local seasonal

labor market. Rather than rigidly tying workers to a single employer, it would therefore be more appropriate to allow controlled mobility between producers participating in the program, thereby reducing workers' incentive to leave the program while keeping their continued employment within an institutionally supervised system. Such an arrangement is also consistent with the findings of the comparative analysis, which showed that tying workers to an employer can increase their dependence, while SAWS allowed for organized transfers between farms (Hennebry and Preibisch 2012, e24-e25, e32; Consterdine and Samuk 2015, 8).

The fourth element of the model concerns the protection of migrant workers and the distribution of program costs. Since the existing regime established by the Law on Simplified Work Engagement on Seasonal Jobs applies to foreign seasonal agricultural workers (Kuzminac 2023, 248), there would be no need to establish a separate regime governing working conditions for them within the migration program. Possibilities for improving the existing regime will be examined in greater detail in the following chapter, and the proposed measures would simultaneously improve the position of both domestic and foreign seasonal workers. An additional issue specific to the organized arrival of migrant workers concerns accommodation, the provision of which, together with compliance with minimum standards, should be a condition for producers' participation in the program. Compliance with these requirements could be verified by the competent state body or by an authorized independent inspection body appointed through a public procedure, drawing on the experience of SAWS, where operators verified employers' compliance with accommodation requirements and the Gangmasters Licensing Authority provided an additional mechanism for monitoring employment standards and preventing worker exploitation (Consterdine and Samuk 2015, 7; Martin 2006, 32).

Another important issue is the distribution of program costs, which must take into account its economic sustainability for both producers and migrant workers. Employers would pay workers the agreed wage and bear the costs arising from their lawful seasonal engagement, as well as provide appropriate accommodation, while the state would finance the administrative and regulatory activities necessary for the functioning of the program. Under the basic model, the costs of international arrival and return would primarily be borne by migrants, an approach also found in the previously analyzed programs, in which migrant workers participated in financing transportation costs (Hennebry and Preibisch 2012, e32-e33; Martin 2006, 28), while the organization of transportation could, where necessary, be

undertaken by the competent state body or authorized agencies involved in program implementation. This distribution would limit the additional financial burden on producers, which could reduce their willingness to participate in the program. Since high transportation costs represent a particularly important constraint on seasonal migration from more distant countries (Perloff et al. 1998, 154), before accepting employment a migrant would need to be informed of the expected earnings, duration of employment, and costs they would bear, so that they could assess the economic viability of participating in the program. The competent body would monitor compliance with the conditions established in advance, thereby limiting the risks of abuse associated with the costs of migrant employment.

10.4. Limitations and Risks of the Proposed Program

The most significant limitation of the proposed program arises from the limited possibility of ensuring its temporary and circular character. As shown in the preceding analysis, the end of employment through the program does not necessarily entail the departure of the migrant worker from Serbia, meaning that some participants may remain in the country and gradually shift from temporary to more permanent migration. This development is particularly important from the perspective of dual labor market theory. Piore (1979, 86-87) argues that temporary migrants generally do not compete with domestic workers in the primary segment because they accept secondary labor market jobs that the domestic population avoids. Over time, however, some migrants settle permanently in the destination country, form families, and increasingly tie their social identity to the new social environment. As a result, they, and particularly their descendants, become less willing to accept secondary jobs and increasingly aspire to employment in the primary segment, while the need for a new inflow of migrant labor into the secondary segment remains (Piore 1979, 60-68, 87; 1986, 25). Permanent settlement therefore represents not only a departure from the circularity of the program, but may also alter its relationship with the structure of the domestic labor market. In addition, family, friendship, and community ties can play an important role in transmitting employment information, recruiting new migrants, and providing assistance in finding work (Piore 1979, 19, 104), while cumulative causation theory explains that the expansion of such networks reduces the costs and risks of migration and increases the likelihood of its reproduction (Massey et al. 1993, 448-450). Establishing an organized migration channel may therefore, over time, generate migration flows whose scale and duration cannot be fully controlled by the competent body.

An additional limitation concerns the possibility of controlling the scale and movement of migrant labor after workers arrive in Serbia. As previously shown, a worker lawfully residing in the country may leave the program and, if the legal requirements are met, seek employment with another employer or in another sector, while experiences of agricultural migration also indicate the possibility of moving from agriculture into employment in urban areas (Consterdine and Samuk 2015, 17). The proposed quota could therefore limit the number of workers engaged through the program, but not their subsequent participation in the domestic labor market. This issue is also significant from the perspective of dual labor market theory. Piore (1979, 99) warns that a virtually unlimited supply of migrant labor can exert downward pressure on wages to a level at which the employment of domestic workers is threatened. Although foreign agricultural workers may complement the domestic labor force (Rye and Scott 2018, 930), there are also empirical findings indicating that migrants in agriculture may function more as substitutes than as complements (Cristea and Noja 2019, 121). The role of migrant workers should therefore remain complementary to the domestic labor force, while the limited possibility of controlling them after they leave the program makes preserving such a relationship more difficult.

The practical scope of the program would depend on the institutional and financial capacities required for its implementation, as well as on the ability to attract a sufficient number of migrant workers. Given the considerable resources that implementation would require, insufficient capacities of the competent body could limit both the scale of the program and the quality of oversight. At the same time, it remains uncertain whether Serbia could attract enough workers to significantly mitigate the labor market gap in raspberry production. Reljanović (2023, 139) points out that the key question is not only whether foreign workers will come to Serbia, but also how long they will remain, since Serbia may represent only one stage on their route toward European Union labor markets. The previously presented experiences of engaging foreign raspberry pickers show that foreign seasonal labor is available to some extent, but do not show that it is sufficiently large and stable to meet the needs of an organized program, particularly given Serbia's limited attractiveness as a migration destination and competition from other labor markets and sectors. The actual scale of the program could therefore be constrained by implementation capacities and by the number of migrants willing to participate under the conditions offered.

Finally, the scope of a temporary labor migration program should be viewed in light of its broader limitations. Temporary migration cannot resolve structural labor market

deficiencies, but it may represent one of the strategies for maintaining labor market balance (Predojević-Despić 2021, 77). In the case of raspberry production in Serbia, its scope is further limited by the previously identified obstacles to ensuring circularity, controlling worker mobility, implementing the program institutionally, and attracting a sufficient number of migrants. In addition to these limitations, its implementation may also produce new challenges associated with the more permanent settlement of some migrants and the development of migration flows beyond the institutional framework of the program. Taken together, these considerations suggest that a temporary labor migration program could represent only a partial response to the labor market gap and would need to be complemented by the other approaches considered in the following sections.

11. Program for Improving Working Conditions in Raspberry Production

In addition to increasing the supply of labor, the labor market gap can also be addressed by improving job quality in the sectors in which it occurs. Nikolić and Maksimović (2024, 76) emphasize that bringing in foreign labor is not in itself sufficient to address the labor market gap, but that structural reforms aimed at improving working conditions are also necessary. Similarly, FAO (2020, 78) stresses that, in addition to reducing the labor market gap, the sustainable development of rural areas also requires improvements in job quality and working conditions. Improving working conditions therefore represents an additional approach to addressing the gap, complementary to measures aimed at increasing labor supply or reducing labor requirements. Although most of the available literature and the existing legal regime concern seasonal work in agriculture in general, the proposed measures are particularly relevant to raspberry production, since it relies heavily on seasonal labor during harvesting. The program is therefore not based on establishing a separate regime for raspberry production, but on improving the existing system of seasonal agricultural work as a means of mitigating the gap in raspberry production.

From the perspective of dual labor market theory, labor shortages do not necessarily arise exclusively from an insufficient number of potential workers, but may also be associated with the characteristics of the jobs themselves. De Haas, Castles, and Miller (2020, 276) point out that labor demand for certain jobs may be partly socially constructed, since the local population refuses to perform them because of unfavorable working conditions, low

wages, and low social status. Piore (1979, 47) emphasizes that job-security arrangements can change the characteristics of particular jobs and make them more attractive to domestic workers. On this basis, improving working conditions in raspberry production can be viewed as an institutional intervention aimed at increasing the attractiveness of seasonal jobs for the domestic labor force, rather than solely as a worker-protection measure.

11.1. Reform of Seasonal Employment as the Starting Point of the Program

Serbia has already taken significant steps toward the formalization of seasonal work in agriculture. Since stricter penalties and labor inspection had not produced significant results in encouraging employers to register seasonal workers, the reform focused on simplifying their engagement and reducing costs (Radulović and Anđelković Đoković 2019, 6). Before 2018, seasonal work in agriculture was regulated under general labor legislation as a form of temporary and occasional employment, whereas the adoption of the Law on Simplified Work Engagement on Seasonal Jobs in Certain Activities established a separate legal regime for agriculture, forestry, and fisheries (Končar 2022, 475-476; Radulović and Anđelković Đoković 2019, 7; Kovačević 2023, 7).

The new system substantially simplified the registration and deregistration of seasonal workers through an electronic procedure and reduced the administrative procedures and costs associated with their engagement (Radulović and Anđelković Đoković 2019, 15, 17-18, 20-23; Kovačević 2023, 7). It provided workers with pension insurance and a minimum price of labor, while entitlement to social assistance or unemployment benefits is not suspended during seasonal employment (Radulović and Anđelković Đoković 2019, 13; Kovačević 2023, 14). Initial results indicate significant progress in formalization, since during the first nine months of implementation the number of registered seasonal workers increased from 3,500 to 25,000 (Radulović and Anđelković Đoković 2019, 47). Nevertheless, employment is still based on an oral agreement, health insurance is limited to workplace injuries and occupational diseases, some rights characteristic of standard employment relationships remain unavailable, and permitted working time may amount to up to 12 hours per day (Končar 2022, 476; Radulović and Anđelković Đoković 2019, 11, 13; Kovačević 2023, 12, 15). The reform therefore primarily improved the formalization of seasonal work, while employment security and job quality improved to a considerably lesser extent.

Viewed in light of the theoretical framework, the further development of the seasonal employment system should, in addition to formalization, include strengthening institutional mechanisms governing employment security, job quality, and working conditions. Such an approach is consistent with OECD's (2022, 163) recommendations that labor formalization should be accompanied by further improvements in job quality and more consistent enforcement of labor legislation. The focus of further reforms should therefore not be exclusively on increasing the number of registered workers, but also on the quality and security of seasonal employment.

11.2. Directions for Further Improving Seasonal Working Conditions

Moving from the formalization of seasonal work toward improving job quality requires improvements in the conditions under which such work is performed. However, the scope for improving job quality is limited by some characteristics inherent in seasonal raspberry harvesting, particularly its seasonality and physically demanding nature. The proposed measures therefore focus primarily on those aspects of seasonal employment that can be improved institutionally, particularly workers' rights and social protection. Since seasonal work is based on an oral agreement between employer and worker, one possible measure would be to introduce a requirement to provide written information on the basic conditions of work with each engagement. Such a measure could contribute to greater transparency in employment arrangements, better awareness among seasonal workers of their rights and obligations, and greater legal certainty in the event of disputes, since the current system provides for the issuance of such information only at the worker's request (Kovačević 2023, 13). At the same time, it would be appropriate to consider the gradual improvement of labor and social protection for seasonal workers, particularly in areas where the existing system provides a lower level of protection than standard forms of employment (Končar 2022, 476). In addition to improving regulations, their consistent implementation in practice must also be strengthened. More effective protection of seasonal workers' rights is currently constrained by insufficient institutional capacities and the slow pace of judicial proceedings in the field of labor relations (Kovačević 2023, 9-10).

In this way, the formalization of seasonal work would be complemented by institutional measures aimed at improving the quality of seasonal employment. Viewed from the perspective of the internal heterogeneity of the secondary segment identified by Uys and Blaauw, the 2018 reform of seasonal employment can be interpreted as an institutional

intervention that contributed to the formalization of seasonal work within the secondary segment, while the proposed measures would represent a continuation of that process through improvements in the quality of formal seasonal employment. Since the existing regime also covers foreign seasonal workers in agriculture, the proposed improvements would apply to both domestic and foreign seasonal workers. At the same time, such measures could contribute to increasing the attractiveness of seasonal work for part of the domestic labor force, which represents the main mechanism through which the program could contribute to mitigating the labor market gap.

However, the potential of these measures to increase the attractiveness of seasonal work faces structural limitations. Piore (1979, 59) points out that the need for migrant labor can be substantially reduced through job restructuring that improves employment security and opportunities for advancement. However, if the low attractiveness of certain jobs is primarily associated with their social status, the possibilities for reducing reliance on migrants by changing job characteristics are considerably more limited. In raspberry production, this limitation is particularly pronounced because harvesting is characterized by strong seasonality, physically demanding work during the summer months, and the low social status of day-labor jobs. In addition, dual labor market theory suggests that for jobs at the lowest end of the occupational hierarchy, wage increases alone are insufficient to substantially increase the interest of the domestic labor force, which means that mitigating the gap requires combining different policies and mechanisms for securing labor (Piore 1979, 80). This is also consistent with the results of the content analysis conducted in this thesis, which show that the gap remained present despite a several-fold increase in daily wages for raspberry pickers during the observed period. Improving working conditions and wages should therefore be viewed as an important, but not sufficient, instrument for mitigating the gap, whose effects could be greater if implemented in combination with the other programs.

12. Labor-Saving Mechanization

12.1. Potential for Mitigating the Structural Labor Market Gap

Labor-saving mechanization represents one possible response to the labor market gap in raspberry production. This approach involves the application of technologies that substitute for human labor, such as automated mechanical and robotic harvesters, conveyor belts, and drones (Ryan 2023, 31). Unlike policies aimed at increasing labor supply, this approach seeks

to mitigate the gap by reducing demand for seasonal labor, that is, by replacing part of manual labor with machinery (Suchopár et al. 2025, 1-2). According to Urošević et al. (2011, 81-84), one automated raspberry harvester with four operators can replace the work of approximately 96 pickers on an area of 12 ha, while other studies confirm a similar relationship between mechanical and manual harvesting (Strik 2007, 30).

Since raspberry production depends significantly on seasonal labor (Kljajić et al. 2017, 63; 2025, 520; Veljković et al. 2025, 186), the development of modern technologies has primarily focused on automating harvesting, the stage of the production process that requires the greatest amount of labor (Dimitrijević and Ceranić 2011, 167-168; Petrović et al. 2017, 2). Seasonal labor is also one of the most expensive production inputs in raspberry production (Petrović et al. 2017, 2; Urošević et al. 2011, 80; Marković et al. 2017, 569). In this context, labor-saving mechanization, in addition to reducing labor requirements, can contribute to increasing productivity and reducing production costs (Kljajić 2025, 85). Marković et al. (2017, 568) estimate that costs can be reduced by as much as 78%. Rising labor costs and difficulties in securing labor have historically been important drivers of the development of mechanized harvesting technologies (Suchopár et al. 2025, 1-2).

From the perspective of dual labor market theory, labor-saving mechanization represents a shift from a more labor-intensive to a more capital-intensive form of production organization. Piore (1979, 36-37) points out that technological differences between these two types of production affect the organization of work and the structure of labor demand. On this basis, the application of mechanization does not merely mean replacing human labor with machinery, but also changing the structure of jobs within the production process. By reducing the need for manual seasonal jobs, which have the characteristics of the secondary segment of the labor market, the importance of jobs related to the operation, supervision, and maintenance of advanced machinery increases, and these jobs require a higher level of skills. Ryan (2023, 10, 30) likewise emphasizes that the broader application of labor-saving mechanization increases demand for highly skilled workers trained to operate these systems.

The COVID-19 pandemic further highlighted the importance of labor-saving technologies under conditions in which the engagement of seasonal labor, particularly foreign labor, became more difficult (Ryan 2023, 23-25). The pandemic demonstrated that agricultural production systems that rely on migrant labor can be particularly vulnerable during international crises (Predojević-Despić 2021, 74-75), while automation can contribute

to reducing such dependence and increasing the resilience of agricultural production (Ryan 2023, 9, 22-25).

12.2. Possibilities and Limitations of Applying Labor-Saving Mechanization in Serbian Raspberry Production

The application of mechanized harvesting requires an appropriate plantation layout that allows harvesters to move and operate, including sufficient spacing between rows (Petrović et al. 2017, 4-5; Marković et al. 2017, 571-573). An example of its application under such production conditions is the company “Libertas-agrar” from Šabac, which by the end of the first decade of the twenty-first century already had three self-propelled harvesters in use on a 65-hectare raspberry plantation (Urošević et al. 2011, 80-81; Nikolić et al. 2008, 246). In addition to imported machines, domestic trailed and self-propelled harvesters have also been developed in Serbia (Petrović et al. 2017, 2-4). At the international level, robotic harvesters designed to pick individual ripe fruits are also being developed, although their commercial application remains limited (Suchopár et al. 2025, 2).

Despite its significant potential for mitigating the labor market gap and existing examples of its application, labor-saving mechanization remains very limited in raspberry production in Serbia. The findings of the content analysis likewise show its limited presence among the recorded responses to labor shortages: labor-saving mechanization does not appear in any of the analyzed articles from the 2015-2020 period, while in the 2021-2025 period it was recorded in 3 of 33 articles (9.1%), all three of which were published in 2021. Unlike in many countries where modern technologies are used in harvesting (Strik 2007, 30), most harvesting in Serbia is still carried out manually (Kljajić 2017, 50). Most producers are characterized by the use of traditional production methods and outdated machinery (Kljajić 2025, 81; SORS 2024, 6), while the application of even simpler technologies, such as irrigation systems and anti-hail nets, remains relatively modest (Nikolić et al. 2008, 245).

Serbian agriculture is characterized by pronounced structural duality, with a large number of small and fragmented farms using outdated technology on the one hand, and a small number of large and technologically more advanced producers on the other (World Bank 2019, 7; FAO 2020, XV, 18). A similar division is present in raspberry production, where modern technologies are used by only a small number of producers, mainly on consolidated plots and with higher levels of investment (Keserović et al. 2014, 39). Efficient and economically viable mechanized harvesting requires large, interconnected raspberry

plantations (Marković et al. 2017, 569; Nikolić et al. 2008, 243). However, raspberry production in Serbia is characterized by a large number of small, irregularly shaped raspberry plantations located at considerable distances from one another (Božić and Munćan 2007, 225; Pejanović et al. 2017, 1621), which is why Kljajić (2025, 13) and Nikolić et al. (2008, 243-246) identify fragmentation as one of the key challenges to the application of mechanized harvesting. Only around 10% of raspberry plantations cover more than one hectare, while approximately half are smaller than 0.2 hectares (Wróblewska et al. 2019, 72), which prevents the full utilization of machinery capacity and significantly reduces its economic viability.

In addition to limitations arising from the size and fragmentation of plantations, the broader application of labor-saving mechanization is hindered by a range of technical and organizational challenges. A significant number of existing plantations are not adapted to mechanical harvesting because they were established for manual fruit picking (Petrović et al. 2017, 2; Urošević et al. 2011, 80). Narrow row spacing often prevents automated harvesters from passing through plantations, making plantation reorganization necessary for their efficient use (Challies and Murray 2011, 44; Marković et al. 2017, 569). Adapting existing plantations requires additional investment and increases the costs of introducing mechanized harvesting (Jara-Rojas et al. 2018, 352-353; Strik 2007, 30). Some technical limitations have nevertheless been partially overcome. Although sloping terrain makes the use of automated harvesters more difficult (Petrović et al. 2017, 2; Urošević et al. 2011, 80), one domestically developed model is equipped with a leveling system that enables operation on such terrain (Petrović et al. 2017, 4-5; Marković et al. 2017, 571-573). Another limitation is that not all raspberry cultivars are suitable for mechanized harvesting (Jara-Rojas et al. 2018, 353; Strik 2007, 30), although the Willamette and Meeker varieties, which are widely grown in Serbia, are suitable for mechanical fruit harvesting (Urošević et al. 2011, 80).

In addition to technical and organizational challenges, the application of labor-saving mechanization is constrained by institutional and financial factors. Insufficient awareness among producers of the possibilities for applying modern technologies represents a barrier to their wider adoption (Ryan 2023, 23). At the same time, insufficiently developed technology transfer between scientific and educational institutions and the agro-industry, together with the underdeveloped domestic research capacity in the field of agricultural mechanization, slows the modernization of raspberry production (Pejanović et al. 2017, 1624-1625). The high costs of purchasing and maintaining automated harvesters represent a significant

obstacle to their wider application (Jara-Rojas et al. 2018, 352; Strik 2007, 30). Financial constraints have been further reinforced by unfavorable credit conditions, since large loans represented a significant risk for producers, while high interest rates made commercial loans unfavorable (Ivanović and Gogić 2013, 323).

Although existing examples confirm that mechanized raspberry harvesting is technically feasible in Serbia, its wider application depends on overcoming the financial, institutional, and organizational barriers discussed above. The state could encourage the broader application of labor-saving mechanization through financial support for its introduction, since expensive agricultural technologies are often inaccessible to individual producers without public support (Ivanović and Gogić 2013, 324). Experience from previous periods shows that more favorable commercial bank loans contributed to improvements in mechanization in raspberry production (Veljković et al. 2008, 13), suggesting that one possible instrument could be more favorable credit lines for the purchase of modern agricultural machinery. In addition to public subsidies and more favorable credit lines, remittances from abroad could represent an additional source of investment capital for farm modernization. Bobić and Babović (2013, 225) point out that domestic institutions neither monitor how this capital is used nor develop mechanisms for directing it toward development initiatives, thereby failing to realize the significant development potential of remittances. Financial support should be complemented by improving producers' awareness of the possibilities for applying modern technologies (Ryan 2023, 23), as well as by strengthening technology transfer and cooperation between scientific and educational institutions and the agro-industry (Pejanović et al. 2017, 1625).

In the long term, one of the key prerequisites for the broader application of labor-saving mechanization is land consolidation, that is, the consolidation of fragmented plots into larger production units (Pejanović et al. 2017, 1621). Its implementation, however, is a lengthy and complex process, since owners are often not interested in selling or exchanging land, while the state lacks sufficiently developed legal and financial instruments to encourage such changes (Nikolić et al. 2008, 243). In addition to practical limitations, the consolidation of production and broader application of mechanization may have wider consequences for the structure of agriculture, since King et al. (2021, 5, 8) associate the industrialization of agriculture with the decline of small family farms and the expansion of large agricultural enterprises and agribusinesses. Land consolidation can therefore be viewed as a long-term direction for creating more favorable conditions for the application of mechanization, while

ensuring that small family farms are able to participate in the modernization process. In the shorter term, priority should be given to the gradual expansion of labor-saving mechanization, while also considering models for the shared use of machinery.

Although it cannot eliminate the need for human labor, labor-saving mechanization represents an important instrument for reducing the dependence of raspberry production on seasonal labor. Its more successful application requires a combination of technological, financial, institutional, and organizational measures, but its potential varies across farms, particularly small family producers. It is therefore also necessary to consider possibilities for adapting production on farms that do not have suitable conditions for the application of labor-saving mechanization, which provides the basis for the following program.

13. Program for Increasing Farm Self-Reliance in Raspberry Production

One possible approach to adapting production to available labor capacities is to align its scale and organization with the labor available to the agricultural household, thereby reducing its dependence on external seasonal labor. From the perspective of dual labor market theory, such an approach represents an alternative response to the structural gap in raspberry production, since it seeks to reduce farms' dependence on seasonal labor from the secondary segment of the labor market. Unlike the previously discussed labor-saving mechanization program, which seeks to reduce the need for human labor by substituting capital for labor, this program is based on aligning the production model with the available family labor force.

One of the most developed models of this approach was proposed by Veljković et al. (2024), who suggest that farm size should be determined by the amount of labor available to the household, that is, that producers should limit the area under raspberries to a scale they can cultivate and harvest independently, without the need to engage additional seasonal labor. Such a model is based on achieving a high degree of farm self-reliance, that is, almost complete independence from the labor market during the most labor-intensive phase of production. Although the study is primarily aimed at increasing farm resilience to price changes on the international market, the authors also recognize it as one possible response to the problem of seasonal labor shortages (Veljković et al. 2024, 175-177).

Veljković et al. (2024, 175-177) determine the size of the plantation that a household can independently cultivate and harvest on the basis of the production and labor characteristics of raspberry production. The recommendation that a four-member household organize raspberry production on an area of approximately 0.2 ha is based on calculations conducted on farms with many years of experience in the areas of Arilje, Ivanjica, Dragačevo, and Kosjerić during the period from 2013 to 2023. The calculations assume that an average picker harvests between 50 and 60 kg of raspberries per day, while harvesting lasts approximately 25 to 30 days. Based on these indicators, the authors estimate that a four-member household can perform all key production tasks with only a minimal need to engage additional seasonal labor.

Although the model proposed by Veljković et al. concerns raspberry production in Serbia, the idea of adapting farm size to the available family labor force is not entirely new. A similar approach has also been considered in the western United States, where the shift toward more labor-intensive fruit and vegetable production led to increased seasonal labor requirements. One proposed solution was to divide large farms into smaller family holdings so that household members could independently perform most seasonal tasks. This approach did not prevail, however, since the availability of seasonal migrant labor contributed to the persistence of the model based on large agricultural enterprises and agribusinesses (Martin 2006, 14-15).

13.1. Extending the Harvesting Season as a Way of Expanding the Model

Although the model proposed by Veljković et al. (2024) represents a significant step toward increasing farm self-reliance, its recommended plantation size is based on a calculation in which harvesting lasts approximately 25 to 30 days. There is therefore scope to expand the possibilities of this model by extending the harvesting season, which would allow the same household labor capacities to be distributed over a longer period. This approach is also supported by Kljajić et al. (2022, 100), who emphasize that the level of production is not entirely constrained, since a household can seek to extend the season and thereby increase the scale of production.

The first strategy for expanding the possibilities of this model is based on combining cultivars (varieties) with different ripening periods (Nikolić et al. 2008, 247), thereby extending the harvesting period (Kljajić 2025, 16). Such an approach can reduce the need to

engage a larger number of workers within a short period, which is particularly important under conditions of seasonal labor shortages (Kljajić 2025, 85). The possibility of such combinations arises from the existence of numerous cultivars with different ripening periods, including primocane- and florican-fruiting varieties (Nikolić et al. 2008, 244, 247; Kljajić 2025, 11, 16; Suchopár et al. 2025, 1-2). For example, the dominant florican-fruiting cultivar Willamette ripens in mid-summer, while the primocane-fruiting Polka ripens in late summer and early autumn (Keserović et al. 2014, 38). By combining them, the harvesting period can be extended compared with production based on a single cultivar, allowing the same family labor capacity to be spread over a longer period without a proportional increase in the need to engage additional seasonal labor.

A second possibility for extending the harvesting season is the use of plastic tunnels and greenhouses (Nikolić et al. 2008, 247; Kljajić et al. 2025, 536), which can bring forward the beginning and delay the end of the harvesting period. Protected cultivation, especially when combined with cultivars that ripen at different times, can further extend the harvesting season. Kljajić et al. (2025, 536) note that the season can last up to six months, creating opportunities to sell fresh raspberries at higher prices outside the usual harvesting period.

The application of this model could have significant potential precisely under the conditions characteristic of Serbia. Raspberry production can be suitable for small farms because relatively small areas can provide significant income without requiring extensive machinery and equipment (Paraušić and Simeunović 2016, 1420). This is also supported by the fact that approximately half of raspberry plantations are smaller than 0.2 ha (Wróblewska et al. 2019, 72), showing that production on relatively small areas already represents an important characteristic of raspberry production in Serbia. In addition, 69% of agricultural farms in Serbia are operated by households with one or two members (SORS 2024, 9), further indicating the need to adapt plantation size to the actual labor capacities available to each household rather than applying a single recommended area.

The advantage of this approach lies in the possibility of aligning the scale and organization of production with available family labor capacities, thereby reducing farms' dependence on external seasonal labor. Combined with an extended harvesting season, this model may represent a particularly significant solution for smaller family farms seeking to organize production predominantly through their own labor. The role of public policy would therefore be to facilitate such adaptation by supporting producers in adjusting the

organization of production and applying strategies that extend the harvesting season, rather than prescribing a uniform farm size.

14. Possibilities for Combining the Proposed Programs

The preceding analysis shows that the programs considered address different dimensions of the structural labor market gap in raspberry production and therefore do not need to be viewed as mutually exclusive alternatives. Possible responses to labor shortages differ across countries and sectors, meaning that, depending on the specific case, one or more programs, or different combinations of available measures, may be applied (Ryan 2023, 31; Berger and Piore 1980, 9). In the case analyzed here, the temporary labor migration program increases the supply of seasonal labor, improvements in working conditions seek to increase the attractiveness of seasonal employment for domestic workers, labor-saving mechanization reduces the need for manual labor, while increasing the self-reliance of farms adapts the scale and organization of production to available family labor capacities. Combining these programs therefore makes it possible to address different dimensions of the gap simultaneously.

A particularly complementary relationship exists between the engagement of temporary migrant workers and improvements in seasonal working conditions. While the first program makes it possible to increase the supply of labor during periods when domestic workers are insufficient, the second seeks to increase the attractiveness of the same jobs to the domestic population. Such a combination may also be important because of the risk that excessive reliance on migrant labor may over time contribute to the perception of certain agricultural jobs as “migrant jobs,” thereby further reducing the interest of the domestic population in performing them (Ryan 2023, 26; King 2012, 16). On the other hand, the possibility of attracting domestic workers increases when working conditions and potential earnings are improved (Martin 2020, 5-6). Combining these two approaches would therefore allow migrant labor primarily to complement the domestic labor supply, rather than allowing its engagement to become a substitute for improving the conditions and attractiveness of seasonal work.

Another possibility is to combine programs that increase labor supply with programs that reduce the need for labor. In this sense, temporary labor migration can help fill the immediate shortage of seasonal workers, while labor-saving mechanization can gradually

reduce the dependence of production on manual labor. The experience of Poland illustrates the role that foreign workers can play in filling labor market gaps, while technological change, including robotization and automation, represents another important factor shaping future labor demand (Malkowska and Drela 2024, 667-669). Nevertheless, the relationship between these two approaches may also operate in the opposite direction, since the availability of migrant labor may reduce producers' incentives to invest in labor-saving mechanization (Martin 2020, 2). Their combination should therefore allow migrant labor to be used where the need for manual labor continues to exist, without undermining the longer-term process of reducing production's dependence on such labor.

Combining the programs does not, however, imply their equal application across all farms, but rather allows responses to be adapted to their production and labor capacities. The program for increasing self-reliance is particularly directed toward smaller family farms that can adapt the scale and organization of production to the available family labor force, thereby reducing their need to engage external seasonal workers. By contrast, on farms that maintain a larger scale of production, a more prominent role may be played by mechanization or the engagement of additional domestic and migrant labor. The example of Italian regions also shows that different production systems can develop different responses to the same problem: in the production of the same labor-intensive crop, Emilia-Romagna relies to a greater extent on mechanization, while migrant labor has assumed a more significant role in Campania (Rye and Scott 2018, 932).

The relationship between individual programs can be further shaped through public policy instruments. Martin (2006, 1) points to the possibility of using tax and other economic mechanisms to influence the balance between the engagement of migrant labor and labor-saving alternatives. Building on this approach, through subsidies, tax instruments, and other economic incentives, the state could influence the relative attractiveness of different programs and, depending on their expected effects and established objectives, provide stronger incentives for particular approaches to mitigating the labor market gap. The advantage of a combined approach lies in its ability to address different dimensions of the gap simultaneously, while allowing the limitations of one program to be partially mitigated through the application of another and reducing dependence on a single approach to mitigating the structural labor gap.

Conclusion

The central research question of this thesis concerned how long-term structural changes on the labor supply side contributed to the formation and persistence of the labor market gap in raspberry production in Serbia and what public policy options arise from the structural constraints shaped by these changes. The analysis shows that the contemporary shortage of seasonal labor cannot be explained by a single isolated factor or solely by changes in the scale of production. Long-term changes in the size and availability of the domestic labor force and changes in the labor capacities and organization of work on family farms contributed to the formation and persistence of the gap, while changes in the scale of production affected its intensity. Linking these processes at the macro, meso, and micro levels shows that the existence and persistence of the gap cannot be reduced solely to a current shortage of raspberry pickers, but are associated with a longer-term transformation of the labor base on which raspberry production has traditionally relied.

At the macro level, key changes on the labor supply side occurred through two interconnected processes. Long-term rural-to-urban migration and emigration gradually reduced the demographic base from which agricultural labor was traditionally recruited, while among the population remaining in rural areas, employment patterns, available economic alternatives, and the position of social groups identified by dual labor market theory as traditional sources of reserve labor were simultaneously changing. Although the nature and intensity of these changes differed across individual categories, taken together they contributed to a decline in the size and availability of domestic labor for seasonal agricultural work. This gradually narrowed the labor base on which labor-intensive branches of agriculture, including raspberry production, rely, with migration primarily changing the number of potentially available workers, while changes in the traditional reserve labor force altered the availability of the remaining population for this type of work.

Changes at the macro level, however, do not directly affect the gap in raspberry production; rather, their effects are manifested through changes in the labor capacities and organization of work on agricultural farms. The meso-level analysis showed that between the two agricultural censuses there was a decline in the number of family members and relatives engaged on family farms, which was also recorded in four of the five leading raspberry-producing municipalities. At the same time, the volume of family labor in most of these municipalities did not decline but increased, indicating that the reduction in the number of

persons engaged was partially compensated for by more intensive engagement of the remaining family labor force. Nevertheless, such adjustment has limited scope, particularly during harvesting, when a large volume of labor is required within a short period. Seasonal labor therefore remains an important additional source of labor, with a greater volume of realized seasonal work recorded between the two censuses in most of the leading raspberry-producing municipalities. The simultaneous presence of difficulties in securing a sufficient number of seasonal workers shows that increased engagement of existing sources of labor was not always sufficient to fully meet production needs. The secondary character of harvesting does not in itself explain the emergence of the gap, but it helps explain why, under conditions of reduced availability of the traditional labor base, the required seasonal labor cannot simply be replaced by other sources of domestic labor.

Finally, the analysis of the relationship between production trends and labor shortages makes it possible to distinguish changes in the scale of production that affect the intensity of the gap from long-term structural processes that contribute to its persistence. The expansion of the area under raspberries until 2020 could have contributed to the intensification of the existing gap, but could not explain its persistence. The shortage of seasonal labor remained present after 2020 despite a significant decline in the area under raspberries, meaning that its persistence cannot be explained solely by increased labor demand resulting from the expansion of production. When this finding is linked to the long-term decline in the size and availability of the traditional labor base at the macro level and the limitations of family farms' labor capacities at the meso level, it provides a basis for defining the labor market gap in raspberry production as structural. Its intensity may vary with the scale of production, but its persistence points to a deeper mismatch between the needs of labor-intensive production and the labor force on which it has traditionally relied.

The second part of the research question concerned public policy options for mitigating the identified gap. Building on the theoretical framework and the literature on responses to labor shortages in agriculture, the thesis considered four possible approaches adapted to the specific characteristics of raspberry production. Their role is not to reverse the long-term structural processes that have changed the size and availability of the domestic labor force, but to mitigate their consequences and adapt production to changed labor market conditions. Temporary labor migration can expand the supply of seasonal labor, improvements in working conditions can increase the attractiveness of seasonal employment for part of the domestic labor force, labor-saving mechanization can reduce the need for

manual labor, while increasing farm self-reliance is aimed at adapting the organization and scale of production to farms' labor capacities. Since each approach addresses a different dimension of the gap and has its own limitations, the findings of the thesis point to the possibility of combining them in accordance with the characteristics of individual farms and local production conditions.

The main hypothesis of the thesis, according to which long-term structural changes on the labor supply side lead to a structural gap through reduced labor availability and growing dependence on hired seasonal labor, was partially confirmed. The findings support its basic assumption that long-term changes on the labor supply side contributed to the formation and persistence of the structural gap. However, the analysis revealed a more complex mechanism than initially assumed: the decline in the size and availability of traditional sources of domestic labor constrained the labor capacities of family farms, which sought to secure the required labor through more intensive engagement of the remaining family members and seasonal labor. The findings therefore do not provide a sufficient basis for claiming an unequivocally growing dependence on hired seasonal labor, but they do support the broader structural mechanism assumed by the main hypothesis.

Sub-hypothesis H1 was partially confirmed. The findings show that rural-to-urban migration and emigration reduced the demographic and labor base of rural areas from which agricultural labor has traditionally been secured, thereby also narrowing the potential labor base relevant to raspberry production. However, the available data do not make it possible to determine directly the extent to which migration reduced family and seasonal labor specifically in raspberry production, nor do the local data allow a conclusion of an unequivocal decline in realized seasonal work.

Sub-hypothesis H2 was partially confirmed. The findings show that changes in employment patterns, the expansion of economic alternatives, and changes in the position of traditional categories of the reserve labor force contributed to a decline in the availability of domestic labor for seasonal agricultural work. However, not all elements of the initial formulation received equal empirical support, particularly the shift toward informal and more socially desirable forms of employment. Instead, the analysis revealed different changes in the position and availability of traditional categories of the reserve labor force, whose significance for raspberry production is manifested indirectly through changes in the labor capacities and organization of work on agricultural farms.

Sub-hypothesis H3 was partially confirmed. The findings confirm the decline in the size of the family labor force and show that limited family labor capacities create a need to secure additional labor from outside the household, with seasonal labor representing the key source of additional labor during harvesting. However, the decline in the number of family members engaged was partially compensated for by more intensive engagement of the remaining members. The available data also do not make it possible to determine directly the extent to which the decline in family labor increased the effective demand for seasonal labor, since labor requirements were simultaneously changing with the scale of production.

The limitations of this research primarily arise from its reliance on secondary data sources and their limited ability to directly measure the supply of and demand for seasonal labor in raspberry production. Statistical data on seasonal work generally refer to agriculture as a whole and measure the realized volume of work, while comparison of the two agricultural censuses does not allow changes to be tracked throughout the entire intercensal period. The media content analysis made it possible to longitudinally track the presence and manifestations of labor shortages, but because of the purposive selection of articles, it does not allow their actual magnitude to be estimated. Combining different secondary sources made it possible to connect patterns and reconstruct the mechanisms through which the structural processes analyzed contributed to the formation and persistence of the gap, but not to precisely quantify the individual contribution of each of these processes. Future research should therefore supplement these sources with primary data collected from producers and seasonal workers in the leading raspberry-producing areas in order to examine more precisely the extent of unmet labor demand, changes in the relationship between family and seasonal labor, the motivations of domestic workers for accepting or rejecting harvesting work, and the significance of different economic alternatives. Such research would also allow a more precise assessment of the relative importance of the individual structural processes identified in this thesis, as well as an empirical evaluation of the effects of the proposed public policies following their potential implementation.

The overall findings of the thesis show that the shortage of seasonal labor in raspberry production cannot be viewed as an isolated problem of individual production seasons, but rather as an expression of a long-term mismatch between the needs of labor-intensive production and the changed demographic and labor base of the rural areas of Serbia. Its mitigation can therefore hardly be based on a single measure or on attempts to restore the former availability of domestic labor. Adapting to changed labor market conditions may

therefore involve combining measures that can expand the available labor supply, increase the attractiveness of seasonal employment, reduce production's dependence on manual labor, and adapt the scale and organization of production to the available labor capacities of farms, in accordance with the possibilities of different farms and local areas. Preserving raspberry production, and thereby the economic and developmental benefits it provides to agricultural farms and rural areas in Serbia, will therefore increasingly depend on the ability of producers and public policies to adapt to the structural changes that have transformed the labor base on which this sector has traditionally relied.

Bibliography

- Arandarenko, Mihail. 2010. "Politička ekonomija nezaposlenosti." In *Ekonomsko-socijalna struktura Srbije: Učinak prve decenije tranzicije*, edited by Mihail Arandarenko, Aleksandra Prašćević, and Slobodan Cvejić, 71-86. Belgrade: University of Belgrade - Faculty of Economics.
- Arandarenko, Mihail. 2011. *Supporting Strategies to Recover from the Crisis in South Eastern Europe: Country Assessment Report: Serbia*. Budapest: International Labour Organization.
- Bajić-Hajduković, Ivana, and Sara Bernard. 2023. "'Money Can't Buy Me Love': Remittances, Return Migration, and Family Relations in Serbia (1960s-2000s)." In *Remittances as Social Practices and Agents of Change: The Future of Transnational Society*, edited by Silke Meyer and Claudius Ströhle, 77-98. Cham: Palgrave Macmillan. https://doi.org/10.1007/978-3-030-81504-2_4
- Barać, Lazar, Anđelka Živojinović, and Jelena Ćuković. 2024. "Migratorni, strateški i ideološki aspekt povratka na selo u savremenoj Srbiji." *Antropologija* 24 (2): 29-45. <https://doi.org/10.21301/ant2422>
- Baučić, Ivo. 1970. *Porijeklo i struktura radnika iz Jugoslavije u SR Njemačkoj*. Migracije radnika, knj. 1. Radovi Instituta za geografiju Sveučilišta u Zagrebu, sv. 9. Zagreb: Institut za geografiju Sveučilišta u Zagrebu.
- Baučić, Ivo. 1971. "Vanjske migracije radne snage kao faktor socijalno-ekonomskih promjena u seoskim sredinama." *Sociologija sela* 9 (31-32): 127-140.
- Berger, Suzanne, and Michael J. Piore. 1980. "Overview." In *Dualism and Discontinuity in Industrial Societies*, 1-12. Cambridge: Cambridge University Press.
- Bobić, Mirjana, and Marija Babović. 2013. "Međunarodne migracije u Srbiji - stanje i politike." *Sociologija* 55 (2): 209-228. <https://doi.org/10.2298/SOC1302209B>
- Bogdanov, Natalija, and Marija Babović. 2014. *Radna snaga i aktivnosti poljoprivrednih gazdinstava*. Popis poljoprivrede 2012: Poljoprivreda u Republici Srbiji. Belgrade: Statistical Office of the Republic of Serbia.
- Božić, Dragica, and Petar Munćan. 2007. "Family Farms - The Factors of Agricultural Development in Serbia." In *Development of Agriculture and Rural Areas in Central and Eastern Europe: Thematic Proceedings of the 100th Seminar of the EAAE*, edited by Danilo Tomić and Miladin M. Ševarlić, 221-230. Novi Sad: Serbian Association of Agricultural Economists. <https://doi.org/10.22004/ag.econ.162392>
- Božić, Dragica, and Petar Munćan. 2015. "Regional Aspects of Family Holdings Structure in the Republic of Serbia." *Economics of Agriculture* 62 (1): 107-122. <https://doi.org/10.5937/ekoPolj1501107B>
- Cain, Glen G. 1975. "The Challenge of Dual and Radical Theories of the Labor Market to Orthodox Theory." *The American Economic Review* 65 (2): 16-22. <https://doi.org/10.2307/1818827>

- Castles, Stephen, Hein de Haas, and Mark J. Miller. 2014. *The Age of Migration: International Population Movements in the Modern World*. 5th ed. Basingstoke: Palgrave Macmillan.
- Challies, Edward R. T., and Warwick E. Murray. 2011. "The Interaction of Global Value Chains and Rural Livelihoods: The Case of Smallholder Raspberry Growers in Chile." *Journal of Agrarian Change* 11 (1): 29-59. <https://doi.org/10.1111/j.1471-0366.2010.00282.x>
- Consterdine, Erica, and Sahizer Samuk. 2015. *Closing the Seasonal Agricultural Workers Scheme: A Triple Loss*. Sussex Centre for Migration Research Working Paper No. 83. Brighton: University of Sussex.
- Cristea, Mirela, and Gratiela Georgiana Noja. 2019. "European Agriculture under Immigration Effects: New Empirical Evidence." *Agricultural Economics - Czech* 65 (3): 112-122. <https://doi.org/10.17221/69/2018-AGRICECON>
- de Haas, Hein, Stephen Castles, and Mark J. Miller. 2020. *The Age of Migration: International Population Movements in the Modern World*. 6th ed. London: Red Globe Press.
- de Haas, Hein. 2007. *Migration and Development: A Theoretical Perspective*. COMCAD Working Papers, No. 29. Bielefeld: Center on Migration, Citizenship and Development (COMCAD), Universität Bielefeld.
- de Haas, Hein. 2012. "The Migration and Development Pendulum: A Critical View on Research and Policy." *International Migration* 50 (3): 8-25. <https://doi.org/10.1111/j.1468-2435.2012.00755.x>
- Dickens, William T., and Kevin Lang. 1985. "A Test of Dual Labor Market Theory." *The American Economic Review* 75 (4): 792-805. <https://doi.org/10.2307/1821356>
- Dimitrijević, Bojan, and Slobodan Ceranić. 2011. "Razvoj proizvodnje maline u funkciji smanjenja ruralnog siromaštva u Republici Srbiji." *Ekonomika poljoprivrede* 58 (SB-2): 163-174. <https://www.ea.bg.ac.rs/index.php/EA/article/download/738/650>
- Doeringer, Peter B., and Michael J. Piore. 1970. *Internal Labor Markets and Manpower Analysis*. Cambridge, MA: Harvard University and Massachusetts Institute of Technology.
- Drobnjaković, Marija, and Milena Panić. 2024. "Urban-Rural Differentiation in Serbia Beyond the Women's Role in the Local Labor Force." *European Countryside* 16 (4): 647-667. <https://doi.org/10.2478/euco-2024-0033>
- Finlayson, Caitlin, Nicholas Harrigan, Ariane Utomo, Van Touch, Andrew McGregor, Katharine McKinnon, and Brian R. Cook. 2025. "The Dual Employment Destinations for Rural Cambodians: Skills, Distance and Non-Monetary Returns on Migration." *Population, Space and Place* 31 (2): e70016. <https://doi.org/10.1002/psp.70016>
- Food and Agriculture Organization of the United Nations (FAO). 2020. *Smallholders and Family Farms in Serbia: Country Study Report 2019*. Budapest: FAO. <https://doi.org/10.4060/ca7449en>
- Gábrity Molnár, Iren. 1997. "The Sociology of Migration from the Former Yugoslavia." *New Community* 23 (1): 109-122. <https://doi.org/10.1080/1369183X.1997.9976578>
- Gligorov, Vladimir, Kosovka Ognjenović, and Hermine Vidovic. 2011. *Assessment of the Labour Market in Serbia*. wiiw Research Report No. 371. Vienna: The Vienna

- Institute for International Economic Studies (wiiw).
<https://hdl.handle.net/10419/204143>
- Grečić, Vladimir. 2017. "Uticaj migracione politike na razvoj Srbije." *Međunarodna politika* 68 (1168): 36-61. <https://medjunarodnapolitika.rs/wp-content/uploads/MO/2017/1168/MO-2017-1168-article-3.pdf?>
- Hennebry, Jenna L., and Kerry Preibisch. 2012. "A Model for Managed Migration? Re-Examining Best Practices in Canada's Seasonal Agricultural Worker Program." *International Migration* 50 (S1): e19-e40. <https://doi.org/10.1111/j.1468-2435.2009.00598.x>
- Hoggart, Keith, and Cristóbal Mendoza. 1999. "African Immigrant Workers in Spanish Agriculture." *Sociologia Ruralis* 39 (4): 538-562. <https://doi.org/10.1111/1467-9523.00123>
- Hudson, Kenneth. 2007. "The New Labor Market Segmentation: Labor Market Dualism in the New Economy." *Social Science Research* 36: 286-312. <https://doi.org/10.1016/j.ssresearch.2005.11.005>
- Institut ekonomskih nauka. 2025. *Strukturne promene u poljoprivredi i njihov uticaj na ekonomski rast u Srbiji, 2023*. Belgrade: Statistical Office of the Republic of Serbia.
- Ivanović, Sanjin, and Petar Gogić. 2013. "Contribution of Investments in Raspberry Plantations to Development of Rural Areas of the Republic of Serbia." Paper presented at the 50th Anniversary Seminar, *Agriculture and Rural Development - Challenges of Transition and Integration Processes*, 317-325. <https://doi.org/10.22004/ag.econ.161822>
- Ivanović, Vladan. 2021. *Regionalno tržište rada na Zapadnom Balkanu - objektivna potreba u nepovoljnim uslovima*. Belgrade: Center for Democracy Foundation.
- Janačković, Marko, and Ognjen Dimitrijević. 2024. "Research on the Attitude of Young People Regarding the Attractiveness of Agriculture: A Case Study of Serbia." *Economics of Agriculture* 71 (2): 365-380. <https://doi.org/10.59267/ekoPolj2402365J>
- Jara-Rojas, Roberto, Boris E. Bravo-Ureta, Daniel Solís, and Daniela Martínez Arriagada. 2018. "Technical Efficiency and Marketing Channels among Small-Scale Farmers: Evidence for Raspberry Production in Chile." *International Food and Agribusiness Management Review* 21 (3): 351-364. <https://doi.org/10.22434/IFAMR2016.0168>
- Kalanović-Bulatović, Branka, Bojan Dimitrijević, Dušan Milić, and Zoran Milovančević. 2015. "Organization and Costs of Repurchasing, Transportation, Warehousing and Storage of Raspberry Fruit." *Economics of Agriculture* 62 (4): 1017-1030. <https://doi.org/10.5937/ekoPolj1504017K>
- Keserović, Zoran, Nenad Magazin, Aleksandar Kurjakov, Marko Dorić, and Jovica Gošić. 2014. *Voćarstvo. Popis poljoprivrede 2012: Poljoprivreda u Republici Srbiji*. Belgrade: Statistical Office of the Republic of Serbia.
- Keserović, Zoran. 2025. *Stanje u savremenoj proizvodnji voća u Srbiji i mogućnosti za njeno poboljšanje, 2023*. Belgrade: Statistical Office of the Republic of Serbia.
- King, Russell, Aija Lulle, and Emilia Melossi. 2021. "New Perspectives on the Agriculture-Migration Nexus." *Journal of Rural Studies* 85. Accepted manuscript, 1-24. <https://doi.org/10.1016/j.jrurstud.2021.05.004>

- King, Russell. 2012. *Theories and Typologies of Migration: An Overview and a Primer*. Willy Brandt Series of Working Papers in International Migration and Ethnic Relations 3/12. Malmö: Malmö Institute for Studies of Migration, Diversity and Welfare (MIM), Malmö University.
- Kljajić, Nataša, and Jonel Subić. 2022. "Economic Effects of Raspberry Production on the Family Farm." In *Agrarian Economy and Rural Development - Trends and Challenges: International Symposium, 13th Edition*, edited by Steliana Rodino and Vili Dragomir, 31-39. Bucharest: The Research Institute for Agricultural Economy and Rural Development (ICEADR).
<https://www.econstor.eu/bitstream/10419/301703/1/ICEADR-2022-p031.pdf?>
- Kljajić, Nataša, and Predrag Vuković. 2014. "Fruit Production Analysis in Republic of Serbia in the Function of Rural Development." In *International Scientific Meeting Sustainable Agriculture and Rural Development in Terms of the Republic of Serbia Strategic Goals Realization within the Danube Region: Rural Development and (Un)limited Resources*, 444-460. Belgrade: Institute of Agricultural Economics.
<http://repository.iep.bg.ac.rs/22/>
- Kljajić, Nataša, Iwona Pomianek, and Predrag Vuković. 2025. "A Production and Economic Analysis of Raspberry and Its Impact on the Sustainable Development of Rural Areas: A Special Focus on the Situation in the Serbia and Poland." *Economics of Agriculture* 72 (2): 519-540. <https://doi.org/10.59267/ekoPolj2502519K>
- Kljajić, Nataša, Jonel Subić, and Zorica Sredojević. 2017. "Profitability of Raspberry Production on Holdings in the Territory of Arilje." *Economics of Agriculture* 64 (1): 57-68. <https://doi.org/10.5937/ekoPolj1701057K>
- Kljajić, Nataša, Predrag Vuković, and Slavica Arsić. 2022. "Raspberry Production, Trade and Market in the Republic of Serbia." *Ekonomika* 68 (3): 91-102.
<https://doi.org/10.5937/ekonomika2203091K>
- Kljajić, Nataša, Predrag Vuković, and Slavica Arsić. 2023. "Production and Foreign Trade Exchange of Raspberries: Case Study of Serbia." *Western Balkan Journal of Agricultural Economics and Rural Development* 5 (1): 91-105.
<https://doi.org/10.5937/WBJAE2301091K>
- Kljajić, Nataša. 2017. "Production and Export of Raspberry from the Republic of Serbia." *Ekonomika* 63 (2): 45-53. <https://doi.org/10.5937/ekonomika1702045K>
- Kljajić, Nataša. 2025. *Malina kao strateški poljoprivredni proizvod Srbije: Ekonomika i perspektive razvoja*. Belgrade: Institute of Agricultural Economics.
<https://doi.org/10.46793/6269.147.7.NK>
- Končar, Lara. 2022. "On the Socioeconomic Status and the Experiences of Female Seasonal Agricultural Workers in Contemporary Serbia: Are There Elements of Structural Violence?" *Philosophy and Society* 33 (2): 465-494.
- Korhecz, Reka, Marko Vladislavljević, Otilija Sedlak, Aleksandra Marcikić Horvat, and Jelica Eremić Đodić. 2025. "Demographic Analysis of the Agricultural Population of Serbia." *Economics of Agriculture* 72 (1): 205-224.
<https://doi.org/10.59267/ekoPolj2501205K>
- Kovačević, Ljubinka. 2023. "Seasonal Workers in the Republic of Serbia - Between New Flexibilization (and Precarization) of Work, and Catalogue of Minimum Rights for All Workers." *Svet na rabotata* 2: 1-23.

- Krstić, Gorana, and Jelena Žarković. 2025. *Radna snaga na poljoprivrednim gazdinstvima u Srbiji - rodna perspektiva, 2023*. Belgrade: Statistical Office of the Republic of Serbia.
- Krstić, Gorana, and Peter Sanfey. 2008. *Earnings Inequality and the Informal Economy: Evidence from Serbia*. wiiw Balkan Observatory Working Papers No. 075. Vienna: The Vienna Institute for International Economic Studies (wiiw).
<https://hdl.handle.net/10419/226113>
- Kuzminac, Mina. 2023. "Otvoreni Balkan - otvaranje novih mogućnosti za sezonske radnice u poljoprivredi." *Harmonius* 12 (1): 228-259.
https://doi.org/10.51204/Harmonius_23110A
- Law on Foreigners [Zakon o strancima]. „Službeni glasnik Republike Srbije“, br. 24/2018, 31/2019 i 62/2023. https://www.paragraf.rs/propisi/zakon_o_strancima.html
- Law on Simplified Work Engagement in Seasonal Jobs in Certain Activities [Zakon o pojednostavljenom radnom angažovanju na sezonskim poslovima u određenim delatnostima]. „Službeni glasnik Republike Srbije“, br. 50/2018.
<https://www.paragraf.rs/propisi/zakon-pojednostavljenom-radnom-angazovanju-sezonskim-poslovima.html>
- Lewis, J. R. 1986. "International Labour Migration and Uneven Regional Development in Labour Exporting Countries." *Tijdschrift voor Economische en Sociale Geografie* 77 (1): 27-41. <https://doi.org/10.1111/j.1467-9663.1986.tb01293.x>
- Malkowska, Agnieszka, and Karolina Drela. 2024. "Labour Shortages and the Role of Foreigners: A Case Study of the Labour Market in Poland." *European Research Studies Journal* 27 (2): 661-672. <https://doi.org/10.35808/ersj/3810>
- Marjanović, Dragana. 2015. *Migracija radne snage i njen uticaj na demografsku sliku i tržište rada u Srbiji*. Belgrade: International Organization for Migration (IOM).
- Marković, Todor, Željko Kokot, and Merima Makaš. 2017. "Ekonomski efekti primene mehanizacije u berbi maline." *Radovi Poljoprivredno-prehrambenog fakulteta Univerziteta u Sarajevu* 62 (67/2): 568-575.
- Martin, Philip. 2006. "Managing Labor Migration: Temporary Worker Programmes for the 21st Century." Paper presented at the *International Symposium on International Migration and Development*, Population Division, Department of Economic and Social Affairs, United Nations Secretariat, Turin, Italy, June 28-30.
- Martin, Philip. 2020. *Food Supply Resilience and Migrant Workers*. MigResHub Think Piece No. 3. Florence: Migration Policy Centre, European University Institute.
- Massey, Douglas S. 1990. "Social Structure, Household Strategies, and the Cumulative Causation of Migration." *Population Index* 56 (1): 3-26.
<https://doi.org/10.2307/3644186>
- Massey, Douglas S., Joaquín Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino, and J. Edward Taylor. 1993. "Theories of International Migration: A Review and Appraisal." *Population and Development Review* 19 (3): 431-466.
<https://doi.org/10.2307/2938462>
- Medić, Pavle, Dragan Aleksić, and Vladimir Petronijević. 2022. *Analiza potreba tržišta rada i radne snage u kontekstu upravljanja migracijama*. Belgrade: Center for Advanced Economic Studies (CEVES).

- Nedeljković, Miroslav, Milovoje Ćosić, and Florentina-Emilia Marin. 2024. "Raspberry Production Trends in Serbia." *Proceedings of the International Conference on Business Excellence* 18 (1): 3235-3241. <https://doi.org/10.2478/picbe-2024-0263>
- Nikolić, Ivan, and Marijana Maksimović. 2024. "The Impact of Migratory Movements on the Labour Market in the Countries of the Western Balkans." *Stanovništvo* 62 (1): 65-83. <https://doi.org/10.59954/stnv.531>
- Nikolić, Ivan. 2023a. *Ekonomija Srbije praćena optikom MAT-a u periodu 2020-2023*. Belgrade: Economics Institute. <https://doi.org/10.5281/zenodo.8286348>
- Nikolić, Ivan. 2023b. *Ekonomija Srbije praćena optikom MAT-a u periodu 2013-2020*. Belgrade: Economics Institute. <https://doi.org/10.5281/zenodo.8286338>
- Nikolić, Mihailo, Mirko Ivanović, Slobodan Milenković, Jasminka Milivojević, and Momčilo Milutinović. 2008. "The State and Prospects of Raspberry Production in Serbia." *Acta Horticulturae* 777: 243-250. <https://doi.org/10.17660/ActaHortic.2008.777.36>
- OECD. 2022. *Labour Migration in the Western Balkans: Mapping Patterns, Addressing Challenges and Reaping Benefits*. Paris: OECD Publishing. <https://doi.org/10.1787/af3db4f9-en>
- Pantelić, Ivana. 2025. "The Liberation of Women: International Influences and National Practices in 19th-Century Serbia and in Yugoslavia." In *Serbia and the Balkans: Three Centuries of Embrace with Europe*, edited by Slobodan G. Markovich, 355-382. Belgrade: Faculty of Political Science and Zepter Book World. <https://doi.org/10.46793/7494.189.355P>
- Paraušić, Vesna, and Ivana Simeunović. 2016. "Market Analysis of Serbia's Raspberry Sector and Cluster Development Initiatives." *Economics of Agriculture* 63 (4): 1417-1431. <https://doi.org/10.5937/ekoPolj1604417P>
- Paunović, Blagoje, Nicola Fabris, Ray Phillips, Anastasia Fetsi, and Henrik Huitfeldt. 2005. *Labour Market Review of Serbia*. Working Paper. Turin: European Training Foundation.
- Pejanović, Radovan, Danica Glavaš-Trbić, and Mirela Tomaš-Simin. 2017. "Problems of Agricultural and Rural Development in Serbia and Necessity of New Agricultural Policy." *Economics of Agriculture* 64 (4): 1619-1633. <https://doi.org/10.5937/ekoPolj1704619P>
- Perloff, Jeffrey M., Lori Lynch, and Susan M. Gabbard. 1998. "Migration of Seasonal Agricultural Workers." *American Journal of Agricultural Economics* 80 (1): 154-164. <https://doi.org/10.2307/3180277>
- Petrić, Jasna, Tamara Maričić, and Jelena Basarić. 2012. "The Population Conundrums and Some Implications for Urban Development in Serbia." *SPATIUM International Review* 28: 7-14. <https://doi.org/10.2298/SPAT1228007P>
- Petrović, Dragan V., Mirko Urošević, Rade L. Radojević, Zoran I. Mileusnić, and Srbobran Petrović. 2017. "Razvoj hidrauličko-mehaničkog sistema automatske nivelacije berača maline i kupine." *Poljoprivredna tehnika* 42 (2): 1-10.
- Piore, Michael J. 1972. "Notes for a Theory of Labor Market Stratification." Working Paper No. 95. Cambridge, MA: Massachusetts Institute of Technology, Department of Economics.

- Piore, Michael J. 1979. *Birds of Passage: Migrant Labor and Industrial Societies*. Cambridge: Cambridge University Press.
- Piore, Michael J. 1986. "The Shifting Grounds for Immigration." *The ANNALS of the American Academy of Political and Social Science* 485 (1): 23-33.
<https://doi.org/10.1177/0002716286485001003>
- Piore, Michael. 2014. "A Long Term Perspective on Immigration and the Crisis." *Gazeta de Antropología* 30 (2), artículo 01.
- Piro, Valeria, and Giuliana Sanò. 2017. "Entering the 'Plastic Factories': Conflicts and Competition in Sicilian Greenhouses and Packinghouses." In *Migration and Agriculture: Mobility and Change in the Mediterranean Area*, edited by Alessandra Corrado, Carlos de Castro, and Domenico Perrotta, 293-308. London: Routledge.
<https://doi.org/10.4324/9781315659558-23>
- Popović, Marija. 2025. "The Role of the Labour Force on Family Agricultural Farms in the Republic of Serbia." In *Proceedings of International Scientific Conference Sustainable Agriculture and Rural Development V*, 729-736. Belgrade: Institute of Agricultural Economics.
- Predojević-Despić, Jelena. 2021. "Mere za regulisanje privremenih i cirkularnih migracija i reintegracije: Dodatni izazovi za zemlje Zapadnog Balkana u vreme COVID-19 pandemije." *Demografija* 18: 71-92. <https://doi.org/10.5937/demografija2118071P>
- Preibisch, Kerry. 2010. "Pick-Your-Own Labor: Migrant Workers and Flexibility in Canadian Agriculture." *International Migration Review* 44 (2): 404-441.
<https://doi.org/10.1111/j.1747-7379.2010.00811.x>
- Radulović, Branko, and Milica Anđelković Đoković. 2019. *Analiza sistema angažovanja sezonskih radnika - iskustva ekonomija Zapadnog Balkana*. Belgrade: NALED.
- Rašević, Mirjana. 2016. *Migration and Development in Serbia*. Belgrade: International Organization for Migration (IOM).
<https://serbia.iom.int/sites/g/files/tmzbd1126/files/documents/Migration%2520and%2520Development%2520in%2520Serbia.pdf>
- Rašević, Mirjana. 2017. "Serbia: The Migration Issue in Key National Strategies." In *Towards Understanding of Contemporary Migration: Causes, Consequences, Policies, Reflections*, edited by Mirjana Bobić and Stefan Janković, 131-150. Belgrade: Institute for Sociological Research, Faculty of Philosophy, University of Belgrade, and Serbian Sociological Society.
- Reljanović, Mario. 2023. "Transition from Work of Seasonal Workers to Permanent Labour Immigration—The Case of Serbia." *Stanovništvo* 61 (2): 129-144.
<https://doi.org/10.59954/stnv.528>
- Ryan, Michael. 2023. *Labour and Skills Shortages in the Agro-Food Sector*. OECD Food, Agriculture and Fisheries Papers No. 189. Paris: OECD Publishing.
<https://doi.org/10.1787/ed758aab-en>
- Rye, Johan Fredrik, and Sam Scott. 2018. "International Labour Migration and Food Production in Rural Europe: A Review of the Evidence." *Sociologia Ruralis* 58 (4): 928-952. <https://doi.org/10.1111/soru.12208>

- Sredojević, Zorica, Nataša Kljajić, and Nikola Popović. 2013. "Investing in Raspberry Production as an Opportunity of Sustainable Development of Rural Areas in Western Serbia." *Economic Insights - Trends and Challenges* 2 (1): 63-72.
- Stanković, Vladimir. 2014. *Srbija u procesu spoljnih migracija*. Belgrade: Statistical Office of the Republic of Serbia.
<https://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2011/Inostranstvo.pdf>
- Statistical Office of the Republic of Serbia (SORS). 2012. "[Table 20 - Labour Force on Agricultural Holdings, Annual Work Unit (AWU)]." 2012 Census of Agriculture Database. Belgrade: Statistical Office of the Republic of Serbia.
https://www.stat.gov.rs/media/377634/20_radna-snaga-na-gazdinstvima-godisnja-radna-jedinica-awu.xls
- Statistical Office of the Republic of Serbia (SORS). 2023. "[Tables 5.1 - Members of the Holding and Permanently Employed Persons on Family Holdings by Sex; 5.5 - Annual Work Units of Labour Force Engaged in Agriculture]." 2023 Census of Agriculture Database. Belgrade: Statistical Office of the Republic of Serbia.
https://popispoljoprivrede.stat.gov.rs/media/31127/tabela-51_cir.xlsx;
https://popispoljoprivrede.stat.gov.rs/media/31131/tabela-55_cir.xlsm
- Statistical Office of the Republic of Serbia (SORS). 2024. *Popis poljoprivrede 2023*. Belgrade: Statistical Office of the Republic of Serbia.
- Statistical Office of the Republic of Serbia (SORS). 2026. "Exports and Imports by SITC Product: 0583220 - Raspberries, Frozen, Without Sugar." Dissemination Database. Belgrade: Statistical Office of the Republic of Serbia.
<https://data.stat.gov.rs/Home/Result/170304?displayMode=table&guid=f0c8ff73-6171-4d69-998d-164cfb439633&languageCode=sr-Cyrl>
- Stevanović, Simo, and Milan R. Milanović. 2014. "Specifičnosti radne snage u poljoprivredi Srbije." *Ekonomski vidici* 19 (2-3): 227-241.
- Strik, Bernadine C. 2007. "Berry Crops: Worldwide Area and Production Systems." In *Berry Fruit: Value-Added Products for Health Promotion*, edited by Yanyun Zhao, 3-49. Boca Raton, FL: CRC Press.
- Suchopár, Albert, Jiří Kuře, Barbora Kuřetová, and Monika Hromasová. 2025. "A Review of Integrated Approaches in Robotic Raspberry Harvesting." *Agronomy* 15 (12): 2677.
<https://doi.org/10.3390/agronomy15122677>
- Taubman, Paul, and Michael L. Wachter. 1986. "Segmented Labor Markets." In *Handbook of Labor Economics*, vol. 2, edited by Orley Ashenfelter and Richard Layard, 1183-1217. Amsterdam: Elsevier Science Publishers. [https://doi.org/10.1016/S1573-4463\(86\)02011-4](https://doi.org/10.1016/S1573-4463(86)02011-4)
- Urošević, Mirko, Rade Radojević, Dragan Petrović, and Milica Bižić. 2011. "Opravdanost uvođenja mehanizovane berbe maline u Srbiji." *Poljoprivredna tehnika* 36 (3): 79-86.
<https://aspace.agrif.bg.ac.rs/handle/123456789/2498?locale-attribute=sr>
- Uys, M. D., and P. F. Blaauw. 2006. "The Dual Labour Market Theory and the Informal Sector in South Africa." *Acta Commercii* 6: 248-257.
<https://doi.org/10.4102/ac.v6i1.122>
- Veljković, Biljana, Dušan Marković, Ranko Koprivica, and Marija Gavrilović. 2024. "Calculations in Raspberry Production on Family Farms in Western Serbia." In *2nd*

- International Symposium on Biotechnology: Proceedings*, 175-181.
<https://doi.org/10.46793/SBT29.23BV>
- Veljković, Biljana, I. Glisic, and A. Leposavic. 2008. "An Analysis of Raspberry Production Conditions in Serbia." *Acta Agriculturae Serbica* 13 (25): 9-16. <https://scindeks-clanci.ceon.rs/data/pdf/0354-9542/2008/0354-95420825009V.pdf?>
- Veljković, Biljana, Zorica Sredojević, Dušan Marković, Ranko Koprivica, and Marija Gavrilović. 2025. "The Importance of Raspberries in Serbia's Export Market." In *3rd International Symposium on Biotechnology: Proceedings*, 183-190.
<https://doi.org/10.46793/SBT30.23BV>
- Vidovic, Hermine, Stefanie Brodmann, Gonzalo Reyes, Sara Johansson de Silva, Alicia Marguerie, Jamele Rigolini, Calogero Brancatelli, Olga Kupets, and Sandra Leitner. 2020. *Western Balkans Labor Market Trends 2020*. Washington, DC: World Bank Group.
- Wachter, Michael L. 1974. "Primary and Secondary Labor Markets: A Critique of the Dual Approach." *Brookings Papers on Economic Activity* 1974 (3): 637-693.
<https://doi.org/10.2307/2534250>
- World Bank. 2019. *Serbia Competitive Agriculture Project (SCAP): Project Appraisal Document*. Report No. PAD3446. Washington, DC: World Bank.
<https://documents1.worldbank.org/curated/en/961711573843471628/pdf/Serbia-Competitive-Agriculture-Project.pdf>
- Wróblewska, Wioletta, Joanna Pawlak, and Dariusz Paszko. 2019. "Economic Aspects in the Raspberry Production on the Example of Farms from Poland, Serbia and Ukraine." *Journal of Horticultural Research* 27 (2): 71-80. <https://doi.org/10.2478/johr-2019-0019>
- Zarić, Vlade, Zorica Vasiljević, Branislav Vlahović, and Jasmina Andrić. 2013. "Basic Characteristics of the Raspberry Marketing Chain and Position of the Small Farmers in Serbia." Paper presented at the 135th EAAE Seminar, *Challenges for the Global Agricultural Trade Regime after Doha*, Belgrade, Serbia, August 28-30.
<https://doi.org/10.22004/ag.econ.160517>

Appendices

Appendix A. Content Analysis Coding Matrix

Appendix A presents the coding matrix used for the content analysis of 60 media articles published between 2015 and 2025. The matrix presents the information recorded for each article and the codes used in the analysis, divided into several parts for readability and due to space constraints. An “X” was entered in each field where the corresponding code was identified in the analyzed article. All articles were first accessed between April 1 and April 30, 2026. Given the changing nature of online media archives, some of the analyzed articles may subsequently have been removed from the websites of the respective media outlets and may therefore no longer be accessible through the links provided. Although relevant quotations from the articles were recorded during the coding process, they are not presented in the appendix due to space constraints.

No.	Title of the article	Media	Year of publication	Amount of the daily wage mentioned in the article	It is suggested that there are not enough workers to pick raspberries	It is suggested that the interest in picking raspb. is low	It is suggested that there are enough workers to pick raspberries	The daily wages are perceived as high	Cause of the lack of labor		
									Migration (emigration)	Low (insufficient) daily wages	Hard work or bad working conditions
1	Malinjaci zovu, ali niko ne čuje: Dnevnice do 5.000 dinara, a berača nema	Blic	2025	4500 - 5000		X		X			
2	Prva berba malina u Mačvi: Cena 350 dinara po kilogramu, ne vredi ni dnevnicu od 6.000 dinara, nedostatak berača i ove godine problem	Blic	2025	6000	X		X	X			
3	Dnevnice do 5.000 dinara ili "po dogovoru", ali se berači maline traži sve manje: Kubanci i Palestinci beru voće u Srbiji	Blic	2025	4000 - 5000		X		X			X
4	ŠTO SU VEĆE PARE U PITANJU, TO SI VEĆI ROB Da li je branje malina posao od koga bi trebalo BEŽATI? Evo šta kažu bivši berači	Blic	2019	2500 - 3000				X			X
5	Valja li malinarima sada, kad cena za kilo ide i do 400 dinara? Naravno - da ne valja. Kako da valja? Sad nema berača	Blic	2021	3000	X			X			
6	Dobra zarada od branja malina	Blic	2015	2000	X		X				
7	PLATA I DO 10.000 DINARA DNEVNO Za deset dana branja malina može da se zaradi za more, a radnika je sve manje	Blic	2021	5000	X			X			X
8	Uskoro počinje berba malina! Dnevnice nikad veće, ali nedostatak radnika muči malinare	Blic	2024	4000 - 6000	X			X			
9	Dnevnicu za branje 5.000 dinara: Mladići iz Svrnjiga na plus 35 beru maline, nije lako, ali zadovoljni uslovima	Blic	2025	5000	X			X			
10	Postoji OZBILJAN RAZLOG zašto malinari nude stan, hranu i 2.000 dinara dnevnicu, a ne mogu da NAĐU BERAČE	Blic	2017	2000	X			X			X
11	PRINOS REKORDNO MALI, BERAČI NIKAD SKUPLJI Bliži se sezona berbe maline, cena i dalje nepoznanica	Blic	2022	5000	X					X	
12	Ovi radnici za dan zarade 6.000 dinara: Imaju obezbeđen obrok i smeštaj, ali nema ko da radi	Blic	2024	4000 - 6000	X			X	X		
13	Pokušaj uvoza berača iz Bangladeša i Pakistana propao zbog zakona: Berba ariljskih malinjaka zavisi od ovih radnika (FOTO)	Blic	2025	4500 - 5000	X						
14	Malinjak - šansa mladima za zaradu	RTS	2015	1300 - 1700		X	X				
15	Нико неће у бераче малина	RTS	2017	2000	X						

No.	Title of the article	Media	Year of publication	Amount of the daily wage mentioned in the article	It is suggested that there are not enough workers to pick raspberries	It is suggested that the interest in picking raspb. is low	It is suggested that there are enough workers to pick raspberries	The daily wages are perceived as high	Cause of the lack of labor		
									Migration (emigration)	Low (insufficient) daily wages	Hard work or bad working conditions
16	Малине нема ко да бере	RTS	2020	3000		X		X			
17	Малине нема ко да бере – сезони долазе из Албаније, чак и из Монголије	RTS	2021	3500	X	X					
18	Maline u Srbiji беру i Bosanci	Kurir	2016	2000			X	X			
19	Oglasi puni ponuda za branje malina, a radnika nigde! NIKO NEĆE DA RADI ZA 70.000 DINARA!	Kurir	2018	2500	X	X				X	
20	SRPSKE MALINE BERU RADNICI IZ NEPALA, PAKISTANA, INDIJE: Srbi neće ni za dnevnicu od 8.000 dinara, a za mesec mogu uzeti i 150.000	Kurir	2022	5000 - 8000		X		X			
21	Ovi radnici dnevno mogu da zarade i do 5.000 dinara, a za sezonu uzmu direktorku platu! Obezbeđena hrana i smeštaj, a nema ko da radi	Kurir	2025	4000 - 5000	X			X			
22	ARILJSKO MALINARSTVO POGOĐENO SUŠOM I NEDOSTATKOM RADNE SNAGE: Prinosi malina drastično smanjeni, a malinari se suočavaju sa velikim izazovima	Kurir	2025	4500 - 5000	X						
23	KO OVE SEZONE ODE U MALINE, DOBRO ĆE SE OPARITI: Dnevnicе berača nikad veće, a evo koliko daje gazda Radojko iz Arilja	Kurir	2024	4000 - 6000	X			X			
24	OGROMNA POTRAŽNJA ZA BERAČIMA MALINA: Ovako se kreću dnevnicе! Smeštaj i hrana uglavnom obezbeđeni	Kurir	2025	4000 - 6000		X		X			
25	SAVO NUDI PLATU OD 100.000, ALI RETKO KO HOĆE DA RADI: Berba počinje uskoro, a Rumuni sprečeni da dođu (FOTO)	Kurir	2021	3000 - 3500	X			X			
26	ZA OVAJ POSAO DNEVNICA IDE DO 50 EVRA, A NEMA KO DA RADI: Gazda daje čak i hranu i smeštaj	Kurir	2023	5000 - 6000	X			X			
27	DNEVNICE REKORDNE A NEMA KO DA RADI: Malinari u problemu, nude odlične uslove a niko ne želi u berbu	Kurir	2021	2500 - 3000	X			X			
28	Potražnja za beračima malina, dnevnicа do 3.300 dinara	N1	2017	2000 - 3300	X	X		X			
29	Berba malina od sledeće nedelje, početna cena 200 dinara	N1	2020	3000	X			X			
30	Uprkos dobroj dnevnicі, sve manje ljudi hoće da bere maline	N1	2018	2000	X	X		X			

No.	Title of the article	Media	Year of publication	Amount of the daily wage mentioned in the article	It is suggested that there are not enough workers to pick raspberries	It is suggested that the interest in picking raspb. is low	It is suggested that there are enough workers to pick raspberries	The daily wages are perceived as high	Cause of the lack of labor		
									Migration (emigration)	Low (insufficient) daily wages	Hard work or bad working conditions
31	Zbog nedostatka domaće radne snage, maline će brati i radnici iz Indije, Nepala, Pakistana, Moldavije	Danas	2022	3000 - 4000	X	X					
32	Branje malina i rad u polju nisu na ceni, radi se ako nema šta drugo	Danas	2019	2000	X	X			X		X
33	Cena maline solidna, ali nema ko da je bere	Danas	2020	3000	X			X			
34	Niko neće u maline, svi razvlače kablove (VIDEO)	Danas	2019	2000	X						X
35	Rod maline manji za 30 odsto, radnici za dnevnicu traže i do 7.000 dinara	Danas	2022	6000	X			X			
36	Pajići beru maline od zore do mraka: Rade i Jela (75) i Bogdan (4), ali umesto da od "crvenog zlata" mlata milione, oni ih daju komšinicama za čizkejk	Nova S	2023	3500 - 4000	X				X		
37	Dok je cela Srbija pod klima uređajima, oni beru malinu i na +40, a evo koliko zarađuju: "Dode mi da sve batalim. Veliko poniženje trpimo", "Ovde je kao u Etiopiji, ne zna se šta više gori, tabani ili glava"	Nova S	2024	4500							X
38	Zašto Čileanci prodaju srpsku malinu na Novom Zelandu	Nova S	2020	2500 - 3000	X			X			
39	Beračima malina dnevnicu i do 8.000 dinara: "Krvav" posao za pristojne pare	Nova S	2022	4000 - 5000							X
40	IŠLI SMO DA BEREMO MALINE: 12 sati dnevno za 1.500 dinara! I evo kako smo se proveli!	Telegraf	2015	1500 - 2000			X			X	
41	Prošle godine sam plaćao 15 evra, a za ovu, videćemo: Kreće ludnica za poslom koji svake godine podeli ljude u Srbiji	Telegraf	2017	1500 - 2000						X	X
42	Gospoda neće u maline za 600 evra, a kukaju da nemaju para: Ovo je samo jedan u nizu oglasa na koji se niko ne javlja	Telegraf	2018	2500	X	X				X	X
43	POSAO SNOVA I TO U SRBIJI: Za radnom snagom vlada POMAMA, potrebno je samo da prihvatite OVE uslove	Telegraf	2016	2000 -2500		X					
44	Traži se 5.000 sezonskih radnika, dnevnicu i do 3.300 dinara: Počinje se za 7 dana, evo detalja!	Telegraf	2017	2000 -2500	X			X			
45	Dnevnicu do 50 evra, ali Srbi neće "u maline": Mesec dana pred berbu nema radnika	Telegraf	2022	3000 - 6000	X	X		X			X

No.	Title of the article	Media	Year of publication	Amount of the daily wage mentioned in the article	It is suggested that there are not enough workers to pick raspberries	It is suggested that the interest in picking raspb. is low	It is suggested that there are enough workers to pick raspberries	The daily wages are perceived as high	Cause of the lack of labor		
									Migration (emigration)	Low (insufficient) daily wages	Hard work or bad working conditions
46	Visok je i snažan, bere po 60 kilograma malina dnevno: Nauvin iz Indije brzo postao omiljen u Arilju	Telegraf	2023	4000	X			X			
47	Dnevnicu 4.000 dinara, smeštaj i hrana obezbeđeni: "Dobrog radnika danas je preteško naći"	Telegraf	2024	4000	X			X			
48	Počela berba malina u Mačvi: Berači se mukom nalaze, otkupna cena "crvenog zlata" 350 dinara	Telegraf	2025	5000 - 6000	X		X				
49	Najplaćeniji sezonski posao silazi sa trona: Zbog niske cene i manjka prinosa, tražiće se manje berača	Telegraf	2018	2000 - 2200			X			X	
50	Bolje dinar u ladu nego 100 na radu	Novosti	2015	2000	X		X	X		X	X
51	Beračima malina nude i kolače	Novosti	2016	2000 - 2500	X						
52	DNEVNO ZARADA DO 3.000 DINARA: Ispovest radnika koji zarade minimalac od branja malina	Novosti	2021	3000		X					
53	OGROMNA POTRAŽNJA ZA BERAČIMA MALINA: Ovako se kreću dnevnice	Novosti	2025	4000 - 6000	X	X		X	X		
54	DNEVNICA DO 5.000 DINARA: Počinje berba malina u valjevskom kraju	Novosti	2025	4500 - 5000		X					
55	PLATA I DO 10.000 DINARA NA DAN: Za deset dana branja malina može da se zaradi za more, a radnika je sve manje	Novosti	2021	4000 - 5000	X			X		X	
56	Malina: Cena 200 dinara, kiša odlaže berbu, ali i nedostatak berača?	Agroklub	2020	3000	X						
57	Malina stiže - čeka se otkupna cena, a berača nema?	Agroklub	2020	3000	X						
58	Muke poljoprivrednika u Bačkoj Palanci: Posla ima, ali radnika nema	Agroklub	2019	1800	X						
59	Malina: Rod je dobar, ali niko neće da je bere	Agroklub	2019	2000	X						
60	Dnevnicu 4.000 dinara - srpskih radnika nema, azijski jeftiniji	Agroklub	2022	4000	X			X			

No.	Year of publication	Consequences				The represented workforce in raspberry fields			The main source of information in the article				Tone of reporting		Link to article
		Reduction and abolition of ras. fields	Greater involvement of family	Hiring of migrant labor	Labor saving mechanization	Youth	Women	Elderly and retired	State official	Producers	Professionals	Workers	Positive	Negative	
1	2025		X			X				X				X	https://www.blic.rs/biznis/moj-novcanik/malinjaci-zovu-ali-niko-ne-cuje-dnevnice-do-5000-dinara-a-beraca-nema/h7q6vfv
2	2025	X	X			X				X				X	https://www.blic.rs/biznis/moj-novcanik/prva-berba-malina-u-macvi-cena-350-dinara-po-kilogramu-nedostatak-beraca-i-ovegodine/jd9xstl
3	2025		X	X			X			X				X	https://www.blic.rs/biznis/privreda/koliko-zaraduju-radnici-zabranje-malina-u-sezoni-kubanci-i-palestinci-uzimajuposao/ebxy91n
4	2019					X				X		X		X	https://www.blic.rs/vesti/drustvo/sto-su-vece-pare-u-pitanju-to-siveci-rob-da-li-je-branje-malina-posao-od-koga-bi/jkrzh74
5	2021				X		X			X				X	https://www.blic.rs/premium/valja-li-malinarima-sada-kad-cena-zakilo-ide-i-do-400-dinara-naravno-da-ne-valja/48zxf2v
6	2015									X		X	X	X	https://www.blic.rs/vesti/srbija/dobra-zarada-od-branja-malina/7q5lygb?
7	2021				X					X		X	X	X	https://www.blic.rs/biznis/privreda/plata-i-do-10000-dinara-dnevno-za-deset-dana-branja-malina-moze-da-se-zaradi-zamore/hr11249?
8	2024									X				X	https://www.blic.rs/biznis/moj-novcanik/nikad-vece-dnevnice-zaberace-malina-berba-usko-pocinje/d6pqrkt?
9	2025			X						X		X	X	X	https://www.blic.rs/biznis/vesti/mladici-iz-svrljiga-na-plus-35-berumaline-u-dragacevu-i-kazu-nije-lako-ali-mora-da/pph4j3z?
10	2017									X		X		X	https://www.blic.rs/vesti/ekonomija/postoji-ozbiljan-razlog-zastomalinari-nude-stan-hranu-i-2000-dinara-dnevnice-a-ne/x0escxj
11	2022		X							X	X			X	https://www.blic.rs/vesti/drustvo/prinos-rekordno-mali-beracnikad-skuplji-blizi-se-sezona-berbe-maline-cena-i-dalje/nvv7dx0
12	2024					X		X		X		X		X	https://www.blic.rs/biznis/moj-novcanik/ovi-radnici-za-dan-zarade-6000-dinara-imaju-obebedjen-obrok-i-smestaj/978ktr2?
13	2025			X						X				X	https://www.blic.rs/biznis/privreda/pokusaj-uvoza-beraca-u-arilju-iz-bangladesa-i-pakistana-propao-zbog-zakona-foto/7fx4bj9
14	2015					X				X		X	X		https://www.rts.rs/lat/vesti/ekonomija/1958626/malinjak---sansamladima-za-zaradu.html?
15	2017							X		X		X	X	X	https://www.rts.rs/vesti/srbija-danas/2780022/niko-nece-u-beracemalina.html?

No.	Year of publication	Consequences				The represented workforce in raspberry fields			The main source of information in the article				Tone of reporting		Link to article
		Reduction and abolition of ras. fields	Greater involvement of family	Hiring of migrant labor	Labor saving mechanization	Youth	Women	Elderly and retired	State official	Producers	Professionals	Workers	Positive	Negative	
16	2020													X	https://www.rts.rs/radio/radio-beograd-1/3984591/maline-nema-ko-da-bere.html?
17	2021			X					X	X					https://www.rts.rs/vesti/ekonomija/4433104/maline-nema-ko-da-bere--sezonci-dolaze-iz-albanije-cak-i-iz-mongolije.html?
18	2016			X		X		X		X		X	X		https://www.kurir.rs/vesti/drustvo/2289135/maline-u-srbiji-beru-i-bosanci?
19	2018		X							X				X	https://www.kurir.rs/vesti/drustvo/3053953/niko-nece-da-radi-za-70-000-dinara-oglas-puni-ponuda-za-branje-malina-a-radnika-nigde?
20	2022			X						X				X	https://www.kurir.rs/vesti/drustvo/3912509/srpske-maline-beru-radnici-iz-nepala-pakistana-indije-srbi-nece-ni-za-dnevnicu-od-8000-dinara-a-za-mesec-zarada-je-150000?
21	2025	X	X							X			X	X	https://www.kurir.rs/vesti/drustvo/9703578/dnevnice-bera-a-malina-u-srbiji-2025?
22	2025			X						X				X	https://www.kurir.rs/vesti/srbija/9850195/berba-ariljskih-malin-jaka-zavisi-od-radnika-sa-juga-srbije?
23	2024									X					https://biznis.kurir.rs/novcanik/4395837/dnevnica-za-berbu-malina-i-do-6-000-dinara
24	2025		X	X						X				X	https://biznis.kurir.rs/moj-biznis/9683480/dnevnica-za-berbu-malina?
25	2021			X						X				X	https://biznis.kurir.rs/info-biz/3693035/berba-maline-sezonski-radnici
26	2023			X						X					https://biznis.kurir.rs/info-biz/4150978/kolika-je-dnevnica-za-berace-malina
27	2021									X				X	https://biznis.kurir.rs/info-biz/3705611/malinari-beraci-posao-dnevnica
28	2017									X				X	https://n1info.rs/biznis/a275291-Potraznja-za-beracima-malina/
29	2020									X				X	https://n1info.rs/biznis/a611853-Cena-malina-na-pocetku-berbe/
30	2018									X		X	X	X	https://n1info.rs/biznis/a393369-Beraca-malina-sve-manje/

No.	Year of publication	Consequences				The represented workforce in raspberry fields			The main source of information in the article				Tone of reporting		Link to article
		Reduction and abolition of ras. fields	Greater involvement of family	Hiring of migrant labor	Labor saving mechanization	Youth	Women	Elderly and retired	State official	Producers	Professionals	Workers	Positive	Negative	
31	2022			X			X	X		X					https://www.danas.rs/vesti/ekonomija/zbog-nedostatka-domace-radne-snage-maline-ce-brati-i-radnici-iz-indije-nepala-pakistana-moldavije/
32	2019									X		X		X	https://www.danas.rs/bbc-news-serbian/branje-malina-i-rad-u-poljunisu-na-ceni-radi-se-ako-nema-sta-drugo/
33	2020	X	X							X			X	X	https://www.danas.rs/vesti/ekonomija/cena-maline-solidna-alinema-ko-da-je-bere/
34	2019									X		X		X	https://www.danas.rs/vesti/ekonomija/niko-nece-u-maline-svirazvlace-kablove/
35	2022									X				X	https://www.danas.rs/vesti/ekonomija/rod-maline-manji-za-30-odsto-radnici-za-dnevnice-traze-i-do-7-000-dinara/
36	2023		X					X		X				X	https://nova.rs/vesti/biznis/pajici-beru-maline-od-zore-do-mrakarade-i-jela-75-i-bogdan-4-ali-umesto-da-od-crvenog-zlata-mlate-milione-oni-ih-daju-komsinicama-za-cizkejk/?
37	2024									X				X	https://nova.rs/vesti/biznis/berba-malina-zarada-uslovi/
38	2020									X	X			X	https://nova.rs/vesti/biznis/zasto-cileanci-prodaju-srpsku-malinuna-novom-zelandu?
39	2022			X						X		X			https://nova.rs/vesti/biznis/beracima-malina-dnevnica-i-do-8-000-dinara-krvav-posao-za-pristojne-pare/?
40	2015											X		X	https://www.telegraf.rs/vesti/1631454-isli-smo-da-beremo-maline-12-sati-dnevno-za-1-500-dinara-i-evo-kako-smo-se-proveli?
41	2017					X				X				X	https://www.telegraf.rs/vesti/2790504-prosle-godine-sam-placao-15-evra-a-za-ovu-videcemo-krece-ludnica-za-poslom-koji-svake-godine-podeli-ljude-u-srbiji?
42	2018		X							X				X	https://www.telegraf.rs/vesti/srbija/2960467-gospoda-nece-u-maline-za-600-evra-a-kukaju-da-nemaju-para-ovo-je-samo-jedan-u-nizu-oglasa-na-koji-se-niko-ne-javlja?
43	2016									X					https://www.telegraf.rs/vesti/2142356-posao-snova-i-to-u-srbiji-za-radnom-snagom-vlada-pomama-potrebno-je-samo-da-prihvate-ove-uslove?
44	2017									X				X	https://www.telegraf.rs/vesti/2818021-trazi-se-5-000-sezonskih-radnika-dnevnica-i-do-3-300-dinara-pocinje-se-za-7-dana-evo-detalja?
45	2022									X					https://biznis.telegraf.rs/agro-biz/3500542-dnevnica-do-50-evra-ali-srbi-nece-u-maline-mesec-dana-pred-berbu-nema-radnika?

No.	Year of publication	Consequences				The represented workforce in raspberry fields			The main source of information in the article				Tone of reporting		Link to article
		Reduction and abolition of ras. fields	Greater involvement of family	Hiring of migrant labor	Labor saving mechanization	Youth	Women	Elderly and retired	State official	Producers	Professionals	Workers	Positive	Negative	
46	2023			X						X		X	X		https://www.telegraf.rs/vesti/srbija/3712427-nauvin-iz-indije-brzozje-postao-omiljen-medju-beracima-malina?
47	2024									X				X	https://biznis.telegraf.rs/info-biz/3890325-dnevnic-4000-dinara-smestaj-i-hrana-obebedjeni-dobrog-radnika-danas-je-pretreskonaci?
48	2025	X	X			X				X			X	X	https://biznis.telegraf.rs/agro-biz/4125212-pocela-berba-malina-umacvi-beraci-se-mukom-nalaze-otkupna-cena-crvenog-zlata-350-dinara?
49	2018		X							X				X	https://www.telegraf.rs/vesti/srbija/2961141-najplaceniji-sezonskiposao-silazi-sa-trona-zbog-niske-cene-i-manjka-prinosa-trazicese-manje-beraca
50	2015					X				X					https://www.novosti.rs/vesti/naslovnareportaze/aktuelno.293.html%3A554830-Bolje-dinar-u-ladu-nego-100-na-radu
51	2016									X	X	X			https://www.novosti.rs/vesti/naslovnareportaze/aktuelno.293.html%3A605171-Beracima-malina-nude-i-kolace
52	2021			X		X						X	X		https://www.novosti.rs/ekonomija/vesti/1018238/dnevno-zarada3-000-dinara-ispovest-radnika-koji-zarade-minimalac-branja-malina
53	2025		X							X				X	https://www.novosti.rs/ekonomija/vesti/1495093/ogromnapotraznja-beracima-malina-ovako-krecu-dnevnice
54	2025		X			X				X				X	https://www.novosti.rs/ekonomija/vesti/1500868/dnevnic-5-000-dinara-pocinje-berba-malina-valjevskom-kraju
55	2021				X	X				X		X	X	X	https://www.novosti.rs/ekonomija/vesti/1008276/plata-10-000-dinara-dan-deset-dana-branja-malina-moze-zaradi-more-radnikasve-manje
56	2020									X			X	X	https://www.agroklub.rs/vocarstvo/malina-cena-200-dinara-kisadolaze-berbu-ali-i-nedostatak-beraca/60875/
57	2020	X								X				X	https://www.agroklub.rs/vocarstvo/malina-stize-ceka-se-otkupnacenaa-beraca-nema/60285/
58	2019	X						X		X				X	https://www.agroklub.rs/vocarstvo/muke-poljoprivrednika-ubackoj-palanci-posla-ima-ali-radnika-nema/53194/
59	2019		X							X				X	https://www.agroklub.rs/vocarstvo/malina-rod-je-dobar-ali-nikonece-da-je-bere/52343/
60	2022			X				X		X				X	https://www.agroklub.rs/poljoprivredne-vesti/dnevnic-4000-dinara-srpskih-radnika-nema-azijski-jeftiniji/76800/

