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Agrarian questions, digitalisation of the countryside, immigrant labour in agriculture and the official discourses on rural development in the Uppsala region, Sweden

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Abstract. This paper focuses on the Uppsala region of Sweden to analyse the dynamics of new agrarian questions intersecting with the prospects for immigrants to work in agriculture in the region. The paper seeks to explore the role of labour skills, agricultural automation and digitalisation of rural areas in local patterns of agrarian change and why and how they became barriers for the integration of immigrants through agricultural jobs in the region. The paper starts by laying out some basic conceptual insights to explore the current potential of agriculture to provide employment and livelihood possibilities for immigrants in Sweden and within this context the paper addresses issues of digitalisation and current technological trends in farming and rural development. Empirically, the paper is based on semi-structured interviews conducted with local farmers, officials working on rural development and integration programmes at the Uppsala county administrative board level, officials working on rural development and environmental planning at one rural municipality of the Uppsala region, and members of rural advocacy networks working with both rural development and integration issues in Sweden. In addition, the paper includes the analysis of regional and national policy documents developing new regional and rural development plans. Furthermore, the paper analyses information published in one of the leading Swedish magazines of the Federation of Swedish Farmers which focuses on agricultural development and technology and the paper uses other secondary sources.

Keywords: agrarian question, digitalization, technology, agriculture, immigrant labour, capitalism, rural development, Sweden.
JEL codes: F22, Q10, Q16, Q18.

1. INTRODUCTION

In 2015, the arrival of the latest large wave of immigrants to Sweden sparked intense discussions on the regulation and integration of new immigrants in the country. This coincided with growing support for the far-right Sweden Democrats party, which has discursively organised its rural politics on immigration policy and an exclusionary defence of the welfare for what the party invokes as the Swedish people (Alarcón, Ferrari, 2020). Five years

later, during 2020, media reports were again addressing the political discussions about immigration policies and integration and the real possibilities for immigrants to get permanent jobs in the country. Though some media reports have highlighted integration of immigrants in rural areas, they often show examples of immigrants working in economic sectors other than agriculture (see for example: SVT 2020a, 2020b). Yet, at the beginning of the Covid-19 crisis, the scenario of a dramatic scarcity of migrant workers for temporal employment in agriculture and forestry became a serious fear that showed again the dependence of some agricultural and forestry activities in Sweden on migrant labour. These migrant workers come to work seasonally and travel to Sweden from countries as diverse as Thailand and Estonia, for instance (Hedberg *et al.*, 2019). This has raised political questions and discussions about their working conditions (Iossa, Selberg, 2020), and also proposals to further regulate their work in Sweden, which includes proposals to tax their incomes in the country.

On the other hand, rural areas of Sweden are today territories of the active implementation of regional development policies following the adoption of new national food and rural development programmes. One of those regions is Uppsala, which though it encompasses large and important rural areas, is also characterised by the central role of Sweden's fourth largest city Uppsala. The city hosts two of the country's largest universities and its closeness to Stockholm makes Uppsala an important urban regional centre. The case of the Uppsala region offers relevant urban and rural relations to explore issues and dynamics associated with the prospects for the integration of immigrants through permanent rural agricultural jobs in the context of new agrarian changes and discourses on rural development and technological transformations of agriculture. In addition, such dynamics take place in the context of new regional and local efforts to work with both rural development and integration of immigrants. Though there are important empirical insights that indicate that rural areas do provide jobs to immigrants, such jobs are often based on either temporary employment or are in sectors other than agriculture. For example, an ILO report from 2014 shows that in 2011, only 0.7% of the immigrants who arrived to Sweden between 1998 and 2002 were employed in the agriculture, forestry, and fisheries sectors (Bevelander, Irastorza, 2014). In this regard, this paper seeks to more deeply understand and explain the specific issues concerning prospects of permanent employment of immigrants in agriculture, and to expand this into an analysis of immigration politics in the context of wider agrarian questions. By placing this analysis in the wider context of new agrarian questions, the paper seeks to approach the interconnections between the processes of agricultural development, and change, and the contradictions of rural development under capitalism, in the specific regional setting of Uppsala in Sweden. One reason to look at such issues in terms of agrarian questions is to focus the analysis on structural, social and personal relations in agriculture under capitalism. The paper does not focus on the experiences of immigrants in the rural areas of the region, but on a number of relevant processes and agents that are key for the analysis of the prospects of jobs for immigrant workers in agriculture in Sweden. Thus, the paper aims to explore the following question: how are contemporary agrarian relations, technological change and rural development discourses intersecting with the prospects of employment for immigrants in agriculture in the region of Uppsala, Sweden?

The paper is based on qualitative research with rather exploratory purposes. In answering the research question stated previously, the paper has the objective of analysing ongoing processes of automation of agriculture and digitalisation of rural areas and the contradictory relations between the political economy of local farms, the possibilities of immigrants making a living from agriculture and the political and economic terms of the official discourses on rural development in Sweden. The paper is divided into four sections and concluding remarks. The first section offers a conceptual background to analyse immigration, technology and labour relations, and agricultural development in an agrarian question framework. The second section details the case study and the methodology for the empirical work. The third section presents results and the analysis with a first focus on local farms and the political economy and ecology of agricultural automation, and a second focus on the scope and limits of regional and rural development plans, the digitalisation of rural areas, and contested meanings of rurality. The fourth section discusses new agrarian questions where integration of immigrants through jobs in agriculture is confronted with the contradictions within the automation of agriculture and the digitalisation of rural development in Sweden. Finally, some concluding remarks are presented.

2. CONCEPTUAL BACKGROUND: IMMIGRATION, TECHNOLOGY, LABOUR RELATIONS AND AGRICULTURAL DEVELOPMENT IN AN AGRARIAN QUESTION FRAMEWORK

The conceptual starting points for this paper are drawn from a selection of relevant insights in the analysis

of the historical terms of the agrarian questions and in the ongoing global resignification of rurality in the context of combined social and ecological crises of capitalism. Within this context, there are two specific relevant issues concerning the theorising of agrarian questions and immigration. First, in the original terms of the discussion of agrarian questions in socialist thinkers such as Kautsky, Lenin and Luxemburg, there were always several social questions interacting within the approach to the more specific questions concerning agricultural development and capitalism. More specifically, one can discern from Kautsky's *On the Agrarian Question* from 1899 that he and the Social Democratic Party of Germany engaged in a political analysis and discussion of the interrelated questions of labour, housing, forestry and also water use and regulation in the context of agricultural and industrial transformations under capitalism (Kautsky, 1988). Thus, the approach to the changes in agriculture connected to the development of capitalism meant a dialectical approach to social relations and processes at the level of technology and forces of production and reproduction, including a focus on means of subsistence in relation to means of production. Secondly, and when looking to the agricultural dimensions in the agrarian question, the problems addressed in the agrarian question literature are issues of capitalist development in a global context, and today one specific way to understand agrarian questions is by putting at the centre of the analysis ecological and global relations in and of agriculture (Akram-Lodhi, Kay, 2010a, 2010b; McMichael, 2013, 1998). Thus, it is important to stress here that I conceive the analysis of agrarian questions by considering it as a process that can be better understood in the plurality of questions and political answers it encompasses, and in the local-global and ecological dimensions of such questions and answers. This means that the analysis of agrarian questions implies giving appropriate space to the understanding of uneven geographical development and the different times and scales of agricultural transformations. Thus, the historical specificity of today's processes of capitalist development in rural areas and the discourses on rural development and rurality are all processes that need to be fully incorporated into the analysis of agrarian change under capitalism. In this regard, it seems relevant to recall how in the terms of Kautsky, the questions of agricultural development and capital were specifically formulated in terms of: "whether, and how, capital is seizing hold of agriculture, revolutionising it, making old forms of production and property untenable and creating the necessity for new ones" (Kautsky, 1988: 12).

The formulation of these questions is important here for two reasons. First, they aim at focusing the analysis on the particularities and contingency of the changes in agriculture. Second, in the terms of Kautsky, the analysis of the agrarian question is aimed at exploring possible future forms of production in rural areas as well. This process, as Kautsky emphasised, is especially connected to the transformations of labour relations and the transformations of property relations and technological relations in agriculture. Thus, these are questions pertaining to interactions between labour in the rural areas, local and urban manifestations of global processes of food and agricultural production, and the political economy and ecology of agrarian change at the level of the farm and its legal regulations. In this regard, the contemporary analysis of agrarian questions is very much an analysis of the contradictions between technology and work in rural development. In the terms of David Harvey, such a contradiction is a sort of moving contradiction of capital, since «it is not stable or permanent but perpetually changing its spots». In this context, Harvey correctly argues that it becomes crucial to evaluate "where the processes of technological change are at right now and where they might move to in the future", and this analysis concerns particularly the relations between technology and work in agriculture (Harvey, 2014 location 1643 Kindle version). Importantly, this kind of analysis connects in more specific terms agricultural development to the assessment of how the specificities of labour skills, the role of immigrant labour and the process of digitalisation and robotisation in agriculture are today changing the relation between relative surplus populations and the reserve army of labour. This, on the one hand, continues being generally characterised by the role of the relative surplus population in capitalist development, which, as Braverman pointed out, means that the industrial reserve army takes a variety of forms in modern society, "including the unemployed; the sporadically employed; the part-time employed; the mass of women who, as house workers, form a reserve for the «female occupations»; the armies of migrant labor, both agricultural and industrial; the black population with its extraordinarily high rates of unemployment; and the foreign reserves of labor" (Braverman, 1998: 267). In this regard, and following Marx's theorising, Braverman connected the issue of skills and the reserve army to a latent relative surplus population found in the agricultural areas. Thus, writing in 1974, Braverman observed that "in the most developed capitalist countries in northern Europe and North America, this pool of latent relative surplus population has been largely absorbed, although in the United States the black population of the rural areas still remains, in dwindling numbers, as part of this pool" (Braverman, 1998: 268). On the other hand, today

it is important to observe that several studies have theorised that the potential of robots and technology is particularly overarching in relation to the deepening of the process of eliminating labour and manual skills in agriculture (Frey, Osborne, 2017; Schlogl, Sumner, 2020). In this regard, robots can even be seen as the new reserve army of capital (Schlogl, Sumner, 2020) and this impacts especially the future of agriculture, which is particularly prone to local labour-saving technologies and where some manual works that were until recently protected from mechanisation because of workers' visual skills, are today susceptible to transformations by new visual technologies in robotics (Ford, 2015). Though Ford observes that advanced agricultural robots "are especially attractive in countries that do not have access to low-wage, migrant labor" (Ford, 2015: 24), the issue needs to be addressed in the specificity of rural contexts. In doing so, the analysis of agrarian questions and how immigration processes intersect with rural and agricultural development in a new age of dramatic technological transformations in agriculture is key. In this regard, it is important to add the following historical and theoretical insights for the analysis.

First, it can be observed that in the nineteenth century, agricultural areas in the Americas played a fundamental role in the attraction of immigrants and the consequent incorporation of new labour forces in nation states (Gabaccia, 2013: 68). However, the consequences of mechanisation were already noticeable and they affected particularly the possibilities for temporal employment of international migrants (Lucassen, Lucassen, 2013: 54-55). On the other hand, countries that promoted the permanent settlement of immigrants in rural areas, such as Chile, opened their borders to European immigrants and the state actively offered lands and agricultural possibilities to those immigrants (Norambuena, Bravo, 1990). This happened even in areas reclaimed by indigenous people (Solberg, 1969). In bringing new agricultural techniques and with a determined productive orientation towards agricultural markets, many of those immigrants became both large landowners and important political actors in rural areas. Having support from the state, which through the official discourse conceived those immigrants as developmental forces, many of them became wealthy groups with lasting influence in the development of capitalism in the country. A similar pattern can be discerned within Europe as well, where interregional migration shows that agriculture played an important role in immigration processes in France for example, where Italian immigrants became landlords and contributed to regional development in decisive ways. This contrasted with their lack of land opportunities in Italy, where «hunger for land» characterised the overpopulated Italian countryside (Teulières, 2006: 68-69). Today, as Delgado Wise and Veltmeyer (Delgado Wise, 2015; Delgado Wise, Veltmeyer, 2016) and Castles (Castles, 2015) have forcibly shown, the relations between migration and work cannot be understood without fully considering and analysing the dynamics of neoliberal globalisation. This is especially observable in Sweden where neoliberal policies in the welfare state have deeply defined the contours of immigration and integration policies and discourses in the country (Schierup *et al.*, 2006).

Second, it is important to stress that the well-known fact about the shift from the dominance of agricultural employment in national economies is generally deeply connected to technological development and innovation. As Autor highlights: "In 1900, 41 percent of the US workforce was employed in agriculture; by 2000, that share had fallen to 2 percent (Autor, 2014), mostly due to a wide range of technologies including automated machinery" (Autor, 2015). In this regard, one of today's most challenging discussions concerning agriculture has to do with the role of digitalisation and robots in reshaping farming and agricultural work at large (Carolan, 2020; Christiaensen *et al.*, 2020; Lowenberg-DeBoer *et al.*, 2020; Sparrow, Howard, 2020). This often leads to both negative and positive assessments. In a review of literature, issues of social justice have been identified as missing links in the ways through which digitalisation of agriculture is promoted today (Rotz *et al.*, 2019). On the other hand, several actors argue that there are important positive environmental dimensions in the digitalisation and robotisation of agriculture. Here one example would be the contribution of precision and smart farming to reducing the use of resources and thus contributing to environmental objectives. In this regard, it can be argued that the new process of digitalisation of agriculture creates new contexts that deserve more empirical analysis in a way that incorporates into the analysis the current combined crisis of employment and ecology under capitalism.

Third, and within the previous context, the prospects of livelihoods for immigrants in rural areas of countries within the European Union are contested. Though in general terms immigration policy varies considerably across European Union members (Goodman, 2014), an especially important difference among European countries is the role of agriculture in providing jobs to immigrants. A more specific issue here has to do with welfare states and the challenges of integrating immigrants in contexts where there is growing pressure from far right political parties pushing selective anti-

immigration agendas. In this regard, the complicated links between employment of immigrants and digitalisation in Sweden have been addressed in a recent book that argues precisely how immigration and digitalisation create new challenges for the welfare state (Blix, 2017). In this regard, Blix specifically argues that the low levels of inequality in Sweden are today threatened by the deskilling of labour, the rise of superstars, the presence of more unskilled workers from immigration and the human ability to adapt being lower than the pace of technological development. In his view, the economic and social forces at work here are "the higher pace of change, a situation where winner takes all, the automation of work and a platform based labor market" (Blix, 2017: 21). On the other hand, an OECD report on agriculture in Sweden from 2018 noted that: "There is an ongoing discussion on whether the agricultural sector and rural areas can be part of the integration of immigrants in Sweden. This would at the same time reduce labour shortages in the agricultural industry, enable low-skilled new comers to be integrated into the labour market, and modify the age structure of rural areas. The proportion of immigrants in the agricultural sector has already increased for all sub-sectors in the industry since 2007. The growing of perennial crops is the industry with the highest proportion of immigrants (25%), while the lowest proportions are found in animal production, mixed farming and the agricultural support industry" (OECD, 2018: 114). Yet, this assessment says little about the more specific relations between immigrant employment and agriculture in different regional settings and also in relation to more permanent paths of immigrant integration through agricultural jobs in rural areas.

The previous background gives some basic starting points from which to address the interlinks between contemporary agrarian questions and immigration through a focus on technology and labour in rural areas of Sweden. In this regard, the Swedish rural context is an important case to be analysed more deeply. Here, the history of agricultural development shows us complicated paths characterised by issues concerning the observed changes in the family farm, the incorporation of Sweden into the European Union and global markets for food, and the recent new political issues arising from the process of depopulation, decline of rural areas, the arrival of new immigrants to the country and the political ecology of resource use in the country. Regarding family farms, in 1998 Djurfeldt identified important conceptual gaps in theorising Swedish family farms in contexts of agrarian transformation and new tensions of rural and agricultural politics (1998). In addition, and within the ongoing social and ecological transformation of rural areas, issues concerning both family farm and labour, and integration, raise fundamental issues about the role of immigrant skills as one of the defining factors for integration of immigrants in rural areas (Søholt *et al.*, 2018).

In what follows, the case study and the methodology for the paper are presented in order to then explore the interactions between agrarian relations, technological change and rural development discourses in the prospects of employment for immigrants in agriculture in the region of Uppsala, Sweden.

3. CASE STUDY AND METHODOLOGY

Empirically, this paper is based on a qualitative case study focused on the Uppsala region in Sweden. Nine qualitative semi-structured interviews were conducted during 2020 and 2021 with the following key informants: 1) two officials working with rural development plans at the county level in Uppsala, 2) two officials working with integration plans at the county level in Uppsala, 3) one official working with environmental policy in a rural municipality of the Uppsala region, 4) one official working with rural development in a rural municipality of the Uppsala region, 5) one farmer running and working on a farm focused on ecologically certified and locally produced dairy products, 6) one farmer running and working on a farm where recently a countryside coffee shop and rural product store had become part of the farm business, and 7) a family farm oriented towards meat and grain production (four family members participated in the interview). The interviews were conducted between October 2020 and January 2021 and the interviewees and questions were defined with the aim of obtaining views of farmers with different production orientations and staff working with rural, integration and environmental policies at regional and municipal levels in Uppsala. The interviews were recorded and transcribed for the analysis, and quotations were translated by the paper's author. When needed, context for the quotations is added in the text. The farms and interviewees are anonymised in the paper. In addition, interviews from previous research with members of national civil society's rural development networks are used in the paper. In addition, the paper includes the analysis of regional and national policy documents developing new regional and rural development plans, national and regional food policies, and integration policies at the Uppsala regional level. Furthermore, relevant material has been obtained from the analysis of information published in one of the leading Swedish magazines of the

Federation of Swedish Farmers which focuses on agricultural development and technology. Other secondary sources include reports and studies on rural development and agrarian change in Uppsala and Sweden and on the situation of immigrants in the Uppsala region.

The region of Uppsala is a relevant case study because it encompasses rural areas with diversified agriculture including a dairy sector, grain production and meat production, and today there is an important and growing movement for organic and agroecological farming which also combines agriculture with rural tourism. As observed in previous studies, the Uppsala region has also witnessed economic concentration on fewer but larger farms and increased agricultural specialisation in operating orientations, and family farms have gone through multilevel processes of change due to internal and external pressures (Nilsson, 2020; Wästfelt, Eriksson, 2017). It is estimated that the population of the Uppsala region will increase by between 123,000 and 173,000 in habitants by 2050 and in this context, it is estimated that about 30% of the growth will take place in the smaller towns and in the countryside (Region Uppsala, 2020). The city of Uppsala is the main urban centre in the region, and it hosts important hubs of agricultural and forestry innovation and technological development. Today, the regional development plans for Uppsala consider investment in digitalisation as a key contribution to regional and rural development.

For the purposes of this paper, the farms included in this case study and where interviews were conducted are identified as farm A, farm B and farm C. These three farms are characterised as follows: Farm A is mainly oriented toward dairy production and it is part of one of the new cooperatives of ecological farms operating in the Uppsala region. The farm is run by two brothers who inherited the activity from their parents. Also, and mainly during the summer season, riding activities and a coffee shop are run on the farm. The farm is located in the surroundings of Uppsala and no more than 11 km away from downtown Uppsala. The farm includes 100 hectares used for pasture and 580 hectares used for cultivation. Of the total area included in the activities of the farm, 95% is accessed under lease agreements. Four people work full time on the farm, including the two brothers that own the farm, and they also employ one person to work part time at specific tasks depending on the season. Farm B is also a family farm, mainly oriented to meat and grain production. This farm is located 33 km from the city of Uppsala and includes 375 hectares of arable land used to grow grains (of which 50% is accessed under a lease agreement). In addition, the farm includes 50 hectares of pasture which is used for the cows and 325 hectares of forest. The operations on the farm are run by two members of the family and two employees. Farm C is oriented toward growing grains, oilseeds and peas and it also focuses on the egg market. This farm covers 630 hectares and the drying and storage of products is done at the farm level. At the time of the interview and the visit to the farm, and due to a fire that had completely destroyed the hen house, eggs were not produced on the farm, but were bought from other producers and commercialised on the farm. Recently, a rural coffee shop where rural products are sold was opened at the farm. This farm is located 36 km from the city of Uppsala.

The interviews and the analysis of policy documents and other relevant documents shed light on some key aspects of the barriers for integration of immigrants through jobs and employment in agriculture in the Uppsala region. In this regard, I draw on Burton and Carlen's approach to official discourses (1977) and will analyse rural and food policies as official discourses that must simultaneously constitute an ideal addressee to whom justification can be made and negate a specific material situation that engendered that discourse.

4. RESULTS AND ANALYSIS

In the first instance, the presentation of the results and the analysis is organised in order to focus on and deal with the relations between the reality of labour and work on the local farms and the political economy and ecology of agricultural automation. In the second instance, the analysis is focused on the scope and limits of regional and rural development plans in relation to the digitalisation of rural areas and contested meanings of rurality thereby.

4.1. Local farms and the political economy and ecology of agricultural automation

One of the most striking characteristics of the development of agriculture in Sweden has been the pace of technological development (Flygare, Isacson, 2003). Yet, Swedish agriculture is still considered to lag behind other European agricultural producers in terms of productivity. Thus, rural policies are oriented toward increasing agricultural productivity through innovation and technological development (OECD, 2018) and developing new market positions for Swedish agricultural products. Those increases in productivity are mainly based on the adoption of technologies at the farm level. The three different farms included in this research, and the views of

the farmers running those farms on immigrant labour and technology suggest a structural barrier to integration through rural jobs in Sweden. On the other hand, the interviews with the farmers owning and managing these three different farms and their production systems show that they are willing to employ immigrants on their farms.

In the case of farm A, at the time of the interview the farm had two immigrant workers from Estonia employed in its dairy and agricultural operations. On farm C, one immigrant from Palestine was employed packing eggs. On farm B, despite no immigrant workers being employed on the farm, the interviewed family members agreed that immigrant background would not matter in the employment of new workers on the farm. In the three cases, the connection between technical development and farming is more concretely framed in terms of the use of agricultural machinery. Below, translated quotations of relevant statements during the interviews on the farms are offered. I start by quoting a farmer from farm A, who explained that:

> […] the technologyis expensive, and has to deliver much in a short time and it can be difficult to find staff with competences, you want to use the machines full potential from the beginning […] The challenge is to find the staff that can use the new technology straight away.

When asked if they may consider employing more workers from other countries, he answered:

> Yes, absolutely. Where the person comes from does not matter, what is important are the competences […] The language can be a barrier, but English is the working language and is not a problem.

He added that the competences are based on the use of machines and having experience working with agricultural machines. Regarding simpler tasks on the farm, he said that:

> […] Things are so advanced now, it is difficult to employ someone full-time and for the whole year only for simpler tasks on the farm […] for that one needs a bigger farm.

In dealing with the same topic during the interview on farm B, one member of the family explained that:

> […] We cannot forget that Swedish agriculture is quite steered by technology, as we talked about GPS tractors earlier for example, and this requires that one learns the technology, and it is not only to come in and work, one needs to know how the very advanced machines work. Thus, it is hard.

When I asked if they could teach immigrants to use those machines, another member of the family said:

> Well, if the person is really capable of learning how to use the machines… because we cannot afford to make the effort if the person will not be able to work in the end, that's a big risk for us, it doesn't matter where the person comes from, as long as he has the right attitude and wants to.

What is particularly relevant in this case is that farm B is situated only metres away from a former housing centre for refugees who arrived in Sweden after 2015. They were provisionally located in that area while waiting a final destination and visa decisions. According to the Swedish policies, the housing centre only offered housing to the refugees while they awaited the process of obtaining a visa. Thus, the stay there did not mean time spent in education or in job training.

On farm C, and when I asked about how such a large farm could be run with only two workers, the interviewed farmer explained that:

> It is connected with the structural development and the development of technology, and this has been going on very strongly after the Second World War… there has been some change between technology and work.

And he added:

> The technical development was going from horses to tractors, machines became bigger and bigger and there were more technically developed GPS-controlled tractors. You do not have to control anymore. You sit more like a supervisor. Of course, we will have self-driving vehicles in the future. The concentration of capital can be called capital intensification. But it's the same with the hen. We do not have our own hen house. Now we have a temporary solution, we buy eggs and then pack them… We have managed to keep our brand alive … We have managed to survive and keep the brand until we get a new hen house, but egg production is extremely capital intensive.

In relation to the issue of employing immigrants on the farm, at one point he said:

> You need to have an open mind. To be able to see that there is always a potential behind the façade. You must be able to see the potential in the person and together help to bring out their potential.

And in relation to the immigrant workers who already work with him on the farm, he said:

> There is no one who can load these packages (of eggs) so nicely… they are perfect. It is one hundred percent in

quality, when we exhibit it in the store, it is a pleasure to deliver those packages (of eggs).

Within this context, it is important to highlight that these three farms represent forms of family farms where ownership of, and access to, the farms and the agricultural lands is regulated in different ways. Also, the interviews show the persistence of family engagement in agriculture and in different production systems and goals and we observe farmers and relatives working on the farms. Though in the interviews the farmers highlighted that the employment of immigrants was certainly a possibility and they were willing to do that, it becomes apparent how machinery use limits and qualifies those intentions. They stressed that for this, special agricultural skills were needed.

Importantly, the two farms that had employed immigrants shed light on two important factors. First, in one case both employees were from Estonia and they had a previous agricultural background and know-how concerning agricultural activities similar to those they carry out today on the farm in Sweden. This allowed them to take on agricultural tasks without major problems. Even though English is the working language, this factor does not create major barriers to their work on the farm. In the other case, the worker is employed for packing eggs, which could be understood as a simpler task. The quality of his work is highly regarded by the farm owner and manager. Yet, in this case we can observe that his labour skills are used in an activity that is not directly connected to agriculture. In the third case, and although the whole family expressed the willingness to employ workers independently of their origins and solely based on their skills, it was also expressed that any new employee would need to have very specific skills to work in the agricultural activities of the farm and to know how to organise the work on the farm. As an example, they referred to one of the Swedish workers who currently works with them and described him as an independent worker who knows what should be done and does not need to receive instructions. In the same interview, a member of the family suggested that one alternative is simpler tasks that can be found in other agricultural activities and he used the example of dairy production to illustrate that possibility. What is interesting to observe here is that in the farm oriented toward dairy production, the economic possibility of employing immigrants to do simpler tasks was conceived as being directly linked to the possible expansion of the farm. In the view of the interviewed dairy producer, the current economic conditions of the farm would not allow the employment of more workers for full time jobs in simpler tasks at the farm.

This illustrates something we can analyse in terms of the political economy of farms in Uppsala, which today constrains possibilities to incorporate more immigrant workers as agricultural workers. From the interviews with farmers, one might characterise this political economy as highly dependent on already-adopted technology, the markets with which they interact, the new machineries they can access today and economic activities on the farms that are not properly agricultural activities. For example, in one case a new full-time employment opportunity was created on the farm after the owners decided to open a countryside coffee shop, which also commercialises different products associated with local rural production. At the same time, the farmer expressed that new technologies would continue characterising the agricultural activities on the farm. The same farm joined a local movement to create and promote a rural tourist destination in the area, which is based on a network of local producers. In this regard, we can observe that more ecological production finds it owns barriers and problems concerning markets and production. As the farmer oriented toward ecological dairy production explained, a recent drop in prices for ecological products can be observed in the region. He explained that this is due to the incorporation of more ecological producers in the markets. We observe here another potential barrier to employment on farms. Though one might expect that more ecologically oriented farms would tend to employ more workers, this is more difficult to achieve in practice. For example, the same farmer explained that there are few simple tasks in agriculture that may justify employment of unskilled workers. This resonates in the conclusions of a recent larger study on this topic in Sweden focusing on agroforestry which found that: "Hiring personnel at set Swedish salaries is expensive and is often unfeasible for smaller farmers. The farmers studied already use cheap labour through organized volunteering or internships. In a society where labour time is an expensive asset, access to appropriate technology is critical" (Schaffer *et al.*, 2019: 10-11).

While in the three farms analysed above environmental concerns have been incorporated in their organisation and thinking around agriculture, there are differences in the approaches taken. For example, while two of the farms are certified by environmental standards, one is not. However, despite not being certified, the environmental goals of that non-certified farm are framed in terms of local production. In this regard, the political economy and ecology that characterise the farms analysed above show important differences in terms of production, multiplicity of economic activities and also incorporation of environmental concerns. This point

serves to connect the analysis of these farms to the wider context of the regional incorporation of a set of new development plans in Sweden. Among these policies, the food policy deserves special attention as it is framed to an important degree towards sustainable food production chains and as a source of jobs for immigrants.

4.2. The scope and limits of regional and rural development plans, the digitalisation of rural areas and contested meanings of rurality

In 2017, the Swedish government launched a new food policy for the country, and this became an influential official policy in the context of local rural development. The new food policy centres around an official discourse where its central elements are constructed as a vision (Government of Sweden, 2016). This vision incudes the following objectives:

> By 2030, food production in Sweden is competitive. Steadily rising production values and cost-efficiency in food production are evidence of this. Improved productivity and successful commercialisation of the existing Swedish strengths create profitability in the various sectors. Businesses in the food supply chain help provide employment throughout the country. The sector provides employment in urban as well as rural areas, for people originating from Sweden or other countries and ranging widely in terms of age, gender and previous experience including many immigrants. It is easy to recruit workers with the right skills in the various sectors of the food supply chain, and skills requirements are easily satisfied. New business opportunities and complementary activities also help to boost the diversity of rural industries.

This national food policy is today implemented at regional and municipal levels along with regional development plans. In the case of Uppsala, a main declared goal is to favour ecological farming and to incorporate sustainability concerns into the local implementation of food policy. Here, two central local goals are first that the production value from the agricultural and horticultural sector is increased by 20 percent by 2030, and second, that the production value from organic food is increased by at least 200 percent during the same period (Länsstyrelsen Uppsala Län, 2019). Within this context, one of the five key areas of work focuses on the supply of skills and labour force. In the terms of this local policy in Uppsala:

> Entrepreneurs in the green industries today have a hard time finding labor and at the same time there are groups that are without work. Potential employees and entrepreneurs have a hard time finding each other and entrepreneurs in the county are asking for easier ways to find labor. Part of the problem is that it is missing meeting places and opportunities for networking, exchange of experience and cooperation linked to companies' recruitment (Länsstyrelsen Uppsala Län, 2019).

Thus, the Uppsala region envisions that these challenges can be faced through efforts to "increase interest in working in the green industries and show what opportunities there are for work in the food sector, from production to consumption" (Länsstyrelsen Uppsala Län, 2019).

Within this context, sustainability and employment concerns are a common issue in both regional development plans and food policies. In so doing, the political economy and ecology of the farms explained earlier are today at the centre of two new and connected plans for local and regional development. In this regard, meanings of rural sustainability are constructed through discursive struggles. This permeates Swedish rural areas at large, and here official discourses on rural development are just one type of discourse producing meaning about the present and the future of rural areas and agriculture. In this regard, it is important to highlight that behind these official discourses bringing together claims about employment possibilities, sustainable agriculture and food production, there is an important structural problem associated with the recent history and the dominant forms of agricultural development in Sweden. That problem arises as a result of the national and regional failure to reach one of the national environmental quality objectives established by the Swedish State in 1999, and which have guided the national environmental policy since then. In more specific terms, the latest assessment of the objective, a *Varied Agricultural Landscape* for the region of Uppsala, shows that this objective will not be reached in the region within the time frame decided upon for this objective. Such an environmental quality objective is defined in terms of protecting the value of the farmed landscape and agricultural land for biological production and food production, and at the same time is defined in terms of the preservation and strengthening of biological diversity and cultural heritage assets (Naturvardsverket, 2018: 21). What is relevant to observe here is that a central aspect of the challenges towards which that environmental objective is aimed are that, in the Swedish State's own terms: "Agricultural practices need to be adapted so as to conserve and develop the natural and cultural values of the farmed landscape. At the same time, farming has to be efficient and competitive".

In this regard, the goal of efficiency and competitiveness of farming is connected to competences and

labour force in agriculture, which, as we noted earlier, is crossed by processes of technological change including automation and digitalisation. In this regard, and in contrast with the declared objectives of the national food policy, it is not clear how integration policies are incorporated in local rural development and food policies. As an official working with these policies at the county administrative board stated: "The focus of our mission is to support all farmers so they can survive (as farmers). Firstly, the number of farmers is declining and there are also fewer people working in agriculture. We try to provide support for the maintenance of agriculture. But I do not think that we work with farmers and integration. There is not an assignment for this. It is only to support farmers. But if there was a political decision and we had a written regulation/instruction to support the farmers in receiving and employing immigrants, we could offer them training as an employer to receive recently arrived immigrants. And then they could train the new (immigrant) to work in agriculture".

And in this regard, she added, "More work would be needed; systematic work at the national level is needed, which does not exist now".

As we saw earlier, a structural issue here is the type of labour skills required in agriculture in Uppsala today. One argument for better integration of immigrants in Sweden is that simple jobs would allow higher levels of employment of immigrants (Ek *et al.*, 2020). Yet, this is clearly problematic when taking into account the structural conditions for rural employment within agriculture today, where competences and labour skills are deeply determined by the logic of agricultural automation and demands for increasing productivity.

Within this context, the ongoing digitalisation of rural areas is essentially predicated on the need to find new prospects for rural development. This is linked to the creation of incentives for new economic activities in rural areas and also for the permanence of rural in habitants to counteract depopulation. Here, the ongoing efforts to provide the infrastructure for fibre-optic internet connections are rapidly advancing in the region, and the regional digital agenda requires that all municipalities "should have a strategy for how to succeed with broadband expansion, both in urban areas and in rural areas" (Region Uppsala, 2020). Thus, rural municipalities expect that digitalisation will enable better living conditions for rural in habitants and new economic prospects. In one such municipality, digitalisation coincides with the inception of a new important hub of economic activity formed by the activities of two major national online retailers located in the municipality. Both companies, Adlibris and Apotea, are today major employers in the area, but at the same their local inception has brought important challenges concerning working conditions and local infrastructure. Yet, when it comes to agriculture, as an official in the municipality explained: "(In agriculture today) few people are needed, and large machines are used on large tracts of land...".

The same official then added: "In Sweden the plots are getting bigger and the machines too, and there is more land consolidation [….] It is not so easy to start working just like that (in agriculture) because (agriculture) has become very specialised and efficient".

In this regard, and deeply associated with the ongoing digitalisation of rural areas, we have the new prospects of robotisation of agriculture. As one interviewed farmer explained, the new infrastructure provided by fibre-optic internet connections will certainly allow agricultural machinery to perform both in more precise ways and also without direct manual labour. This assessment coincides with the view of an expert commenting on the Swedish-made robot named Ekobot, which clears weeds in onion plantations. Ekobot is one of the new innovations considered among the Ten Biggest Agricultural Innovations Right Now by the magazine of the Federation of Swedish Farmers, ATL Lantbrukets Affärstidning (agriculture business magazine) in September 2020. For the magazine's expert, the innovation of Ekobot is especially interesting in the context of the Covid-19 crisis:

> Everyone has seen how corona has stopped foreign labour from working in horticulture. It increases interest in robotic systems. Both Blue River in California and Kubota in Japan have said that their main driving force for robot development is precisely the fear of labour shortages. Corona has made that even clearer (Frankelius, 2020).

While Ekobot is designed to clear weeds, advances in the adoption of robots in agriculture are manifold and all-encompassing in Sweden. The case of Farm Droid, for example, shows that at the other end of the process, this robot, in the view of its producer, ca help "farmers and plant growers reduce the costs for sowing and weeding of crops while keeping it CO2 neutral and organic"[1]. The cases of Ekobot and Farm Droid serve to further analyse the dynamics of robotisation and digitalisation of agriculture in relation to both labour and environmental concerns. First, Ekobot is an agricultural robot designed with the explicit purpose of reducing pesticides and also to reduce manual labour on farms touted as ecological farms. In the inventor's words:

[1] Available here: https://roboxplore.com/farmdroid/

> The fully autonomous robot (Ekobot) finds its way to the field and automatically detects and removes the unwanted weed. Our innovation gives the farmer ways to completely stop or to minimise the use of herbicides […] by using our robot system, the farmer can become more efficient and the consumer doesn't have to worry about unwanted chemicals and at the same time the yield can increase as much as 10 percent. And the need for manual labour can decrease substantially. The markets within precision farming robotics ispredicted to grow rapidly as a new technology comes forward, and more available on the market in the upcoming years.[2]

Secondly, these are robots that in comparison to labour costs in Sweden are not very expensive. As the price of Farm Droid shows, in 2020 the robot cost the equivalent of 650,000 USD (ATL Lantbrukets, Affärstidning, 2020). This, I would argue, adds a new context for the real possibilities of immigrants to be employed in agriculture. Also, this undermines possibilities of immigrants becoming farmers themselves, as even the meaning of ecological farming is changing through the discursive construction of agricultural robots as components of ecological farming.

5. DISCUSSION: NEW AGRARIAN QUESTIONS, INTEGRATION OF IMMIGRANTS THROUGH JOBS IN AGRICULTURE, AND CONTRADICTIONS WITHIN THE DIGITALISATION OF RURAL DEVELOPMENT IN SWEDEN

One of the most relevant results of this study is that although in the cases analysed different actors express a political will to offer integration possibilities for immigrant workers through jobs in rural areas, this willingness clashes with the reality of an increasingly automated and technology-driven agricultural development within Uppsala region. This makes a contrasting point with arguments about employment focused on simple tasks as a path into employability for immigrants in Sweden. In this regard, we can see the cases presented above in the light of some comparative perspectives on immigrants becoming farmers, and also in relation to alternative social relations and technology presented in the analysis of agroecology. In relation to the former, cases such as those of Latino immigrants in the North American context studied by Laura-Anne Minkoff-Zern show that there exists evidence of immigrants establishing themselves as farmers and innovating in the ways through which they develop agriculture (Minkoff-Zern, 2018). This includes cases where these new farmers choose alternative farming techniques in line with agroecological thinking and practice, and the use of low-or non-organic certified inputs. Within this context, we can also think of possible alternative connections between the political economy and ecology of the farms and immigration by considering how in different geographical settings of Latin America and Europe, agroecology is also changing social relations of production in agriculture (Altieri, Toledo, 2011; van der Ploeg, 2020). Here, it seems to be politically important today to connect the agroecological possibilities to alternative ways to deal with the contingency of technology and work contradictions in terms that can also incorporate new prospects for immigrants in rural areas, even in Europe. As van der Ploeg argues with a focus on the European context, agroecology is "helping peasants to move beyond the limits imposed by capital. It does so by moving farming beyond the scripts imposed by capital and the state (ongoing scale-enlargement, technology-driven intensification and specialization as the inevitable path to progress), whilst simultaneously offering an alternative that is increasingly convincingeven in economic terms".

These types of counter movement serve to gain a contrasting perspective concerning the new agrarian questions in Sweden. In this regard, this study shows that in the Swedish rural context today, the prospects of both immigrants becoming farmers and of agroecology transforming social relations of production need to be analysed with a political focus on how accesses to farm ownership and how the drivers of technological adoption define work relations at the farm level. One key aspect here is that even when immigrant labour can be conceived as cheaper labour on farms, the prospects of immigrants working in agricultural activities on farms are few because of the technological requirements for this. On the other hand, the price of farms, and of the technology associated with current agricultural development in Sweden, make it extremely difficult for immigrants to even attempt to become farmers in the country. In this regard, a historical path for the integration of immigrants in rural areas is precluded even in contexts where depopulation and a generational shift in agriculture is taking place. Although the settlement of immigrants in rural areas may be an alternative to counteract depopulation and address a generational shift in farm ownership, the political economy of current farms makes it extremely difficult. If we add to this that a technologically-centred discourse on ecological agriculture is taking on an increasing role in the imagination about future ecological farming, but at the same time implies labour-saving robots, the future of

[2] Available here: https://www.youtube.com/watch?v=SdQ8gIT4yc8&t=104s

agriculture can become even more contradictory when thinking about job opportunities for immigrant workers. Here the connection between labour-saving technologies and ecological farming can then become a new barrier to the political possibilities of thinking of and materialising a rural path for better integration policies in the countryside.

Finally, the analysis of the interviews and documents conducted in this research shows that automation of agriculture and digitalisation of rural areas reproduce contradictory relations between the political economy of local farms, the possibilities of immigrants making a living from agriculture and the terms and promises of the official discourses on rural development in Sweden. This creates new meanings of rurality as well, and these are constructed and re-signified through the implementation of rural and regional development plans. In terms of new agrarian and labour questions, we can see that digitalisation of the countryside means the local materialisation of a wider political economy and ecology process with new configurations of relations of knowledge, technology and ecology. However, what continues operating as a structuring force in this context are the imperatives of competition in global markets, and increases in productivity and economic growth, which are today followed by environmental discourses that conceal how all this finally reproduces capitalism and undermines alternatives for immigrant workers in agriculture. While it is important to stress here that technology should not be understood in unidirectional and deterministic ways, this study suggests that the combination of digitalisation and robotisation of agriculture in Sweden goes today in the direction of again revolutionising agriculture toward an increasing process of local labour-saving development. Yet, a major social problem today is that this time this kind of contradiction between work and technology is not only taking place within agriculture, but in society at large and in a global context. This makes both integration of immigrants through rural jobs and the implementation of ecological objectives even more problematic in Sweden today. In this regard, this paper suggests that ongoing discussion on agricultural development actualises some of the central questions posed by Kautsky and others during past processes where the dynamics of capitalism also revolutionised agriculture. Within this context, it is also important to highlight that alternative answers to these new agrarian questions in the rural areas of Uppsala can still lead to the political construction of different social relations between technology and work, this time oriented toward different directions than those dominant today.

6. CONCLUDING REMARKS

This paper has shown that prospects of employment for immigrants in agriculture cannot be separated from the analysis of new agrarian questions in Sweden today. As seen above, historical paths of agricultural automation, the specificity of agricultural labour skills within the current state of agriculture, the ongoing digitalisation of the countryside and the integration of sustainability concerns in agriculture brings new questions concerning the meaning of rural development in Sweden. Within this context, a first conclusion of this study is that agricultural automation and the process of digitalisation brings new contradictions to the political economy and ecology of the farms in Uppsala and this determines the prospects of employment for immigrants in agriculture in the area. Thus, the current technological structure and the ongoing digitalisation of rural areas is becoming a structural problem for thinking and materialising paths for integration through agricultural jobs in the region. Secondly, an important social problem arises when automation and digitalisation are today entangled with discourses on ecological farming, which brings new contradictions between technology and work. In this regard, as this study suggests, those contradictions between technology and work in agriculture define and limit the new official discourses on rural development in Sweden and their promises of creating rural jobs for immigrants. The findings of this paper thus suggest that new discourses about both ecological agriculture and rural development framed in the terms of a green capitalist economy perspective further reproduced contradictions not only between capitalist technology and labour, but also ecological contradictions intrinsic to capitalism.

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