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The role of migration in post-soviet communities: the changing structure of rural livelihoods in Moldova

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The nexus between migration and differentiation of livelihood strategies in sending countries is a widely investigated topic. However, this nexus has been often approached from narrow perspectives, highlighting the impact of migration only on limited elements of households' livelihood strategies, typically related to the economic impact of remittances. This research presents a multi-level analysis of the migration-livelihood differentiation nexus, adopting the Republic of Moldova as a case study. Starting from two sets of original quantitative and qualitative data, a model-based cluster analysis allowed to identify 8 typologies of farmers with distinctive livelihood and income generation strategies. Then, a logistic regression model was developed to assess the impacts of demographic, economic, and social characteristics of rural households on the adoption of different livelihood choices. Finally, results from cluster analysis and logistic regression were integrated and discussed through qualitative data collected with interviews and focus groups conducted in Moldova between September 2020 and December 2022. Results shows that the impact of migration in the livelihood strategies adopted by Moldovan smallholders is multifaceted, ranging from the prevalent role of pure subsistence to the limited role of incentive for investing in higher added value activities, both in and off farm. Finally, out-migration represents a fundamental part of the livelihood strategy to cope with the multifaceted challenges experienced daily by rural households.

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Introduction

The nexus between migration and the diversification of livelihood strategies in sending countries, intended as the combination of economic and non-economic factors through which individuals construct their means of living (Ellis, 2008; Žakevičiūtė, 2019), has been widely explored in the scientific literature across a diverse range of geographical contexts. This nexus, however, is often investigated adopting narrow perspectives, focused on specific monetary or social impacts of migration and on specific impacts of migration on households living conditions, rather than adopting a comprehensive approach integrating economic, social, and behavioural elements to understand the phenomenon.

Aim of this work is to integrate economic, social, and behavioural elements into the analysis of the migration-livelihood differentiation nexus. To reach this aim, the relation between monetary and non-monetary outcomes of migration and the differentiation of livelihood strategies of households is analysed through a mixed-method approach applied to primary quantitative and qualitative primary data collected between January 2021 and December 2022.

The multi-method approach is adopted to investigate the case study of the Republic of Moldova, an agrarian Eastern-European country where migration is deeply embedded in the socio-economic fabric and plays a pivotal role in shaping the livelihood strategies of rural households.

The impact of migration on livelihood strategies of rural household of Moldova is largely of economic nature, reflecting the importance of the remittances on the definition of their income. Remittances are invested to pursue different objectives, including the satisfaction of basic need of left-behind household members (access to food and to high quality healthcare services), to increase welfare and quality of life (building and repairing the house, invest in higher education for children), and to invest in agricultural and non-agricultural activities. Migration also contributes to shape age and gender dynamics, in particular concerning the division of work among members, caregiving duties, and the management of material resources. (Bloch, 2017; Danzer and Dietz, 2014; Lopez-Ekra et al., 2011).

The most relevant turning point in Moldovan recent history can be identified in the transition from a socialist centralized economy to a post-socialist free market in the 1990s. The central aspect of this transition was represented by the agrarian reform, which led to the equal redistribution of state-owned land to the former employees of collective farms (*sovkhoz* and *kolkhoz*). The agrarian reform introduced land property rights in the Moldovan legislation, transforming land from a state asset to a commodity subject to market rules. (O'Brien et al., 2011).

The primary goal of the agrarian reform was to promote self-sustained small and medium-sized farms, ideally oriented toward market production (Piras et al., 2021). However, the commoditization of land, combined with the proliferation of informal leasing practices and private arrangements, led small and medium farms to be marginalized, in favour of large competitive ones (Gorton, 2001; Spoor, 2012). The socio-economic context emerged from de-collectivisation and privatisation of economic activities led to a decline of centrality of small farms, increasing lack of jobs, inflation, and reduction of purchasing power of a large share of population. These dynamics prompted Moldovan small farmers to adopt different livelihood strategies, ranging from resistance to adaptation to the emerging socio-economic context (Mamonova, 2015; Piras et al., 2021), with migration-based strategies playing a prominent role (Obi et al., 2020).

The perspective of the impact of migration in the definition of farmers livelihood strategies evolved over time, from being considered as a way to satisfy basic needs (Culiuc, 2006; IOM, 2018)

to serve as a potential resource to support the establishment of income-generating activities (UNDP, 2016).

The variety of migration patterns in Moldova defines the characteristics of migration flows and the impacts of migration on livelihood strategies of rural households. Concerning out-migration flows, the dynamics registered in Moldova outline a multifaceted context, where different typologies of migration (circular, short-term, long-term) coexist with different impacts on the livelihood strategies of smallholders.

To this extent, data from Moldovan national statistics, from International Organization (IOM, 2018) and from fieldwork conducted in Moldova highlighted a constant “Europeanization” of the migration out-flows, with an increasing preference for EU countries over Russian Federation as destination for short- and long-term migration. This phenomenon seems to be related to the combination of three major elements. First, the definition in 2012 of the EaP (Eastern Partnership) between the EU and Moldova, which guaranteed an easy access to European Union countries for Moldovan citizens, thus making circular mobility patterns easier.

The second, specular, element is represented by the tightening of the legal constraints for Moldovans entering Russia to work (Bloch, 2014), which is also influenced by severe geopolitical elements. Finally, Moldovan migrants moving to Russian Federation are facing an increasing competition with migrants moving to Russia from Asian regions (Bloch, 2014).

Characteristics and goals of Moldovan migrants are also changing. The age of first migration is lowering since youngsters often choose to leave the country after completing secondary school to find more profitable jobs or to enrol in tertiary education abroad. Migration primarily focused on the research of a more profitable job is slightly moving toward a more education-oriented emigration.

Consistent changes can also be observed in the trajectory of Moldovan migrants: while the first migrants used to move from the country to accumulate resources to be reinvested in their home settings, latest outmigration trajectories are more likely to with the settlement of migrants in the destination country. These new migratory paths, although fostering positive effects in terms of monetary and non-monetary remittances sent to Moldova, could strengthen the phenomenon of the “brain drain”, that affects the country in fields as health, education, and public administration (Stratan and Chistruga, 2012).

The coexistence of dual and opposite effects makes the migration-rural development nexus in the Republic of Moldova a multifaceted phenomenon, characterizing the country as a paradigmatic case study for its understanding, while being, at the best of authors knowledge, under investigated.

This work contributes to the debate on the migration-rural development nexus through the analysis of the micro-dynamics of the rural households of the republic of Moldova participating to the migration process. It explores whether migration is a driver for abandoning the agricultural sector, thus weakening the rural development process through the generation of poverty traps and vicious circles in rural areas, or whether it supports and promotes agricultural activities through fresh monetary and non-monetary resources.

Impacts of migration on livelihood strategies of Moldovan rural households are investigated adopting a multifaceted perspective. First, the main sources of income of rural households, their combination, and their contribution to the overall income of rural smallholders are identified. Then, the impact of social, economic, and demographic characteristics of rural households on the definition of their livelihood strategies is analysed. Finally, the relations between the characteristics of migration patterns experienced by Moldovan rural households (short-term or long-

term migration and destination country) and the livelihood strategies they adopt are investigated, to assess the influence of the migration phenomenon on the differentiation of these strategies.

The paper is organized as follows: section 2 presents a review of literature investigating monetary and non-monetary impacts of migration in rural areas; section 3 describes the methodology implemented for the quantitative and qualitative data collection and analysis; section 4 describes the results; section 5 presents the discussion of results; section 6 describes the conclusion of the research.

Literature review

The nexus between migration and livelihood differentiation of rural households has been extensively investigated across different geographical areas and from different perspectives. The drivers and impacts of the migratory phenomenon on the livelihood strategies of rural households can be categorized in monetary and non-monetary.

Among monetary impacts of migration, remittances represent one of the most thoroughly investigated aspect. Remittances play a crucial role in enhancing the livelihood conditions of recipient households by reducing poverty, ensuring the satisfaction of primary needs as health and instruction, and increasing the capability to cope with unforeseen events (Daidone et al., 2019; Khan, 2023; Mbiba and Mupfumira, 2022; Tapsoba, 2022). This phenomenon has been observed in African (Alleluyanatha and Treasure, 2021; Apatinga et al., 2022; Chamberlin et al., 2020; Zewdu, 2018), Asian (Atreya et al., 2022; Cui et al., (2023); Martin and Lorenzen, 2016; Sunam et al., 2021), and post-socialist European contexts (Abduvaliev and Bustillo, 2020; Cebotari et al., 2018, 2016).

Monetary remittances are also associated with a reduction of income inequality (Tung and Thang, 2023) and with income-equalizing effects (Akobeng, 2016; Chiwuzulum Odozi et al., 2010). This phenomenon has been widely recognized in African (Anyanwu and Erhijakpor, 2010; Beyene, 2014; Sodokin, 2021), Asian (Kousar et al., 2019; Pan and Sun, 2024), and central-eastern European rural areas (Arapi-Gjini et al., 2020; Bajra, 2021; Giannetti et al., 2009).

Literature shows that, despite a general consensus on the effective impact of monetary remittances on the general reduction of inequalities, the magnitude and direction of these effects can vary (Arapi-Gjini et al., 2020; Mallick et al., 2020) and are depending from the initial conditions of recipient households. Factors associated with a greater impact of remittances in reduction of inequalities include a longer migration history among household members, the presence of international migrants, higher educational attainment within the household, and higher levels of wealth among recipient families (Gang et al., 2018; Shams and Kadow, 2020).

Financial remittances can also be invested to differentiate income generating activities conducted within rural households and both for in-farm and off-farm activities, as described for countries and areas where agrarian sector has a prominent socio-economic role. Examples can be found in Asia (Bierkamp et al., 2021; Karki Nepal et al., 2022; Sunam et al., 2021; Zhunusova et al., 2022), and in post-socialist European and Central Asian countries (Rzayeva and Rzayev, 2019). The differentiation of entrepreneurial activities, either of agricultural or non-agricultural nature (Nanyiti and Sseruyange, 2022; Obi et al., 2020) seems to be the most effective strategy to contrast poverty in rural areas (Acheampong et al., 2021).

Non-monetary impacts of migration consist in the role of social remittances, intended as the circulation of immaterial

resources as ideas, behaviours, identities, and social capital that flow from receiving to sending country communities (Levitt, 1998; Levitt and Lamba-Nieves, 2011; Vari-Lavoisier, 2020). Social and monetary remittances are often interconnected, and their impacts are mutually influencing one another (Solari, 2019; Vari-Lavoisier, 2016; Williams, 2020).

At the individual level, social remittances represent a key element for the definition and reshaping of social and individual identity of migrants and of their community, by contributing to increase the social and economic status of recipient and their household, who can be perceived as examples of success stories. This has been observed in sending countries from different geographical areas as post-socialist European and Asian Countries (Drbohlay et al., 2017), India (Kaba, 2023), and sub-Saharan Africa (Baada et al., 2021; Zewdu, 2018). However, the presence of social remittances can contribute to the perpetuation of inequality, especially in relation to the reinforcement of gender roles (Ge et al., 2011; Wahid and Kamaruzzaman, 2018).

At societal level, the presence of social remittances can promote the transfer and diffusion of new socio-economic and political ideas and approaches, sometimes challenging existing socio-economic structures (Lacroix et al., 2016; Montefrío et al., 2014; Nikolova et al., 2017; White and Grabowska, 2019), and foster the establishment and strengthening of community-based social organizations (Bocagni et al., 2016; Griffiths, 2019).

The impact of non-monetary remittances, similarly to that of monetary remittances, is influenced by the conditions of recipient households and communities. These recipients must possess the social, economic, and educational capabilities required to harness the intellectual resources brought by migrants and returnees, to avoid the perpetration of social and political disparities (Chauvet et al., 2016; Coe, 2017; Tuccio et al., 2019).

Materials and methods

This study relies on two sets of primary data collected through fieldwork activities conducted in rural areas of Moldova: a quantitative dataset including results of a household survey submitted to a nationally representative sample of smallholders living in the rural areas of all the regions of the Republic of Moldova (with the exclusion of the autonomous Transnistria Region) and a qualitative dataset including results of direct interviews and focus group discussion conducted with institutional stakeholders and smallholders from different rural areas of the country. Quantitative and qualitative data were combined and analysed through a mixed method research (MMR) approach (Timans et al., 2019).

The MMR adopted in this work integrates Model-Based Cluster Analysis (MBCA) and logistic regression on the quantitative data, which results were discussed and validated through qualitative insights from direct interviews and focus groups discussions.

The household survey and the focus groups. Quantitative data from the household survey were collected in January 2021, with the support of a marketing agency operating in Moldova. The questionnaire included 75 items investigating different livelihood aspects of rural Moldovan household, including their general livelihood strategies, cultural patterns of migration, changes in allocation of agricultural resources before and after migration, gender and generational changes in decision making in the households related to management of remittances. Questions not related to socio-demographic aspects were based on a Likert scale ranging from 1 (completely disagree) to 5 (completely agree), with 3 representing the neutral value.

Table 1 participants to direct interviews and focus group by typology and gender.

Direct interviews with stakeholders (2018-2022)

	Women	Men	Total
Representatives of Governmental Institutions	10	6	16
Representatives of International Organizations	1	3	4
Representatives of Local Administration	3	2	5
Scholars	2	3	5
Others*	1	2	3
Total participants to direct interviews	17	16	33
Focus Groups (2021-2022)			
	Women	Men	Total
North Region			
Cubolta (Sîngerei District)	1	6	7
Gordinești (Edineț District)	5	8	13
Soroca (Soroca District)	3	6	9
Țaul (Donușeni District)	1	7	8
Centre			
Niscani (Călarăși District)	0	8	8
Nisporeni (Nisporeni District)	0	6	6
Trebujeni (Orhei District)	2	1	3
Ungheni (Ungheni District)	3	6	9
South			
Cantemir (Cantemir District)	3	6	9
Cahul (Cahul District)	2	6	8
Autonomous Gagauzia Region			
Cioc-Maidan (Comrat District)	0	4	4
Congaz (Comrat District)	0	3	3
Total participants to focus groups	20	67	87
Total number of participants	37	83	120

*Others: The President of a Farmers' association; a foreigner expatriate working for a transnational company operating in Moldova; a highly educated Moldovan informant with migration experience in several EU countries.

The questionnaire was submitted to a representative sample of 608 adult respondents from rural households where at least one member is involved in any agricultural activity (inside or outside the household) and at least one member of the household migrated seasonally or long-term in the last 10 years.

Concerning the sampling strategy, in rural villages the quantitative data collection started from a relevant location, such as the town hall. If there was no town hall in the village, then a church, a school, a post office or, if these are missing, a local shop or pub was adopted as starting point. The interviewer conducted the first interview at the first household to the left of the starting point and continued with a step of 3 households until the final number of interviews foreseen for the specific location was reached. This approach ensured the randomization of final sample of rural households.

The qualitative dataset was built from a set of 33 direct interviews and 12 focus group discussion organized online and in person in rural areas of the country from September 2020 to September 2022, which involved 120 respondents among farmers, rural households' representatives, and national and local stakeholders. Participants to stakeholder interviews and focus groups were contacted with the support of the Moldovan National Institute for Economic Research-INCE, which facilitated

the engagement of relevant stakeholders and representatives of local authorities and local organization of producers to include them in the research. The samples of stakeholders and farmers participating to the direct interviews and the focus group were balanced in terms of gender and the type of activities conducted. Table 1 summarizes the main characteristics of participants to qualitative data collection.

Figure 1 illustrates the locations in which focus groups, stakeholder interviews, and the household survey were conducted.

Cluster analysis. Data from the household survey were analysed through a Model-Based Cluster Analysis, to identify groups of smallholders homogeneous in terms of livelihood and income generation strategies in an unbiased mode (Wolfe, 1963). Thanks to the representativity of the sample, this approach allowed to obtain results that could be extended to the entire population of Moldovan rural smallholders through inferential analysis.

Respondents were clustered on the base of three main income sources: agricultural income, remittances, and off-farm income. Agricultural income is the result of the sum of declared income from crops sold in the previous year, and of the income generated from each animal owned. Remittances is the result of the sum of each declared destination of remittances in the past year, including savings. Off-farm income is the the result of the sum of declared salaries from off-farm activities of each active member of the household currently working in Moldova. Figure 2 summarizes the considered income sources.

Inconsistent or lacking prices of crops and animal products were substituted with the median values. In case of unknown values of remittances, the expected value of the log-normal distribution of the other units was imputed for the households who declared that remittances are a source of income, and 0 was imputed to the others. Unknown values of salary were substituted with the expected value of the log-normal distribution of the other inputs multiplied by the number of household members employed in Moldova.

The mutual independence of the distribution of the three variables was assessed through an explorative graphical analysis confirmed by a Shapiro normality test.

Through cluster analysis, eight homogeneous groups of smallholders were identified. The Kruskal-Wallis test (Kruskal and Wallis, 1952) was adopted to assess the statistical significance of differences in the median values of survey responses among the eight clusters' members. This non-parametric test verifies whether two or more independent samples originate from different populations. The results of these analyses are presented in detail in the Results section.

Livelihood strategy model specification. Once established that the most efficient clustering method was based on the combination of the three income sources for each household (agriculture, off-farm activities, remittances), it was possible to estimate the share of Moldovan rural households perceiving the different income typologies and the related average self-declared income.

The reference population is composed by all Moldovan rural households either with a migrant member in the past 10 years or engaging in any form of agricultural activity. Assuming the independence between engagement in agricultural activities and out-migration and given that all households in the sample have at least one member that migrated in the past ten years, the results can be extended to all rural Moldovan households. The model specified for the three sources of income (agricultural income, remittances, and income from off-farm activities) is a tri-variate Bernoulli-Lognormal mixture distribution, with the three variables being independent. Being the distribution a discrete-

Locations of Focus Groups and Stakeholder Interviews



Locations of Household Surveys

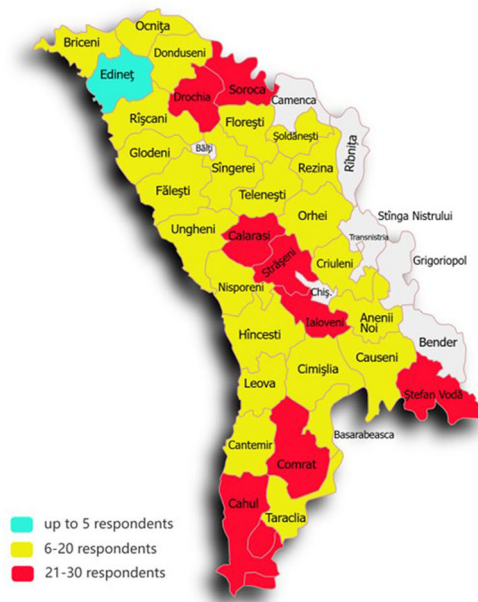


Fig. 1 Locations of focus groups, stakeholder interviews, and household survey.

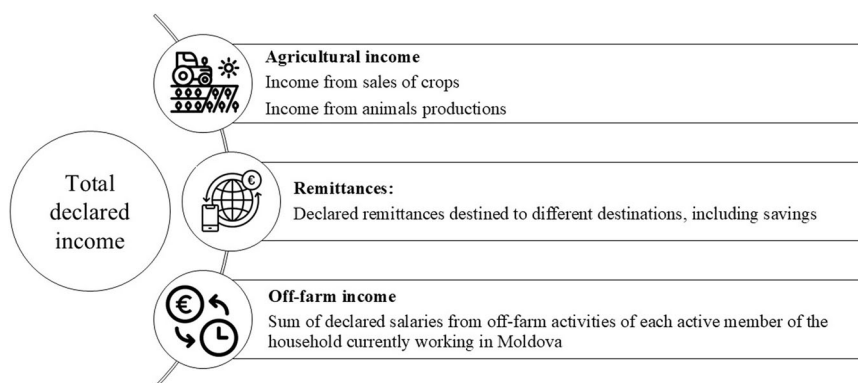


Fig. 2 Sources of declared income of Moldovan rural households.

continuous mixture, a two-step maximum likelihood estimation was conducted and then goodness-of-fit tests on the cumulative distribution function was performed.

As far as the sampling method was defined, a simple random sampling was employed, with the goodness of fit assessed through Shapiro-Wilk tests of normality on the natural logarithms of the positive data. Maximum Likelihood Estimation (MLE) of distributions of declared income sources to find averages and confidence intervals was performed. The final result is the definition of the point estimates and the confidence intervals (c.i.) at 0.95 of the distributions of income from agricultural activities, salaries from off-farm activities and of remittances. The Shapiro-Wilk normality test on the natural logarithms of the income data confirmed that the distributions of agricultural income and remittances fit the Bernoulli-Lognormal model (p -values: agricultural income=0.33, remittances=0.17 off-farm income<0.01).

After the identification of general characteristics of income sources and of the 8 clusters of households, a logistic regression was performed to test the impact of socio-demographic, economic, and migration-related factors on the probability for a farmer to be included in one of the groups.

As final step, outcomes of cluster analysis and logistic regression has been explored and validated through the qualitative data collected through the direct interviews and focus groups discussions conducted from September 2020 to September 2022.

Results

Income structure of rural households in Moldova. The model-based cluster analysis and the representativity of the sample allowed to draw general estimates of the overall characteristics of income structure of Moldovan rural households and insights about the distribution of wealth, described by the estimation of the Gini Index (Dodge, 2008), as reported in Table 2.

Off-farm activities and remittances are the most remunerative sources of income, while agricultural activities have a small impact on economic conditions of Moldovan rural smallholders. Also, the estimations of Gini index of inequality for the three income sources highlight a high degree of concentration of income generated by agricultural activities and remittance, while income from off-farm activities are more equally distributed.

Table 2 Income structure of Moldovan rural households.

Income source	Share of smallholders involved	Average yearly income	Gini index
Agricultural activities	31.6% (27.9% - 35.3%)	175€ (138€ - 212€)	0.72
Remittances	56.7% (52.7% - 60.6%)	1065€ (924€ - 1205€)	0.63
Off-farm work	47.4% (43.5% - 51.4%)	3153€ (2915€ - 3390€)	0.36

Note: confidence intervals at 95% in brackets; exchange rate considered: 20.45 MDL for 1 euro

Table 3 clusters of respondents.

Cluster	Income structure	Number of households	Share of sample	Average declared Yearly Income (OECD adjusted)
1	Income from agriculture, no remittances last year, no income from off-farm work	35	5.8%	220 €
2	Income from agriculture, No remittances last year, Income from off-farm work	28	4.6%	2404 €
3	Income from agriculture, received remittances last year, no income from off-farm work	70	11.5%	1214 €
4	Income from agriculture, received remittances last year, Income from off-farm work	62	10.2%	3182 €
5	No income from agriculture, No remittances last year, income from off-farm work	91	15%	2404 €
6	No income from agriculture, received remittances last year, no income from off-farm work	109	18%	1269 €
7	No income from agriculture, received remittances last year, income from off-farm work	108	17.8%	3312 €
8	No income from agriculture, no remittances last year, no income from off-farm work	105	17.3%	-

Definition of the clusters. The cluster analysis allowed to identify 8 homogeneous groups of consumers on the base of their declared prevalent income sources. Table 3 describes the clusters, their numerosity, and the declared income (excluding direct food consumption), adjusted according to the OECD equivalence scale (European Commission et al., 2005).

Data show that remittances are a more common and larger source of income than agriculture. The economic impact of remittances in terms of market income is also larger. 18% of households rely only on remittances, being the largest group of rural households in rural Moldova, followed by the ones that combine remittances and an off-farm income, and those who have no source of income. On the other side smallest groups are represented by households that declared only agricultural income and those combining agriculture and an off-farm jobs are less than 5%.

Considering the income combination of each group, off-farm income is on average larger than remittances, which are larger than agricultural revenues. Indeed, when comparing the OECD-equivalent individual income per household it emerges that that the richest households are those combining remittances and off-farm income (3312€/year), followed by the ones perceiving the three sources of income (3182€/year), while the groups declaring the lowest income are those relying only on remittances or only on agriculture as a source of income (respectively 1269€/year and 220€/year).

The groups relying only on agriculture as income source are at extreme risk of poverty, practice small-scale agriculture and are using agriculture to produce their own food, relying on social transfers and savings.

A possible insight on the relation between the income from agriculture and the income from remittances is provided by the

comparison between the income sources of Cluster 2 and Cluster 6, and by comparing income structures of Cluster 3 and Cluster 5: in both cases, the introduction of income from remittances generates a decrease of the income from agriculture. So, migration and agriculture seem to be alternative, and not synergic, livelihood strategies for most of the households belonging to the four considered groups, at least in the short term. This does not apply to the other four clusters, where agricultural income and off-farm income seem to be more interdependent.

Socio-demographic characteristics of the clusters. This section discusses the characteristics of the 8 groups of households in terms of socio-demographic aspects, reasons for migrating, structure of the farm, role of migration and use of remittances. Those characteristics were investigated through the average values of the answers provided by respondents from each group to specific items of the questionnaire. Statistical significance of differences among the groups was assessed through a Kruskal-Wallis test, to relax the assumption of normality of distribution of the answers. Table 4 summarizes the socio-demographic characteristics of the clusters.

Considering demographic characteristics of the groups, smaller households are associated with groups not declaring income from agricultural and off-farm activities (Clusters 6 and 8), while larger households are registered in groups of smallholders involved in those activities (Clusters 3 and 4).

The group of households engaged in off farm activities (Cluster 7) register the lowest average age of its members (35.3 years old) and the lowest number of adults in their retirement age. On the other side households declaring no income from agriculture, off-farm activities, and remittances (Cluster 8) are the oldest, with an

Table 4 Socio-demographic characteristics of the clusters (average values and % shares).

Cluster	1	2	3	4	5	6	7	8
Cluster size	35	70	62	28	108	109	91	105
Share of sample (%)	5.8	11.5	10.2	4.6	17.8	18.0	15.0	14.3
Household size***	2.9	2.8	3.5	3.6	3.4	2.6	3.2	2.2
Age***	49.4	44.1	36.2	38.6	38.7	43.6	35.3	52.3
N° of females (%)***	1.4	1.5	1.7	1.7	1.7	1.4	1.7	1.1
Share of females***	57.5	52.6	51.1	48.6	50.3	56	50.8	49.2
N° of short-term migrants***	0.5	0.7	0.8	0.5	0.8	0.7	0.6	0.4
N° of long-term migrants***	0.8	0.9	0.9	0.7	0.7	0.8	0.7	0.8
N° of children 0-12 y.o.**	0.2	0.3	0.5	0.3	0.3	0.3	0.4	0.1
N° of children 13-18 y.o.***	0.1	0.2	0.3	0.4	0.3	0.1	0.2	0.1
N° of adults 19-59 y.o.***	1.8	1.8	2.4	2.4	2.4	1.6	2.3	1.2
N° of adults 60 + y.o. (retirement age)***	0.8	0.6	0.2	0.4	0.4	0.5	0.2	0.8
<i>Individual factors influencing decision to migrate (1=totally disagree, 5=totally agree)</i>								
Factors for migration: to provide my family resources for education***	3.2	3.4	4.1	4.3	3.6	3.5	4.1	3.6
Factors for migration: to provide my family resources for healthcare***	3.1	3.4	4.0	4.3	3.5	3.6	4.0	3.6
<i>Daily income generating activities (hours spent daily)</i>								
Time spent on work not in agriculture***	1.9	4.8	1.4	2.6	4.4	1.9	4.0	1.9
Time spent in other people's farm***	0.4	0.5	0.9	1.3	0.5	0.4	0.2	0.4
Time spent on work own land***	3.2	2.9	3.0	2.5	1.6	2.1	2.2	2.5
Time spent on animal husbandry***	1.7	1.0	1.9	1.6	0.7	1.2	1.5	1.2
Time spent on cooking***	1.4	1.2	1.5	1.2	1.0	1.5	1.3	0.9
Time spent on caring for children and elderly**	0.6	0.6	0.7	1.2	0.9	0.9	0.7	0.5
Time spent on other household activities**	1.4	1.5	1.6	1.1	1.1	1.8	1.4	1.2
<i>Structure of the farm</i>								
<i>Size of the farm</i>								
Total land (ha)***	2.9	3.8	2.0	0.9	0.6	0.6	0.9	0.6
<i>Ownership of agricultural equipment</i>								
Tractor (% yes)	32.4	18.5	12.9	11.3	1.1	5.5	6.5	6.7
Mini-tractor (% yes)	20.6	3.7	14.3	19.4	11.0	11.1	15.0	8.6
Trailers (% yes)	8.8	3.7	10.0	6.5	0.0	0.0	1.9	0.0
Combine harvester (% yes)	14.7	3.7	0	1.6	0.0	0.0	1.0	0.0
Sprinklers (%yes)	8.8	18.5	10.0	14.5	3.3	5.5	11.2	2.9
Seeder (% yes)	17.7	11.1	7.1	8.1	2.2	3.7	1.9	4.8
Soil preparation machine (% yes)	23.5	25.9	18.6	14.5	3.3	9.2	8.4	6.7
<i>Animals</i>								
Number of animals: cows**	1.4	0.4	0.6	0.3	0.2	0	0.1	0.2
Number of animals: pigs**	0.9	0.3	1.1	1	0.4	0.2	0.5	0.4
Number of animals: birds and poultry***	22.1	15.5	15.7	25.5	16.1	14.1	20.0	15.8
Number of animals: bees (hives)**	3.3	0.4	1.6	0.3	0.4	0	0	0
<i>Migration profile</i>								
Members migrating seasonally**	0.5	0.5	0.7	0.8	0.6	0.7	0.8	0.4
Monthly net income of members migrating seasonally	810€	699€	1100€	960€	622€	787€	1091€	920€
Members migrating long term last 10 years*	0.8	0.7	0.9	0.9	0.7	0.8	0.7	0.8
Number of returnees*	0.5	0.8	0.5	0.8	0.4	0.5	0.6	0.4
Monthly income of long-term migrants **	1236€	954€	1893€	1169€	802€	1283€	1002€	477€
Estimated share of income from last year remittances (%)***	5	7.3	39	29.1	8.5	46.7	35.2	13

Significance of differences of means: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

average age of 52.3 years old, and those with the highest number of adults in retirement age.

Considering the average number of migrant members, short-term migrants are more present in clusters where remittances are reported as a source of income, while the number of long-term migrants is almost the same number for all clusters. This confirms the role of seasonal migration in the definition of the livelihood strategy of a relevant share of Moldovan rural households, while the long-term migration remains a consolidated phenomenon among Moldovan rural smallholders.

Concerning the elements influencing potential decision to migrate of members of Moldovan rural households, contextual factors, considered as the lack of public services and support to agricultural activities do not have peculiar roles in decision to migrate among Moldovan rural smallholders. Also, the average degree of importance attributed to those factors by

respondents is neutral (the average score attributed to those items is around 3). When considering individual factors influencing the decision to migrate, the differences between clusters become statistically significant, and members of all groups present a consensus on their influence on potential migratory decisions. The degree of this consensus is generally higher than the one expressed for contextual factors, evidencing a stronger role for the former in the decision to potentially include migration in livelihood strategy of rural households. In this context of consensus, members of two groups (Clusters 3 and 7) associate the highest values for the importance of migration to provide resources for higher quality education to their families. Also, three groups of smallholders (Clusters 2,3, and 5) consider the possibility to provide better healthcare to their family as the most important reason to migrate.

Moving to the distribution of time dedicated to income generating activities different groups of smallholders present statistically significant differences. As expected, households engaged in off-farm activities (Clusters 3, 4, 5, and 7) dedicate the largest number of working hours to those typology of work (with Cluster 1 registering the highest average value, more than three hours per day), that are considered as more profitable than agricultural work.

Households which income is generated partly or in total by agriculture (Clusters 1, 2, 3, and 4) dedicate 2.5 to 3.2 hours per day to agricultural work. In the context of agricultural work, time dedicated to animal husbandry is particularly relevant for the households declaring one or two income sources (Clusters 1, 2, and 3), that dedicate to this activity more of half of the time spent working their land.

Considering the structure of the farms and the availability of agricultural equipment and animals, the average dimension of the plot show that households generating part of their income through agriculture and off-farm activities (Clusters 1, 2, and 4) cultivate larger land surfaces. Plots cultivated by other smallholders are smaller, with an average surface of about 1 hectare, comparable to the average size of land plots redistributed after the de-collectivization conducted through the agrarian reform.

Results from the survey show that a large majority of Moldovan rural household do not own agricultural machinery. Considering that, the most common machinery owned by smallholders are tractors, mini-tractors and soil preparation machines. The property of agricultural machinery, however, is quite different among Moldovan rural households. Groups of smallholders engaged in agriculture declared more often to own a tractor (Clusters 1 and 4), a mini-tractor, and a soil-preparation machine (Clusters 1, 2, and 3). It is interesting to notice that members of groups who did not earn income from agricultural activities (Clusters 5 and 6), declared quite frequently to own a mini-tractor and a soil preparation machine. Considering the small average dimension of their plot (0.9 and 0.6 hectares), it can be assumed that a share of members of those groups sell agricultural services as off-farm activity, while practicing a quite advanced self-consumption agriculture, as confirmed by the quite frequent ownership of sprinklers and soil preparation machines.

An example of this typology of smallholders was described in an in-depth interview conducted with a Mayor of a rural town located near Chisinau, the capital of Moldova:

“The family [returning] from Italy invested in a tractor, that provides services. They process their land and in case there are requests from other farmers they will provide services. Moreover, I don’t know if we can consider these as investments, but they spent money for house maintenance in order to reach basic conditions of living.”

Animal husbandry represents a relevant activity for smallholders engaged in agricultural work. In particular, households engaged only in agricultural activities (Cluster 1) show the higher degree of diversification of animal ownership, declaring the possess of, on average, almost one cow, 1.6 sheep and almost 25 birds and poultry heads.

Finally, the migration profile of Moldovan rural households shows several peculiarities. Households declaring to generate income from remittances present the highest average number of short-term migrants, equal to almost 1 (Clusters 3, 4, 6, and 7). On the other side, no statistically significant differences in terms of number of long-term migrants (migrating for 1 year or more) and of number of returnees were found among the eight groups of smallholders.

The role of remittances in the definition of income of the four groups relying on them is also relevant. Members of households

relying only on remittances (Cluster 6) declare that remittances generate about half of their total income. Then, members of households receiving remittances and conducting other activities (Clusters 3, 4, and 7), declare a share of income generated by money received from abroad ranging from 35 to 39 percent. Impact of remittances on income generation of members of other clusters is consistently lower, ranging from 5% of households engaged only in agricultural activities (Cluster 1) to 13% of households declaring no sources of income (Cluster 8).

Factors influencing livelihood diversification strategies. This section presents the results of the logistic regression, summarized in Table 5, performed to identify the impact of different demographic, social and economic characteristics of the rural households on the probability to adopt different livelihood and income-generating strategies.

Socio-demographic factors. Considering the impact of socio-demographic factors on the probability for a household to be part of one of the 8 groups, the likelihood of being part of the group where no source of income is declared (Cluster 8) is influenced, negatively, only by the Region of residence. So, members of this group are present in almost all socio-demographic contexts of Moldova, except for the wealthier Centre region, where is less probable to find members of this group.

Age has a strongly positive impact on the probability for a smallholder to belong to households relying on remittances and on income from off-farm activities (Cluster 7), while it has a negative impact on the probability to belong to the groups engaged only in off-farm activities or only receiving remittances (Clusters 5 and 6). This indicates a higher propensity of younger generation to be engaged in off farm activities, but also to rely only in remittances as for of income, the latter case especially if they live in the South Region. Also, smallholders included in the 46–65 years old age class are more likely to generate their income through remittance and off-farm activities (Cluster 7), when compared to younger generations. So, smallholders in this age class seems to be more propense to invest financial resources from migration to integrate the income from non-agricultural activities they conduct.

Concerning household size, its increase is correlated with an increase in probability to belong to households engaged only in agricultural activities (Cluster 1), and with a decrease of probability of being part of those that generate their income from agricultural activities or from a combination of resources from abroad and off-farm work (Clusters 3 and 6). This indicates a higher probability for larger households to be engaged in not profitable activities, potentially increasing their likelihood to be at risk of poverty.

High education levels are positively correlated with the probability of a smallholder to belong to clusters of farmers engaged in off-farm activities (Clusters 2, 4, 6, and 7). This result confirms the impact of high education levels on the possibility to conduct activities more profitable than work in agriculture and collection of remittances.

Migration-related factors. History of migration of the household is correlated only with the probability to not belong to households engaged in work in agriculture and receiving remittances (Cluster 3). So, households with a longer history of migration are less likely to be part the group of households declaring all the three income sources. Hence, duration of migration history appears to have a minor impact on the definition of livelihood strategies of Moldovan smallholders.

Table 5 factors influencing livelihood diversification strategy.

Cluster	1	2	3	4	5	6	7	8
<i>Socio-demographic factors</i>								
<i>Region</i>								
North			ref	ref		ref	ref	ref
Centre				-1.40***			0.78*	-0.63*
South			-0.84**	-1.29**		0.82**		
<i>Age class</i>								
<25					ref	ref	ref	
26-45								
46-65					-1.17**	-1.32***	1.48**	
66+								
Household size	0.38*		-3.11*			-0.58**		
<i>Education level</i>								
Primary education		ref		ref	ref		ref	
Secondary education		2.33**		1.86**	1.93***		2.39***	
Higher education		2.68**		1.91**	1.18***		2.81***	
<i>Migration-related factors</i>								
Year of first household member migration								
Before 2000			ref					
2001-2005			-1.00**					
2006-2011								
2012-2017								
2018-2021								
Has migrants to Russia			-1.04*				1.95**	
Has Short term migrants					0.68**		0.81*	-1.07**
Has Long term migrants		-1.39*						-1.24*
Has returnees								-0.62*
Self-financed migration	1.22**							-0.56*
Externally financed migration				1.29**				
<i>Economic factors</i>								
Number of household members employed in off farm activities							1.35***	
<i>Use of remittances</i>								
Household animals						-0.72*		
2 wheels tractor	2.42**	3.66**				-1.99*		
4 wheels tractor				1.42**				
Combine								
Irrigation pumps		6.54**			4.20**			
Build a new house		6.0***						
No remittances received last year			1.96***					
<i>Sources of income</i>								
Off-farm activities	-1.49**		-1.54**		1.08**		1.89***	-1.28**
Sale of crops								
Sale of animals								
Pensions					-0.98**		0.99**	-1.00**
Remittances		-8.3***			-2.48**	1.31***	1.77**	

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; ref: reference level

The presence of migrants moving to Russia increases the probability of a household to belong to households involved in off-farm activities and receiving remittances (Cluster 7), and slightly decreases the probability of belonging to those declaring income from agricultural activities and from remittances (Cluster 3). This is coherent with the insights from focus groups and direct interviews conducted with farmers, where the short-term migration to Russia was reported as a strategy to collect resources to be re-invested in economic activities not strictly related to agriculture in Moldova, with the additional aim to avoid permanent migration. This approach was frequent for respondents living in areas of the country where Russian-speaking population is more present, since the knowledge of Russian language decreases the non-monetary cost of migration. This makes the choice to migrate to Russia more convenient, even in presence of lower working and living conditions compared than those that could be experienced in EU countries. This difference is reported by several returnees interviewed. For example, a male

farmer from the town of Cahul, when asked about the differences in working conditions in Russia and in EU countries reported:

“[working in Russia and European countries is] not comparable. In Moscow, I lived in a trailer near the construction site, while in Europe... Well, you cannot compare. The workers in Europe are much more respected.”

While, when considering income from working in Russia, a young male farmer, who participated to a focus group in Soroca, reported:

“I have only been abroad a few months, once in Russia. I worked for two months without earning anything. With the money I left with, I returned.”

This trend, however, is declining in the last years, due to the increasing restrictions to the freedom of movement posed by Russia to Moldovan citizens and goods. As two farmers (a middle-aged man and a middle-aged woman) participating to a focus group in a town in the North region stated:

“[Male]: [People are still migrating] towards Europe as Russia has closed. Moreover, there is a big demand for documents [in Russia]. It is more problematic.”

“[Female] People started to migrate to Europe more recently, as there are more opportunities. Whereas past generations used to go to Russia.”

The presence of long-term migrant is, as expected, correlated to a significant probability of not being part of groups declaring income from in-farm and off-farm activities (Cluster 2) or declaring no income sources (Cluster 8). Also, the presence of short-term migrant is positively correlated with the probability of being part of households only receiving remittances or combining remittances and income from off-farm activities (Clusters 6 and 7), while it is negatively correlated with the probability of being part of households declaring no income sources (Cluster 8). This confirms the relevant role of financial remittances in contributing to the development of non-agricultural activities among the rural households. Also, the presence of short-term migrants seems to generate a substitution effect between agricultural income and other income sources, allowing smallholders to get engaged in activities more profitable than on-farm ones.

The presence of returnees is correlated only to the probability of a household not to be part of the no-income group (Cluster 8). This indicates the propensity of returning migrants to invest in income generating activities both in agriculture and off the farm. Examples of this typology of farmers, which are not always examples of successful return migration, were described by the Mayor of a town near Chisinau:

“We have some stories of local people coming back and investing in businesses. For instance, there are cases of parents who left with the whole family, but the children came back, and the family money were invested in a Pizzeria, an Italian pizzeria. There are also cases of agricultural businesses, they invested in machinery [...]. However, each case is unique, there is not a formula. There are also people who try and fail.”

This propensity to invest is also supported by the presence of public programs aiming to attract remittances to be invested in rural areas, as the PARE 1 + 1. An example of this is reported by a male farmer interviewed in a town near Chisinau:

“I was working at the beginning in Moldova for 5000 lei a month (approx. 250€) which was good money, but having two children, school, and other expenses, I could not manage with those money. That’s why I decided to move abroad. Having found out about these programs with ODIMM thanks to my daughter, I applied for subsidies. I started the project when I was abroad and then, when I was about to complete, I got back. I won the subsidies [of PARE 1 + 1] for the projects, and they gave me the funds very quickly, I was very surprised by this, we didn’t expect the process to be that quick. [Mine] was already a small business of growing rabbits, and with the support of the programs we increased it. We started from 200 rabbits and now we have 3000 rabbits. All the meat is sold to the rural pensions.”

Financing sources of migration are correlated to the probability of smallholders to be part of a cluster. Self-financed migration, intended as migration financed with savings and selling of properties is correlated to a positive probability to belong to households only engaged in agricultural activities (Cluster 1), while the presence of externally financed migration, intended as migration financed with loans and loans from family, is correlated to positive probability of being part of households combining all

the considered sources of income (Cluster 4). This meaning that members this group are more propense to take risks when deciding to migrate, since they rely on resources not provided by other household members, generating debts that could be which may be more difficult to extinguish.

Economic factors. The number of household members employed in off farm activities is directly associated with an increase of probability for the household to be engaged in off-farm activities and to receive remittances (Cluster 7). This indicates that off-farms activities, integrated by remittances, are a preferred compared to other income generating activities that are often perceived as less remunerative, riskier, and, in case of in-farm activities, more prone to external elements as intermediaries. As reported by several farmers who participated to focus groups,

“The markets for agricultural products are very little, and the prices do not correspond to the costs that were sustained”; “the prices are small for agricultural products, for grapes for instance.”

and

“There shouldn’t be intermediaries, this is the biggest pain. Our biggest pain is that... It has remained like this, the monopoly on the market: we cultivate crops and give them for free. Do you understand? There are 10/15 people in the country that make profit out of our work, they are engaged in tricks.”

Also, data shows that the presence of income from off-farm activities generates a substitution effects, being negatively correlated with the probability of being part of groups that rely on agricultural income (Clusters 1 and 2) or declare no source of income (Cluster 8).

Also, the presence of remittances is positively correlated with the probability of being part of clusters where the money received from abroad play a relevant role in the definition of the livelihood strategy (Clusters 6 and 7).

Finally, the presence of sales of crops and animals among the sources of income is not correlated to the probability of being part of any group. This is coherent with the diffusion of this source of income among a large part of Moldovan rural household, regardless of their specific livelihood strategy.

Concerning the investments of remittances in agricultural assets, the acquisition of a 2-wheels tractor is positively correlated with the probability of being part of clusters employed in agricultural and off-farms activities, including the provision of agricultural services (Clusters 1 and 2). An example of the latter case was described by a representative of a town located near the capital Chisinau, Niscani:

“In the last two years we have had families who went abroad, and after their retirement came back to Moldova, from Italy or we also have a family from Paris, who obtained the right to some social allowance in France and decided to come back to the village. [A] family [returned] from Italy invested in a tractor and provide [agricultural] services. They process their land and in case there are requests from other farmers they will provide services.”

Discussion

Results from quantitative and qualitative data allowed to shed light on the impact of migration on the definition of livelihood strategies of rural households of the Republic of Moldova and on the characteristics of the migration-rural development nexus in the country.

First, the analysis of the structure of income sources of Moldovan rural households highlighted that income from migration has a greater influence on the total income of rural households, compared to income generated through agricultural activities. This makes migration attractive, both as a resource to be reinvested in agricultural activities and, to a greater extent, as the main source of income for a relevant share of rural households.

The analysis of quantitative data also led to the definition of differences in terms of income among households with different income generating strategies. Results show that households engaged only in agricultural activities declared the lowest, by far, yearly OECD adjusted income level (220€ on average for Cluster 1 members). On the opposite, households engaged in off-farm and migration related activities declare the highest levels of yearly OECD adjusted income level, (3182€ on average for Cluster 3 members). These findings confirm the positive impact of monetary remittances on the differentiation of entrepreneurial activities among Moldovan smallholders and highlights the importance of this strategy in contrasting poverty in rural areas, coherently in line with existing literature (Acheampong et al., 2021).

These results, combined with the insights from focus groups and interviews, allowed to understand how social, economic, and demographic characteristics of rural household influenced their livelihood strategies. Within the different combinations of income generating activities, outcomes of migration, monetary and non-monetary remittances play a fundamental role, when present. In this regard, data from household survey highlights the role of remittances in the definition of the income of receiving households. To this extent, members of the clusters declaring remittances as one or the only source of income stated that money from migrants account for more than one third of the total.

Monetary remittances, in addition of representing a safety net for a large share of rural households, seem to have a direct role on the economic development of a small, but significant group of rural households engaged in income-generating activities, either agricultural or conducted out of the farm. This phenomenon was confirmed by the insights from interviews conducted with stakeholders and farmers.

This is partially in contrast with the literature on the impact of remittances on economic growth of countries as Romania and Bulgaria (Giuliano and Ruiz-Arranz, 2009; Haller et al., 2018), but is in line with findings from countries of the Balkan area (Bucevska, 2022) and from other post-socialist European countries (Abduvaliev and Bustillo, 2020; Cebotari et al., 2018, 2016).

Also, interviews and focus groups discussion with stakeholders and farmers highlighted the prominent role of non-monetary remittances in the construction of social capital. In particular, those remittances affect the possibility to replicate and adapt development models encountered while abroad, with the aim to implement more profitable and higher added value practices. This aspect is coherent with the findings of literature on the importance of non-monetary remittances for the diffusion of innovative economic and productive models in recipient areas (Lacroix et al., 2016; Montefrio et al., 2014; Nikolova et al., 2017; White and Grabowska, 2019).

Data collected through focus groups highlighted several factors pushing smallholders to pursue a migration path. The most relevant factor indicated by respondents is the lack of economic perspective and the general decrease of purchasing power, ascribed to several elements. The most relevant was reported to be the increasing costs of agricultural activities (e.g., increasing prices for fuel, fertilizers, machinery, daily workers' wages, etc.) and a constant decrease of profit from the selling of products over the last 10 years, together with a growing instability of market prices. As reported by a female farmer participating in a focus group in the North of the Country,

“The biggest problem is represented by the fertilizers and agrochemicals, as the chemicals that we use for our orchards are very expensive and the quality is not the best one. [...] Even gasoline has increased in price.”

Another element of instability for the rural areas of Moldova is their increasing vulnerability to climate change due to the lack of effective insurance schemes and governmental support in case of crop loss for adverse climatic events. This, combined with a poor financial market and high interest rates for financial products, discourages investments that would make agriculture more profitable.

This instability is increased by the parcellation and dispersion of land plots generated by the agrarian reform, and by the lack of infrastructures for food processing, that would allow producers to diversify their selling strategies. In this unstable context remittances are perceived as a fundamental mitigating factor.

Concerning migration patterns, the decision on the destination country is influenced by the material (financial resources) and non-material capital (labour and linguistic skills) of migrants, with short-term migration being more frequent for households engaged in agricultural activities. Results of this research shows that the short-term migration to Russia is a strategy to collect resources to be re-invested in economic activities not strictly related to agriculture in Moldova, with the aim to avoid permanent migration. This is more frequent in regions with a strong presence of Russian-speaking population since the knowledge of Russian language decreases the non-monetary cost of migration. On the other side, EU and USA are more attractive for long-term or permanent migratory approaches.

In conclusion, Moldova is entangled in a vicious circle, a quite frequent scenario for developing countries with high out-migration flows. The low quality and quantity of economic opportunities pushes citizens who have resources to out-migrate, and this led to the decrease of economic opportunities that could have been generated by migrants if their monetary and non-monetary resources were invested in the country. This vicious circle is also fuelled by the lack of infrastructures, that slows the development of rural areas. This is an issue highlighted by several farmers and stakeholders interviewed during the fieldwork activities. For example, a male farmer interviewed in a focus group held in the South and one interviewed in a focus group in the Centre Region of the country stated:

“Yes, this is clearly relevant [infrastructure is a relevant push factor for migration]. For instance, if we compare the village with the town, people from the village want to go to Cahul. If more attention was paid to solve the problems comprehensively, in order to create the same conditions both in the village and the town, then people would stay. For instance, in the IT domain, people also work from home.”

These vicious cycles also hinder the potential to leverage the potential positive outcomes of migration, such as increased economic resources and enhanced social capital, as they prevent receiving communities from developing the tools and capabilities needed to absorb these benefits, an aspect identified in the literature as crucial for fostering a reduction of poverty and inequalities (Chauvet et al., 2016; Coe, 2017; Tuccio et al., 2019).

Results from this research highlight the fundamental role of public sector to break this vicious circle. In particular, public intervention should focus on rural and infrastructural development through tailored policies and programs, aimed to specific typologies of farmers and smallholders, to better meet with their needs and requests.

To this extent, stakeholders and farmers reported several successful public policies aimed at fostering the development of rural

areas of the Republic of Moldova. Fieldwork activities allowed to identify different public programs perceived as effective by the interviewed stakeholders. These include the PARE 1 + 1 program, promoted by Moldova's national agency AIPA, aiming to attract remittances for investment in rural areas by offering financial support and training to Moldovan citizens seeking to start businesses using the remittances they receive. Another initiative is the DAR 1 + 3 program, promoted by the Moldovan government, which provides financial and educational support for local development projects led by local hometown organizations and diaspora associations. Finally, the National Subsidies for Agricultural Producers, promoted by the Ministry of Agriculture and AIPA, encompass a variety of measures designed to enhance agricultural productivity and stabilize farmers' incomes.

Among these programs, PARE 1 + 1, is perceived to be the most effective and is being replicated by other post-socialist countries as Kyrgyzstan. For example, a representative of a Mayoralty near Chisinau reported that:

"The programs for investments as PARE 1 + 1 helps create job opportunities, while agricultural subsidies only help farmers with their livelihood, do not help broader local development. The subsidies prevent agricultural business from failing, current expenses that are losses are compensated (for unsold or unharvested products, etc.). Moreover, compensations take long time, and they are inefficient. If there were no compensations the agricultural businesses would fail."

Conclusions

This study investigates the role of migration-livelihood differentiation in rural areas, through the analysis of the Republic of Moldova, a post-socialist rural country that has become a peculiar case study for the study of the impacts of migration on the definition of livelihood strategies of rural households. This research is based on two sets of primary data collected in the Republic of Moldova, a set of quantitative data, collected through a survey conducted with a representative sample of 608 Moldovan rural households, and a qualitative dataset including findings from 33 direct interviews and 12 focus groups discussions conducted in the Republic of Moldova between September 2020 and September 2022.

Starting from those data, 8 different typologies of farmers with peculiar livelihood and income generation strategies and smallholders were identified through a model-based cluster analysis approach. After the definition of different typologies of farmers, a logistic regression model was adopted to identify the impact of demographic, social and economic characteristics of the rural households on the probability to adopt different livelihood and income-generating strategies. Finally, results from quantitative analysis were validated through insights from direct interviews and focus groups.

Results from fieldwork showed that the impact of migration outcomes in the livelihood choices of Moldovan smallholders is multifaceted, ranging from the pure subsistence to the role of incentive for investing in higher added value activities, both inside and outside the farm.

Within this range of livelihood strategies, the adoption of migration as a strategy to abandon the unfruitful agricultural sector is largely prevalent among Moldovan rural households. Other dynamics can be found, but in a large minority of households, where migration is adopted to drive resources into already existing agricultural and off-farm activities, which are not always profitable. Also, few success stories of producers able to take

advantage of migration and rural development policies to increase their business emerged from interviews and focus groups.

Fieldwork activities also highlighted that out-migration has become a fundamental part of the livelihood strategy of Moldovan rural households, adopted to cope with daily problems and challenges. To this extent, several elements were indicated by respondents as push factors for migration. Besides of lack of economic perspective and the general decrease of salaries and purchasing power, factors encouraging migration were indicated in the general lack of public services and of governmental support to farmers dealing with farm-related issues, such as indebtedness for losses, adverse climatic events, and climate change. Another pushing factor was indicated by farmers in the low profitability of the agricultural sector, caused by low prices of products and by general lack of labour force and market opportunities.

According to results of focus groups and stakeholder interviews, public policies aiming at attracting monetary and non-monetary resources from migration (as the PARE 1 + 1 promoted by Moldovan national agency AIPA, the DAR 1 + 3 program promoted by Moldovan government, and the National subsidies for agricultural producers, promoted by the Ministry of agriculture and AIPA), have been proven effective in fostering the socio-economic development of rural areas.

Results of this study show that, while being present together in a large number of households, agricultural activities and migration are far from being complementary and seem to be mutually excluding. At the current stage it is not possible to determine to which degree agriculture prevents migration or migration prevents working in agriculture, and if and how in the long run after many years of migration and capital accumulation there is a positive effect on agricultural development. However, it seems clear that in the short-term agriculture and migration compete economically. This competition should be the focus of future research, to identify policies and interventions that could promote the fair development of countries where the agricultural sector is crucial for the economy, while maximizing the positive outcome of migration dynamics.

Data Availability

The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

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Author contributions

M.M: Conceptualization; Methodology; Writing—original draft A.L.T.: Methodology; Formal analysis; Writing—original draft M. V.: Conceptualization; Supervision; Writing—original draft

Competing interests

The authors declare no competing interests.

Ethical approval

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Informed consent

Data included in this study were collected with the support of a Marketing Agency operating in Moldova and complying with European regulation on protection (GDPR). Written informed consent was obtained by the Marketing Agency at the moment of the interview for the household survey, while oral consent was obtained for the focus groups and the direct interviews. Respondent provided consent to participate to the study, to use of data and to publication. All participants have been fully informed that their anonymity is assured, why the research is being conducted, how their data will be utilised, and if there are any risks to them of participating.

Additional information

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