



Panorama of the village of Mitoc (Orhei)

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REMITTANCES AND AGRICULTURAL CHANGE ON-FARM INVESTMENTS OF MOLDOVAN MIGRANTS

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OUTLINE OF THE PRESENTATION

- I. Geographical and historical background
- II. Relevant issues and research question(s)
- III. Data → Author's survey and Household Budget Survey
- IV. Methodology → logistic regressions, propensity score matching, etc.
- V. Results (preliminary):
 - Production strategies
 - Investment decisions
- VI. Conclusions and recommendations (preliminary)
- VII. Q&A



HISTORICAL AND GEOGRAPHICAL BACKGROUND

- **Republic of Moldova** → landlocked, agricultural post-Soviet country (1991)
- **Land** as the main resource → 30,355 km² (Bessarabia), 64.2% of arable land and permanent crop (WB 2013), 65.8% rural population (NBS 2014), 29.0% of formal agricultural employment (WB 2013)
- Insider equity-driven **land privatization** through the distribution of shares (from 1998)
- Dualist agricultural sector:
 1. 900,000 *family farms* → subsistence-oriented, 1.08 hectares on average, 1.6 million family workers, 43% of the total farmland, lease their shares to...
 2. 3,446 *corporate farms* → export-oriented, 369 hectares on average, 57,000 permanent workers, 57% of the total farmland (NBS 2011)
- Traditional provider of agricultural and food products (wine, fresh fruits, meat) to the Russian market, signed an **Association Agreement** (and a free trade agreement, DCFTA) with the EU in June 2014 → re-orientation of the farming sector, new opportunities
- 3.6 million inhabitants, 4,983 PPP\$ GDP per capita, 26.2% **remittances** (WB 2014)

RELEVANT ISSUES AND RESEARCH QUESTION(S)

- Widespread land property and agricultural background of Moldovan families
- Market opportunities (EU-MD DCFTA and increased internal purchasing power)

vs.

- No credit available, or available at unfavourable conditions (Author's interview)
- Government's preference for large farms (Lerman & Sutton 2008, Author's interview)

Large inflow of remittances

How do remittances affect Moldovan smallholders? Can they become a real opportunity for developing a viable middle-size family farming sector?

1. Production strategies

Are recipients changing their input structure due to a different opportunity cost of labour?

2. On-farm investment decisions

Are recipients investing their remittances in agriculture?

DATA AND METHODOLOGY (I): USED DATA

1. Structured smallholders' survey and semi-structured interviews (Author, 2015)

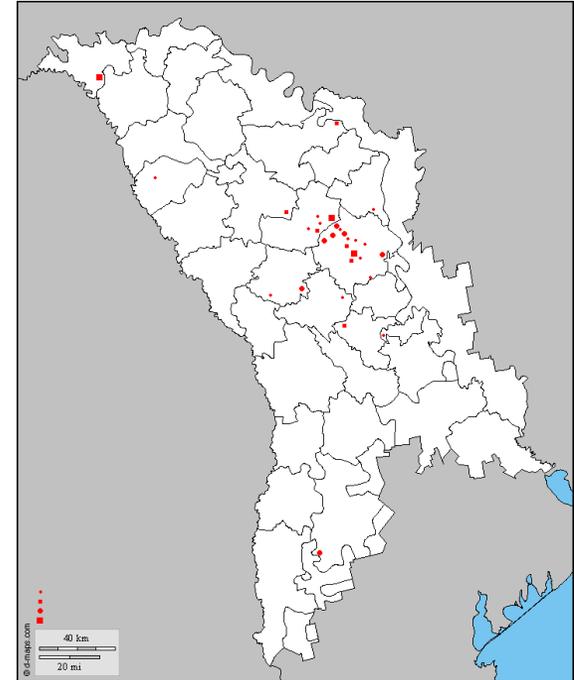
- 126 face-to-face interviews with smallholders
- Mixed (quantitative and qualitative) structured questionnaire
- Snowball sampling (adjusted for land size and family head's age)
- Six semi-structured interviews with important stakeholders of the farming sector

2. Moldovan Household Budget Survey (NBS, 2007-2013)

- Weighted sample of 5-6,000 households per year, stratified by location
- Farming households identified based on the presence of farm income
- Rotating panel (up to four observations per household, once a year, around 50% of all households)

Issue of sample comparability

- Orhei and Telenesti districts (survey) are representative of the whole country
- Similar definition of "farmer" → *an household that obtains a non-zero farm income using a non-zero amount of land*



DATA AND METHODOLOGY (II): METHODOLOGY

Framing the context

- Structure of farming households and of their decision scheme (Author's survey)
- Differences between recipients and non-recipients (*t-test*) and among recipients (*quantile regressions*).

Production strategies

- Production functions for recipients and non-recipients (*Olley-Pakes* and *OLS regression*) (a)
- Shadow wage and cost shares for recipients and non-recipients (*t-test on means*)
- Estimation of a number of production indexes for recipients and non-recipients (*t-test*)
- *Propensity score matching* for the value of these indexes (treatment = remittance inflow)

Investment decisions

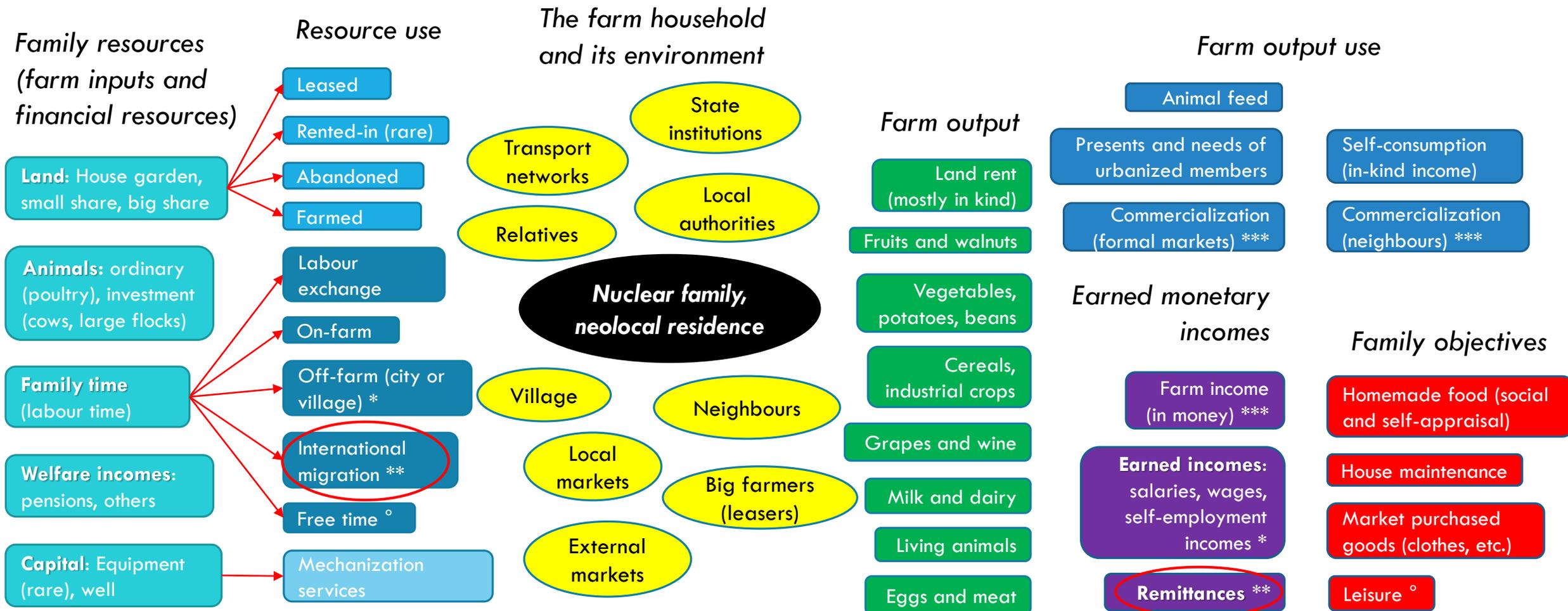
- *Logistic regressions* of investment dummies on different types of income (a)
- *Propensity score matching* to assess the prevalence of investments (treatment = remittances)
- *Descriptive survey statistics* (remittance use, investment choices) and *case studies*

Level of significance: . = 0.10;
* = 0.05; ** = 0.01; *** = 0.001

(a) Covariates (not reported in the following tables):
family characteristics (size, age, gender) and location

Monetary values at
2007 constant prices

RESULTS (I): OVERVIEW OF THE FARMING HOUSEHOLD



RESULTS (II): DIFFERENCES BETWEEN RECIPIENTS AND NON-RECIPIENT, AND AMONG RECIPIENTS

Recipients vs. non-recipients

- Recipient farming households are **larger** and **younger**
- More often led by a **woman** (→ absent husbands?)
- More often from **rural** areas and from the **South**, more rarely from the North or from Chisinau
- Have lower earned incomes (→ substitution?)
- Earn slightly lower farm incomes, but farm more land

Variables (mean)	Non-recipient	Recipient	t-test
Household size (no.)	2.58	2.89	***
Head age (years)	57.41	49.72	***
Male head (%)	64.62	55.31	***
Urban (%)	21.61	18.61	***
North (%)	37.05	30.67	***
South (%)	20.94	29.52	***
Chisinau (%)	6.17	3.20	***
High education	17.60	17.33	
Earned income (MDL)	1093.89	668.98	***
Farm income (MDL)	515.25	484.01	**
Land farmed (m ²)	5773.00	6381.00	***

Quantile regressions	Median	75 th	90 th
Household size (no.)	209.06 ***	394.78 ***	565.64 ***
Head age (years)	-20.22 ***	-33.00 ***	-57.32 ***
Urban (dummy)	46.98	-40.25	-410.96 *
North (dummy)	257.95 ***	257.10 **	56.67
South (dummy)	-120.41 **	-351.77 ***	-831.51 ***
High education (dummy)	229.26 ***	446.06 ***	521.55 *
Earned income (MDL)	-0.10 ***	-0.11 ***	-0.17 *
Farm income (MDL)	-0.05 .	-0.07	-0.26 *
Constant	1750.10 ***	2963.56 ***	5813.36 ***
Pseudo R-sq.	0.057	0.067	0.067

The **amount** of remittances received is **larger** for:

- **Larger** and **younger** households
- Households whose head has a higher level of **education**
- Households with **smaller** levels of waged and farm **income**
- Households from the **North** (but smaller in the South!)

RESULTS (III): PRODUCTION STRATEGIES

Production function

$$Q_r = A_r * L_f^{0.01} * G^{0.14} * V^{0.44} * C^{0.33} \text{ (adj. } R^2 = 0.677)$$

$$Q_{nr} = A_{nr} * L_f^{0.02} * G^{0.16} * V^{0.44} * C^{0.31} \text{ (adj. } R^2 = 0.703)$$

Labour supply function

$$L_r = L_{0r} * w_{agr}^{*-4.01} * Y^{*0.17} \text{ (adj. } R^2 = 0.302)$$

$$L_{nr} = L_{0nr} * w_{agr}^{*-2.55} * Y^{*0.20} \text{ (adj. } R^2 = 0.504)$$

r = remittance recipients; nr = non-recipients

Shadow labour costs (share of total farm costs) significantly lower among recipients

Household type	opreg	regress
Recipients (% lab.)	7.87	4.39
Non-recipients (% lab.)	8.33	7.75
t-test	***	***
Recipients (% lab.)	7.88	4.38
Control group (% lab.)	8.56	8.31
Difference (%)	-0.68	-3.93
Bootstrapped diff. (%)	-0.38	-3.69
P> z	0.000	0.000

Among remittance-recipient farming households:

- Inputs (MDL) / land (m²) → significantly higher (not after matching)
- Labour (h) / land (m²) → significantly higher (also after matching)
- Labour (h) / inputs (MDL) → significantly lower (only after matching)
- Monetary costs (MDL) / output (MDL) → significantly higher (also after matching) → lower profit margin

Type of household	Capital intensity	Labour intensity	Labour-to-capital	Cost share
Recipients	0.793	0.409	0.915	0.528
Non-recipients	0.688	0.385	0.918	0.432
t-test	**	*		*
Recipients	0.789	0.408	0.917	0.522
Control group	0.676	0.415	1.043	0.408
Difference	0.113	-0.007	-0.127	0.115
Bootstrapped	0.059	-0.031	-0.106	0.092
P> z	0.299	0.003	0.035	0.067

RESULTS (IV): ON-FARM INVESTMENT DECISIONS

N.B.: Only panel farm households

Three types of investments:

- **Milking cows:** this niche was already covered by families during the USSR, the survey showed that this investment is persistent (29.7% of interviewees) and profitable
- **Additional land** (either lease or purchase): the survey showed the profitability of planting walnut trees
- **Farm equipment:** the level of mechanization is low; tractors are unsuited for very small plots

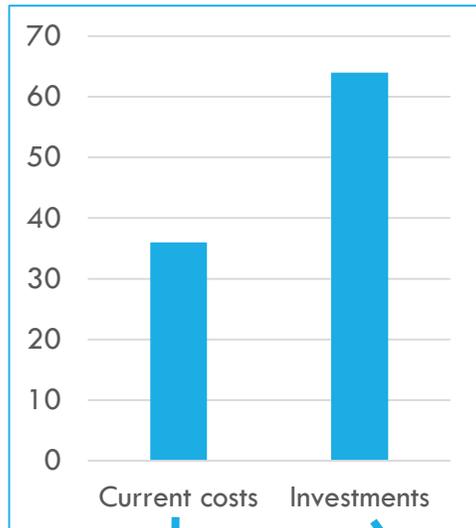
Type of income (logit regression)	Cows	Land	Machines
Remittances (dummy)	0.002	-0.104	-0.161
Welfare (dummy)	-0.046	0.030	-0.014
Earned income (dummy)	-0.100	0.095	-0.218
Remittances (t-1) (dummy)	-0.140	-0.069	-0.374
Welfare (t-1) (dummy)	-0.006	-0.074	-0.444 .
Earned income (t-1) (dummy)	0.138	-0.188 .	-0.410 .
Remittances (1,000 MDL)	0.021	0.251	0.016
Welfare (1,000 MDL)	-0.031	0.159 *	-0.296
Earned income (1,000 MDL)	-0.059	0.069 .	-0.015
Remittances (t-1) (1,000 MDL)	-0.133 *	-0.516	-0.189 .
Welfare (t-1) (1,000 MDL)	-0.051	-0.199 **	-0.051
Earned income (t-1) (1,000 MDL)	-0.133 *	-0.074 *	-0.204 *

- Investments (both their presence – dummy – and their amount) **negatively correlated with non-farm incomes**
- It is less true when land purchase or lease is concerned

Prevalence of investments (%) not significantly higher among recipients, even after matching

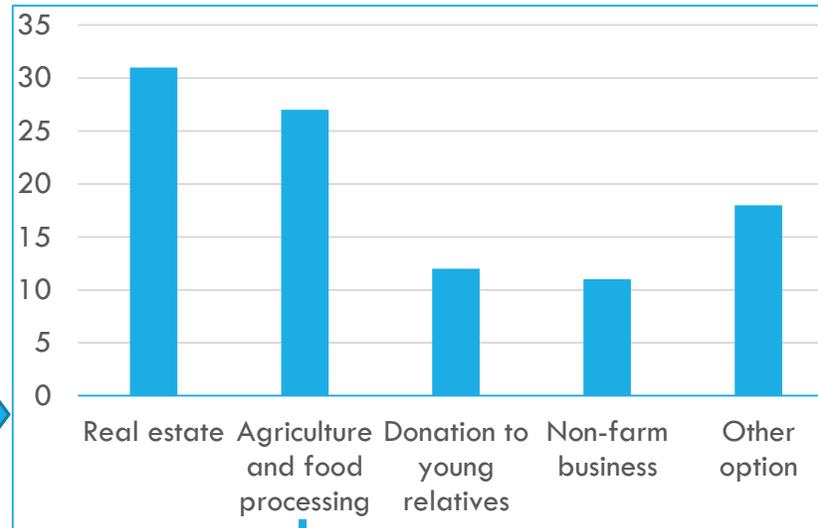
Household type	Cows	Land	Machines
Recipients	3.62	8.55	1.47
Control group	4.40	10.50	2.08
Difference	-0.77	-1.95	-0.61
Bootstrapped diff.	-0.02	-0.95	-0.15
P> z	0.974	0.250	0.665

RESULTS (V): PERSPECTIVES AND CASE STUDIES



If provided with a non-repayable agricultural loan of EUR 1,000 ?

If provided with a generic non-repayable loan of EUR 50,000 ?



- 30% of the interviewees had received remittances in the last 12 months
- 64% of the recipients had used them in agriculture
- 12% of the interviewees had received a loan for agriculture (half bank, half private)

Better seeds, mechanization services

Small orchards, followed by greenhouse and small equipment (rototillers)

Tractors (also to provide services), large orchards (mostly walnuts) or vineyards, storehouses or refrigerators

Remittances from *Spain*: six greenhouses (0.42 ha) for producing vegetables

Remittances from *Ireland*: ten big shares (9 ha) for planting walnut trees

Remittances from *Italy*: rototiller for cultivating berries in the house garden

Remittances from *Russia*: tractor for providing services and pig farm

Remittances from *Italy*: small ethnographic museum and lake for fishing

CONCLUSIONS AND RECOMMENDATIONS (I)

- Remittance-recipient households are younger and larger (labour-abundant)

Production strategies: There seems to be a substitution effect (labour with capital) rather than an increase in efficiency due to remittance inflow.

- Remittances allow recipients to increase the intensity of variable inputs, but their farm activities are also more labour-intense; overall, **the labour-to-capital ratio decreases**
- Remittances allow families to keep farming also when this activity is not economically profitable

Investment decisions: Only a minority of remittance-recipients invest in agriculture, but it seems that almost all small investors could do it thanks to remittances (necessary but not sufficient condition).

- Remittances are **not correlated, or negatively correlated with on-farm investments** → investments are probably too rare to be detected by the Household Budget Survey

CONCLUSIONS AND RECOMMENDATIONS (II)

➤ *Key issue*

- A *sizeable minority* of families are interested in keeping farming for cultural and life-satisfaction reasons, and could potentially invest in agriculture, but
- They must **compete** for land and output markets with large corporate farms

➤ *Some proposals for favouring the investment of remittances*

- De-bureaucratization → reduction of obstacles and corruption opportunities (costs)
- Securing land property at local level → real control over the big shares would allow a more solid starting point
- Promote producers' cooperatives → application for international grants (co-funding)
- Continue the reforms of the judiciary → increased confidence of potential investors, real protection against local landlord-mayors

THANK YOU FOR YOUR ATTENTION!

Questions & Answers

- Including gender issues by splitting female and male agricultural labour?
- Enquiring the propensity of exiting farming for recipients and non-recipients?
- How to address the issue of price differences while aggregating products?
- Which implications of the different labour supply functions?
- Other...

For any additional comment, suggestion, or request of information, please write to: simone.piras3@unibo.it



Mosaic, bus stop, Pelivan (Orhei)



Traditional house, Trebujeni (Orhei)