Socio-economic assessment of existing forest and agroforestry production systems for walnut and apricot production in Kyrgyzstan – A field study using Monte-Carlo simulation analysis

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SUFACHAIN

Source: Sufachain.org

- Field trip to Kyrgyzstan in March 2023

- Five research and SME partners from Germany, and 13 Central Asian partners

- Research institutions, private sector and civil society organizations

- *SUFACHAIN: Promoting sustainable land management through product, process and SME development in NTFP and agroforestry value chains of Central Asia*

Outline

- **Field study overview**

- **Study locations**

- **Household survey preliminary findings**

  - **HH demographics**

  - **Land use**

  - **Tree, crop production and use**

  - **Livestock production**

  - **Agroforestry**

  - **Labor and contract services**

- **Future research interest**

Field study overview

- Study locations: Batken, Arslanbob Aiyl Aimak, Jalal-Abad (Kyrgyzstan)

- Study time period: July 2024 - August 2024

- 256 household surveys conducted via enumeration team (random sampling)

- Focus Group discussion (FGD) (2 for each region)

- Expert Interview (EI) (2 for each region)

Batken
Jalal-Abad
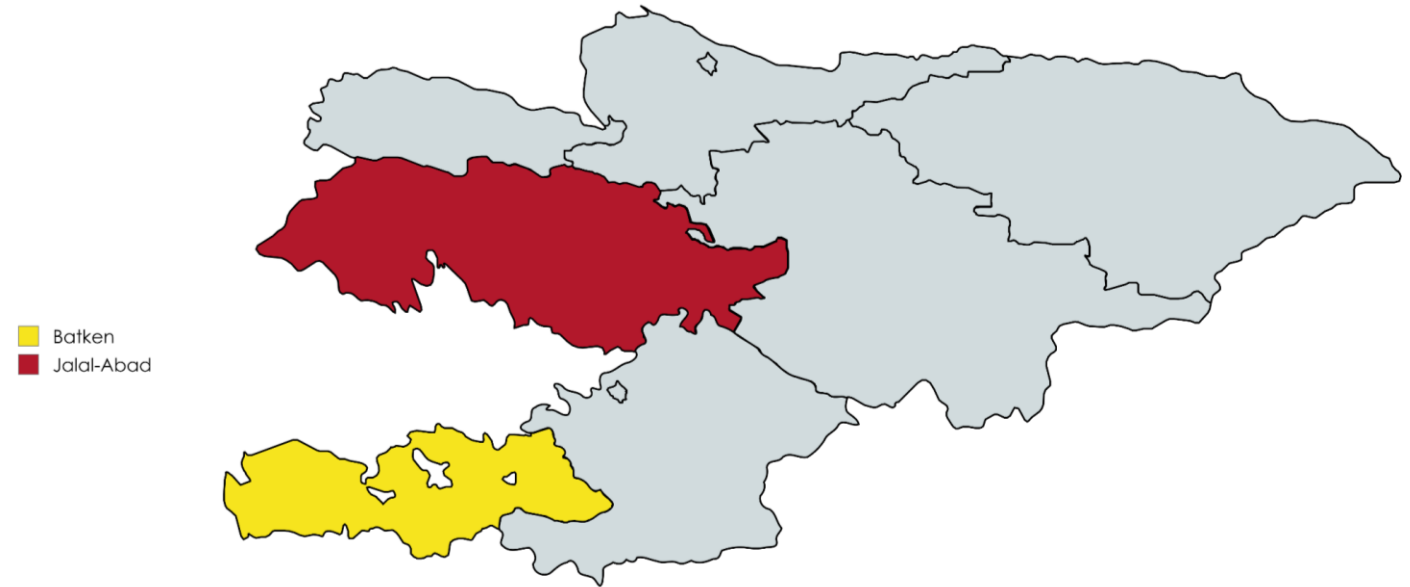
Source: Asia - Detailed | MapChart

Field study overview (contd.)

Household survey design

- **Socio-economic assessment →**
  - Farm/off-farm income & expenses
  - Financial situation (Assets, Liabilities, HH expenses)
- *Crop/Tree management →* (Philip Schierning, Soil Sciences, HSRW)
- *Irrigation management, Coping & adaptation strategies →* (Dr. Jannike van Bruggen, Water Resource Management, HSRW)
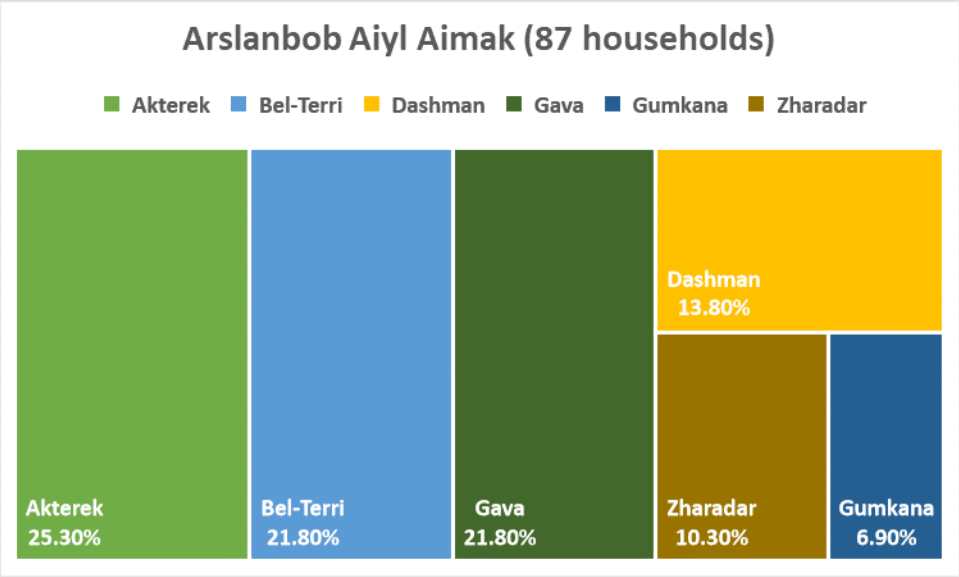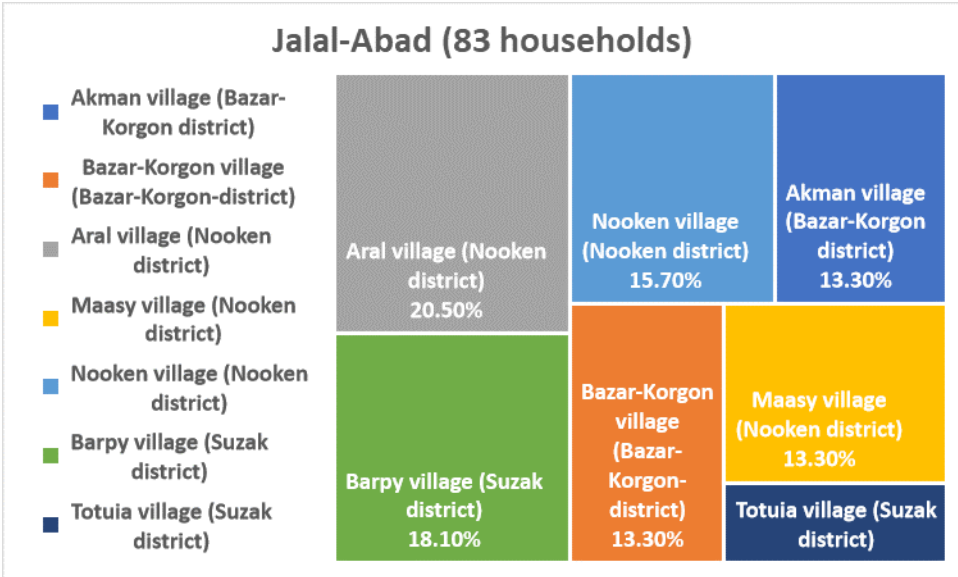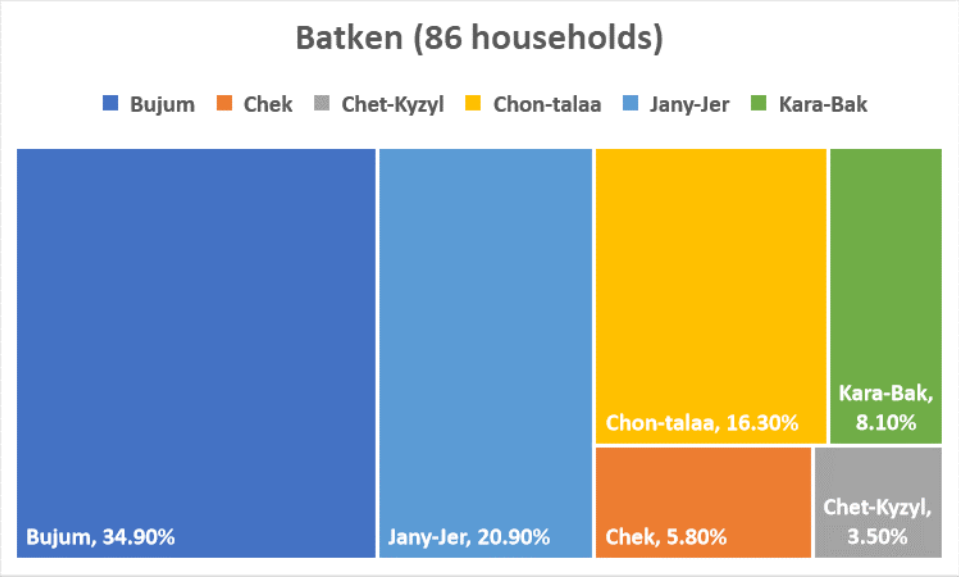
FGD & EI responses

- Expected price fluctuations
- Migrant laborers origin
- Farming objectives
- Biophysical traits of fruits, crops
- Shocks
- Farming activity challenges & measures taken
- Extreme weather conditions
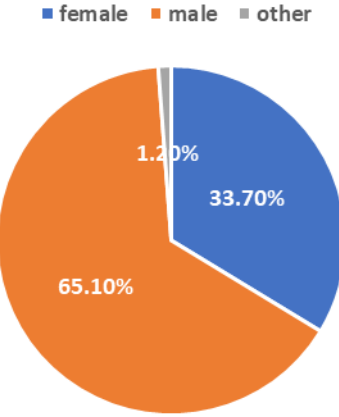- Improvements vital for agricultural development

Research aim

- ST: *Static* analysis → Capital Budgeting techniques, Ratio analysis

- LT: *Dynamic* analysis → Monte-Carlo Simulation

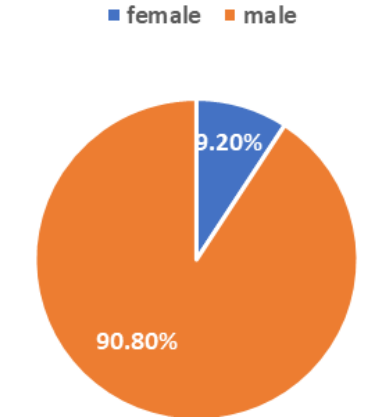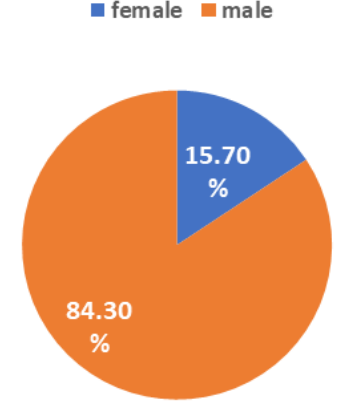*Let's see the preliminary findings! – subject to change*

Study locations

Batken (86 households)

Legend: Bujum, Chek, Chet-Kyzyl, Chon-talaa, Jany-Jer, Kara-Bak

Bujum, 34.90%; Jany-Jer, 20.90%; Chon-talaa, 16.30%; Kara-Bak, 8.10%; Chek, 5.80%; Chet-Kyzyl, 3.50%

Jalal-Abad (83 households)

Legend: Akman village (Bazar-Korgon district), Bazar-Korgon village (Bazar-Korgon-district), Aral village (Nooken district), Maasy village (Nooken district), Nooken village (Nooken district), Barpy village (Suzak district), Totuia village (Suzak district)

Aral village (Nooken district) 20.50%; Nooken village (Nooken district) 15.70%; Akman village (Bazar-Korgon district) 13.30%; Barpy village (Suzak district) 18.10%; Bazar-Korgon village (Bazar-Korgon-district) 13.30%; Maasy village (Nooken district) 13.30%; Totuia village (Suzak district)

Arslanbob Aiyl Aimak (87 households)

Legend: Akterek, Bel-Terri, Dashman, Gava, Gumkana, Zharadar

Akterek 25.30%; Bel-Terri 21.80%; Gava 21.80%; Dashman 13.80%; Zharadar 10.30%; Gumkana 6.90%

Respondent's gender (Batken)

female, male, other

1.20%; 33.70%; 65.10%

Respondent's gender (Arslanbob Aiyl Aimak)

female, male

9.20%; 90.80%

Respondent's gender (Jalal-Abad)

female, male

15.70%; 84.30%
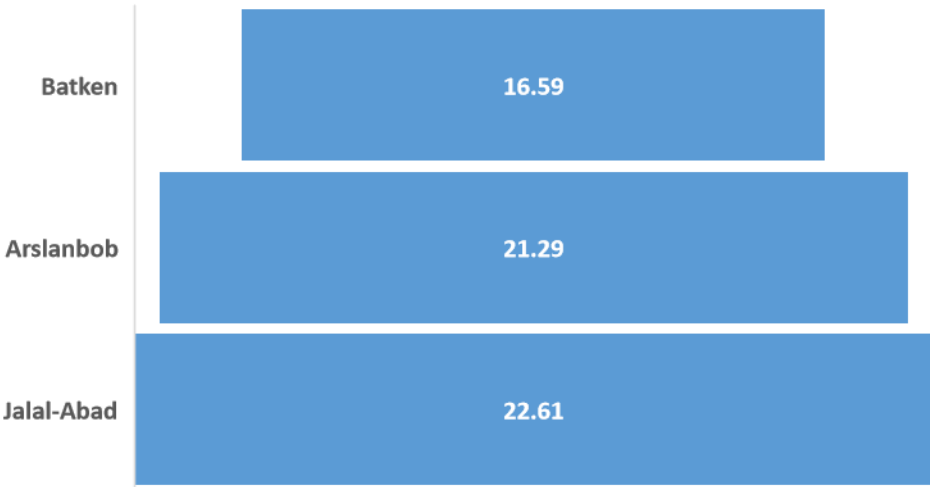
Household demographics

Respondent HH head
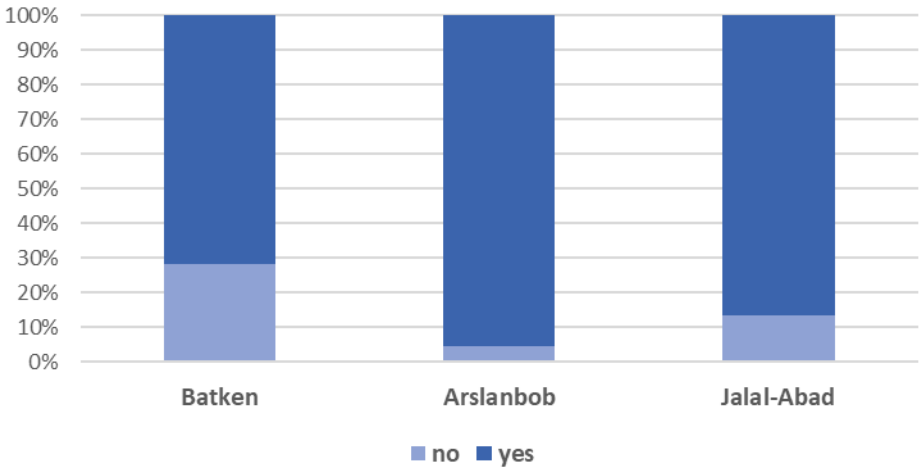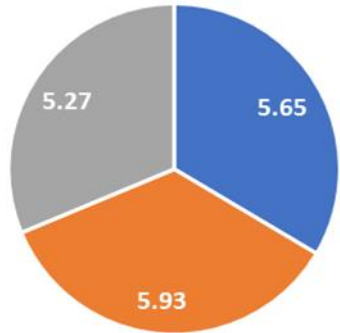
HH head average years of farming experience

- Batken: 16.59
- Arslanbob: 21.29
- Jalal-Abad: 22.61

HH head education

Legend: Higher studies, Incomplete secondary, Secondary, No_answer
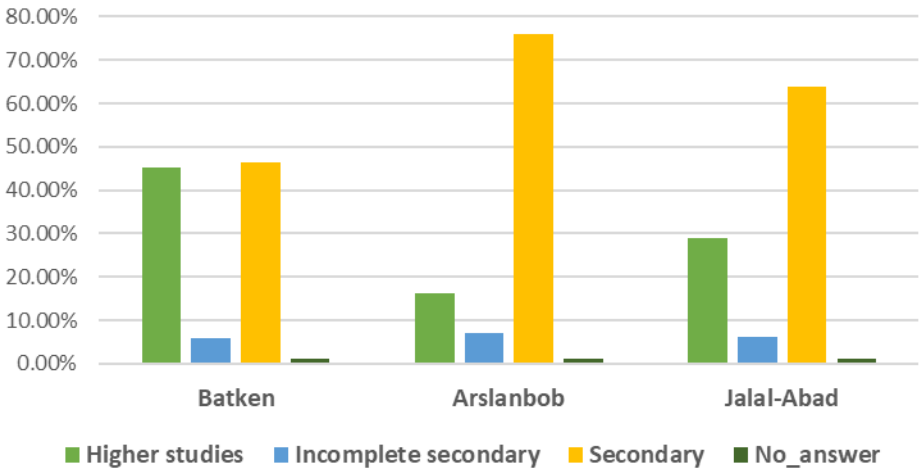
Purpose of farming practice

Legend: Batken, Arslanbob, Jalal-Abad
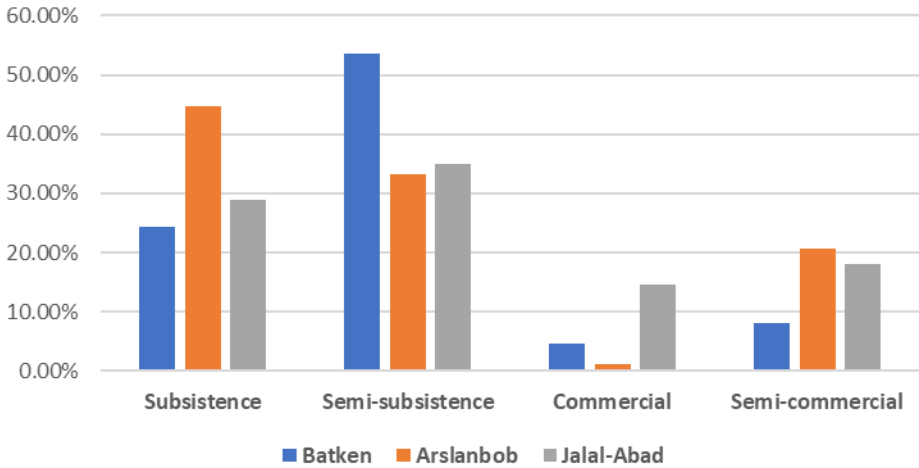
Household demographics (contd.)

HH size (total average)
- Batken: 5.65
- Arslanbob: 5.93
- Jalal-Abad: 5.27

HH expenditure (avg-weighted; KGS/month)

	Batken	Arslanbob	Jalal-Abad
min	12601.35	22525.86	19150.6
avg	16453.18	26819.54	25469.88
max	35188.24	33954.02	32933.73

HH farm contribution
- avg farm contribution (male)
- avg farm contribution (female)
- avg farm contribution (youth male)
- avg farm contribution (youth female)
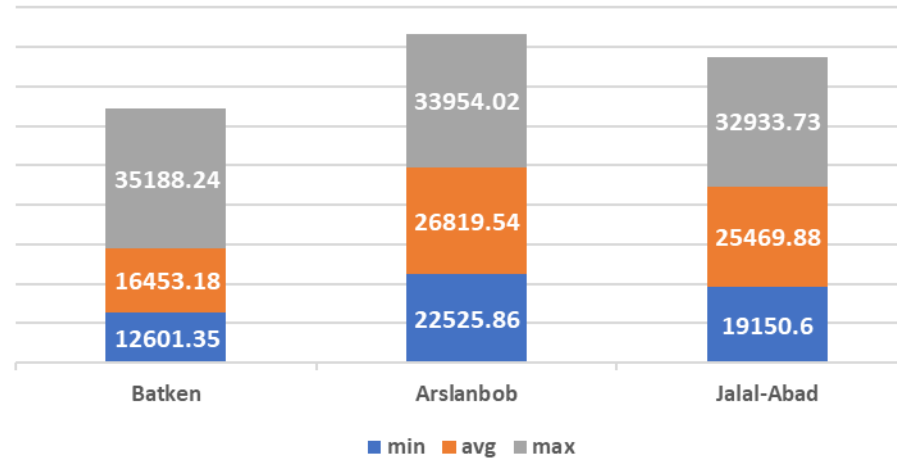
HH off-farm income
- NA
- No
- No answer
- Yes
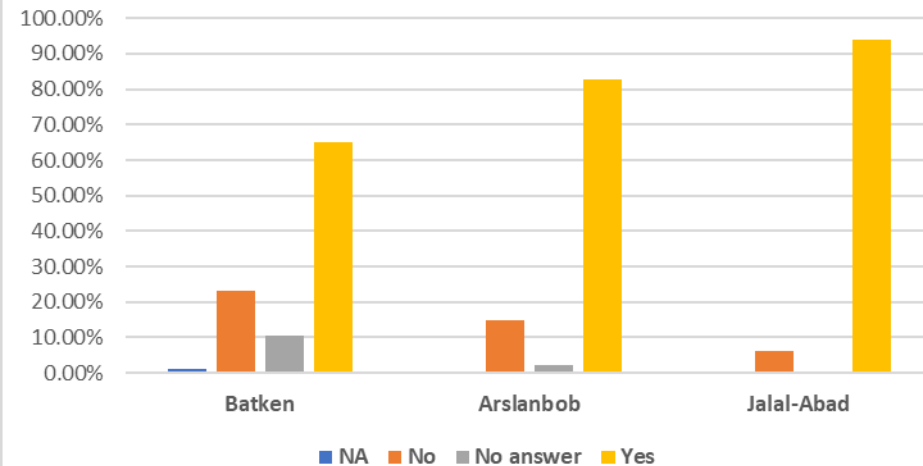
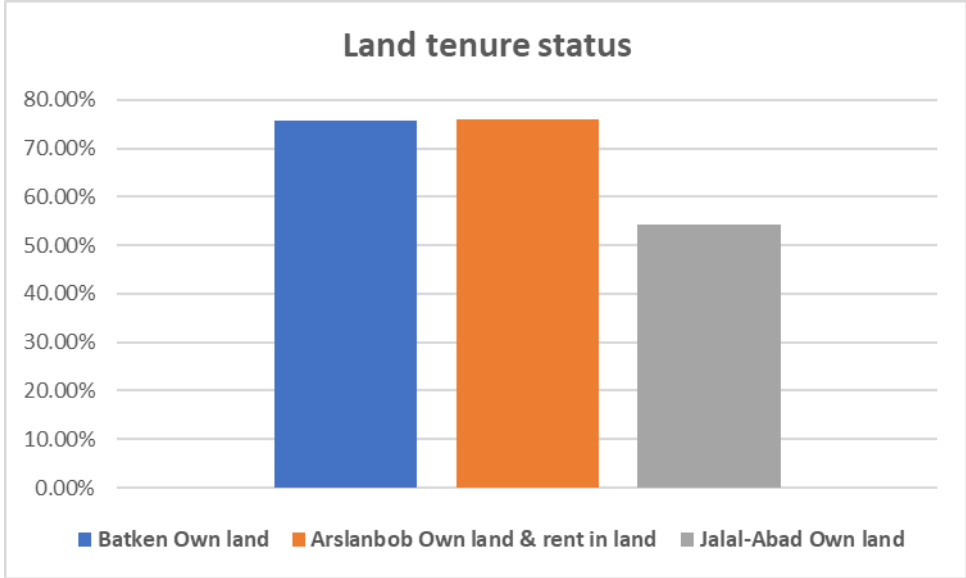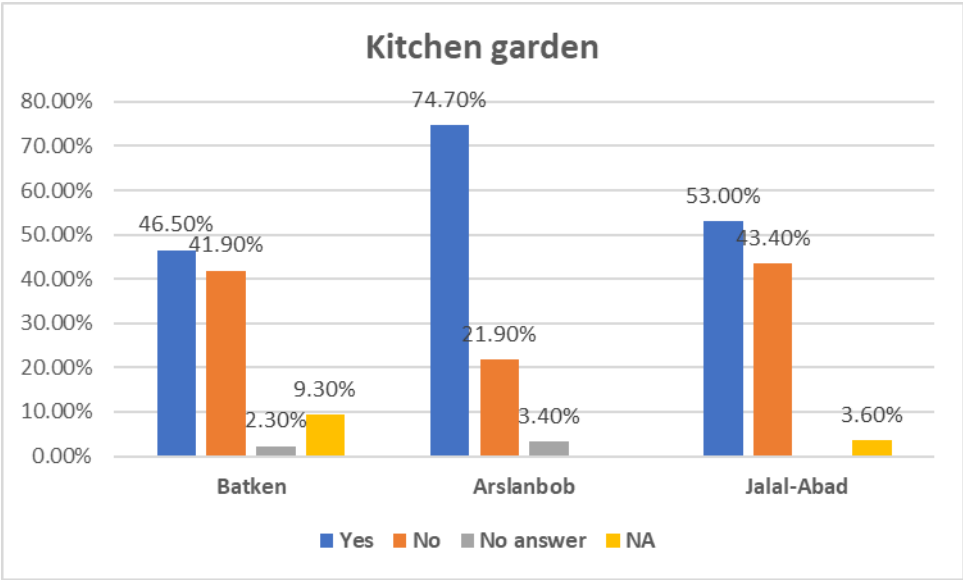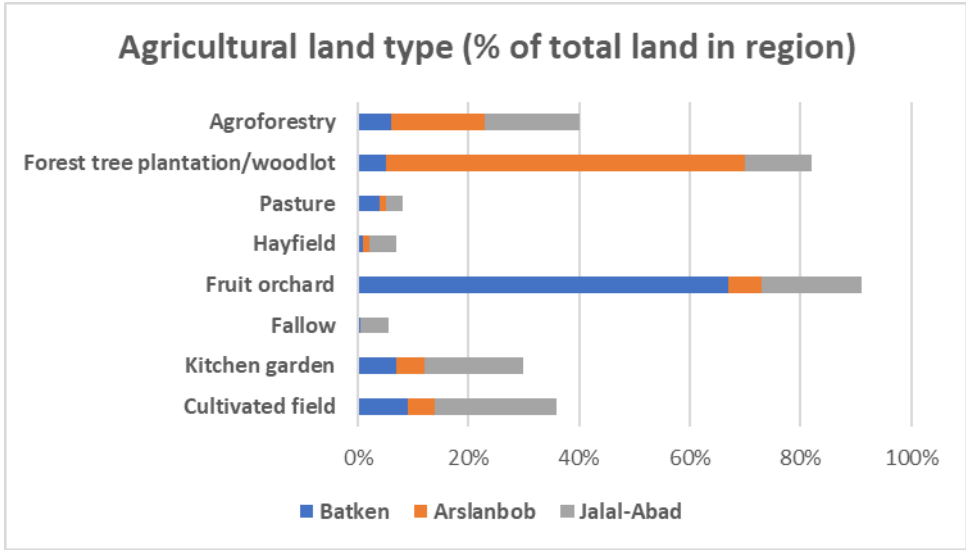## Off-farm income sources

- Contract services
- Pensioner
- Self-employed
- State-employed
- Seasonal employed
- Social welfare
- Local labor, off-farm
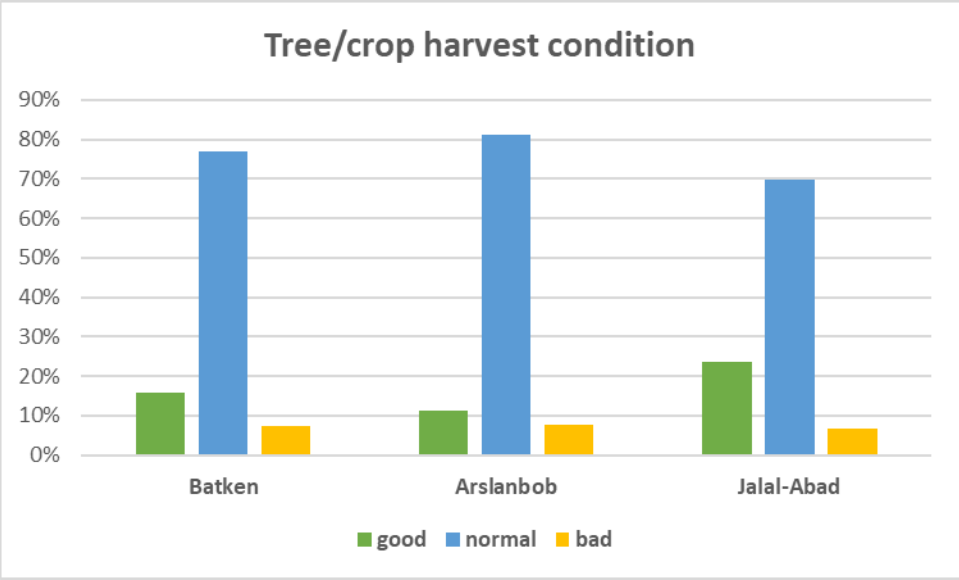- Tourist services
- Salary-based

Land use

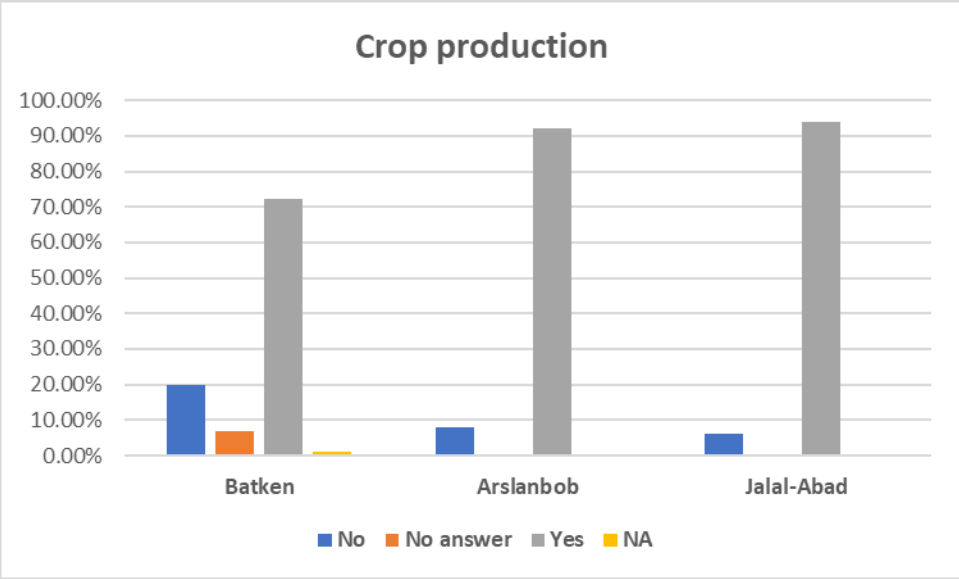Land tenure status

Agricultural land type (% of total land in region)

Farm size (in ha)

	Batken	Arslanbob	Jalal-Abad
Range	0 - 1	0 - 16	0 - 6
Avg	0.172655	1.365511	0.851586

Kitchen garden

Tree, crop production and use

Crop production

No · No answer · Yes · NA

Tree/crop harvest condition

good · normal · bad

Batken	Arslanbob	Jalal-Abad
Alfalfa	**Alfalfa**	**Alfalfa**
Barley		
Fieldgrass	**Fieldgrass**	
Maize	**Maize**	**Maize**
Carrot		
Eggplant		**Eggplant**
Garlic		**Garlic**
Paprika		**Paprika**
Potato	**Potato**	**Potato**
Various vegetables	**Various vegetables**	**Various vegetables**
Clover	**Clover**	
Flowers		**Flowers**
Tomato	**Tomato**	**Tomato**
Tobacco		
		Cotton
		Strawberry
		Rice
		Wheat
		Watermelon

Tree, crop production and use (contd.)

Tree production

0.00% 10.00% 20.00% 30.00% 40.00% 50.00% 60.00% 70.00% 80.00% 90.00%

■ Only felling ■ Yes ■ No ■ NA
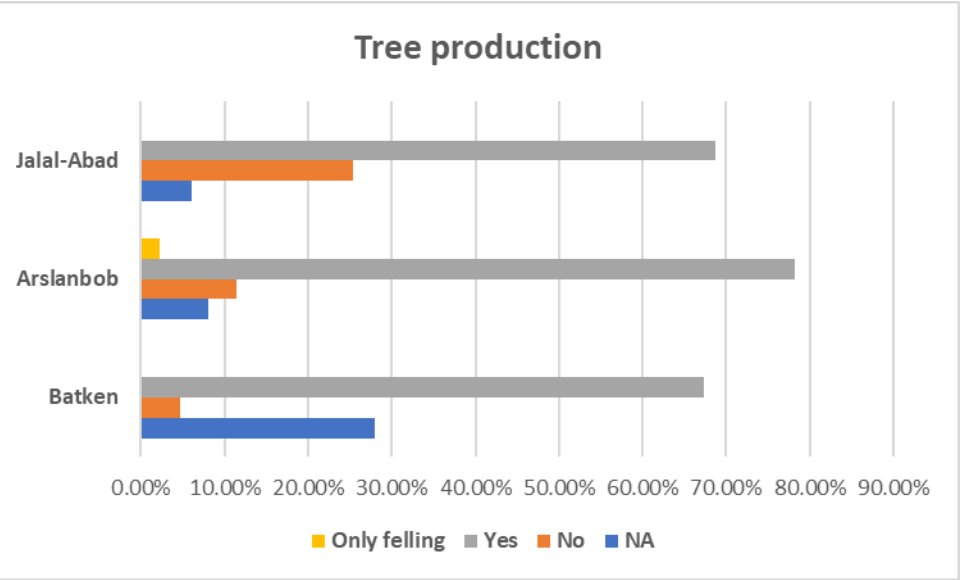
Purpose of tree/crop harvest

- Food
- Fodder
- Fuel
- Timber
- Land benefits

Batken	Arslanbob	Jalal-Abad
Apricot	Apricot	Apricot
Peach		Peach
Mulberry		Mulberry
Pear	Pear	Pear
Cherry		
Plum		Plum
	Almond	
	Walnut	Walnut
	Hawthorn	Hawthorn
	Poplar	Poplar
	Beech	
		Fig
		Lemon
		Elm
		Willow
		Pine

Livestock production

Livestock ownership

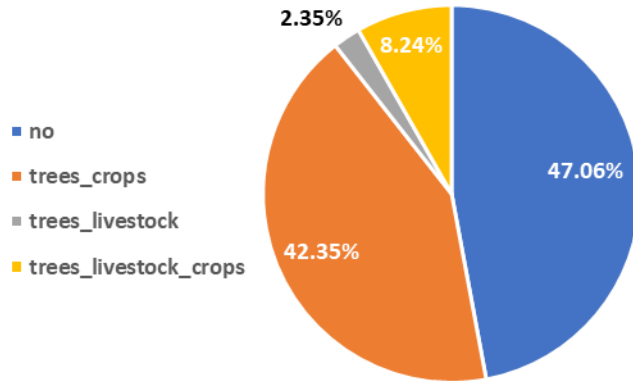| Region	Percentage
Batken	25.60%
Arslanbob	65.50%
Jalal-Abad	68.70%
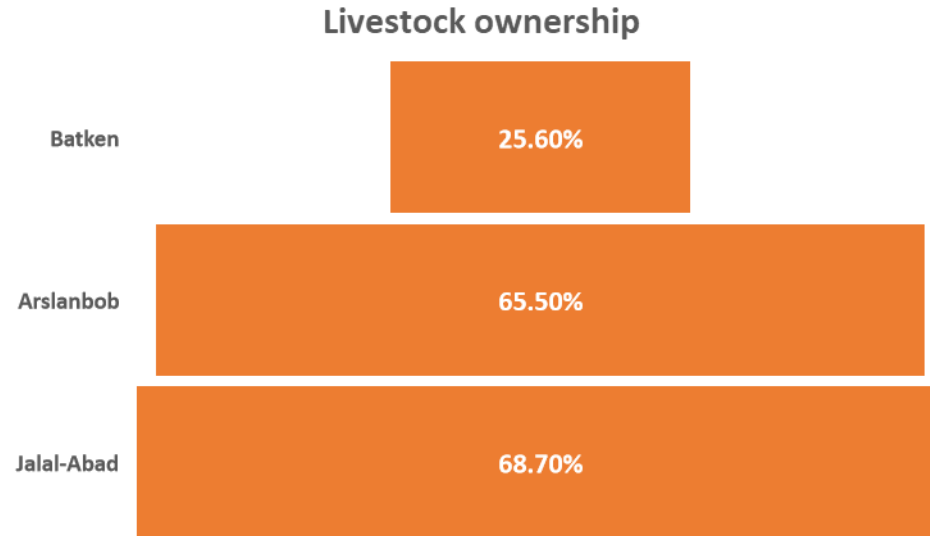
- Cattle
- Poultry
- Sheep

- Cattle
- Poultry
- Sheep
- Horse

- Cattle
- Poultry
- Sheep
- Horse
- Donkey

Agroforestry (AFS)

Agroforestry (Batken)

- no
- trees_crops
- trees_livestock
- trees_livestock_crops

2.35%
8.24%
47.06%
42.35%

Agroforestry (Arslanbob)

- no
- trees_crops
- trees_livestock
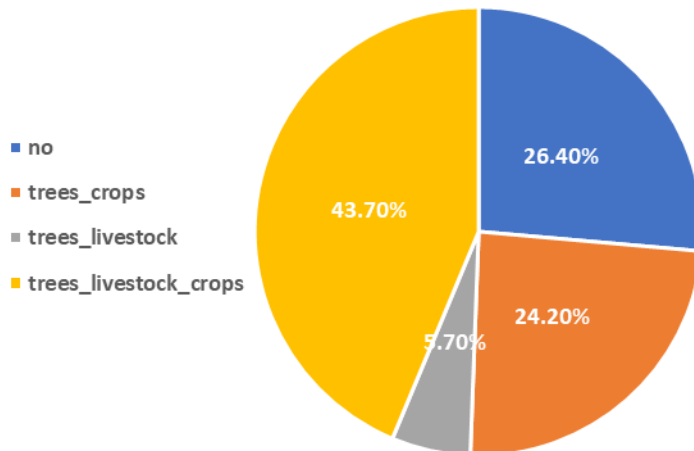- trees_livestock_crops

26.40%
24.20%
5.70%
43.70%

AFS practice

Batken

- Alley cropping (Trees/shrubs in rows with crops in between)
- Food forest (Diverse, edible plant layers mimicking a forest)
- Homegarden (Small, diverse garden near a home)
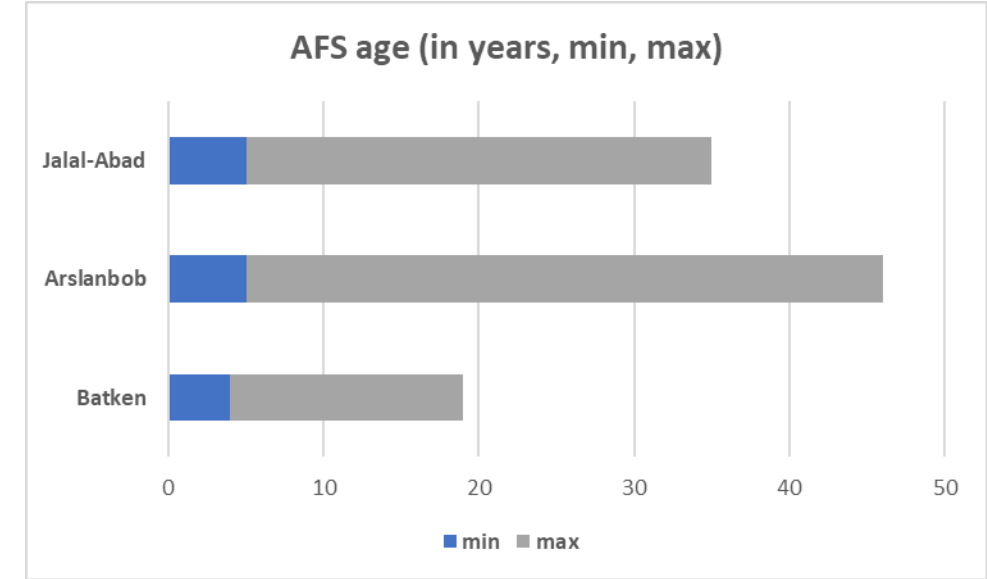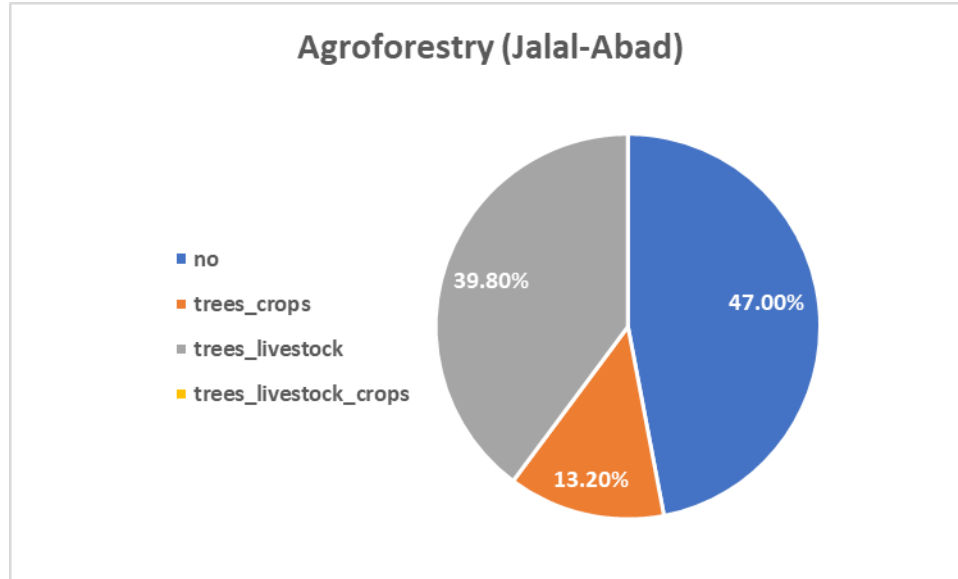- Windbreak (Trees/shrubs planted to protect)

Arslanbob

- Alley cropping (Trees/shrubs in rows with crops in between)
- Homegarden (Small, diverse garden near a home)
- Riparian buffer (Vegetation strips along waterways)
- Windbreak (Trees/shrubs planted to protect)
- Forest farming (Growing crops under a forest canopy)

Agroforestry (Jalal-Abad)

- no
- trees_crops
- trees_livestock
- trees_livestock_crops

47.00% / 39.80% / 13.20%

Jalal-Abad (AFS practice)

- Alley cropping (Trees/shrubs in rows with crops in between)
- Homegarden (Small, diverse garden near a home)
- Riparian buffer (Vegetation strips along waterways)
- Forest farming (Growing crops under a forest canopy)

AFS age (in years, min, max)

Certification

Batken 97.70%
Arslanbob 97.70%
Jalal-Abad 100.00%
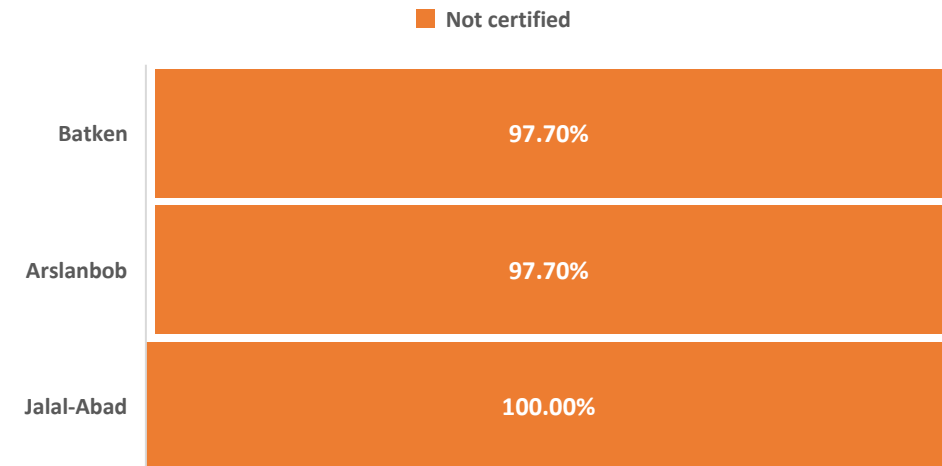
Agroforestry (AFS) (contd.)

**Reasons for adopting AFS by respondents**

- Environmental benefits
- Protection for livestock
- Improve soil fertility
- Improve water efficiency
- Higher yields

Reasons for not practicing AFS by respondents

- High input costs
- Less harvest
- High investment
- Water shortages
- Lack of machinery
- Inadequate weather conditions
- Pest and disease problems
- Limited knowledge

Labor and Contract services

External labor (seasonal/full-time)

Farm hired services
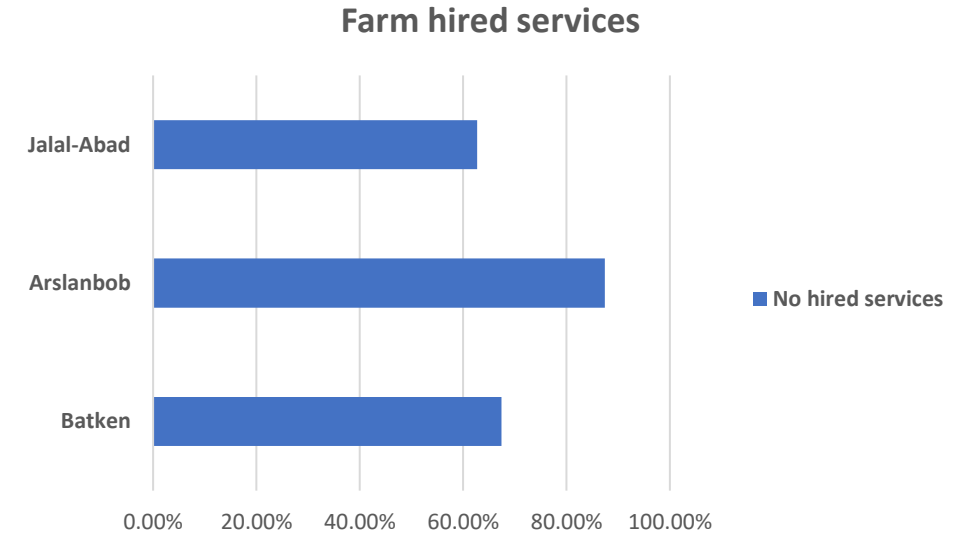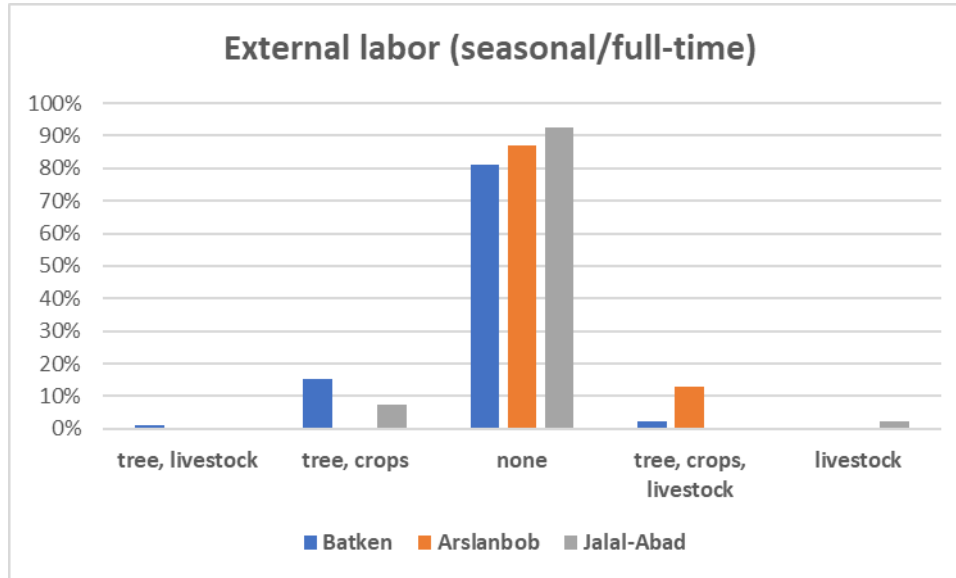
Hired services

- Harvesting services
- Land preparation
- Planting
- Growing
- Transportation

Future research interest…

- Request to connect, collaborate, knowledge-sharing with experts!

- Topic of interest: **Valuation of non-marketed/non-monetary ecosystem services from agroforestry production systems in Central Asia**

Thank you! ☺