The Contribution of the Underutilised Species

in the Walnut-Fruit Forests to the Local Livelihoods in Kyrgyzstan

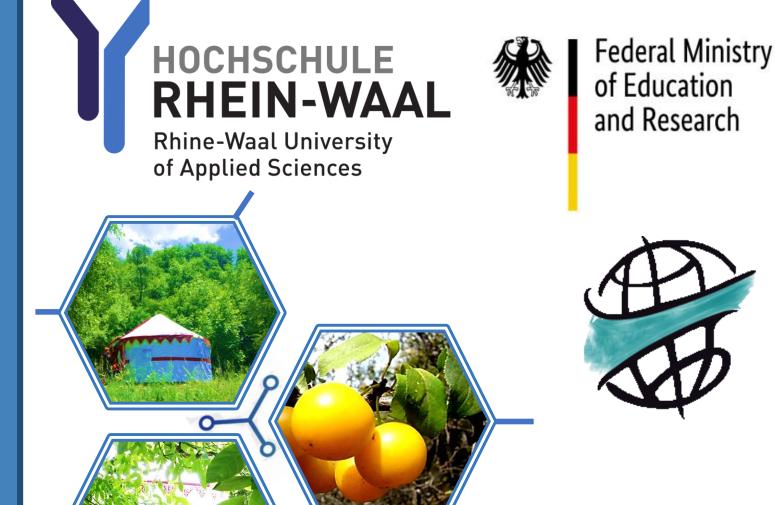
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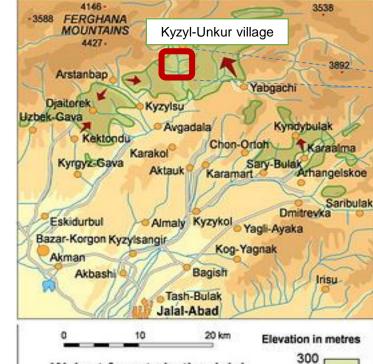
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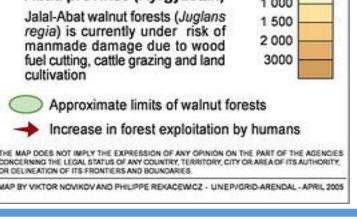


SUSWALFOOD

1. Background and introduction



Namut forests in the Jaiai-Abad province (Kyrgyzstan) 1 000 Jalal-Abat walnut forests (Juglans 2 000 manmade damage due to wood fuel cutting, cattle grazing and land 3000







Kyrgyzstan Surface area, sq. km Rural population Rural population below the poverty line GDP per capita, USD

199,951

The walnut-fruit forests in Kyrgyzstan constitute the world's largest remaining area of this forest type

hawthorn (*Crataegus spp.*), plumb (*Prunus spp.*), rose species (*Rosa spp.*) almond (*Prunus* amygdalus Stokes), and pistachio (Pistacia vera L.) Walnut trees owned by the state and can be leased by tenants³. Most of the forest under critical

> **SUSWALFOOD Research Project** (April 2017 – March 2019, BMBF) Nutritive potential (polyphenol, sugars, elementary components)

Soicio-economic potential to the local population

Ecological dimension: biodiversity conservation and sustainable use Sources: 1: Blaser et al. (1998) 2: Scheuber et al. (2000) 3: Schmidt (2013) 4: Orozumbekov et.al., 2009 5: Kolov, 199



Optimal conditions, better quality, c) Upper sub-zone (1750-2000 masl) Avg. Summer temp. lower than 20°C Avg.annual precip-n: over 1000 mm High frost risk, low productivity, mainly used as pastures, hay-making



Research questions:

- Which factors influence the collection, use and processing of these underutilised forest
- Which species particularly contribute to local livelihoods?
- How the benefits of utilising these species are distributed among the local population?
- Which pathways might ensure better and more equitable access to and use of these plant resources?

Walnuts are the major income source for local peasants. Other less utilised forest species in this area still have a significant potential for human nutrition and local livelihoods, the generation of local incomes, and sustainable commercialisation. However, very few studies to date investigated how such resources are currently used and how their benefits are allocated to the torest users.

Hypothesis:

The underutilized forest species are collected, utilized and processed by resource poor farmers

rather than resource rich farmers and used as a "safety net" for the household subsistence.

2. Methods and tools

- Among the local villages the Kyzyl-Unkur village was selected as a result of an expert group discussion
- A stratified random sampling was used to select 102 sample households in this village.

condition²

- The household suvey took place in October, 2017
- Semi-structured questionnaire was used to survey sample households
- The quantitative survey data was coded in SPSS and was analysed using descriptive and inferential methods
- Qalitative results were analysed and used to support the interpretation/validation of the quantitive results
- Financial valuation and the sensitivity analysis was done based on the average inputs based on survey data



3. Previous findings: the use of the underutilized species

Species	Production or th 1963-67 ¹	e use of wild fruits 2011-15	Fresh harv 1963-67 ¹	est, kg/ha 2011-15	Reported pri 1963-67 ¹	ce, USD/kg 2011-15
Walnut	Consumption	Consumption/ export ²	26	~100²	3.05	1.9 ²
Wild apple	Juices/ processing	Dried and exported, Few used for juices ³	170	2600 ³	2.63	0.373
Wild chery/ cherry plum	Juices/ processing	Household use/ forage ⁴	37	-	0.43	-
Pistachio/ Almonds	Consumption	-	8	-	0.62	-
Barberry	Juices/ processing	Household use ⁴	-	-	-	-
Wild pear	Consumption, juices, procesing	Household use / forage ⁴	-	-	-	-

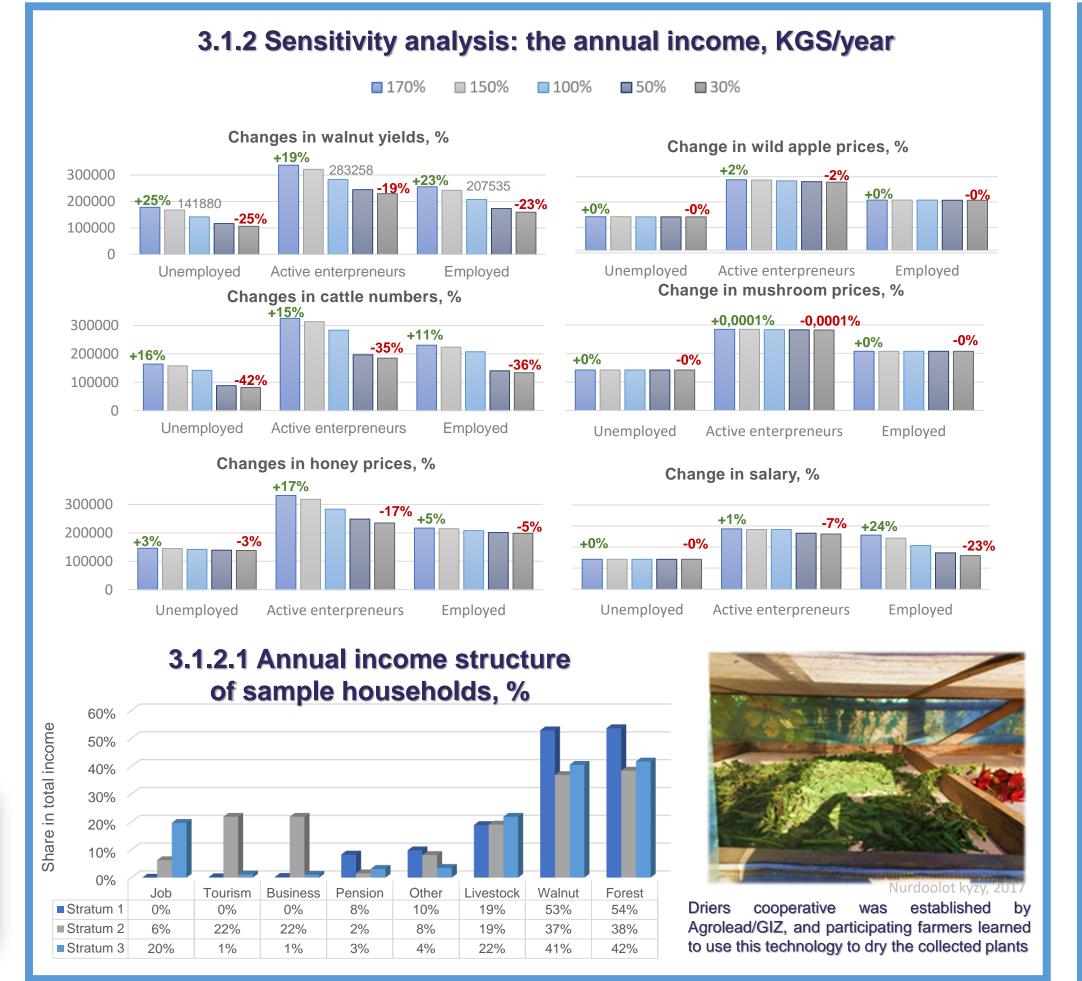
The table shows that in comparison to the earlier periods under the Soviet Union current forest harvests are less diverse. Processing of forest plants into food products in Soviet times ensured a sustained demand for varying forest products, and subsidized price floors supported collectors' incomes and thus less intense load on the forest resources. Since independence subsidies declined and subsistence farming took place instead, leading to a higher dependence on the forest products. The break up of the processing chains also led to the increased dependence on more commercially viable products, such as walnut.

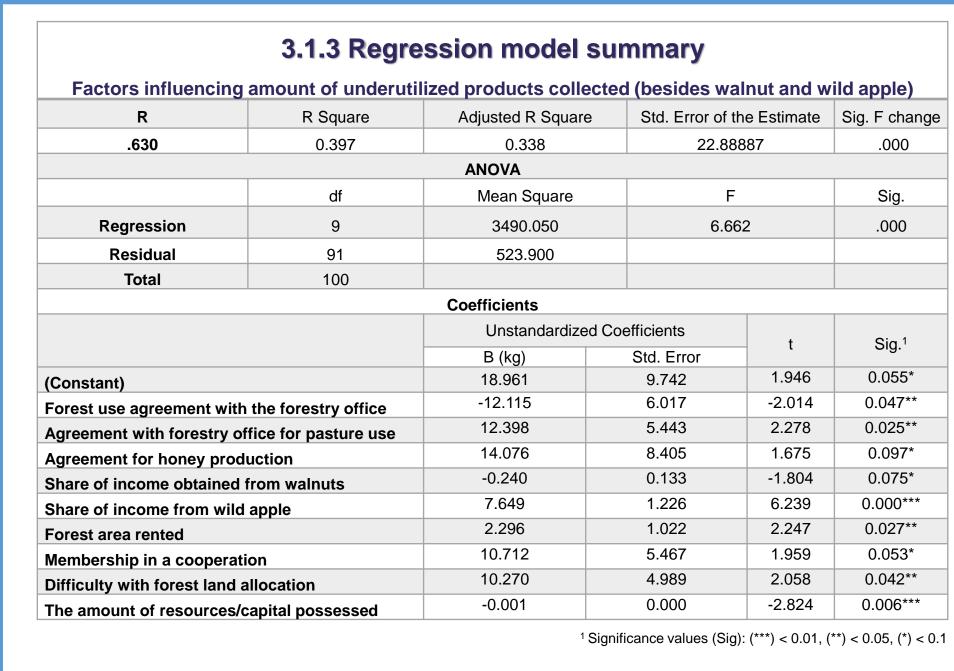
3.1 Analysis results

3.1.1 Two-Step Cluster Analysis (n=102) *

Cluster sizes	31%	16%	53%
Clusters / Stratums Inputs	1 Unemployed	2 Active entrepreneurs	3 Employed
At least one of the family members employed	100% Unemployed	50% Employed 50% Unemployed	100% Employed
Share of income from business	0.28%	21.88%	1.04%
Share of income from tourism	0.16%	21.88%	1.15%
Annual collection of wild apples	156.22 kg	2181.25 kg	181.48 kg
Annual collection of other underutilized products	0.56 kg	30.75 kg	1.93 kg
Livestock units (LU) owned	3.88 LU	9.05 LU	5.01 LU
Honey produced in the forests	44.34 kg	534.38 kg	104.07 kg
Wild walnuts / season	605.3 kg	896.9 kg	804.0 kg
Average forest area	3.6 ha	4.7 ha	3.5 ha







3.1.4 Species contributing to the local livelihoods

			Average / absolute	(*) yields, kg	
Species	Households, %	Total sample	Stratum 1	Stratum 2	Stratum 3
Walnuts	96%	756	605.3	896.9	804
Wild apple	19%	2615	156.2	2181.3	181.5
Barberry	1%	100*	-	100*	-
Cherry plum (consume)	2%	31	12	50	-
Dog-rose (sale)	1%	100*	-	100*	-
Dog-rose (consume)	3%	5	6	6	3
Medical herbs (sale)	1%	23	-	-	23*
Med. herbs (consume)	3%	1.4	0.3	2	2
Mushrooms	10%	31	-	58.5	12.6
Honey	23%	677	44,34	534.38	104.1

4. Discussion

Stratum 1: <u>Unemployed (31%)</u>

1) According to the cluster analysis three stratums were distiguished based on the survey.

•	retired farmer families mainly living on the retirement pensions, or women-headed
	households depending on the subsidies.
•	collect walnuts and breed livestock as a
	primary income sources, whereas other
	types of activities are absent or
	significantly low

sold to sustain the livelihood. No other

significant sources of income.

Stratum 2: Active enterpreneurs (16%)

- both employed and unemployed households the highest numbers of cattle and forest area; obtaining the highest level of the walnut, wild apple and honey yields; income sources from business and tourism activities,
- high amounts of other underutilized forest products collected (mushrooms, dog-rose berries and herbs up to

Stratum 3: Employed (53%)

an average household with employable members varying income sources: salary, livestock capital, walnut/honey yields, along with the collection of wild apples, or honey production, and small amounts of wild fruits, berries and mushrooms collected for sale.

constant income flow over the whole year. At the same

Corresponding with the regression (3.1.3) the resourceful

families tend to collect less amounts of the underutilized

time the incomes are also diversified by walnut / wild

apple collecton and few other NTFPs (3.1.4).

forest products (p =0,006).

types of activities are absent or significantly low	100 kg in some single cases, and 30,75 kg in average).	
	Anual income structure (3.1.2.1)	
Highest share of - walnut collection (53%) and livestock (19%), subsidies, retirement pensions or other sources like foreign transfer.	Income sources are diversified: walnut (37%), livestock (19%), business/tourism (22%)	Walnut and livestock are also the highest share of incomes (41% and 22%), and salary (20%)
	Sensitivity analysis (3.1.2)	
Most sensitive to a reduction in walnut yileds (by 25%) and cattle numbers (by 42%), the rest of the income sources are low	A moderate effect to a reduction in walnut yileds (upto 19%) and salary amounts (7%), and more sensitive result to changes in cattle numbers (up to 35%), honey production (17%).	Significant change of an average annual income in case of walnut yield (23%), salary (23%) and cattle reduction (36%).
	<u>Livelihoods description</u>	
In case of walnut yield reduction, cattle can be	Households diversify incomes and tend to maximize profits by	Households rely on salary and has an access to a

getting involved in different activities (business/tourism, salary

most diverse set of NTFPs (3.1.4)

sources), and collecting highest amounts of wild apple and the

Agrolead (2016) showed that the wild apple collecting farmers in Kyzyl-Unkur are connected in a network of UEBT/UTZ certified suppliers to the European market. Regression (3.1.3) showed that similar cooperations were significantly correlated with higher use of the underutilized forest species (p level of 0.0563). It is practically also mean an access to knowledge and technologies (e.g. fruit/plant dryers). And the households having a higher share of honey production (p =0.004) and wild apple collection (p =0.000) in their income structures tended to collect higher amounts of underutilized species.

5. Conclusion and recommendations

- 1) The regression model showed that the underutilized NTFPs (UNTFPs) tend to be collected more in those sample households with an increased forest area, income from honey production, pasture use and wild apple collection. Farmers who didn't have an agreement with the forestry as well as farmers who encountered difficulties in forest land allocation also tended to collect more UNTFPs.
 - important to improve such cooperatives as those are shown to provide an access/ exchange of know-how (knowledge and technologies) in the local setting.

- Along with those factors a membership in a cooperation was significant correlated with higher amounts of such species collected. It is

- 2) Walnuts make the primary contribution to the local livelihoods (in 96% of the households), while wild apples contribute to 19% of the surveyed households. The survey results showed 14% of the interviewed farmers collecting such products, mainly by the "active entrepreneurs" stratum as shown in the cluster analysis:
 - This stratum also showed less sensitivity to the price/yield changes due to the diverse sources of income.
- 3) The households from stratum 1 depend solely on the subsidies, walnut collection and cattle production and are highly sensitive on those sources. Especially when walnut yields and the state of cattle are both dependent on the weather conditions.
- 4) 68% of the farmers sell the products to the local middlemen. As to theinterviewed households middlemen state lower prices than on the markets. Thus it also important to develop better and direct marketing chains, and make sure that the most disadvantaged groups are included along with other hosuseholds. Farmers mentioned the issue of transportation of products to the market, which is another reason why farmers attend to the middlemen. Thus a better developed marketing chains and infrastructure solutions should be included to the policy adjustment plans.
- 5) Current activities to be improved even further to make better steps forward towards better marketing and higher quality products

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