

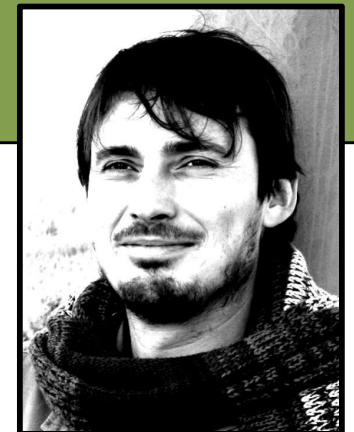


Přednáška pro posluchače U3V

Domácí užitkové zahrady,
strategie sběru a lovu, a tradiční styly hospodaření v
oblastech tropů a méně rozvinutých zemí

Vladimír Verner

Fakulta tropického zemědělství, Česká zemědělská univerzita v Praze
Systémy hospodaření v tropických oblastech



Vize přednášky

Struktura

1. Úvod
2. Rozvoj farem
3. Zdroje
4. Agrobiodiverzita
5. Rozvoj stylů hospodaření

Kdo jsem?

Vladimír Verner

Na Fakultě tropického zemědělství (býv. ITSZ/ITS) působím od r. 2002. Inženýrský diplom jsem získal v oblasti hospodaření a provozu zemědělských podniků, doktorskou práci jsem poté zaměřil na vzájemnou interakci zemědělství-chudoby-“ztracených příležitostí”. Od roku 2010 jsem ve vedení katedry ekonomiky a rozvoje (od r. 2012 jako vedoucí). Přednáším na univerzitách v EU i rozvojovém světě, měl jsem možnost spolupracovat s organizacemi OSN a světovými výzkumnými centry.

Doktorandi

>8 témat



Solomon



Iva



Jan



Magda

Magisterští studenti

>40 témat

Bakalářští studenti

>30 témat





Zemědělství (nejen) v tropických oblastech



Zemědělství (nejen) v tropických oblastech

Základní role zemědělství a nezbytná kombinace tří zásadních rolí zemědělství

Jakkoliv se to v posledních letech nemusí zdát, zemědělství a rozvoj agrárních aktivit, plní – nebo by plnit měl – tři základní funkce:

- a) Produkční**
- b) Krajinotvornou**
- c) Sociální**



Zemědělství (nejen) v tropických oblastech

Produkční role zemědělství



Zemědělství (nejen) v tropických oblastech

Krajinotvorná role zemědělství



Zemědělství (nejen) v tropických oblastech

Sociální role zemědělství



Zemědělství (nejen) v tropických oblastech

Jaké je současné světové zemědělství:

- Celková sklizeň: zhruba 7,7 miliard tun (Světová populace 7,7 miliard)
- Sklizňová plocha: zhruba 12 million km²
- 70-80% celosvětové sklizně tvoří 5-6 plodin: rýže, kukuřice, sója ...

Současné trendy:

- Produkovat potraviny, krmivo, nebo technické/energetické plodiny?
- Jaká je role agrobiodiversity a lokálních odrůd

Otázka současného zemědělství:

- Kterí farmáři jsou schopni vybalancovat svou produkci tak, aby přinášela obživu, produkovala důležité produkty (krmivo, technické plodiny, energetické plodiny aj.), a zároveň plnila roli krajinyotvornou?

Zemědělství (nejen) v tropických oblastech

Základní členění stylů hospodaření

Kritérium	Klasifikační kritérium
Tržní orientace	Procento produkce realizované na trhu
Vlastnictví a kapacita zdrojů	Dostatek zdrojů, Závislost na vlastních zdrojů (vstupů)
Produkční systém	Organizace produkce, míra intensity, stabilita
Etnické a kulturní faktory	Preference, znalosti, etnické rozdílnosti
Klimatické a geografické faktory	Klima (teplota, srážky), odlehlost, vzdálenost k trhu, terén

Zemědělství (nejen) v tropických oblastech

Rozhodovací proces farmářů

Co a jak produkovat?



Zpracovávat?



Doprava/logistika

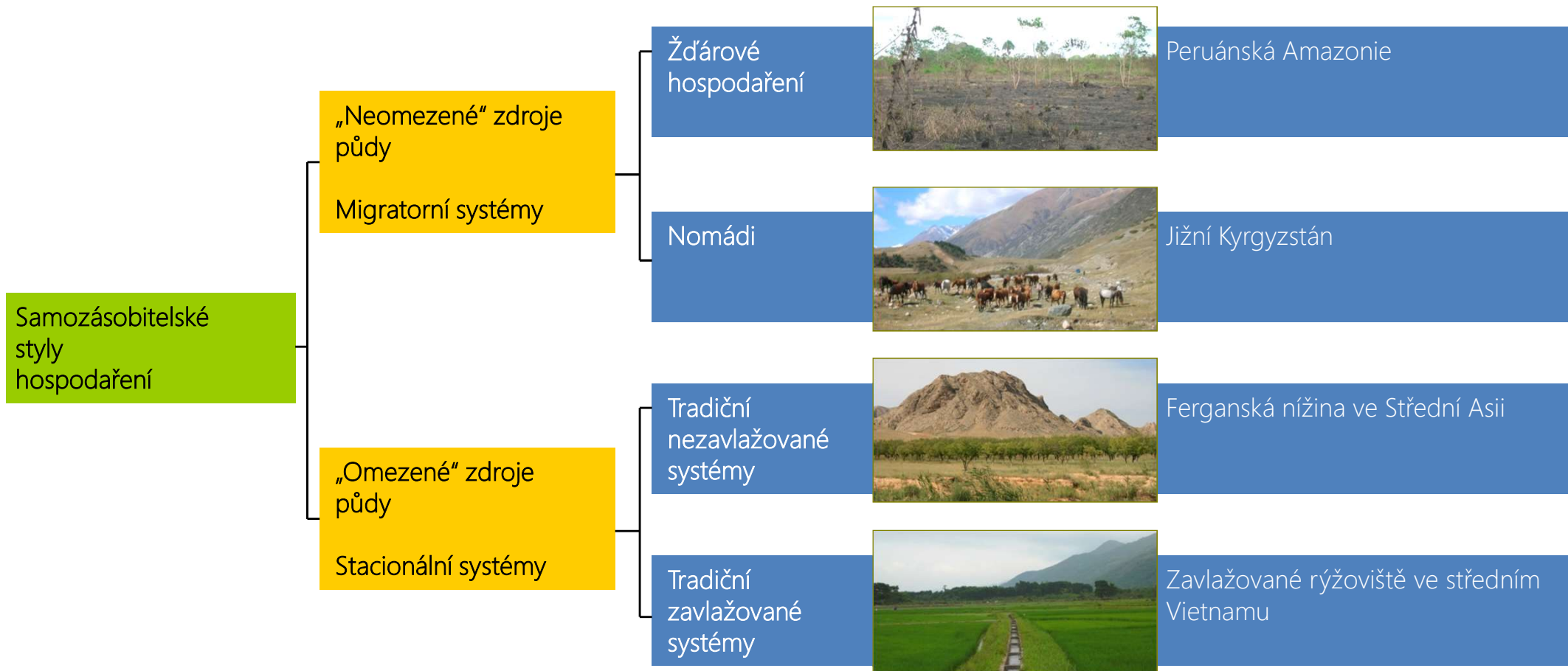


Cena



Zemědělství (nejen) v tropických oblastech

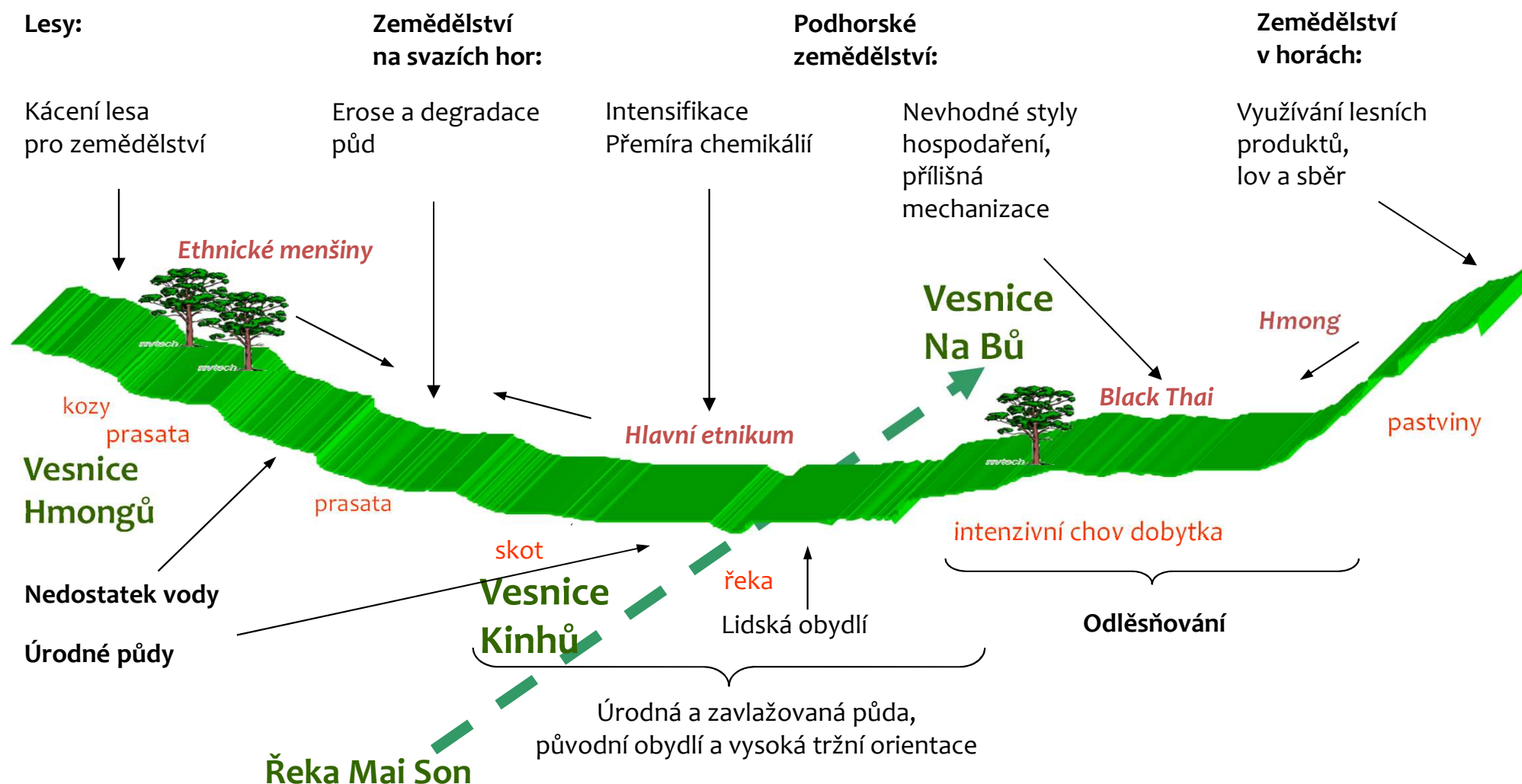
Vývoj stylů hospodaření v tropických a méně rozvinutých oblastech





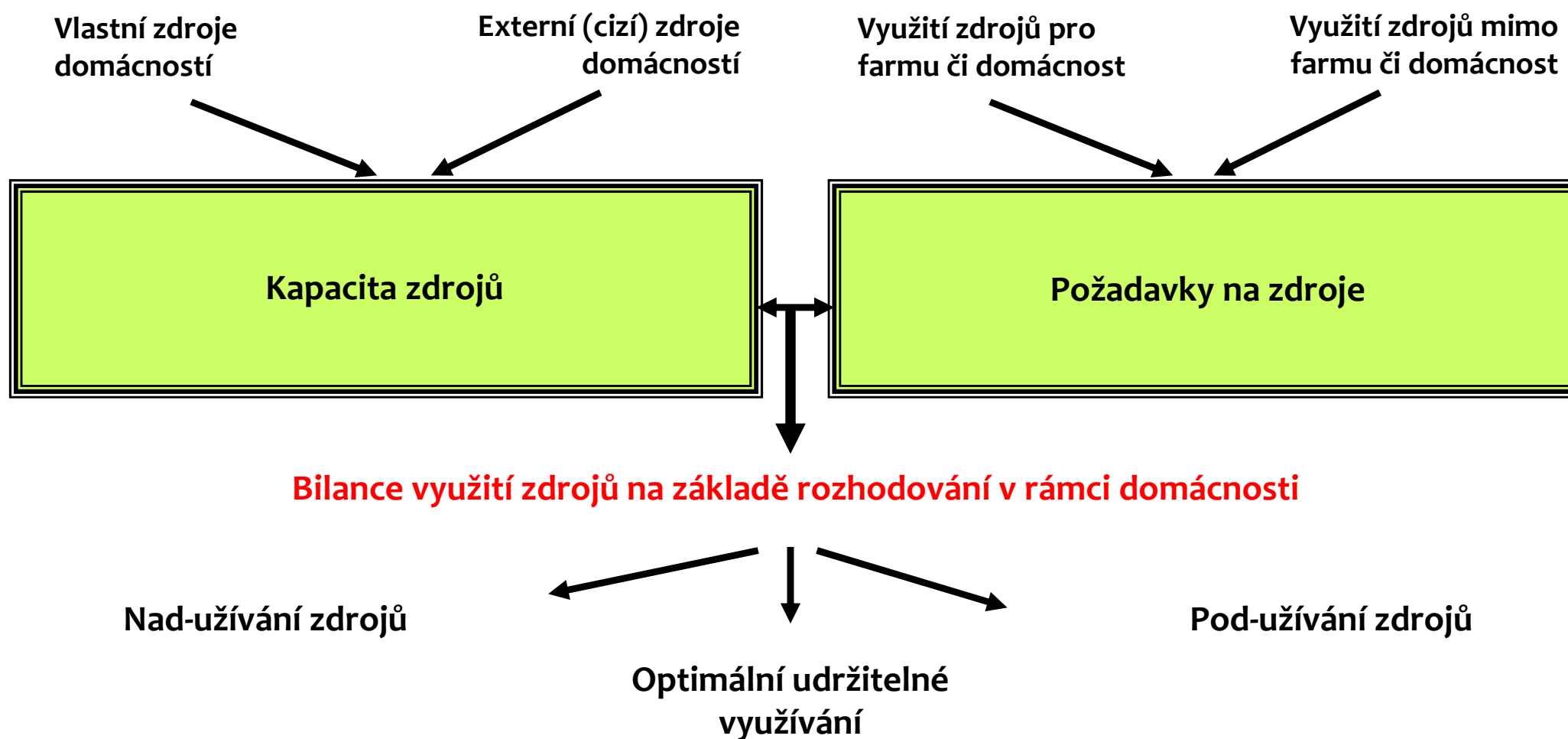
Zemědělství (nejen) v tropických oblastech

Rozdílné styly hospodaření v regionech: Příklad středního Vietnamu



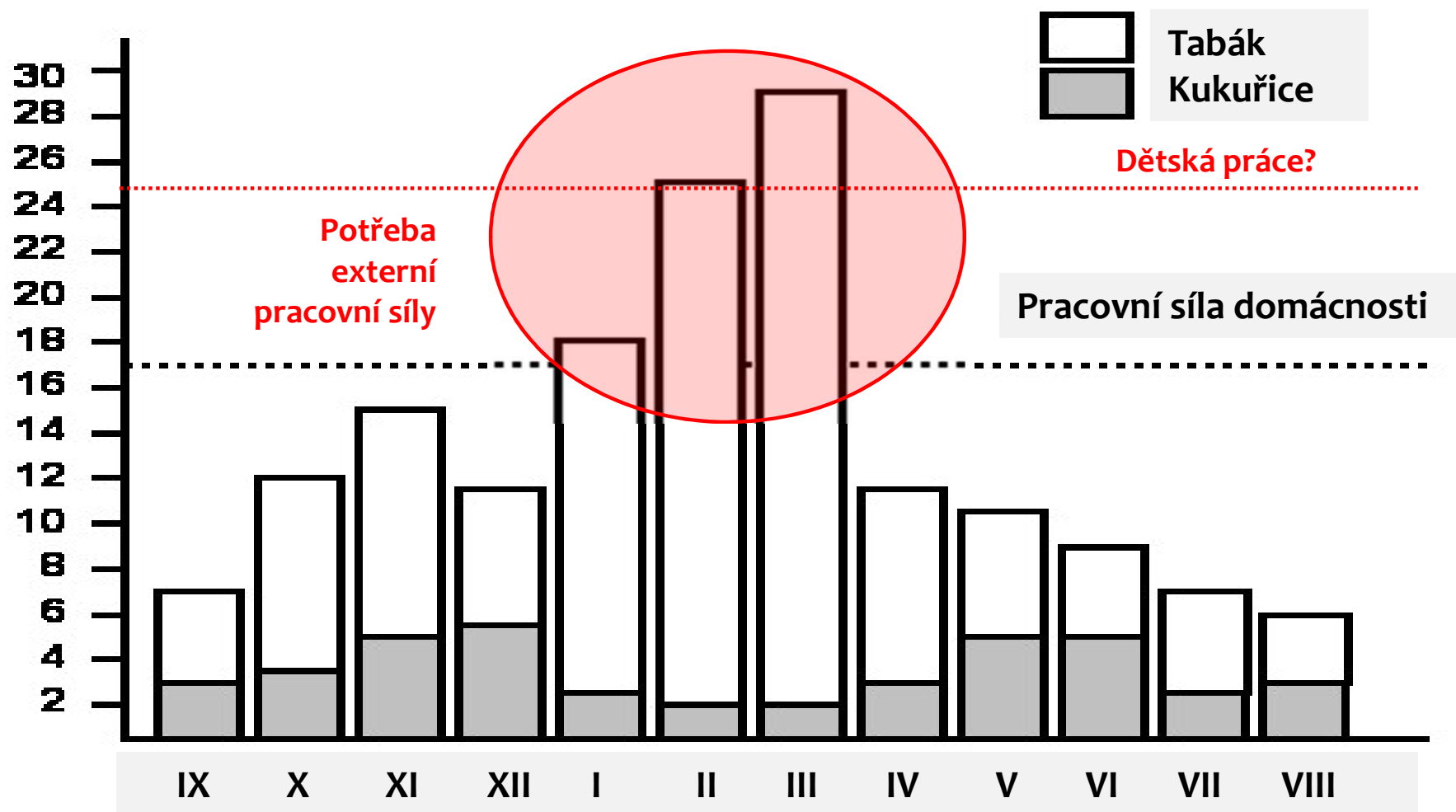


Zemědělství (nejen) v tropických oblastech



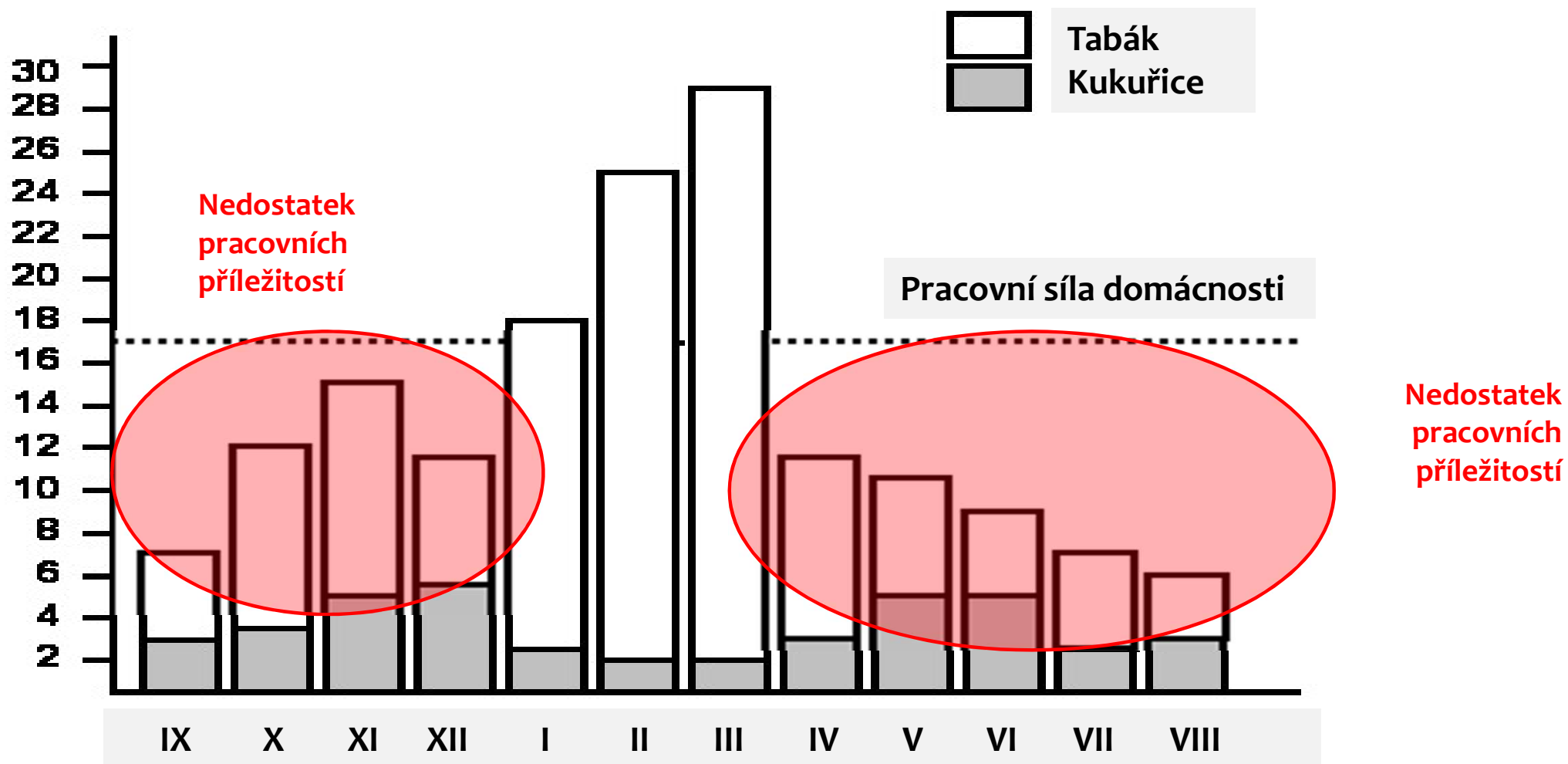


Zemědělství (nejen) v tropických oblastech





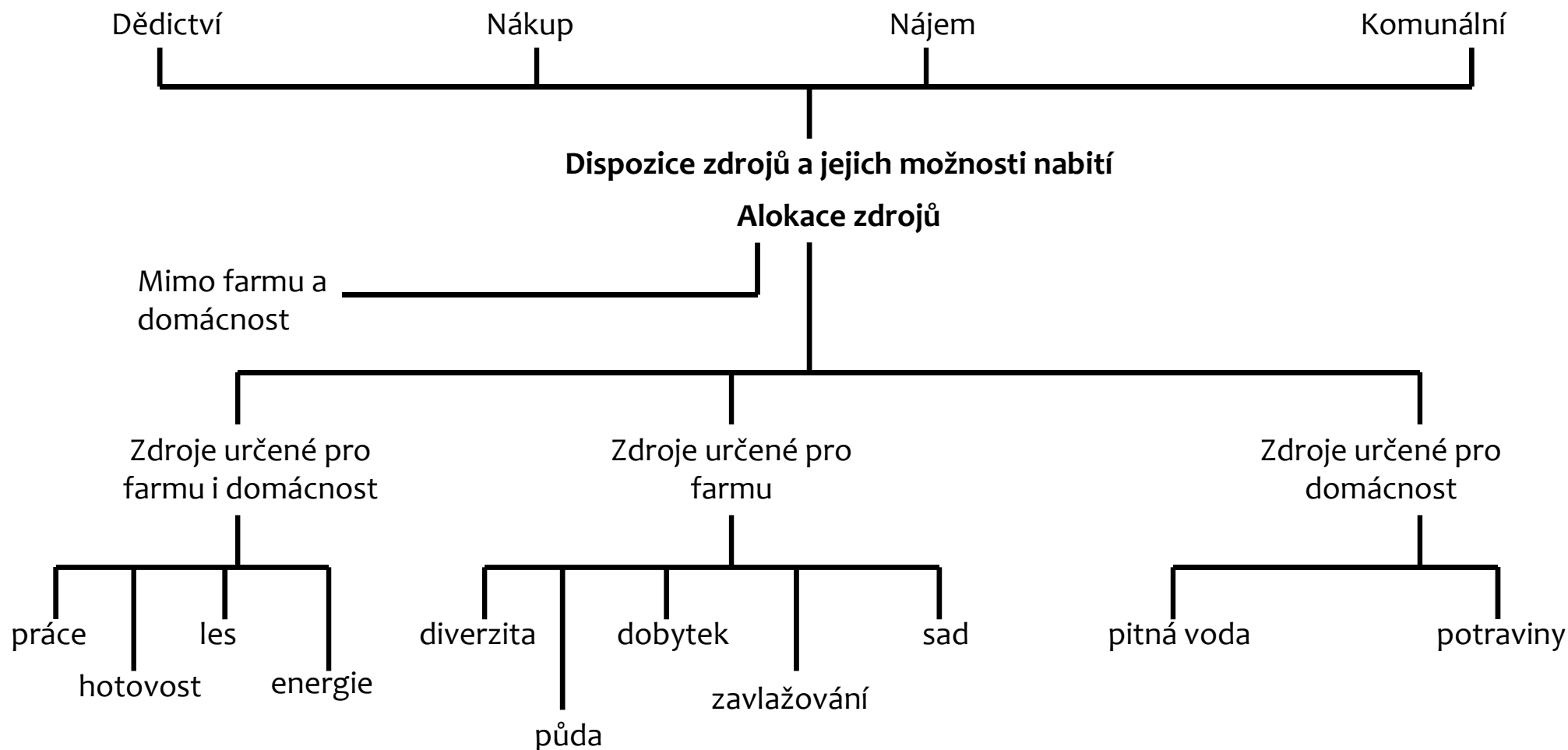
Zemědělství (nejen) v tropických oblastech





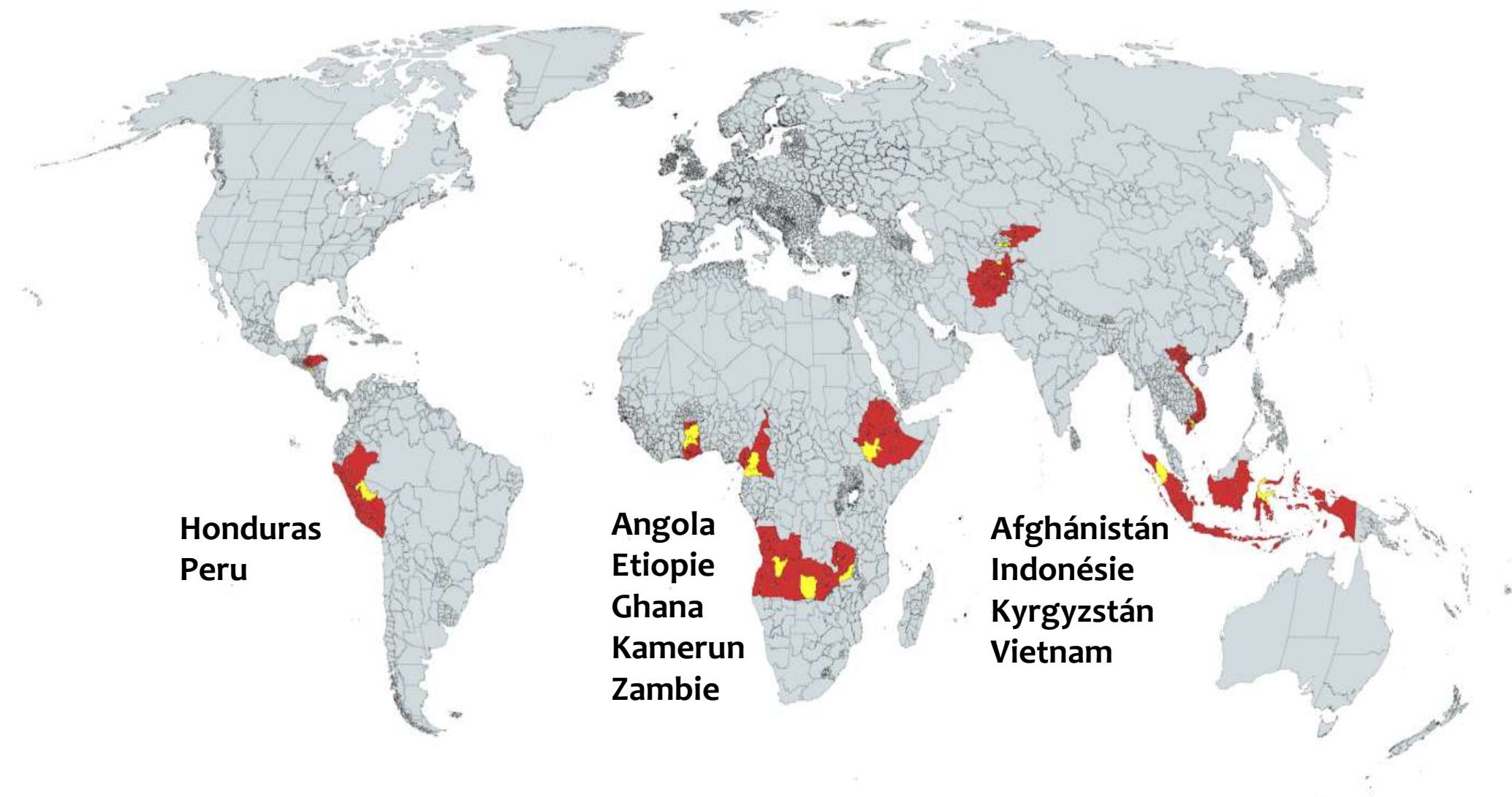
Zemědělství (nejen) v tropických oblastech

Bilance využívání zdrojů u zemědělských domácností





Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech





Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech

Projektový tým je vícečlenný

Jan Banout	Vhodné technologie
Bohdan Lojka	Agrolesnictví
Vladimír Verner	Management farem
Zbyněk Polesný	Agrobiodiverzita a výživa
Olga Landovská	Závlahy
Jaroslav Havlík	Skladování potravin
Jana Lojková	Marketing
Petr Ehl	Zpracování potravin
Le Hien	Lokální koordinátor
Pham Dinh Hien	Technický asistent



Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech

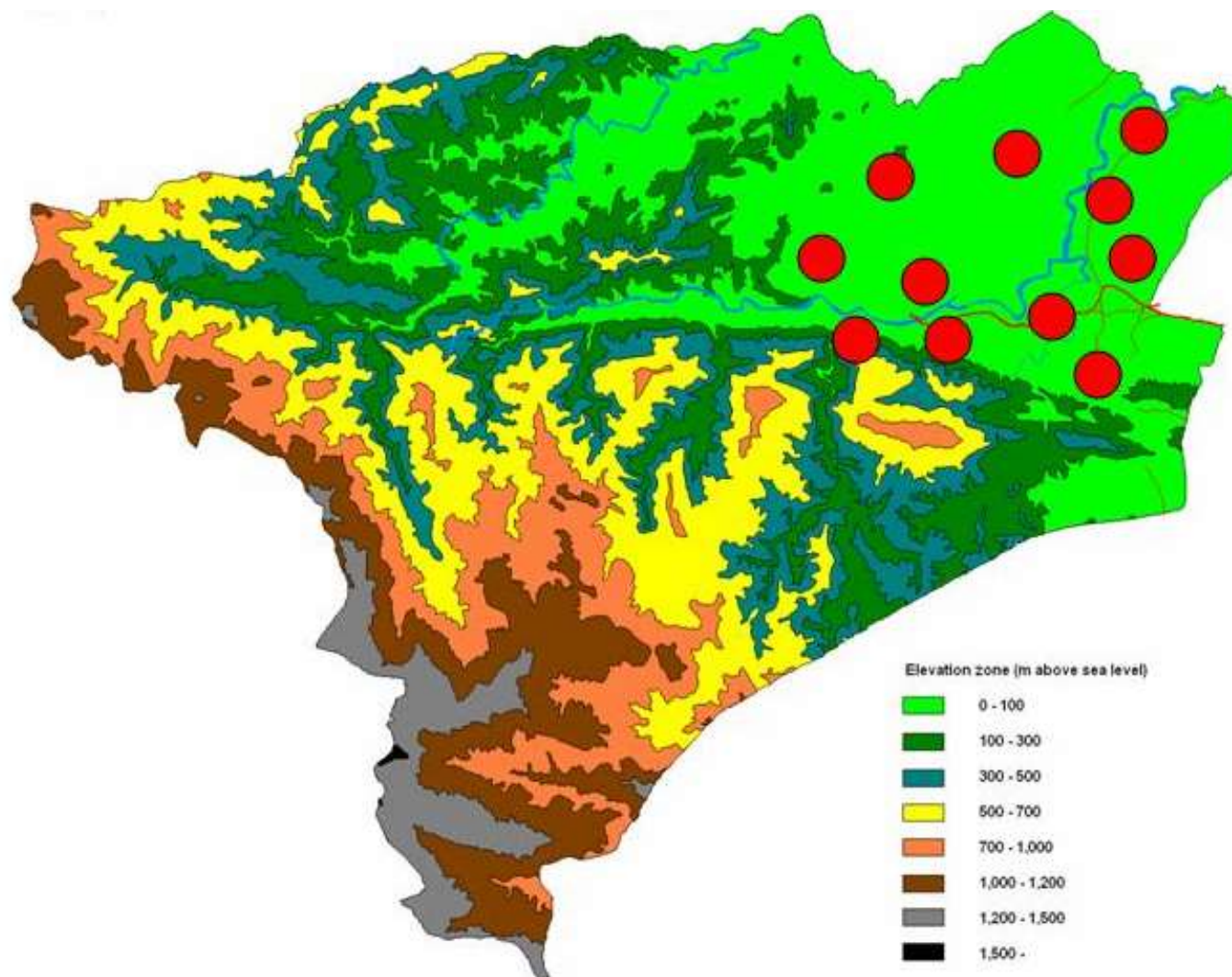
Základní informace o cílové oblasti ve středním Vietnamu

Počet obyvatel:	5 174 v 11 vesnicích
Počet domácností:	991
Zaměstnanost v zemědělství:	2 400 obyvatel, 80% příjmů domácností
Rozloha oblasti:	39 400 ha, z toho 70% přírodní rezervace
Orná půda:	5 000 ha
Nadmořská výška (min-max):	13-1 595 m n.m.



Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech

Mapa cílové oblasti (vesnice vyznačeny červeně)





Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech

Hlavní záměr projektu

Zlepšení životního standardu obyvatel v cílové oblasti, komunitě Phong My

Cíl 1 Zajištění stabilní a nezávadné produkce potravin

Výstup 1.1 Větší diverzita pěstovaných plodin

Výstup 1.2 Zlepšení posklizňových postupů

Cíl 2 Zlepšení přístup k vodním zdrojům

Výstup 2.1 Založení nového zavlažovacího systému

Výstup 2.2 Zlepšení sanitárního vybavení v cílové oblasti

Cíl 3 Rozvoj poradenských služeb pro místní farmáře

Výstup 3.1 Rozvojové studie a plány

Výstup 3.2 Školení



Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech

Zlepšení místních zahrad

Pomelo	(<i>Citrus grandis</i>)
Betelová palma	(<i>Areca catechu</i>)
Bambus	(<i>Bambusa</i> spp.)



4 vesnice, 118 domácností

22 užitkových druhů, 3-8 s největší prioritou pro místní domácnosti

Opomíjené druhy s tržním nebo nutričním potenciálem



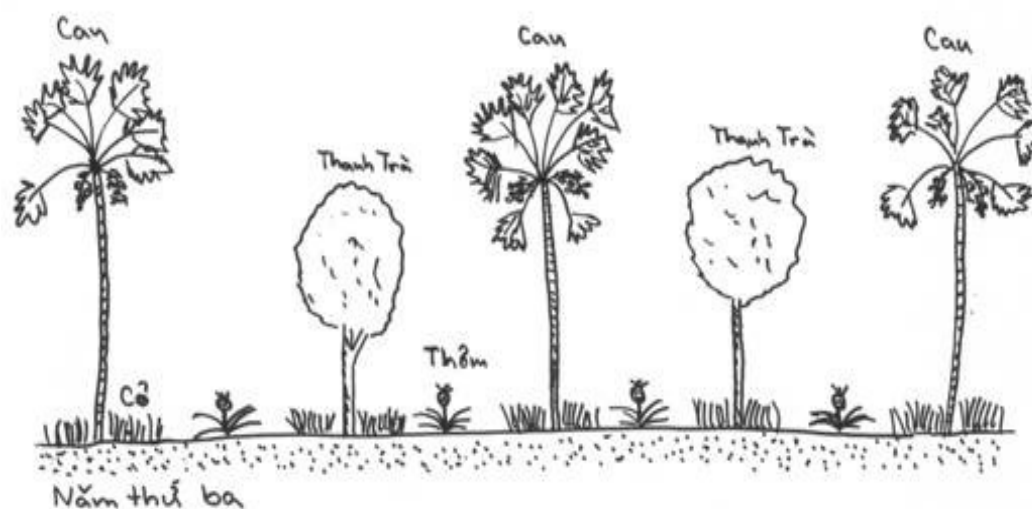
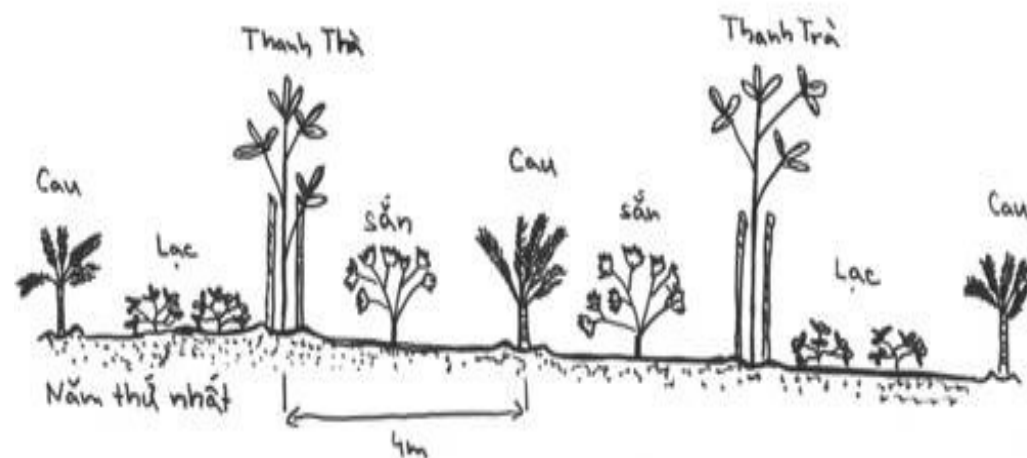
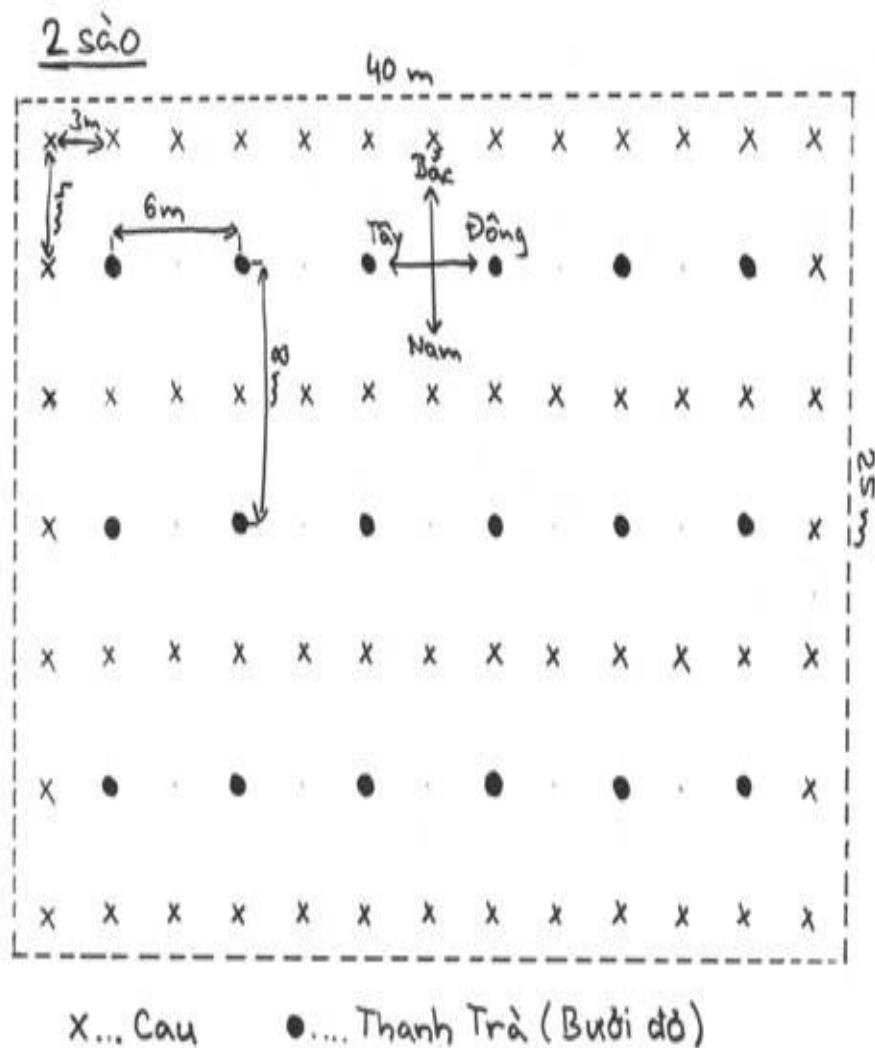
Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech



Workshop on homegarden design
and planting of new seedlings

Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech

Homegarden design



Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech

Delivery of the seedlings





Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech

Controlling of the seedlings delivery, design, percentage of those which survived





Project activities in Phong My commune 2006-09

Publication on traditional farming systems - homegardens

Genet Resour Crop Evol (2011) 58:629–644

DOI 10.1007/s10722-010-9603-3

RESEARCH ARTICLE

Ethnobotanical knowledge and agrobiodiversity in subsistence farming: case study of home gardens in Phong My commune, central Vietnam

Martina Vlkova • Zbynek Polesny • Vladimir Verner •
Jan Banout • Marek Dvorak • Jaroslav Havlik •
Bohdan Lojka • Petr Ehl • Jitka Krausova

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Project activities in Phong My commune 2006-09

Publications on homegarden in target area

Economic appraisal and agrobiodiversity development of urban agriculture in Hue city, Vietnam

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¹Department of Economic Development, Institute of Tropics and Subtropics, Czech University of Life Sciences Prague, ²Department of Crop Science and Agroforestry, Institute of Tropics and Subtropics, Czech University of Life Sciences Prague, ³Department of Sustainable Technologies, Institute of Tropics and Subtropics, Czech University of Life Sciences Prague



Project activities in Phong My commune 2006-09

Conclusions, recommendations and outcomes

Higher agro-biodiversity means ...

lower dependency on market prices

higher food security and nutritional value

higher attractiveness for tourists

better environmental services

conservation of traditional knowledge

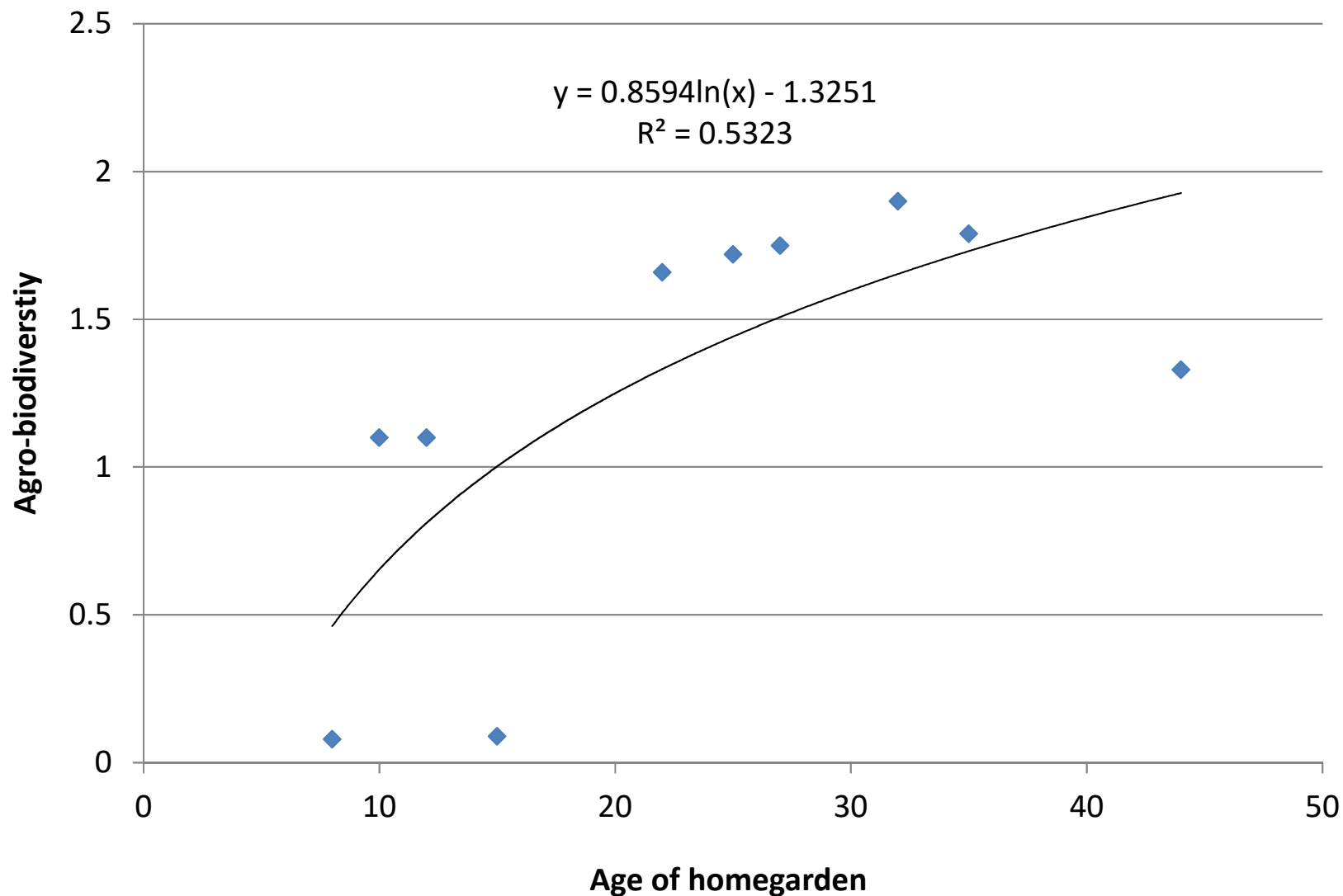


Project activities in Phong My commune 2006-09

Scientific name	Farmer A					Farmer B				
	n	pi	ln pi	pi * ln pi	pi ²	n	pi	ln pi	pi * ln pi	pi ²
<i>Acacia mang. x aur.</i>	20	0.1923	-1.6487	-0.3170	0.0370	...	...	...	...	...
<i>Areca catechu</i>	20	0.1923	-1.6487	-0.3170	0.0370	20	0.0044	-5.4282	-0.0238	0.0000
<i>Artocarpus heterophyllus</i>	2	0.0192	-3.9512	-0.0760	0.0004	6	0.0013	-6.6322	-0.0087	0.0000
<i>Capsicum frutescens</i>	2	0.0192	-3.9512	-0.0760	0.0004	...	...	...	...	...
<i>Carica papaya</i>	1	0.0096	-4.6444	-0.0447	0.0001	...	...	...	...	...
<i>Citrus maxima</i>	9	0.0865	-2.4472	-0.2118	0.0075	14	0.0031	-5.7849	-0.0178	0.0000
<i>Cucurbita maxima</i>	1	0.0096	-4.6444	-0.0447	0.0001	...	...	...	...	...
<i>Cymbopogon citratus</i>	3	0.0288	-3.5458	-0.1023	0.0008	...	...	...	...	...
<i>Dimocarpus longan</i>	1	0.0096	-4.6444	-0.0447	0.0001	1	0.0002	-8.4240	-0.0018	0.0000
<i>Hevea brasiliensis</i>	2	0.0192	-3.9512	-0.0760	0.0004	...	...	...	...	...
<i>Ipomoea batatas</i>	...	...	...	...	...	4,500	0.9879	-0.0121	-0.0120	0.9760
<i>Momordica charantia</i>	1	0.0096	-4.6444	-0.0447	0.0001	...	...	...	...	...
<i>Musa spp.</i>	2	0.0192	-3.9512	-0.0760	0.0004	4	0.0009	-7.0377	-0.0062	0.0000
<i>Piper lolot</i>	40	0.3846	-0.9555	-0.3675	0.1479	10	0.0022	-6.1214	-0.0134	0.0000
number of individuals (N)	104					4,555				
number of species (S)	13					7				
Shanon-wiener index	1.7982					0.0838				
Margalef index	2.5838					0.7123				
Simpson index	4.3092					1.0246				
Homegarden age in years	35					12				
Homegarden size in square meters	1,500					1,500				
Financial value of homegarden	6.13					3.23				

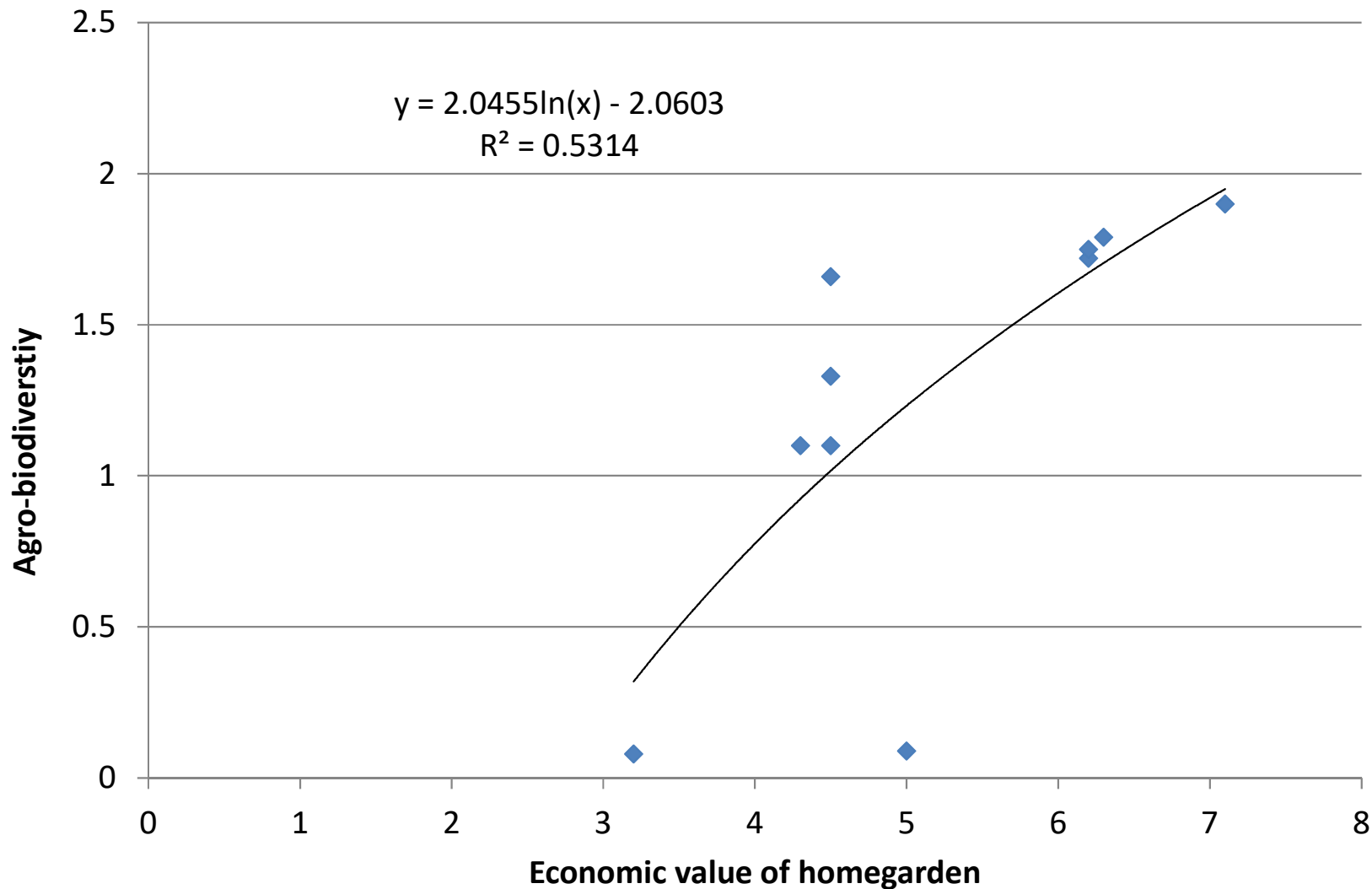
Project activities in Phong My commune 2006-09

Correlation between agro-biodiversity (Shannon-Viewer) and homegarden age (years)



Project activities in Phong My commune 2006-09

Correlation between agro-biodiversity (Shannon-Viewer) and value of homegarden (economic value)





Project activities in Phong My commune 2006-09

Publication on traditional farming systems - homegardens

BOIS ET FORÊTS DES TROPIQUES, 2014, N° 322 (4)
PRODUITS FORESTIERS NON LIGNEUX AU VIETNAM / LE POINT SUR... 39

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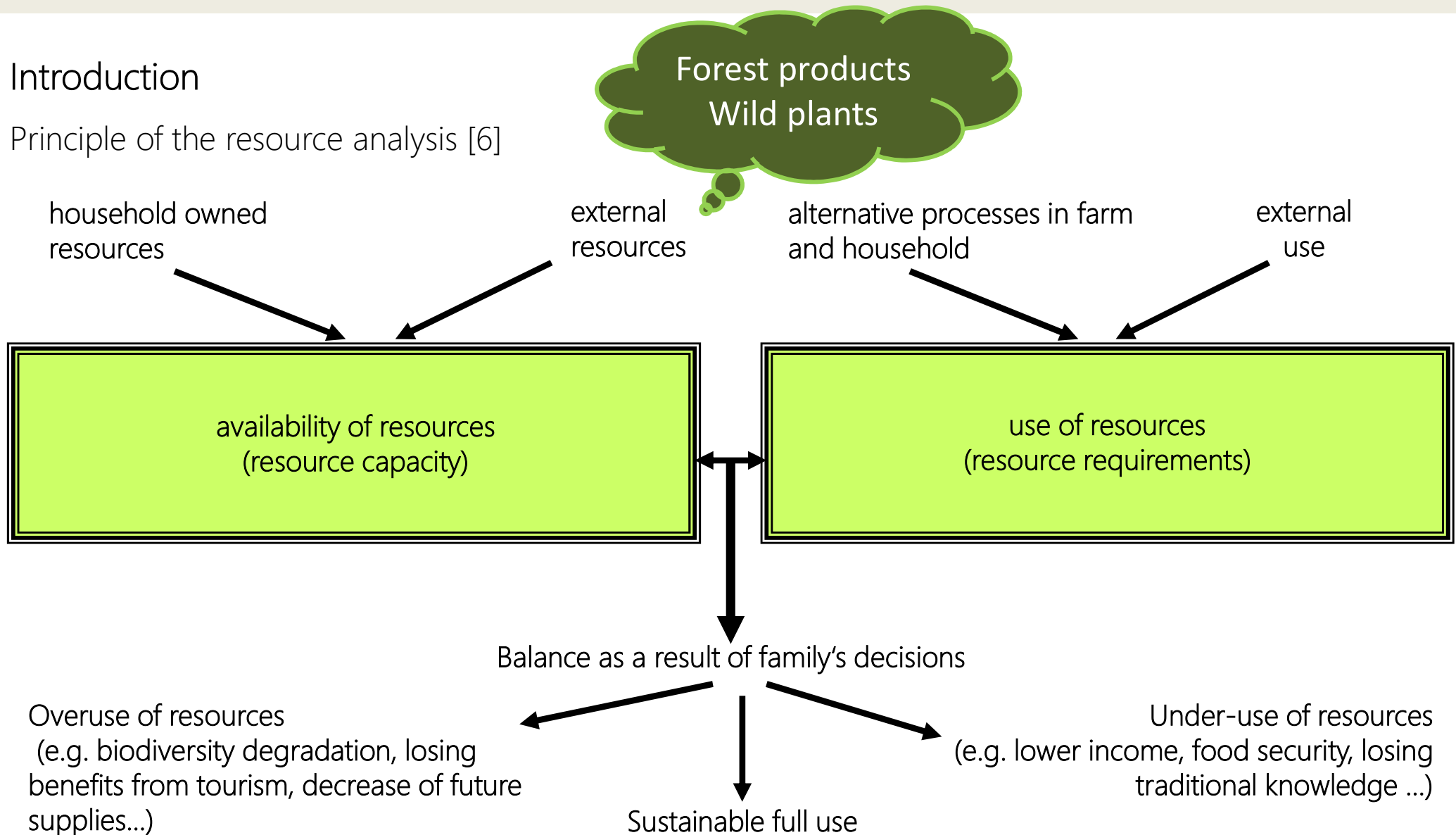
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Non-timber forest products utilization in Phong Dien Nature Reserve, Vietnam: Who collects, who consumes, who sells?

Case study: Non-timber forest products utilisation in Phong Dien Nature Reserve

Introduction

Principle of the resource analysis [6]



Project activities in Phong My commune 2006-09

Introduction

Forest resources significantly to the livelihood of households in rural areas worldwide. Literature identifies two main reasons for relying on the products that could be collected in this specific ecosystem:

1. Reaction/response to some unexpected situations (natural, cultural or socioeconomic) [1; 2; 3]
2. Regular activity [2; 4; 5]



[1] Quang, Anh. 2006. Commercial collection of NTFPs and households living in or near the forests: Case study in Que, Con Cuong and Ma, Tuong Duong, Nghe An, Vietnam. *Ecological Economics* 60, 65-74. [2] Heubach et al. 2011. The economic importance of NTFPs for livelihood maintenance of rural west African communities: A case study from northern Benin. *Ecological Economics* 70, 1991-2001. [3] Babulo et al. 2008. Household livelihood strategies and forest dependence in the highlands of Tigray, Northern Ethiopia. *Agricultural Systems* 98, 147-155. [4] Shackleton et al. 2007. The importance of dry woodlands and forests in rural livelihoods and poverty alleviation in South Africa. *Forest Policy and Economics* 9, 558-577. [5] Saha, Sundriyal. 2012. Utilization of NTFPs in humid tropics: Implications for management and livelihood. *Forest Policy and Economics* 14, 28-40.



Project activities in Phong My commune 2006-09

Introduction

All above mentioned information and situation described are common for South-East Asia as well.

Vietnam

- a specific country with rapidly growing economy
- strong role of the government in the society
- >60% of the population live in rural areas and depend on agricultural production

Studies on NTFPs in Vietnam deal with:

plant diversity [7]
household economics [8]
forest policy [9]
commercialization [1]

[7] Hoang et al. 2011. [8] Mcelwee. 2008. [9] Nguyen. 2006. [1] Quang, Anh. 2006. Commercial collection of NTFPs and households living in or near the forests: Case study in Que, Con Cuong and Ma, Tuong Duong, Nghe Anh, Vietnam. Ecological Economics 60, 65-74.



Project activities in Phong My commune 2006-09

Aim of the study

Based on our previous experience with the focus area we realized that very scientific studies was published on collection and use of forest products in protected areas in Vietnam, where sustainability of resource use must be in balance with ecological services expected to be provided by to forest.

Thus, the aim of our study was to:

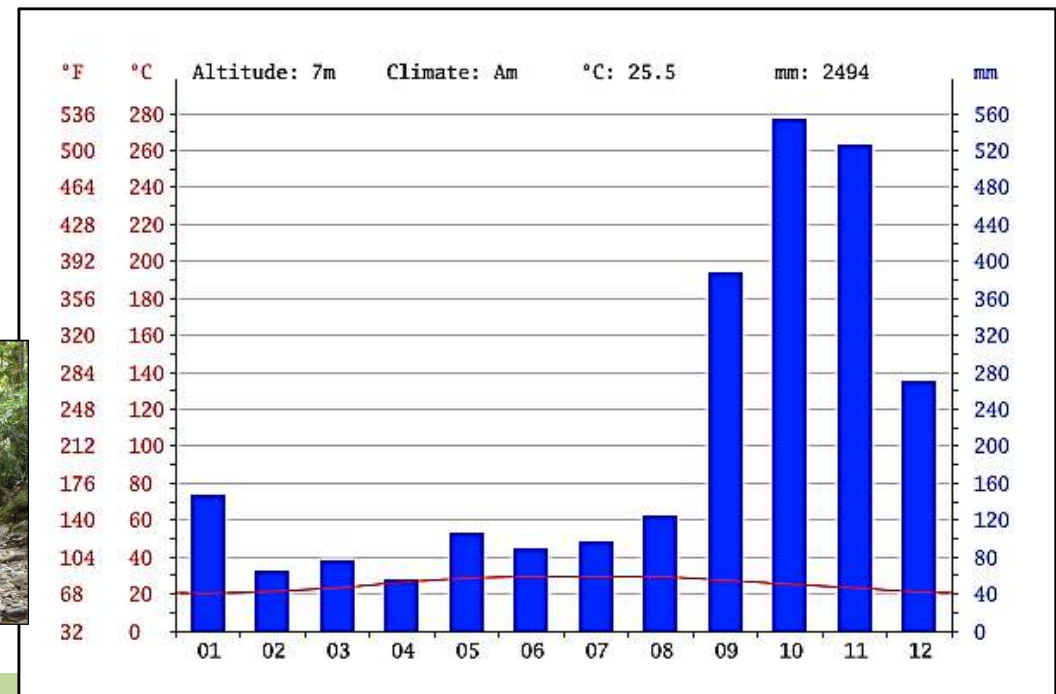
- (i) to document which forest products have been collected in the study area and for what purpose
- (ii) to understand driving forces for intended commercialization of collected products
- (iii) to document future expectation of the local households on forest resources capacity and use

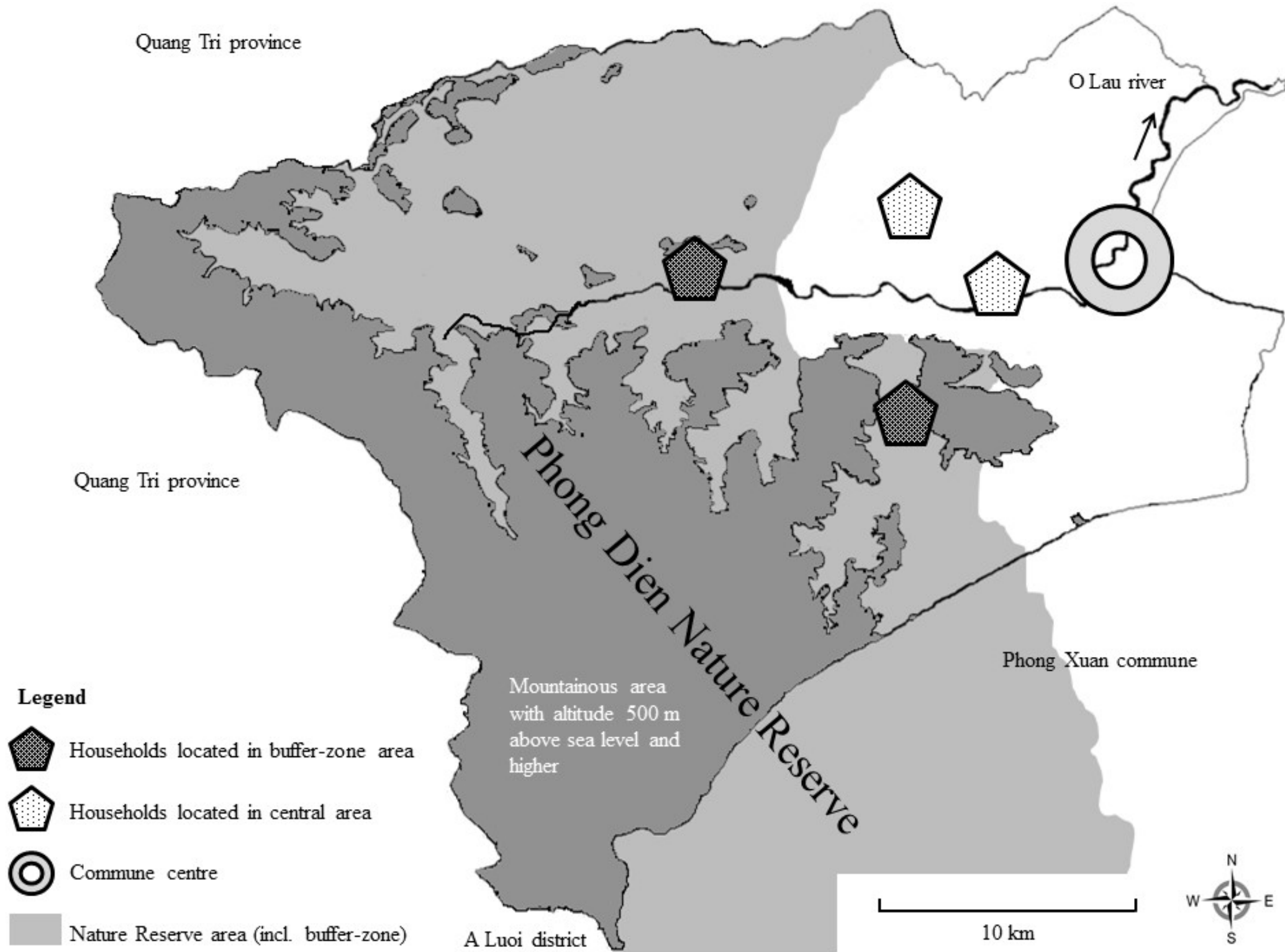
Project activities in Phong My commune 2006-09

Methodology

Study site - Phong My commune

- rural area about 50 km north-west of Hue city in the central Vietnam
- flat terrain at the eastern part, sharply rises at the east-west gradient towards the Annamite Mountains
- tropical monsoon climate
- mean annual temperature around 25°C, average annual relative humidity reaches 85-88% [10]
- 394 sq. km area, 80% nature reserve
- 11 villages; in 2 ethnic minorities, forest area
- 4 villages living close forest, ethnic majority







Project activities in Phong My commune 2006-09

Results

Who are our respondents?

Indicators	Buffer-zone area (N = 26)		Central area (N = 22)		T-test (p=0.05) P (T ≤ t), paired samples
	Mean	SD	Mean	SD	
Farm size (ha)	3.12	2.47	0.83	0.74	0.000***

Household demographic indicators (in members)

Household members	6.08	2.10	6.95	2.36	0.179
Dependent members (≤14, ≥60 years)	1.58	1.27	2.36	1.43	0.050**
Labour force (15-59 years)	4.50	2.25	4.59	2.91	0.903
Male labour force	2.23	1.50	2.23	1.66	0.994
Female labour force	2.31	1.41	2.36	1.99	0.910
Household members involved in off-farm activities	1.19	1.96	0.82	1.05	0.427
Household members involved in household-related activities	2.96	1.51	2.18	1.14	0.053*
Household head age (years)	49.77	18.56	46.59	12.76	0.501
Household settled in study area (years)	19.88	11.90	24.32	12.64	0.218
Years of schooling (15+)	3.85	2.62	4.86	2.19	0.155



Project activities in Phong My commune 2006-09

Results

Who are our respondents?

Indicators

	Buffer-zone area (N = 26)		Central area (N = 22)		T-test (p=0.05) P (T ≤ t), naired samples
	Mean	SD	Mean	SD	
Per capita cash income (thousands VND)					
Total cash income	3,106	1,898	2,563	1,990	0.391
Annual crops	78	158	438	390	0.000***
Plantation	904	1,424	763	1,514	0.742
Home garden	416	408	230	327	0.093*
Livestock	167	412	141	305	0.810
Fishing from local rivers	41	166	8	36	0.358
Small business	126	447	167	542	0.778
Salaries	291	635	213	327	0.605
Government	955	1,333	22	53	0.002***
Forest products excluding timber (NTFPs)	125	231	573	814	0.010**
Other	4	14	9	15	0.266

Project activities in Phong My commune 2006-09

Results

What is the purpose of NTFPs collection?

- 61 total identified
- 39 plant-based, 22 animal-based
- 33 in buffer-zone vs 20 in central part
- plant-based NTFPs: food (46%), medicine (15%), construction material (13%), household (5%), energy
- animal-based NTFPs: food and sales

- strong role of women in collection of plants, men more involved in hunting
- men were more involved in collection of species intended for sale

- commercialized plant-based NTFPs: ratan and licuala palm (for making conical hats)

- NTFPs contributed to household cash income via 23% in central villages compare to 4% in buffer-zone

Project activities in Phong My commune 2006-09

Discussion and conclusion

We documented 61 NTFPs regularly collected in the target area. More than in other socio-economic studies published so far in SE Asia or India.

Forest and NTFPs collection is quite important activity for local households.

Our results corresponds with other studies that commercial collection of NTFPs are the objective of resource-poor households, while the others use them for food security, medicine or cultural purposes.

Commercial collection is focused on a few species only (rattan).

Alternative activities

Reduction or restriction towards NTFPs collection is not a solution.

Based on our findings, we can recommend alternative agricultural practices (homegardens), development of off-farm activities and government incentive mechanism as a suitable strategies leading to sustainable NTFPs collection and use.



Rozvoj stylů hospodaření v tropických a méně rozvinutých oblastech

Ukázka diplomové práce z Peruánské Amazonie

<http://wayvana.blogspot.com/p/video.html>



Development and research activities in southern Kyrgyzstan, 2006-15

2006-08

Preparation activities for project proposal

Budget: US\$ 10,000

Financed by: AgriNatura (70%)
Czech University of Life Sciences Prague (10%)
Kyrgyz National Agrarian University (20%)

2008-10

Implementation of ODA project „Sustainable Rural Development in Leylek District, Kyrgyzstan“

Budget: US\$ 435,000

Financed by: Ministry of Agriculture of the Czech Republic (Czech Development Cooperation) (89%)
Czech University of Life Sciences Prague (5%)
Kyrgyz National Agrarian University (5%)
Other (1%)

2012-15

Research and development activities in southern areas of Kyrgyzstan and self-evaluation of project activities

Budget: US\$ 7,700

Financed by: Internal grant agency of Czech University of Life Sciences Prague (75%)
Other (25%)

since 2016

Cooperation with German and Kyrgyz Universities on Farming Systems and Forests Management



Development and research activities in southern Kyrgyzstan, 2006-15

Project team and project management board

Management

Vladimir VERNER farming and rural systems

Experts from the Czech Republic

Jan BANOUT	appropriate technologies
Zbynek POLESNY	ethnobotany, biodiversity
Bohdan LOJKA	agricultural systems
Jana LOJKOVA	marketing of agricultural products
Alexander KANDAKOV	economy, project evaluation
Petr EHL	post-harvest processing

Experts from Kyrgyzstan

Bekmat MASAIDOV	ethnobotany, soil science
Nurudin KARABAEV	project coordinator at KAU
Aibek USUPBEKOV	project coordinator 2009-10
Aibek KULMASHEV	project coordinator 2008
Isaak PAZYLOV	major of Isfana city, key-farmer

Development and research activities in southern Kyrgyzstan, 2006-15

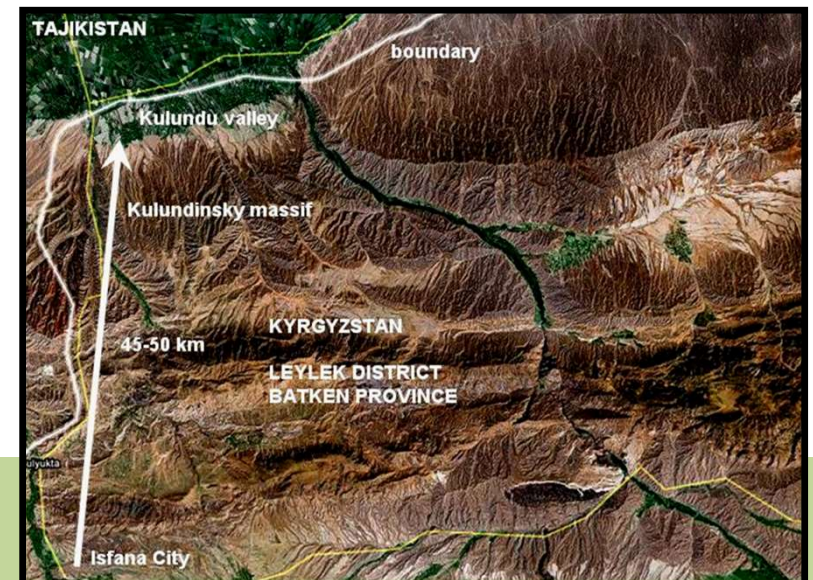
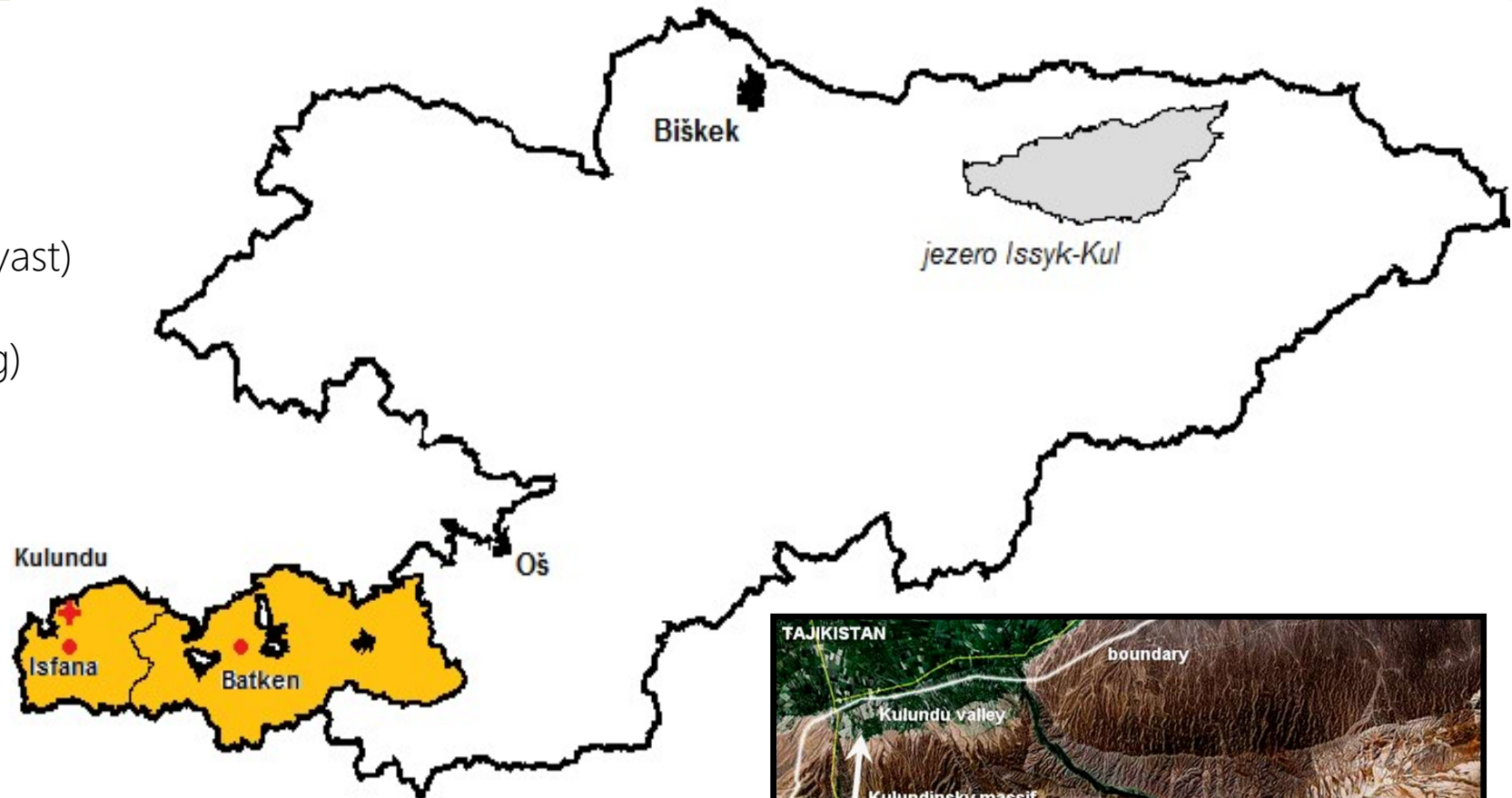
Project target area

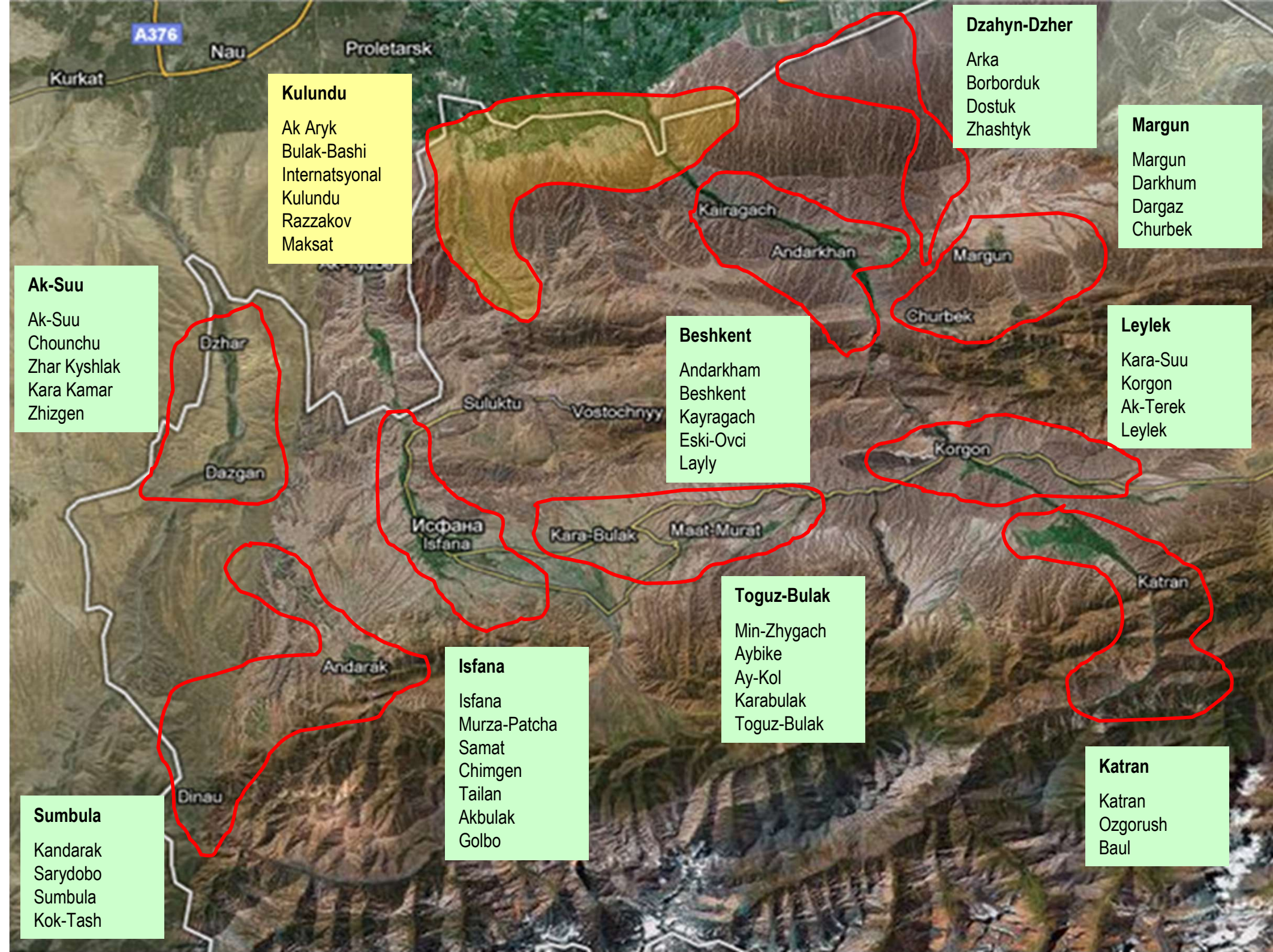
Kyrgyzstan

Batken province (oblyast)

Leylek district (rayon)

Kulundu valley (okrug)





Kulundu

Ak Aryk
Bulak-Bashi
Internatsyonal
Kulundu
Razzakov
Maksat

Ak-Suu

Ak-Suu
Chouchu
Zhar Kyshlak
Kara Kamar
Zhizgen

Dzahyn-Dzher

Arka
Borborduk
Dostuk
Zhashtyk

Margun

Margun
Darkhum
Dargaz
Churbek

Beshkent

Andarkham
Beshkent
Kayragach
Eski-Ovci
Layly

Leylek

Kara-Suu
Korgon
Ak-Terek
Leylek

Isfana

Isfana
Murza-Patcha
Samat
Chimgen
Tailan
Akbulak
Golbo

Toguz-Bulak

Min-Zhygach
Aybike
Ay-Kol
Karabulak
Toguz-Bulak

Sumbula

Kandarak
Sarydobo
Sumbula
Kok-Tash

Katran

Katran
Ozgorush
Baul

Development and research activities in southern Kyrgyzstan, 2006-15

Aim of the project

To improve the living standard of the families in Leylek district

Objective of the project

To improve both quality and quantity of agricultural production in Kulundu valley

Outcomes of the project

- (1) To elaborate of development study
- (2) To introduce an improved agricultural systems and appropriate technologies
- (3) To delivery of capacity-building services
- (4) To increase awareness about the project activities, Czech development assistance and target area among both professional and general society



Development and research activities in southern Kyrgyzstan, 2006-15

Initial data collection among local leaders and respected elders





Development and research activities in southern Kyrgyzstan, 2006-15

Initial data collection on local fields and markets



Development and research activities in southern Kyrgyzstan, 2006-15

Initial data collection among local farmers





Development and research activities in southern Kyrgyzstan, 2006-15

29 important species of used plants identified

11 of them of high priority

6 based for new agricultural system establishment:

<i>Juglans regia</i> L.	walnut	4 trees
<i>Prunus avium</i> L.	cherry	12 trees
<i>Prunus armeniaca</i> L.	apricot	5 trees
<i>Diospyros kaki</i> Thunb.	persimmon / Khaki	5 trees
<i>Prunus dulcis</i> (Mill.) D. A. Webb	almond	16 trees
<i>Ribes nigrum</i> L.	black currant	41 trees

55 families selected in all 6 villages

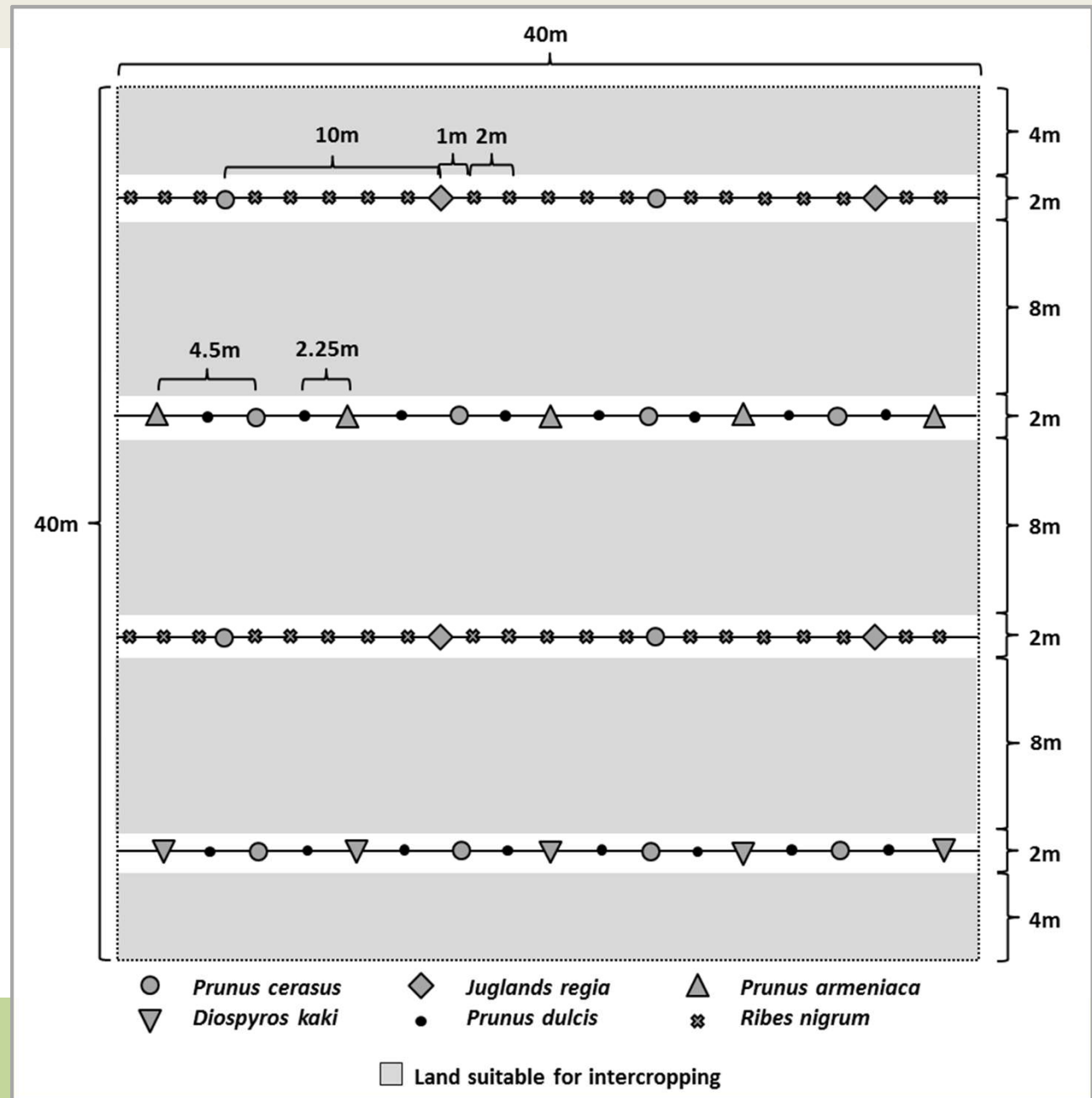
5 total area of new fruit orchards 7.5 ha, increase of total land under orchards by 60%

inter-cropping, means use annual crops together with perennial crops



Development and research activities in southern Kyrgyzstan, 2006-15

Fruit orchard design





Development and research activities in southern Kyrgyzstan, 2006-15

Introducing new design, capacity building and monitoring





Development and research activities in southern Kyrgyzstan, 2006-15

Economic comparison of
annual and perennial
cropping systems in
target area

Pay-back period

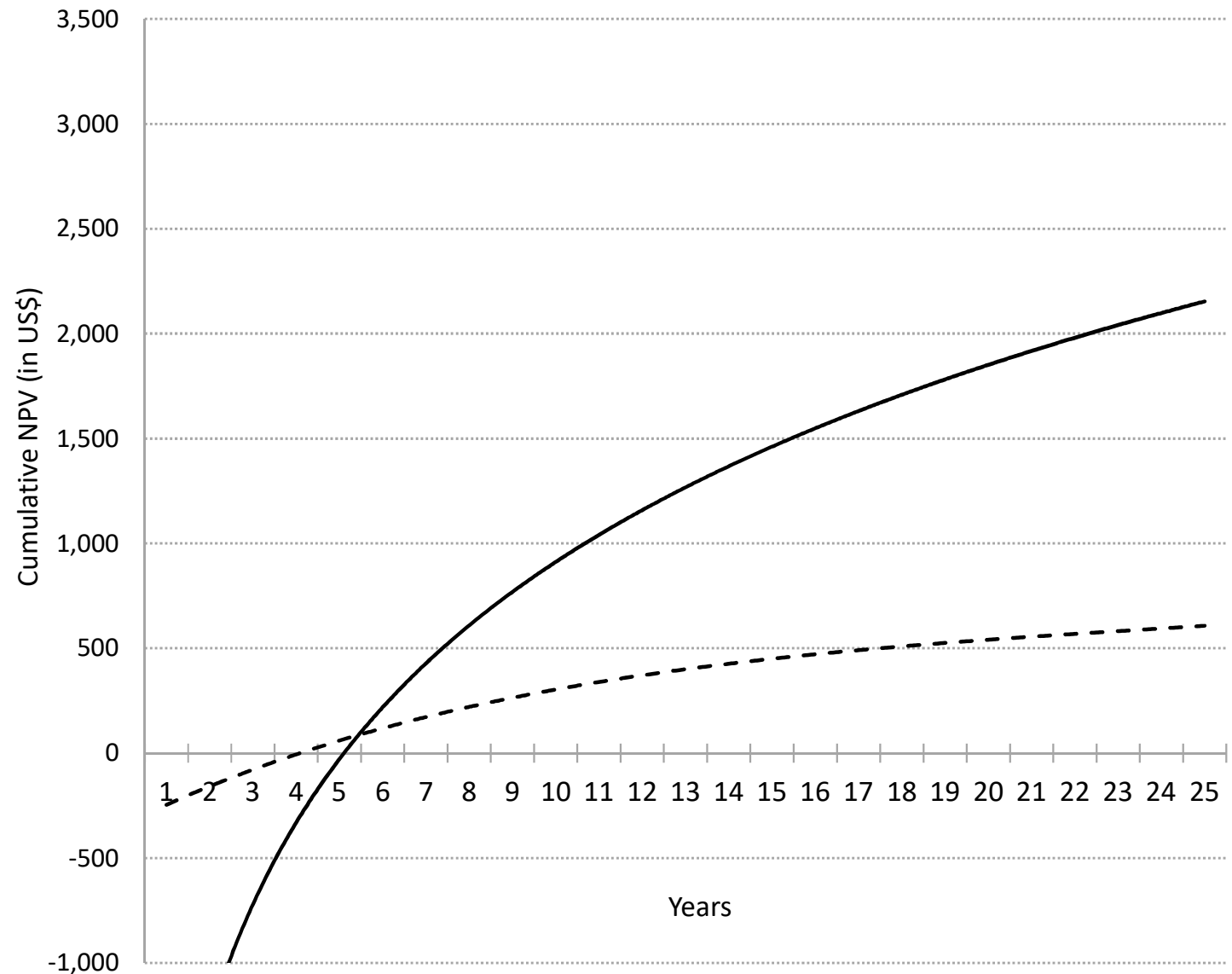
annual: 3 years

perennial: 5-6 years

Return

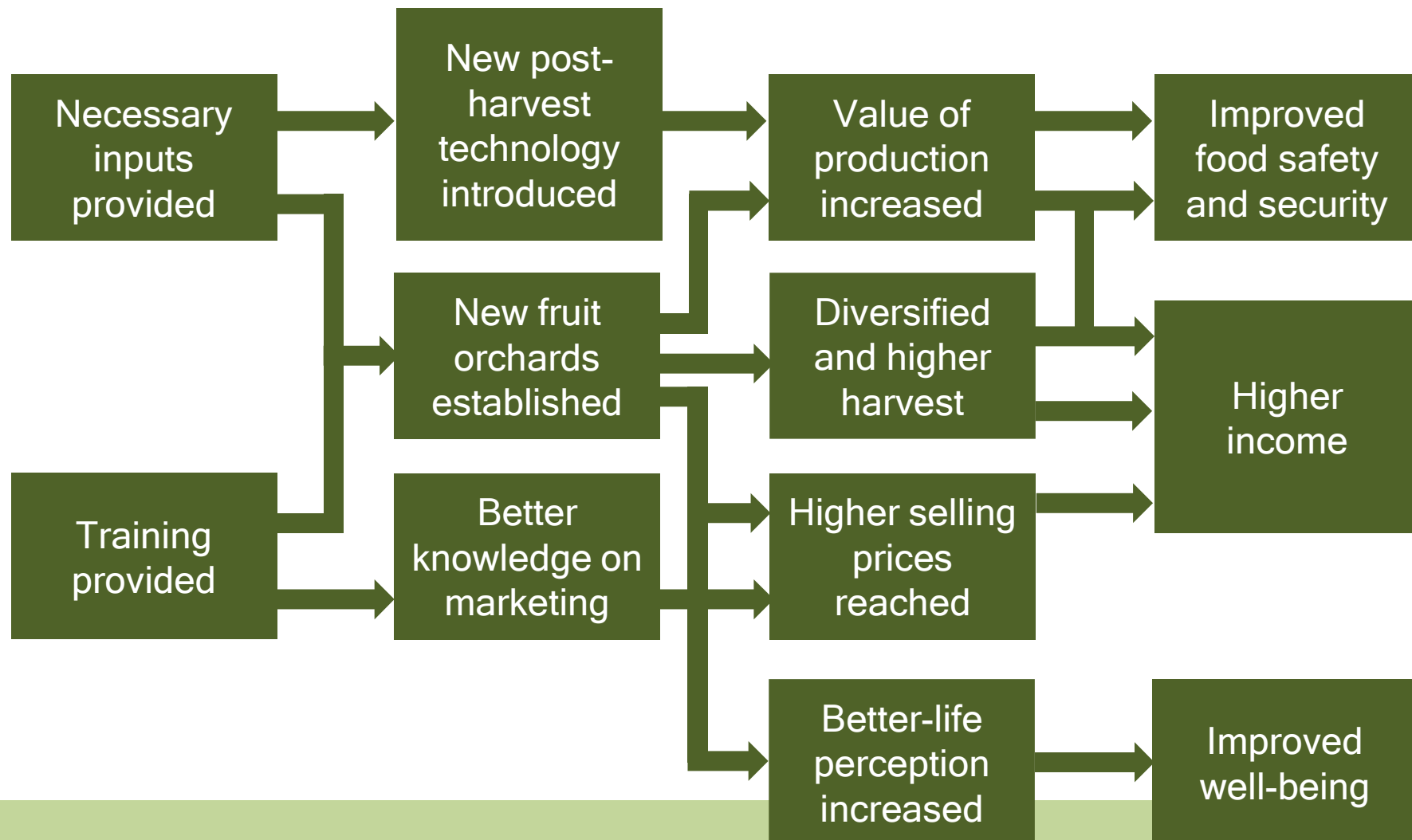
annual: 12.4%

perennial: 26.9%



Development and research activities in southern Kyrgyzstan, 2006-15

Introducing new design, capacity building and monitoring







Development and research activities in southern Kyrgyzstan, 2006-15

Publication on wild products collection and use

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DOI: 10.5586/asbp.3483

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Authors' contributions

LP, ZP, CT, and VV jointly
designed the research; NK
and AK screened titles and
abstracts; LP screened full text
articles; IS and MS provided
taxonomic identification of
species and contributed to the
discussion with botanical and
environmental aspects; LP, ZP,
and CT conducted data analysis;
LP, ZP, and VV drafted the article
narrative and LP generated all
figures and tables; LP and AK
generated the study area map;
all authors read and approved
the final manuscript

ORIGINAL RESEARCH PAPER

Medical ethnobotany of herbal practitioners in the Turkestan Range, southwestern Kyrgyzstan

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Development and research activities in southern Kyrgyzstan, 2006-15

Transect walks, Focus Group Discussions, Key Persons Interviews, Questionnaires

10 herbal practitioners

50 medicinal plants taxa documented

75 different receipts : 63 for human health, 3 for animals

Gastro-intestinal system disorders, Circulatory system disorders, Infections

Majority of species – Close distance to households

High valuable species – Distance from the households

Two species identified for further studies on market/value-chains

Development and research activities in southern Kyrgyzstan, 2006-15

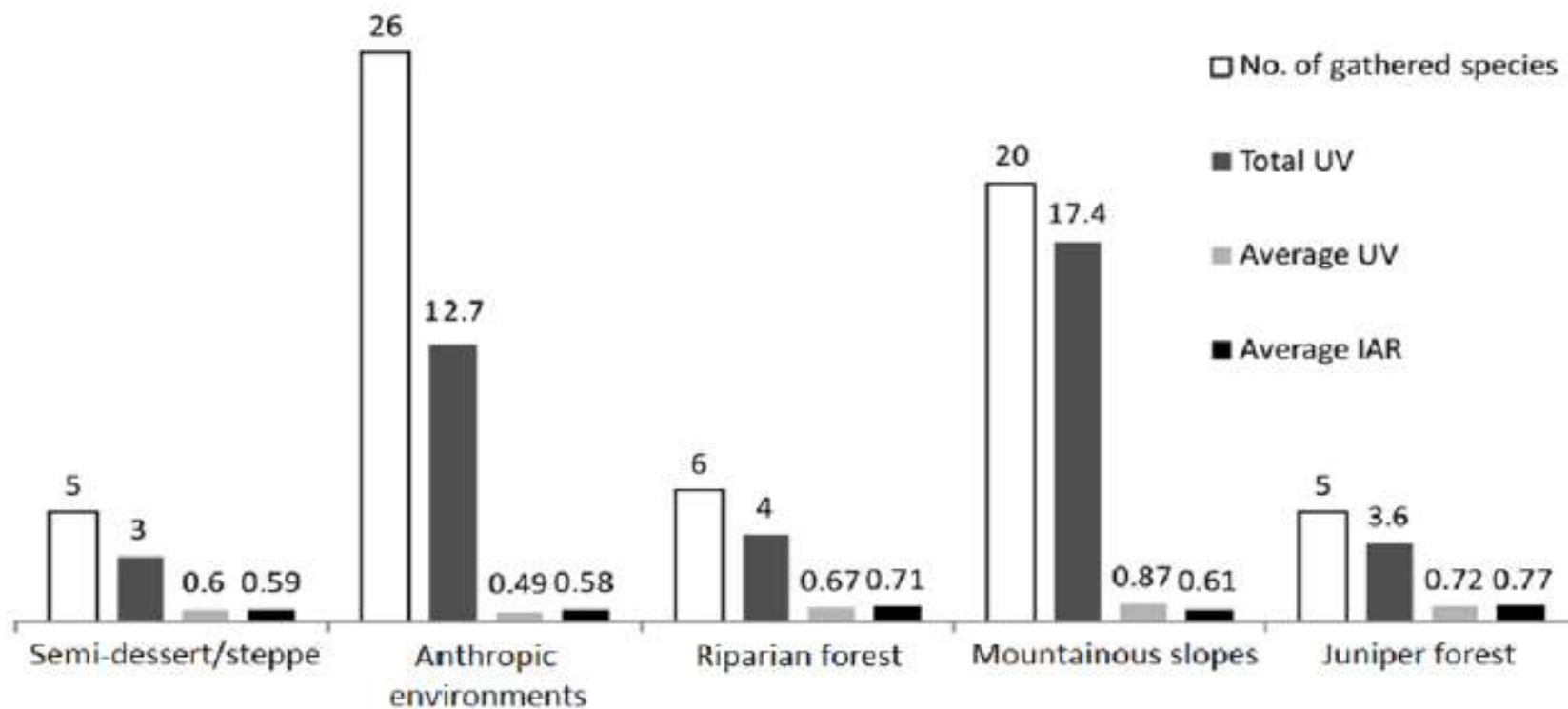


Fig. 5 Ethnobotanical characteristics of the gathering environments. UV – use value index; IAR – informant agreement ratio (certain taxa are gathered in more than one environment).

thank you for your attention

Vladimír Verner

