

# Proposals of topics of dissertation theses for academic year 2018/2019

## Study Programme: Agriculture in Tropics and Subtropics

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| <b>Department:</b> | <b>Department of Sustainable Technologies</b> |
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**1. doc. Ing. Jan Banout, Ph.D.**

Impact of traditional processing and natural antioxidants on the quality and shelf-life of game meat

**2. doc. Ing. Jan Banout, Ph.D.**

Toxicological assessment of selected pollutants accumulated in aquatic vegetables grown in peri-urban wetlands

**3. doc. Ing. Jan Banout, Ph.D. | Ing. Klara Urbanová PhD.**

Influence of drying method on capsaicinoids content from different Capsicum species

**4. doc. Ing. Jan Banout, Ph.D. | Ing. Helga Hernandez PhD.**

Influence of drying pre-treatments on final organoleptic and physical properties of dehydrated products

**5. doc. Ing. Jan Banout, Ph.D.**

The influence of intensive agriculture practices on coral reef resilience in Sumatra

**6. doc. Ing. Jan Banout, Ph.D. | Ing. Jana Mazancová, PhD**

Regional differentiation of small-scale biogas technology development, related driving factors and future prospects in rural areas of Southeast Asia

**7. doc. Ing. Jan Banout, Ph.D. | Ing. Jana Mazancová, PhD**

Social and economic assessment of small-scale biogas plants in developing world: A case of chosen country

**8. doc. Ing. Jan Banout, Ph.D. | Ing. Jana Mazancová, PhD**

Assessment of different designs of small-scale biogas plants in Southeast Asia

**9. doc. Ing. Jan Banout, Ph.D. | Ing. Jana Mazancová, PhD**

Small-scale biogas plants and their environmental impacts reduction

**10. prof. RNDr. Irena Valterová, CSc. | Ing. Klára Urbanová, Ph.D.**

Monitoring volatile compounds and fatty acid composition of tropical oils under different storage condition

**11. Doc. Ing. Vladimír Krepl, CSc. | Ing. Tatiana Ivanova, Ph.D.**

Optimization of the production processes of solid biofuels in selected developing country with a focus on technological lines solutions

**12. Doc. Ing. Vladimír Krepl, CSc. | Ing. Petr Hutla, CSc.**

The study of a biochar application as a raw material for solid biofuel production in a form of pellets and briquettes

**13. Doc. Ing. Vladimír Krepl, CSc. | Ing. Jiří Sobek, Ph.D. (ČSAV), Ing. Petr Hutla, CSc. (VUZT)**

Treatment of organic waste from palm trees by chemical process and pyrolysis process

**14. Doc. Ing. Vladimír Krepl, CSc.** | Ing. Pavel Burian, Ph.D.  
Rehabilitation of postharvest technology in Ethiopia – focused towards Grain milling and Edible oil processing

**15. Doc. Ing. Vladimír Krepl, CSc.** | Ing. Pavel Burian, Ph.D.  
Energy production from cottonseed oil processing waste in the Eastern Ethiopia

**16. Doc. Ing. Vladimír Krepl, CSc.** | Ing. Petr Hutla, CSc.  
Production of Bio – Ethanol from Iraqi sugar cane Molasses and Evaluation of its Potential (Renewable Sources of Energy)

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| <b>Department:</b> | <b>Department of Crop Sciences and Agroforestry</b> |
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**1. doc. Ing. Bohdan Lojka, Ph.D.** | Mgr. Martina Janoušková, Ph.D.  
Ecology of arbuscular mycorrhizal fungi in the domestication of edible plants in the tropical Andes

**2. doc. Ing. Bohdan Lojka, Ph.D.** | Prof. Robert L. Bradley, Ph.D.  
Would planting trees in the agricultural landscape improve soil health through Arbuscular Mycorrhizal Fungi (AMF)?

**3. doc. Ing. Bohdan Lojka, Ph.D.** | doc. Mgr. Bohumil Mandák, Ph.D. (ČZU v Praze a AV ČR – Botanický Ústav)  
Morphological and genetic diversity of tropical agroforestry trees

**4. doc. Ing. Bohdan Lojka, Ph.D.** | doc. RNDr. Josef Raichard, Ph.D. (JČU), Thomas J. Greevy Ph.D. (University of Rhode Island)  
Value of agroforestry for biodiversity conservation

**5. doc. Ing. Bohdan Lojka, Ph.D.** | Prof. Dr. Ir. Patrick Van Damme  
Agroforestry tree domestication among farmers in selected region (country)

**6. doc. Dr. Ing. Eloy Fernández Cusimamani** | Ing. Miroslav Klíma, Ph.D.  
Microspore culture, embryogenesis and doubled haploid induction in *Brassica carinata*, *B. juncea* and *Eruca sativa*

**7. doc. Dr. Ing. Eloy Fernández Cusimamani** | doc. Ing. Pavel Klouček, Ph.D.  
Induced polyploidization *in vitro* of selected medicinal plants

**8. doc. Dr. Ing. Eloy Fernández Cusimamani** | Ing. Jana Šedivá, Ph.D.  
Induced polyploidization *in vitro* of selected ornamental plants

**9. prof. Ing. Ladislav Kokoška, Ph.D.**  
Antimicrobial activity and chemical composition of essential oil-bearing tropical plants against microorganisms causing spoilage of agricultural products

**10. prof. Ing. Ladislav Kokoška, Ph.D.**  
Antimicrobial effect of essential oils from Southeast Asian plants against bacterial pathogens causing respiratory diseases

**11. prof. Ing. Ladislav Kokoška, Ph.D.**  
Antimicrobial activity of Cambodian medicinal plants

**12. prof. Ing. Ladislav Kokoška, Ph.D.**  
Antimicrobial effect of medicinal plants used in Philippines for treatment of food-borne diseases

**13. doc. Ing. Zbyněk Polesný, Ph.D.** | Shamsul Khamis, Ph.D.

Ethnobotany among indigenous people Orang Asli in peninsular Malaysia

**14. doc. Ing. Zbyněk Polesný, Ph.D.** | Dr. Tran Thi Hoa

The wild, indigenous, underutilized fruit tree species (*Xerospermum noronhianum*, Sapindaceae): Domestication, utilization and conservation

**15. doc. Ing. Zbyněk Polesný, Ph.D.**

Diversity, nutritive value and local preference of some tropical underutilized plant species

**16. doc. Ing. Zbyněk Polesný, Ph.D.**

Diversity, properties and management of underutilized root and tuber crops in the Peruvian Amazon

**17. doc. Ing. Zbyněk Polesný, Ph.D.**

Ethnobotany and conservation of Sacha mango (*Grias peruviana*, Lecythidaceae) in the Amazon

**18. doc. Ing. Zbyněk Polesný, Ph.D.**

Ethnobotany of migrant communities in the Czech Republic

**19. doc. Ing. Zbyněk Polesný, Ph.D.**

Historical ethnobotany of the Czech Republic: an archival research

**20. doc. Ing. Zbyněk Polesný, Ph.D.**

Informal seed system effect on cultivated diversity in the Czech Republic: conservation and dissemination of neglected/underutilized crops and local landraces

**21. doc. Ing. Zbyněk Polesný, Ph.D.** | Dr. Tran Thi Hoa

Survey of *Dalbergia* spp. (Leguminosae) in Vietnam for identifying *Dalbergia oliveri* from a species complex for conservation

**22. doc. Ing. Zbyněk Polesný, Ph.D.** | Dr. Tran Thi Hoa

Origin evolution and diversity of Cà Te *Afzelia* spp. (Leguminosae): implication for Vietnam forest conservation and sustainable management

**23. doc. Ing. Zbyněk Polesný, Ph.D.**

Traditional agroforestry systems in Kyrgyzstan: implications for biodiversity conservation in the Central Asia

**24. doc. Ing. Zbyněk Polesný, Ph.D.**

Valorizing smallholder production and use of Cornelian cherry (*Cornus mas*) and true service tree (*Sorbus domestica*) in the Czech Republic

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| <b>Department:</b> | <b>Department of Animal Science and Food Processing</b> |
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**1. Doc. Ing. Karolína Brandlová, Ph.D.**

Ecology of African ungulates

**2. Prof. MVDr. Daniela Lukešová, CSc.**

The Geographical Distribution of Parasitic Zoonoses in Europe and Asia: the Role of Wildlife in the Transmission

**3. Doc. Francisco Ceacero Herrador, Ph.D.**

Characterization and improvement of the meat, goat and wool production of the local breed Meriz goat in Kurdistan

**4. Doc. Francisco Ceacero Herrador, Ph.D.** | Mgr. Barbora Černá Bolfíková, Ph.D.

Development of analytical methods for detection of history of populations

**5. Doc. Francisco Ceacero Herrador, Ph.D.** | Mgr. Martina Komárková, Ph.D. | Mgr. Jaroslav Šimek, Ph.D.

Nutritional landscape and competence among wild and domestic ungulates in the strictly protected area Gobi B, Mongolia

**6. Doc. Francisco Ceacero Herrador, Ph.D.** | Ing. Radim Kotrba, Ph.D.

Influence of selected amino acids in the performance and ecology of Cervids

**7. Doc. Francisco Ceacero Herrador, Ph.D.** | Ing. Radim Kotrba, Ph.D. | Dr. Bronson Strickland

Performance of the introduced population of white-tailed deer in the Czech Republic: comparison with other local Cervids and native populations in USA

**8. Prof. RNDr. Pavla Hejčmanová, Ph.D.**

Habitat Use, Prey Preference, and Social Interactions in free roaming large carnivores on Sir Bani Yas Island, UAE

**9. Prof. RNDr. Pavla Hejčmanová, Ph.D.**

Evaluation of feeding and welfare activities of wild animals on Sir Bani Yas Island, UAE

**10. Prof. RNDr. Pavla Hejčmanová, Ph.D.**

Trace elements bioavailability in the nutrition of wildlife

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| <b>Department:</b> | <b>Department of Economics and Development</b> |
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**1. prof. dr. ir. Patrick Van Damme** | Ing. Vladimír Verner, Ph.D. | dr. ir. Wouter Vanhove

Promoting value-chains of neglected and underutilised species: Biodiversity, Markets, Living standard

**2. Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová** | Ing. Vladimír Verner, Ph.D.

Role of traditional farming systems, agricultural practices and technology innovations on livelihood of rural and/or less developed regions worldwide

**3. Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová** | Ing. Petra Chaloupková Ph.D. | Ing. Vladimír Verner, Ph.D.

Consumer behaviour and household preferences towards tropical products: Lessons learnt from developed and developing regions

**4. Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová** | Ing. Petra Chaloupková

The lack of young labour in agriculture: the case of the Ukraine

**5. Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová** | Ing. Jiří Hejkrlík, Ph.D.

Application of Integrative Impact Assessment Framework for impact analysis of Fairtrade value chain certification and horizontal integration of cashew farmers in the coastal region of Kenya

**6. Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová** | Ing. Jana Mazancová, PhD

Assessing personality trait, cultural practices and moral principles as tools for improving natural resource management practices in Nigeria

**7. Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová** | Ing. Jana Mazancová, PhD

Evaluating Priorities on Socio-Economic Vs Environmental Development: A Comparative Assessment amongst Different Echelons of Youths in Nigeria

**8. Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová** | Ing. Jana Mazancová, PhD

Rural Women and Youth Empowerment through Agri-cooperatives in Selected Countries

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| <b>Department:</b> | <b>Department of Sustainable Technologies</b> |
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| <b>1. Topic:</b>                                  | <b>Impact of traditional processing and natural antioxidants on the quality and shelf-life of game meat</b>  |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | doc. Ing. Jan Banout, Ph.D.  |
| <b>Supervisor-consultant:</b>                     |  |
| <b>Prospective funding:</b>                       | Internal grant agency,   |
| <b>Annotation:</b><br>(150-200 words recommended) | The increasing demand for alternative meat sources leads to the invention of new meat products or to the effort to replace conventional meat (beef or pork) in traditional meat products. Moreover, the consumers' demand and their pressure to eliminate artificial substances in meat products open new opportunities to utilise natural substances as perspective antioxidants and antimicrobial agents. Since the visual appraisal of meat and meat products is critical for the consumers' purchasing decisions, as they relate colour to freshness, a suitable method to lower the amount of used chemical additives, added to meat products, seems to be the use of natural substances (e.g. spices and plant extracts). These substances are known to have a positive affect not only on the colour, but also on the shelf life of conventional meat products. Besides, they are a natural part of meat products and can also pleasantly affect the organoleptic characteristics of these products. The thesis will focus on the application and evaluation of natural substances and traditional processing (drying) and their impact on the sensory and technological properties of antelope meat. |

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| <b>2. Topic:</b>                                  | <b>Toxicological assessment of selected pollutants accumulated in aquatic vegetables grown in peri-urban wetlands</b>   |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Jan Banout, Ph.D.   |
| <b>Supervisor-consultant:</b>                     |   |
| <b>Prospective funding:</b>                       | Internal grant agency, Czech development cooperation project  |
| <b>Annotation:</b><br>(150-200 words recommended) | Aquatic vegetables such as Water spinach ( <i>Ipomoea aquatica</i> ), Water Mimosa ( <i>Neptunia oleracea</i> ), Cambodian mint ( <i>Polygonum odoratum</i> ) and others are intensively cultivated especially in South-East Asia. In this region they are important part of human diet. The same situation is in Cambodia. The numerous plots located around wetlands in peri-urban Phnom Penh, are important sources of edible aquatic vegetables for the city and other areas of Cambodia. Farmers in several wetlands near Phnom Penh make a good living by growing vegetables and selling them in local markets for human consumption. These vegetables, however, pose serious health hazards to consumers, since they are grown using wastewater, much of it polluted with heavy metals from industries as well as additional fertilizers and pesticides are also heavily applied. A cross-sectional study of pesticide handling practices and self-perceived symptoms of acute pesticide poisoning was conducted using questionnaire-based interviews with 89 pesticide sprayers in Boeung Cheung Ek (BCE) Lake, Phnom Penh, Cambodia. The study showed that 50% of the pesticides used belonged to WHO class I + II and personal protection among the farmers were inadequate (Jensen et al., 2011). Up to 80 % of Phnom Penh's domestic wastewater is pumped into the lakes of Phnom Penh, together with industrial and chemical |

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|  | <p>effluents from a growing industrial sector. Thus the main objective of this research is to monitor the consumer behavior and growing practices of selected aquatic vegetables in peri-urban areas of Phnom Penh in Cambodia. Further a representative sample collection and analyses with respect to contamination by potentially toxic elements (PTEs) such as Cd, Cu, Ni, Pb, Sb, Zn and other pollutants such as pesticides will be done. Finally a human health risk assessment will be published based on key indicators such as the Target Hazard Quotients (THQ).</p> |
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| <b>3. Topic:</b>                                  | <b>Influence of drying method on capsaicinoids content from different <i>Capsicum</i> species</b>   |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Jan Banout, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | Ing. Klara Urbanová PhD   |
| <b>Prospective funding:</b>                       | Internal grant agency,  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Chili peppers from different <i>Capsicum</i> species are used worldwide in foods for their pungent flavor, aroma, and to prolong food spoilage. With different capsaicin contents a different varieties offer a wide range of options for people all over the world. The food industry often relies on food additives to suppress microbial growth. Foods are commonly preserved by compounds such as nitrite, sodium benzoate, and sodium metabisulfite that have been tested and proven safe. However, there are occasional reports of allergic reactions. Natural preservatives such as essential oils isolated from some plant sources have been found to be effective antimicrobial agents. Similarly the research is underway to determine the potential for the application of chili pepper extracts in the food industry in place of artificial preservatives. As many other products the chilli peppers are usually processed by drying for its preservation. A limited number of studies were focused on the influence of drying method on capsaicinoids content in chilli peppers. Furthermore up to now a limited number of <i>Capsicum</i> species and chilli varieties were subjected to the investigation of drying process and its influence on final capsaicinoids content. Thus the main objective of this research is to investigate the influence of different drying methods (cabinet drying, solar drying and freeze drying) on the final content of capsaicinoids in <i>Capsicum</i> species. More than 70 varieties of different <i>Capsicum</i> species will be subjected to the investigation in this study. The antibacterial effect of natural extracts from fresh and dried varieties of chilli peppers will be tested as well.</p> |

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| <b>4. Topic:</b>                                  | <b>Influence of drying pre-treatments on final organoleptic and physical properties of dehydrated products</b>   |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | doc. Ing. Jan Banout, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | Ing. Helga Hernandez PhD   |
| <b>Prospective funding:</b>                       | Internal grant agency,   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Pretreatments, such as blanching, dipping and sulfating are common in most drying processes to improve product quality or process efficiency. The main objective of using blanching is to inactivate enzymes in products such as polyphenoloxidases (PPO) and peroxidase (POD) enzymes, which cause deterioration reactions, off-flavor and undesirable changes in color. Other purposes of blanching include the destruction of microorganisms, acceleration of drying rate by expelling intercellular air from the tissues, softening the texture or by</p> |

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|  | dissociating the wax on the products skin, and forming of fine cracks on skin of products. In recent years, exhaustive efforts have been made for an improvement in the quality retention of dried products by altering processing strategy and/or pretreatment. Thus the main purpose of this topic is to use modified dips and blanching pretreatments and investigate their influence on product quality and drying kinetics. |
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| <b>5. Topic:</b>                                  | <b>The influence of intensive agriculture practices on coral reef resilience in Sumatra</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Doc. Ing. Jan Banout, PhD  |
| <b>Supervisor-consultant:</b>                     |  |
| <b>Prospective funding:</b>                       | Internal grant agency (FTA, CULS)  |
| <b>Annotation:</b><br>(150-200 words recommended) | In coral reef damage it is usually difficult to discern the different synergically acting stressors resulting i.a. from climate change, pollution, overfishing but the long-term effects of eutrophication on inner shelf coral reefs has been reported in Florida or Great Barrier Reef. Poor ocean water quality caused by anthropogenic activity plays an important role in lowering the thermal tolerance (i.e. bleaching resistance) of symbiotic reef corals and there is a reported biophysical linkage between terrestrially-sourced dissolved inorganic nitrogen amount and the upper thermal bleaching thresholds of inshore reefs. On inner shelf coral reefs new inputs of nitrogen and phosphorus come primarily from terrestrial runoff which is associated with massive use of fertilizer on cropping land that tend to be located in the close proximity of the coast. The aim of the topic is to identify reef locations that exhibit lower resistance to thermal bleaching and explain the change in thermal-tolerance threshold by poor water quality caused by intensive agriculture. The study will be based on measuring the concentrations of terrestrially-sourced nutrients together with underwater observation of coral reef condition. These measures and observations will be conducted in intensive agricultural areas (river deltas) and in no agriculture areas and these areas will be compared subsequently. |

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| <b>6. Topic:</b>                                  | <b>Regional differentiation of small-scale biogas technology development, related driving factors and future prospects in rural areas of Southeast Asia</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Doc. Ing. Jan Banout, PhD  |
| <b>Supervisor-consultant:</b>                     | Ing. Jana Mazancová, PhD   |
| <b>Prospective funding:</b>                       | Internal grant agency (FTA, CULS)  |
| <b>Annotation:</b><br>(150-200 words recommended) | The anaerobic digestion process is an important technology in improving the environment as it solves organic waste management problems and simultaneously produces both biogas and fertiliser. The use of biogas plants is spreading in many developing countries of Southeast Asia and it has brought benefits to health, environment, economy and energy conservation. This dissertation should present the regional differentiation and the current status of small-scale biogas technology development, as well as examine related driving factors and future prospects. The goal is to provide quantitatively proven information about biogas use in rural areas of Southeast Asia and to assess its major characteristics. Furthermore, policy implications of biogas technology development should be explained and analysed, and policy recommendations should be drawn for consideration in terms to provide the insight into |

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|  | various potential scenarios of biogas technology development in target region. Such results should provide support for decision-makers in terms of development strategies and energy policy formations. |
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| <b>7. Topic:</b>                                  | <b>Social and economic assessment of small-scale biogas plants in developing world: A case of chosen country</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Doc. Ing. Jan Banout, PhD  |
| <b>Supervisor-consultant:</b>                     | Ing. Jana Mazancová, PhD   |
| <b>Prospective funding:</b>                       | Internal grant agency (FTA, CULS)  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Rural households use biomass (i.e. dried dung or firewood) to meet their energy needs. These demands are satisfied at the level of households, but accompanied with negative environmental side/effects such are land degradation and deforestation which often result in various social and economic challenges. In contrast to that, biogas technology is a useful technology in the production of renewable fuel – biogas and brings many benefits to the household. However, it is essential to assess those benefits.</p> <p>This dissertation will be focused on revealing social and economic aspects of small-scale biogas plants in developing world (on a case of chosen country or countries). The study design will be based on the mixed-approach of qualitative and quantitative methodology using tools such are questionnaire surveys, focus group discussions, field visits, observation and evaluation in terms of change in energy usage, kind of benefits, change in sanitation, gender empowerment and operational activities of small-scale biogas plant.</p> |

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| <b>8. Topic:</b>                                  | <b>Assessment of different designs of small-scale biogas plants in Southeast Asia</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Doc. Ing. Jan Banout, PhD   |
| <b>Supervisor-consultant:</b>                     | Ing. Jana Mazancová, PhD  |
| <b>Prospective funding:</b>                       | Internal grant agency (FTA, CULS)   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>The small-scale biogas plants are widely used as a possible treatment of manure in tropics. The production of biogas through the process of anaerobic digestion (AD) provides a clean, efficient, and low-cost renewable source of energy and the digested matter is a high-quality fertilizer for crops. However, there are various types of small-scale biogas plants in Southeast Asia and therefore there is an urgent need in assessment of those various designs and types.</p> <p>This dissertation will be focused on evaluating different designs of small-scale biogas plants in Southeast Asia. It will evaluate their pros and cons from technical, economic and environmental perspectives and provide recommendations for future implementation.</p> |

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| <b>9. Topic:</b>                                  | <b>Small-scale biogas plants and their environmental impacts reduction</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Doc. Ing. Jan Banout, PhD   |
| <b>Supervisor-consultant:</b>                     | Ing. Jana Mazancová, PhD  |
| <b>Prospective funding:</b>                       | Internal grant agency (FTA, CULS)   |
| <b>Annotation:</b><br>(150-200 words recommended) | The anaerobic digestion process is an important technology in improving the environment because it solves organic waste |

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|  | <p>management problems and simultaneously produces both biogas and fertiliser. The use of biogas plants has been spreading in many developing countries over last decades and it has brought benefits to health, environment, economy and energy conservation.</p> <p>This dissertation will be focused on the determining environmental impacts reduction through installation and use of small-scale biogas plants with comparing various scenarios (i.e.: current common practices and an improved scenario with AD plants to produce biogas and CHP plants to produce electrical and thermal power). The investigated environmental impacts should be Global Warming Potential (kg CO<sub>2</sub>-eq.), Acidification (kg SO<sub>2</sub>-eq.) and Eutrophication (kg PO<sub>4</sub>-eq.).</p> |
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| <b>10. Topic:</b>                                 | <b>Monitoring volatile compounds and fatty acid composition of tropical oils under different storage condition</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | prof. RNDr. Irena Valterová, CSc.  |
| <b>Supervisor-consultant:</b>                     | Ing. Klára Urbanová, Ph.D.   |
| <b>Prospective funding:</b>                       |  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Oxidation of lipids is one of the major causes of food deterioration, resulting in the formation of various compounds that impair product quality. Aldehydes, ketones, alcohols, alkanes and alkenes are some of the major volatile secondary lipid oxidation products. They affect flavour of oils and other food products containing fat. The objective of this research will be monitoring and analysis of volatile compounds of different tropical oils under different storage conditions, next the chemical composition fatty acids of these oils will be analysed. For characterization of volatile lipid oxidation products gas chromatography coupled to mass spectrometry (GC–MS) is the method of choice. Sample preparation for the analysis of volatile secondary lipid oxidation products involves various approaches, the solid phase microextraction (SPME) will be used in this research as main method. SPME can be used either for a rapid profiling of volatile compounds for qualitative purposes or for quantitation of particular compounds. Fatty acids will be analysed after suitable derivatisation using gas chromatography with mass spectrometry.</p> |

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| <b>11. Topic:</b>                                 | <b>Optimization of the production processes of solid biofuels in selected developing country with a focus on technological lines solutions</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Doc. Ing. Vladimír Krepl, CSc.  |
| <b>Supervisor-consultant:</b>                     | Ing. Tatiana Ivanova, Ph.D.   |
| <b>Prospective funding:</b>                       |   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p><b>Hypothesis:</b><br/>Existing technology lines for the production of solid biofuels are equipped with standard types of equipment (grinding, pressing etc. components) oriented on the processing of common type of raw biomass material. This fact makes difficult not only to sell such equipment but also to assure the users of technology lines with obtaining cheap and high-quality final product.</p> <p>The solution can be in optimizing the equipment of technological lines for solid biofuels production and its adoption to the specific conditions of potential users (region, country).</p> <p>The main research tasks (objectives) of the thesis are:</p> |

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|  | <ul style="list-style-type: none"> <li>- determination of potential sources of raw material (yearly accumulated quantity) in the region (country);</li> <li>- evaluation of final consumers of the product;</li> <li>- assessment t of the most suitable form of solid biofuel for the consumers;</li> <li>-analysis of the physico-chemical properties of the proposed form of biofuel (quality evaluation);</li> <li>- selection of an optimal equipment of a production technological line according to the specific proprieties, type of raw material, productivity and energy consumption.</li> <li>- elaboration of methodology for technological lines assembling based on outputs from the research.</li> </ul> |
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| <b>12. Topic:</b>                                 | <b>The study of a biochar application as a raw material for solid biofuel production in a form of pellets and briquettes</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Doc. Ing. Vladimír Krepl, CSc.  |
| <b>Supervisor-consultant:</b>                     | Ing. Petr Hutla, CSc. (VUZT)  |
| <b>Prospective funding:</b>                       |   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p><b>Hypothesis:</b><br/>Biochar represents a product that results from the process of carbonization or pyrolysis. This product has many positive properties for application in different areas. One of the most prospective areas of biochar application represents its application for energy purposes.<br/>In present, exist a problem with its utilization in initial form due to its low density. A solution to this problem represents densification of biochar in solid biofuel in different forms - pellets, briquettes.</p> <p><b>The objective of the thesis is:</b></p> <ul style="list-style-type: none"> <li>- determination of initial material properties (physicochemical and mechanical);</li> <li>- determination of the most suitable technology for initial processing of biochar;</li> <li>- determination of the most suitable technology for densification of biochar;</li> <li>- study of the abrasive effect of the initial material on the main working parts of pressing equipment;</li> <li>- analysis of properties of solid biofuel obtained from biochar;</li> <li>- analysis of emissions in the burning process of solid biofuels obtained from biochar.</li> </ul> |

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| <b>13. Topic:</b>                                 | <b>Treatment of organic waste from palm trees by chemical process and pyrolysis process</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Doc. Ing. Vladimír Krepl, CSc.   |
| <b>Supervisor-consultant:</b>                     | Ing. Jiří Sobek, Ph.D. (ČSAV), Ing. Petr Hutla, CSc. (VUZT)  |
| <b>Prospective funding:</b>                       |  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p><b>Hypothesis:</b> The abundant amount of biomass residue from palm tree can potentially be use as a renewable energy source, e.g. through conversion into other energy products such as biofuel. The use of biomass in other forms of energy products is more beneficial than the direct burning of biomass because it releases many pollutants into the air. One potential technique for alleviating these environmental concerns is to convert palm tree residues into bio-oil and bio-char via chemical treatment and by the pyrolysis as well.</p> |

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|  | <p><b>First principal objective of the thesis</b> is extracting the cellulosic component of palm tree waste and functionalizing this cellulose through graft copolymerization with acrylic acid. Provide test of extracted cellulose as biomass from the energetic viewpoint.</p> <p><b>Second principal objective of the thesis</b> is to determine the effects of different reaction temperature and different feed rate on the yield of products bio oil, gas and bio char.</p> <p>The cellulose extraction included hot alkali treatment with aqueous sodium hydroxide to remove the non-cellulosic binding materials or selective hydrolysis with catalyst. The alkali treatment is followed by an oxidative bleaching using per acid/hydrogen peroxide mixture with the aim of removing the rest of non-cellulosic materials to improve the fiber hydrophilicity and accessibility towards further grafting reaction.</p> <p>The proposed project is the design of chemical and pyrolysis process technology for palm oil tree residues (as bark, leaves, branches etc.). The cellulosic components as well as outputs from pyrolysis process to be use for the production of Bio oil, Syn Gas, and Char to get the environmental friendly products and to replace the fossil fuels. A collection of the samples of the Palm waste material from the different tropical and subtropical countries will be provide. The design of the process technology will be modeling with objective to get the maximum efficiency from this biomass and characterize the outputs with focus to disseminating the results from the research. Particularly, the advantages and disadvantages this biomass through the environmental and energetic point of view.</p> |
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| <b>14. Topic:</b>                                 | <b>Rehabilitation of postharvest technology in Ethiopia – focused towards Grain milling and Edible oil processing</b>   |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Vladimír Krepl, CSc.  |
| <b>Supervisor-consultant:</b>                     | Ing. Pavel Burian, Ph.D.  |
| <b>Prospective funding:</b>                       | Ministry of Industry Ethiopia + Aid for Trade – MPO ČR  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>The information from National Millers Association of Ethiopia confirmed increasing importance of the sector and its important role in import substitution for food-processing industry products. Nowadays, Ethiopia is not fully self-reliant in terms of food security in grain milling and bakery products industry. Ethiopia's total production of grain is not adequate to meet its demand; the national production only meets 65% of the country's requirements.</p> <p>The deplorable technical state of machines and equipment for milling grain and pressing oils is the current big problem in Ethiopia. Main objective of the thesis is to design the technological process-flow guideline for the repair and reconstruction of mills and machinery for the production of edible oils. Proposal for developing a methodology for training in maintenance and repair of machines will be an integral part of the thesis. Hypothesis: Edible oil processing is a crucial area in the Ethiopian food-processing sector. It consists of micro and small processors who make up around 75% of all processors in the sector.</p> |

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| <b>15. Topic:</b>       | <b>Energy production from cottonseed oil processing waste in the Eastern Ethiopia</b> |
| <b>Study Programme:</b> | Agriculture in Tropics and Subtropics   |

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| <b>Supervisor:</b>                                | doc. Ing. Vladimír Krepl, CSc.  |
| <b>Supervisor-consultant:</b>                     | Ing. Pavel Burian, Ph.D.  |
| <b>Prospective funding:</b>                       | Ministry of Industry Ethiopia + Aid for Trade – MPO ČR  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Eastern Ethiopia produces a lot of waste from cottonseed oil production. Due to the toxicity nature of this waste, it cannot be processed into feed for livestock (except poultry). Given that this area suffers a shortage of firewood, this waste has a potential as an alternative energy source. It offers good spinoffs in the cottonseed oil production process (increased economic self-sufficiency of oil pressing shops).</p> <p>At present the biomass utilization for the energetic potential in Ethiopia lies at the tail of UNDP raster of renewable sources energy utilization. Nevertheless, from biomass production point of view, Ethiopia being a cotton crop producing country, it is relatively well positioned to exploit the energy potential from the by-product of cottonseed oil production. The objective of the thesis is to investigate energy potential of the cottonseed residues through the laboratory tests and measurements. The specific objective of the thesis will be focused on the behaviour of biomass from the cottonseed residues in the form of briquettes during combustion such as heat efficiency, NO<sub>x</sub> and CO<sub>2</sub> emissions, moisture content and mechanical properties of briquettes. Hypothesis: Can this lays a foundation for reaching a 30% renewable energy share on energy needs for Ethiopia as prescribed in the National Strategic plan?</p> |

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| <b>16. Topic:</b>                                 | <b>Production of Bio – Ethanol from Iraqi sugar cane Molasses and Evaluation of its Potential (Renewable Sources of Energy)</b>  |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | doc. Ing. Vladimír Krepl, CSc.   |
| <b>Supervisor-consultant:</b>                     | Ing. Petr Hutla, CSc.  |
| <b>Prospective funding:</b>                       | Cooperation with the University of Baghdad, College of Agriculture Abu Ghraib. Tentative agreement. Iraqi candidate ... self-payer.  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Nowadays the petroleum products are running out of race due to unbalanced relation between supply and demand besides air pollution of sources. Fossil fuels are the primary global transportation energy source, but are also a limited resource. In addition, their continued use amplifies levels of SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>x</sub>, and CO<sub>2</sub> in the atmosphere, leading to increased acid rain and global greenhouse gas concentrations. The hike in petrol cost is mainly due to shortage of resources which leads to search for alternate fuel to replace fossil fuel. An eco - friendly bio-ethanol is one such alternate fuel that can be used in unmodified petrol engines with current fueling infrastructure and it is easily applicable in present day combustion engine, as mixing with gasoline (Hansen et al., 2005).</p> <p>Combustion of bio-ethanol results in relatively low emission of volatile organic compounds, carbon monoxide and nitrogen oxides.</p> <p>The emission and toxicity of bio-ethanol are lower than those of fossil fuels such as petroleum, diesel etc., (Wyman &amp; Hinman), 1990</p> <p>Sugarcane (<i>Saccharum officinarum</i> L.) is a perennial grass most often grown in the Southern Iraq in the Missan governorate for production sugar and molasses; however the sugar s extracted from sugarcane can be easily fermented to produce ethanol. Sugarcane is considered an ideal energy crop because it produces readily fermentable sugars and very high yields of</p> |

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|  | <p>green biomass. <i>Saccharomyces Cerevisiae</i> is the cheapest strain available for the conversion of biomass substrate.</p> <p>In this study, it is used for bio-ethanol production from Iraqi sugar cane molasses. The influencing parameters that effect the production of bio-ethanol from sugar cane molasses will be optimized.</p> <p>The research and particular laboratory tests will be provide at CULS Prague, in the Research Institute of Agriculture Engineering and the University of Baghdad, College of Agriculture Abu Ghraib.</p> <p>With respect to the fact that until present time nobody carry out the research of molasses from Iraqi sugarcane from the energetic viewpoint, the theme of thesis is possible consider as original one.</p> |
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| <b>Department:</b> | <b>Department of Crop Sciences and Agroforestry</b> |
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| <b>1. Topic:</b>                                  | <b>Ecology of arbuscular mycorrhizal fungi in the domestication of edible plants in the tropical Andes</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Doc. Ing. Bohdan Lojka, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | Mgr. Martina Janoušková, Ph.D., Inst. of Botany, Czech Academy of Sciences   |
| <b>Prospective funding:</b>                       | IGA FTZ, CIGA, student scholarship   |
| <b>Annotation:</b><br>(150-200 words recommended) | The tropical Andes are an important source of biodiversity including numerous plant species nowadays utilized as food. However, plant domestication has been one of the causes for decreasing biodiversity in these ecosystems. At present, conventional agricultural practice includes the use of chemical fertilizers and pesticides with negative impact on soil quality. Organic farming systems are less deleterious, but still lead to considerable losses in biodiversity and ecosystem services. Soil-dwelling arbuscular mycorrhizal fungi (AMF) form association with the majority of plant species and, by facilitating plant phosphorus uptake as the main benefit, constitute a functionally important group of microorganisms especially in tropical soils. AMF communities are sensitive to vegetation structure and physico-chemical soil characteristics. Changes in AMF diversity and community composition may impact on the functionality of the symbiosis. However, studies addressing these two important characteristics of mycorrhizal symbiosis simultaneously are scarce, especially in tropical soils. The objective of the proposed thesis is to determine the effect of plant domestication in the tropical Andes on mycorrhizal symbiosis: the taxonomic diversity of root colonizing AMF communities and their functionality in terms of mycorrhizal effects on plant nutrient uptake and growth. At least two native plant species will be studied in secondary forests, organic and conventional agricultural systems. The methodology will include 1) analysis of prevalence and diversity of AMF in field-sampled root and soil samples by microscopy and NGS; 2) determination of the infectivity and efficiency of the AMF communities in greenhouse and in-situ experiment. The results will render essential background information for potential management of AMF communities in the agricultural systems, which is considered a promising strategy to increase crop phosphorus acquisition efficiency. |

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| <b>2. Topic:</b>                                  | <b>Would planting trees in the agricultural landscape improve soil health through Arbuscular Mycorrhizal Fungi (AMF)?</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | doc. Ing. Bohdan Lojka, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | Prof. Robert L. Bradley, Ph.D., University of Sherbrook, Canada  |
| <b>Prospective funding:</b>                       | University of Sharebrook, Canada   |
| <b>Annotation:</b><br>(150-200 words recommended) | Brassica rapa is a major oilseed crop in both the whole Northern Europe, but also Northern U.S and Canada. Distinguishing features of B. rapa are its non-mycorrhizal roots and tissues that contain glucosinolates. Both of these features, combined with continuous monocropping, are expected to decrease the abundance of arbuscular mycorrhizal fungi (AMF) in soil |

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|  | <p>because: (1) AMF are obligate symbionts and, therefore, cannot grow and multiply in the absence of a host plant, and (2) glucosinolates that are released in soil may be catabolized to produce fungitoxic derivatives. While a decrease in AMF abundance should not pose a problem for <i>B. rapa</i>, it is expected to induce stress in other mycotrophic crops grown in rotation with <i>B. rapa</i> (e.g. barley or wheat). In fact, most agronomic crops rely on the AMF symbiosis to enhance nutrient uptake, drought resistance and protection against root pathogens. Several fast-growing trees, such as poplars (<i>Populus</i> spp.), also form symbiotic associations with AMF. We hypothesize, that if intercropped with <i>B. rapa</i>, poplars roots could maintain a long-term presence of active AMF biomass. Hence, poplar roots could provide a “nursery” of AMF inocula in soils for mycotrophic crops grown in rotation with <i>B. rapa</i>. The research will attempt to demonstrate these phenomena through a series of field, microcosm and laboratory studies. The results are expected to provide strong science-based arguments for the implementation of tree-based intercropping systems in temperate climates.</p> |
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| <b>3. Topic:</b>                                  | <b>Morphological and genetic diversity of tropical agroforestry trees</b>  |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | doc. Ing. Bohdan Lojka, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | doc. Mgr. Bohumil Mandák, Ph.D. (ČZU v Praze a AV ČR – Botanický Ústav)  |
| <b>Prospective funding:</b>                       | IGA FTZ, CIGA, student scholarship   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Tropical regions contain high tree species diversity, but most of these tree species were never intensively studied. On the other hand, high number of native tropical trees are used by local population for their useful products and services, such as fruit, timber, fuelwood, medicine, fodder etc. The sources of germplasm of those semi-domesticated multipurpose trees are usually unknown and their further domestication could help the farmers to increase their production. Moreover the genetic pool of the species can be narrow by selection by farmers and thus there is an urgent need to find useful strategies for conservation of their genetic diversity. In the last decade, there has been an enormous increase worldwide in the use of molecular marker methods to assess genetic variation in trees. These approaches can provide significant insights into the defining features of different taxa and this information may be used to define appropriate management strategies for species. The results from molecular marker research are very limited to date for tropical trees and especially for the tropical agroforestry species. The objective of this thesis is to evaluate morphological and genetic diversity of selected agroforestry tree species. The specific objective is to investigate relationships and to characterize the level and structure of genetic variation of selected tree populations (e.g. differences among wild and domesticated populations of the species). The study will include on-site collection of morphological data, tissue samples of selected species and then laboratory analysis at the CULS molecular genetic labs. The marker techniques will be based on the polymerase chain reaction (PCR). The results could help us to identify appropriate strategies for selected species germplasm conservation and future domestication.</p> |

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| <b>4. Topic:</b>                                  | <b>Value of agroforestry for biodiversity conservation</b>  |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Bohdan Lojka, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | doc. RNDr. Josef Raichard, Ph.D. (JČU), Thomas J. Greevy Ph.D. (University of Rhode Island)   |
| <b>Prospective funding:</b>                       | IGA FTZ, CIGA, student scholarship  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Tropical forests contain some of the highest biodiversity of flora and fauna in the world. However, biodiversity at all scales is increasingly threatened by a variety of human-induced structural impacts. Replacement of native forest through clearing for agriculture continues to be a major issue worldwide. The agroforestry, renowned for their high tree-species richness and complex vegetation structure, stands out as promising biodiversity conservation tools. A number of studies confirm that agroforestry systems are able to conserve biological diversity. The objective of the proposed research is to assess the potential impact of agroforestry on biodiversity conservation in selected tropical region. We focus on relating habitat and animal diversity (various taxa) in selected agroforestry systems as compared with primary and secondary forests and agriculture. To assess the vegetation structure and diversity, we will choose number of representative sites in agroforestry and other habitats. On each site one defined plot will be located and vegetation structure (tree, low and high shrub and herbaceous layer) will be sampled and analyzed according the standard methods. The sampling of selected taxa of (in)vertebrate species richness and diversity will be conducted on the same sampling plots in all land-use systems, according to appropriate methodology that is used for catching and observing the different animals (e.g. insects, birds, mammals, amphibians, fish etc.). Animals will be trapped, identified, morphometric and reproductive measurements taken, and a tissue or mouth swab sample taken for later DNA analysis. The data collected on vegetation and animals will be analyzed with statistical models and traditional biodiversity analysis tools. The outputs of the proposed research will be: 1. Assessment of animal diversity in selected taxons; 2. Evaluation of the capacity of agroforestry to support natural biodiversity; 3. Determination of which habitat parameters are important to animal diversity; 4. Determination of phylogenetic and taxonomic relationships; and/or 5. Value of that biodiversity of integrated pest and crop management. This research will increase our knowledge about biodiversity conservation in tropical agroecosystems and help determine the value of ecosystem services of these systems.</p> |

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| <b>5. Topic:</b>                                  | <b>Agroforestry tree domestication among farmers in selected region (country)</b>   |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Bohdan Lojka, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | Prof. Dr. Ir. Patrick Van Damme (Ghent University)  |
| <b>Prospective funding:</b>                       | IGA FTZ, CIGA, student scholarship  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>The trees are indispensable part of agricultural systems, especially in tropical countries. The multi-purpose trees (MPT) provide farmers with wide variety of products and services and these so called agroforestry systems (AFS) are traditionally practiced almost exclusively by small-scale farmers. The aim of this study is to better understand the diversity of woody species, their uses, importance, state of domestication and preferences among farmers in selected region or country. Knowing the</p> |

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|  | <p>preferences, any domestication efforts should be able to better address the needs of these people and their land use systems. Possibly resulting increased land cover dedicated to AFS due to wider adoption of these could help in the fight against global land degradation. The first objective of this study is prioritization of MPT species preferred by farmers in selected region(s) of and the comparison of the results with previous studies to check if and how preferences of farmers have changed. Among the secondary objectives of the work is the evaluation of how these preferences differ between regions, characterization and description of highly valued native tree species and their products, their presence on farmers' fields, silvicultural management, germplasm availability, pest and disease-related problems, traits desired by farmers and their incorporation within AFS. The methodology of the data collection will be based on a number of classical ethnobotanical approaches and manuals published by ICRAF (World Agroforestry Centre).</p> |
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| <b>6. Topic:</b>                                  | <b>Microspore culture, embryogenesis and doubled haploid induction in <i>Brassica carinata</i>, <i>B. juncea</i> and <i>Eruca sativa</i></b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Dr. Ing. Eloy Fernández Cusimamani   |
| <b>Supervisor-consultant:</b>                     | Ing. Miroslav Klíma, Ph.D.  |
| <b>Prospective funding:</b>                       | Project NAZV QJ1510172 and RO0417 (Crop Research Institute in Prague)   |
| <b>Annotation:</b><br>(150-200 words recommended) | The family Brassicaceae is very diverse and includes many crops worldwide. Some of them are grown also in tropical and subtropical climate as important oilseeds, vegetables or spices. Such crops include, for example, Abyssinian mustard ( <i>Brassica carinata</i> A. Braun), Indian mustard ( <i>B. juncea</i> L.) or Rocket ( <i>Eruca sativa</i> L. (Mill.)). New cultivar development through traditional breeding usually takes 7-9 years. Progressive biotechnological approaches, such as regeneration of completely homozygous plants from microspore embryos under <i>in vitro</i> conditions, can contribute to significant shortening of the whole process. By using the doubled haploid method, it is also possible to create such genetic combinations that are difficult to obtain by conventional techniques. The main aim of the Thesis will be to introduce, optimize and apply microspore culture technique in selected important members of the family Brassicaceae and the subsequent regeneration of genotypes with the required parameters. |

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| <b>7. Topic:</b>                                  | <b>Induced polyploidization <i>in vitro</i> of selected medicinal plants</b>   |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | doc. Dr. Ing. Eloy Fernández Cusimamani  |
| <b>Supervisor-consultant:</b>                     | doc. Ing. Pavel Klouček, PhD. (FAPPZ ČZU), Ing. Jana Šedivá, Ph.D. (Výzkumný ústav pro krajinu a okrasné zahradnictví)   |
| <b>Prospective funding:</b>                       |  |
| <b>Annotation:</b><br>(150-200 words recommended) | Mitotic polyploidization <i>in vitro</i> is widely used method which allows getting various breeding goals (e.g. higher yields, change of chemical composition, equalizing of ploidy level etc.).The main objective of this PHD thesis is to get plants with new physiological, morphological, anatomical and biochemical characteristics. Induced polyploidization will be realized by oryzalin (antimitotic toxin) application on nodal (germinating plants) cultivated in <i>in vitro</i> conditions. The direct method |

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|  | (chromosome counting) and indirect method (flow cytometric assessment of nuclear DNA content) will be used as control of polyploids. Via mentioned mitotic polyploidization in vitro we can get a new breeding material. |
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| <b>8. Topic:</b>                                  | <b>Induced polyploidization <i>in vitro</i> of selected ornamental plants</b>   |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Dr. Ing. Eloy Fernández Cusimamani   |
| <b>Supervisor-consultant:</b>                     | doc. Ing. Pavel Klouček, PhD. (FAPPZ ČZU), Ing. Jana Šedivá, Ph.D. (Výzkumný ústav pro krajinu a okrasné zahradnictví)  |
| <b>Prospective funding:</b>                       |   |
| <b>Annotation:</b><br>(150-200 words recommended) | Mitotic polyploidization in vitro is widely used method which allows getting various breeding goals (e.g. higher yields, change of chemical composition, equalizing of ploidy level etc.).The main objective of this PHD thesis is to get plants with new physiological, morphological, anatomical and biochemical characteristics. Induced polyploidization will be realized by oryzalin (antimitotic toxin) application on nodal (germinating plants) cultivated in in vitro conditions. The direct method (chromosome counting) and indirect method (flow cytometric assessment of nuclear DNA content) will be used as control of polyploids. Via mentioned mitotic polyploidization in vitro we can get a new breeding material. |

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| <b>9. Topic:</b>                                  | <b>Antimicrobial activity and chemical composition of essential oil-bearing tropical plants against microorganisms causing spoilage of agricultural products</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | prof. Ing. Ladislav Kokoška, Ph.D.  |
| <b>Supervisor-consultant:</b>                     |   |
| <b>Prospective funding:</b>                       |   |
| <b>Annotation:</b><br>(150-200 words recommended) | Tropical plant taxa are important industrial sources of essential oils (EOs). For example, plants belonging to the Eucalyptus genus are known to contain more than 200 various types of EOs, which are commonly used in various agricultural applications. Despite the great economical potential of essential oil-bearing tropical plants, a number species endemic in tropical regions have not systematically been investigated for their chemical composition and biological effects.<br>In frame of this thesis, the antimicrobial activity of EOs and their constituents from tropical plants selected based on chemotaxonomical and ethnobotanical data will be tested in liquid and vapour phase using broth microdilution volatilisation method against broad spectrum of bacterial (e.g. representatives of genera <i>Corynebacterium</i> , <i>Erwinia</i> , <i>Pseudomonas</i> , and <i>Xanthomonas</i> ) and fungal (e.g. <i>Aspergillus</i> spp., <i>Fusarium</i> spp., and <i>Penicillium</i> spp.) pathogens of agricultural crops and plant foods. The chemical composition of the most effective EOs will be characterized using gas chromatography/mass spectrometry.<br>The supposed results of the thesis can be used for development of new bio-agents for control pathogenic microorganisms causing spoilage of agricultural products. In addition, the result will deepen the knowledge on chemical composition and biological effects of essential oil-bearing tropical plants. |

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| <b>10. Topic:</b>                                 | <b>Antimicrobial effect of essential oils from Southeast Asian plants against bacterial pathogens causing respiratory diseases.</b>   |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | prof. Ing. Ladislav Kokoška, Ph.D.  |
| <b>Supervisor-consultant:</b>                     |   |
| <b>Prospective funding:</b>                       |   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Respiratory tract infections belong to major health care problems worldwide due to their high morbidity and mortality rates, whereas plant-derived products are an option for treatment and alleviation of their symptoms. Despite the fact that Southeast Asia is rich genetic centre essential oil-bearing families such as Myrtaceae, Myristicaceae, Piperaceae and Zingiberaceae, many endemic species belonging to these families remain phytochemically and pharmacologically unexplored.</p> <p>In frame of this thesis, the antimicrobial activity of EOs and their constituents from Southeast Asian plants selected based on chemotaxonomical and ethnobotanical data will be tested in liquid and vapour phase using broth microdilution volatilisation method against broad spectrum of bacterial pathogens causing respiratory infections such as <i>Haemophilus influenzae</i>, <i>Streptococcus pneumoniae</i>, <i>Streptococcus pyogenes</i>, <i>Staphylococcus aureus</i>, and <i>Pseudomonas aeruginosa</i>. The chemical composition of the most effective EOs will be characterized using gas chromatography/mass spectrometry.</p> <p>The supposed results of the thesis can be used for development of new herbal-based pharmaceutical preparations and may contribute to low-cost and sustainable control of food-borne diseases in Southeast Asia. In addition, the result will deepen the knowledge on chemical composition and biological effects of essential oil-bearing plants.</p> |

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| <b>11. Topic:</b>                                 | <b>Antimicrobial activity of Cambodian medicinal plants.</b>  |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | prof. Ing. Ladislav Kokoška, Ph.D.  |
| <b>Supervisor-consultant:</b>                     |   |
| <b>Prospective funding:</b>                       |   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>It is estimated that there are about 350 generic infectious diseases in the world today, whereas more than half of them are potentially endemic to Cambodia. Thus, alleviating the burden of major infectious diseases is one of the main concerns of the health sector in the region. In Cambodian folk medicine, the use of anti-infective herbal preparations has great tradition in many regions of the country. Despite this rich tradition, the anti-infective potential of herbal preparations used in Cambodian traditional medicine has poorly been studied by modern laboratory methods. In frame of this thesis, the antimicrobial activity of crude extracts and their constituents from medicinal plants used in folk medicine for treatment of infectious diseases will be tested using broth microdilution methods against broad spectrum of microorganisms. The chemical composition of the most prospective extracts will be characterized using high-performance liquid chromatography and mass spectrometry and nuclear magnetic resonance spectroscopy. The supposed results of the thesis can be used by food, pharmaceutical and cosmetic industries for development of new herbal-based food, pharmaceutical and cosmetic preparations. In addition, the result may contribute to</p> |

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|  | low-cost and sustainable control of communicable diseases in Cambodia. |
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| <b>12. Topic:</b>                                 | <b>Antimicrobial effect of medicinal plants used in Philippines for treatment of food-borne diseases.</b>  |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | prof. Ing. Ladislav Kokoška, Ph.D.   |
| <b>Supervisor-consultant:</b>                     |  |
| <b>Prospective funding:</b>                       |  |
| <b>Annotation:</b><br>(150-200 words recommended) | The Philippines continues to witness outbreaks of food-borne infections like cholera, salmonellosis and shigellosis. In many regions of the country, there is great tradition of anti-infective herbal preparations use in folk medicine. Despite this rich tradition, the possibilities of development of new modern anti-infective products based on herbal preparations used in Philippian traditional medicine have poorly been studied. In frame of this thesis, the antimicrobial activity of crude extracts and their constituents from medicinal plants used in folk medicine for treatment of infectious diseases will be tested using broth microdilution methods against broad spectrum of microorganisms. The chemical composition of the most prospective extracts will be characterized using high-performance liquid chromatography and mass spectrometry and nuclear magnetic resonance spectroscopy. The supposed results of the thesis can be used by food, pharmaceutical and cosmetic industries for development of new herbal-based food, pharmaceutical and cosmetic preparations. In addition, the result may contribute to low-cost and sustainable control of food-borne diseases in Philippines. |

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| <b>13. Topic:</b>                                 | <b>Ethnobotany among indigenous people Orang Asli in peninsular Malaysia</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | Shamsul Khamis, Ph.D. (UKM, Malaysia)  |
| <b>Prospective funding:</b>                       | Erasmus credit mobility programme, Ekthagastiftelsen Foundation  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Previous ethnobotanical studies from Malaysia demonstrates a remarkable significance of wild food plants as an intangible cultural heritage in the area where local flora has contributed to local people's dietary diversity. Seventy species of wild edible herbs and over 500 wild fruit species were documented in the area so far. However, none of the previous studies used quantitative analysis of ethnobotanical data neither the analysis of food medicine/medicinal food aspect.</p> <p>This study should contribute to the preservation of the traditional knowledge in the country, which continuously experience losses of folk knowledge due to increasing deforestation, integration into mainstream society and urbanization. It can be assumed, that people in this region still gather wild food plant species, predominantly wild fruits and vegetables. Although living in biodiverse-rich environment, people tend to use common wild plant species for food.</p> <p>The aim of this study is to conduct an in-depth ethnobotanical survey, aimed at documenting uses of wild food and medicinal plants among Orang Asli people living in different plant ecosystems in peninsular Malaysia, using modern ethnobotanical methods. The Royal Belum Natural Reserve in the north of the peninsula has been proposed as a main study site. It is expected to retain important reservoirs of</p> |

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|  | <p>ethnobotanical knowledge, bearing in mind its unique biological as well as cultural richness in the context of a relatively small, developed tropical country.</p> <p>Thesis aims (1) To record the traditional knowledge on wild food plants among Orang Asli in different plant ecosystems, (2) to determine the most culturally important plant species, botanical families and food categories, (3) To identify promising underutilized food species and medicinal foods, (4) To analyze collection patterns in the context of plant species conservation, (5) To compare the diversity of wild food plants and their uses between different biomes and ethnic groups.</p> |
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| <b>14. Topic:</b>                                 | <b>The wild, indigenous, underutilized fruit tree species (<i>Xerospermum noronhianum</i> (Blume) Blume: Sapindaceae): Domestication, utilization and conservation</b>  |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | Dr. Tran Thi Hoa  |
| <b>Prospective funding:</b>                       | Institute of Agricultural Genetics, Center for Biodiversity and Biosafety and local government in HLNR provide financial support on field trips and meals during the field trips in Vietnam.  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Buffer zone of Huu Lien Nature Reserve (BZHL) is among the poorest in the province (Lang Son) and food security problems are severe. Fruit trees are essential in the diets of rural people in these areas, providing: i) nutrients and vitamins to diets otherwise dominated by upland rice and maize; ii) food at times where stocks of annual crops are low; iii) sources of income through commercialisation. Despite the generally accepted importance of trees, most food security programmes focus on cereals. The potential of fruit trees is under-utilised. <i>Xerospermum noronhianum</i>, locally known as ké (leech's longan) is a multipurpose fruit tree species of high economic importance, native to the limestone forests of Vietnam. This species along with lychee (<i>Litchi chinensis</i> Sonn) belong to the Sapindaceae family. The fruits of <i>X. noronhianum</i> are edible, with a sweet and pleasant taste, resembling those of <i>Nephellium lappaceum</i>, another Sapindaceae species that yields the commercially important rambutan tropical fruit. The fruit of <i>X. noronhianum</i> is too small to be of any commercial value, but the species is a source of medicines against diarrhea, stomach pains and Alzheimer disease. This project aims to: i) increase food security and livelihoods for people in BZHL through facilitating access to knowledge about and germplasm of fruit tree species with focus on <i>X. noronhianum</i>; ii) fully training marketing agricultural production including domestication of ethno-botanic productions adapted to environmental change, their product geographical indicator (PGI); iii) Conservation guidelines for conservation and sustainable use. We require a representative group of plants with well established in traditional cultivation and uses, rich in species occupying a wide range of terrestrial habitats. If this can be done for a genus that is part of an extensive continental flora, then inferences relevant to conservation and land management will be well grounded. The student will: i) collect data on the species, uses (medical and other uses), ethnobotanical data including traditional knowledge in cultivation in Nung, Dao and Kinh communities; ii) collect data on cultivation conditions (eco-agricultural data) for domestication; iii) collect data on conservation status of the species to promote conservation guidelines.</p> |

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|  | We concentrate our investigation on two local landscapes within BZHL: 1) Huu Lien lime stone in Huu Lung commune; and 2) Yen Thinh buffer zone. These provide complementary case studies in distinct floristic regions differing in postglacial vegetation history, soils, climate and disturbance regime. |
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| <b>15. Topic:</b>                                 | <b>Diversity, nutritive value and local preference of some tropical underutilized plant species</b>   |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | Dr. Luisa Custódio (Centro de Ciências do Mar, MarBiotech group, Faro, Portugal)  |
| <b>Prospective funding:</b>                       | IGA FTZ, Christensen Fund, Erasmus plus programme   |
| <b>Annotation:</b><br>(150-200 words recommended) | It is generally argued that neglected and underutilized crops can significantly contribute to secure qualitative as well as quantitative nutrition of millions of people. Tropical areas are great reservoir of plant resources, which are now under threat due to deforestation and subsequent degradation of the cleared land. Among these species several plants with significant nutritive value and intraspecific variability occur being utilized by natives in times of food scarcity or they are simply underutilized due to several reasons thus their diversity and nutritive potential remains unknown. The scientific neglecting of these species could lead to continual decrease of their genetic variability, which can limit their use potential for human nutrition as well as human medicine as a source of bioactive compounds. The study will include several cultivated as well as wild species, e.g. <i>Musa</i> spp. The plant material will be characterized from the point view of morphological and genetic diversity, nutritive value, and sensoric characteristics. |

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| <b>16. Topic:</b>                                 | <b>Diversity, properties and management of underutilized root and tuber crops in the Peruvian Amazon</b>   |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | Gisella Cruz García, Ph.D. (CIAT, Cali, Colombia)<br>María Elena Chuspe Zans (UNIA, Pucallpa, Peru)  |
| <b>Prospective funding:</b>                       | IGA FTZ, FINCyT (Peru), EULALINKS Erasmus programme  |
| <b>Annotation:</b><br>(150-200 words recommended) | It is generally argued that neglected and underutilized crops, often conserved through use in local rural or even marginal agroecosystems, can significantly contribute to secure qualitative as well as quantitative nutrition of millions of people. The Amazon basin is a great reservoir of plant resources, which are now under threat due to deforestation and subsequent degradation of the cleared land. Among these species several plants with edible roots and tubers occur being utilized by natives in times of food scarcity or they are simply underutilized due to cultivation of popular “boom” crops such as Inca peanut or <i>Myrciaria dubia</i> . The scientific neglecting of these edible roots and tubers could lead to continual decrease of their genetic variability, which can limit their use potential for human nutrition as well as human medicine as a source of bioactive compounds. The study will include several species, e.g. <i>Dioscorea trifida</i> , <i>Dioscorea bulbifera</i> , <i>Calathea allouia</i> , <i>Xanthosoma sagittifolium</i> , <i>Colocasia esculenta</i> , <i>Canna edulis</i> , <i>Pachyrrhizus ahipa</i> , etc. The species will be characterized from the point view of morphological and genetic diversity, nutritive value, and traditional use and management. |

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| <b>17. Topic:</b>                                 | <b>Ethnobotany and conservation of Sacha mango (<i>Grias peruviana</i>, Lecythydaceae) in the Amazon</b>  |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | Prof. Dr. Ir. Patrick Van Damme   |
| <b>Prospective funding:</b>                       | IGA, CIGA, Eulalinks  |
| <b>Annotation:</b><br>(150-200 words recommended) | It is generally argued that neglected and underutilized species can significantly contribute to secure qualitative as well as quantitative nutrition of millions of people. The Amazon basin is a great reservoir of plant resources, which are now under threat due to deforestation and subsequent degradation of the cleared land. Among these species <i>Grias peruviana</i> is fruit species from the family Lecythydaceae – one the very abundant family in the Amazonian rainforest. This is the semi-domesticated species which is listed in the IUCN red book of endangered plant species. According to our best knowledge this species has not been subjected to any previous comprehensive study of its ecology, ethnobotany and domestication in the context of conservation issues. This study could significantly contribute to the conservation of the species in the wild and to its domestication possibly leading to its conservation through use approach. |

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| <b>18. Topic:</b>                                 | <b>Ethnobotany of migrant communities in the Czech Republic</b>   |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | prof. Andrea Pieroni (University of Gastronomic Sciences, Polenzo Bra, Italy)   |
| <b>Prospective funding:</b>                       | IGA FTZ   |
| <b>Annotation:</b><br>(150-200 words recommended) | It is often assumed that the demand for traditional plant resources will decrease with increasing welfare, because they will be replaced in time by modern cultivated and synthetic products. Moreover, the reliance on medicinal plants may decline in the long term as modern health care facilities become available. Recent studies on urban ethnobotany, however, contradict these assumptions. Research on the use of medicinal plants by ethnic minorities in EU and in the USA has shown that immigrants generally adhere to their culture and continue their traditional medical practices after emigration. Instead of being replaced by conventional medicine as part of the process of cultural adaptation, the demand for medicinal plants remains, even when modern health care facilities are available. Most immigrants in the Czech Republic have a health insurance so they are able to take full advantage of Czech health care facilities. However, they have probably retained their traditional concepts of health and illness, where also daily diet plays an important role. Consequently, the thesis should answer the following questions: Do these immigrants continue to use herbal medicine and traditional foods from their homeland? If so, for which ailments do they use these plants? |

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| <b>19. Topic:</b>             | <b>Historical ethnobotany of the Czech Republic: an archival research</b> |
| <b>Field of study:</b>        | Agriculture in Tropics and Subtropics                                     |
| <b>Supervisor:</b>            | doc. Ing. Zbyněk Polesný, Ph.D.   |
| <b>Supervisor-consultant:</b> | Dr. Jiří Woitsch (Etnologický ústav AV ČR)                                |

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| <b>Prospective funding:</b>                       | IGA FTZ  |
| <b>Annotation:</b><br>(150-200 words recommended) | A valuable source of information for the study of ethnobotany is one of the archival collections deposited in the department of documentation and archival collections of the Centre of Scientific Information of the Institute of Ethnology of the Academy of Sciences of the Czech Republic. This neglected collection includes systematically structured information concerning in particular the importance of different plant species in folk culture. It is not only their therapeutic effects, but also their role in social anthropology, the family and the ceremonies or in folk magic. The collection includes local plant names in the dialects as well as links to related botanical collections. This archival study could tell us important information on historical use of plant resources especially in terms of their medical and veterinary applications |

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| <b>20. Topic:</b>                                 | <b>Informal seed system effect on cultivated diversity in the Czech Republic: conservation and dissemination of neglected/underutilized crops and local landraces</b>  |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | prof. Patrick Van Damme  |
| <b>Prospective funding:</b>                       | IGA FTZ  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>International organizations dealing with agriculture and new sources (FAO, Bioversity International, etc.) constantly stress the importance of preserving indigenous local crops and their old and landraces and related wild species. Especially local varieties excel in high genetic variability and bear especially valuable genes of resistance to biotic and abiotic stresses. They have so much importance in breeding, genetics and overall food security. In addition, in relation to current climate change, where agriculture is a significant contributor to the growing these crops one of the recommended sustainable agricultural measures to curb climate change. These crops and varieties are in fact a long adapted to local conditions, and in particular showing stable revenues without dependence on agricultural inputs such as mineral fertilizers, pesticides and artificial irrigation. In addition to these benefits represent a significant cultural heritage of the past, which unfortunately nowadays conventional agriculture is declining rapidly into oblivion. Last but not least, local crops are practically commercially non-bred on uniformity, appearance or yield, and therefore contain a substantial amount of original vitamins, trace elements and other biologically active substances that contribute to nutrition and health.</p> <p>This study captures the quantity and diversity of cultivated species distributed by non-profit organization Gengel. Data analysis reveals the most popular species and varieties among growers in the network, including factors affecting the interest of the growers in cultivation of orphan and neglected crops. The study will provide the analysis of plant material flows and return of regional varieties to their original growing areas. The study will focus on the aspects and issues of motivation principle of public seed banks - the return of distributed seeds from growers. The results will reveal the rate of return and the total current interest in this valuable form of cultural heritage among Czech growers. In addition, determining what type of growers are most interested in those resources. This study focused on the expansion of agricultural biodiversity contributes to emphasize the importance of public and community seed banks in the global challenge of saving the gene pool of crops. A more thorough analysis of the spread of local crops, although so far little noticed, is important</p> |

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|  | to the overall understanding of the protection of these resources. Documentation of the functioning of community seed bank network, based on voluntary and non-profit activities of several interested small growers can serve as an example of low-cost sustainable conservation and dissemination of agricultural biodiversity in the developing world, which face a rapid and often irreversible loss of diversity of crops. |
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| <b>21. Topic:</b>                                 | <b>Survey of <i>Dalbergia</i> spp. (Leguminosae) in Vietnam for identifying <i>Dalbergia oliveri</i> from a species complex for conservation)</b>   |
| <b>Study Programme:</b>                           | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | Dr. Tran Thi Hoa  |
| <b>Prospective funding:</b>                       | Institute of Agricultural Genetics, Center for Biodiversity and Biosafety and local government in HLNR provide financial support on field trips and meals during the field trips in Vietnam.  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Most tropical ecosystems are characterized by a huge biodiversity that is presently endangered in many countries, hence the need for rapid, accurate and effective ways to document the biodiversity of tropical environments. Identification of <i>Dalbergia</i> spp. for monitoring timber trade (IDMTT) and conservation of species diversity in Vietnam forests has been highly debated. The IDMTT is moreover still not well characterized, particularly the spatial variation of community composition (beta diversity). Four specific aims had been defined: (i) Carrying out morphology-based as well as DNA-based studies and evaluate its statistical performance when the diversity is estimated by community samples; (ii) Quantify morphological analyses and sequences of ITS region and matK gene to describe a newly revised taxon (commonly known as the Cẩm Lai) and redefine <i>D. oliveri</i>; (iii) A description of a new-revised species will be presented.</p> <p>Vietnamese <i>Dalbergia oliveri</i> or Cẩm Lai Bông (vernacular name) is native to Vietnam and found in dense tropical evergreen or semi-deciduous forest. It is hard and heavy with a color that ranges from reddish -orange to a deep red, oftentimes with dark stripes. The species is a quite valuable timber in SE Asia and in the Indochina region. It is currently listed in the IUCN Red List (A1cd) and meets the criteria for CITES category II B since it is at risk of extinction due to illegal logging and deforestation. However, the identification of this species remains problematic until now, hindering its conservation. The aim of this study is therefore to apply morphology and DNA-based taxonomic identification methods to try to overcome this problem and to complete a taxonomic revision of the <i>D. oliveri</i> species complex.</p> <p>The student will: i) collect plants and making specimen vouchers; ii) morphological identification; iii) applying DNA-based taxonomic identification methods such as using sequences of ITS region and matK gene to describe a newly revised taxon. Study Localities: We concentrate our investigation on three national parks namely Chumomray, Cat Tien and Chuyansin National Parks.</p> |

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| <b>22. Topic:</b>       | <b>Origin evolution and diversity of Cà Te <i>Azelia</i> spp. (Leguminosae): implication for Vietnam forest conservation and sustainable management</b> |
| <b>Study Programme:</b> | Agriculture in Tropics and Subtropics   |

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| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | Dr. Tran Thi Hoa   |
| <b>Prospective funding:</b>                       | Institute of Agricultural Genetics, Center for Biodiversity and Biosafety and local government in HLNR provide financial support on field trips and meals during the field trips in Vietnam.   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Tropical Rain Forest Forests (TRFF) represent the most diverse terrestrial ecosystems on the planet. Despite the important services they provide, SE Asia TRFF regress in a context of global change. Understanding how TRFF woody species responded to past climate changes and currently meet the increasing human pressure, participate in the prediction of future evolutionary pathway/trajectory and the formulation of appropriate mitigation strategies. This project addresses the genus <i>Azelia</i> and particularly a complex of species listed under the denomination "pod mahogany". The idea is to model test various hypotheses concerning the impacts of past climate changes (speciation in forest refuges) and current anthropogenic impacts (reduction of genetic diversity). Indeed, the distribution of "pod mahogany" on the continent suggests various adjustments according to ecological gradients, and the quality of their wood makes them priority species for the forest industry. By studying the genetic and ecology of the genus <i>Azelia</i>, this project aims at:</p> <p>(1) understanding more accurately the ecological factors involved in the mechanisms of speciation,<br/> (2) testing the correlation between patterns of genetic diversity and supposed Pleistocene forest refuges,<br/> (3) assessing the impacts of selective exploitation of timber on intraspecific genetic diversity. Strategies for conservation and sustainable management can be deduced from the results of this study.</p> <p>The investigation will be conducted in three national parks namely Chumomray, Cat Tien and Chuyansin.</p> |

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| <b>23. Topic:</b>                                 | <b>Traditional agroforestry systems in Kyrgyzstan: implications for biodiversity conservation in the Central Asia</b>   |
| <b>Field of study:</b>                            | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | doc. Ing. Zbyněk Polesný, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | Dr. Georgy Lazkov (botanist, Academy of Sciences of the Kyrgyz Republic)<br>Dr. Niels Thevs (landscape ecologist, World Agroforestry Centre, Senior scientist Coordinator central Asia programme)   |
| <b>Prospective funding:</b>                       | IGA FTZ, Christensen Fund, Erasmus plus programme   |
| <b>Annotation:</b><br>(150-200 words recommended) | While central Asia is traditionally taken to include Kyrgyzstan, Kazakhstan, Tajikistan, Uzbekistan, and Turkmenistan, the greater central Asia region also extends into parts of Afghanistan, northern Pakistan, western Mongolia, and the Autonomous Region of Xinjiang in China. It is characterized by a transitional economy, which in most countries is evolving from a centrally planned to a market economy. They are undergoing a set of structural transformations intended to develop market-based institutions and increase local and global trade, which includes implementing land reform and changing resource tenure arrangements. For the first time in their history, the region's farmers have to make their own decisions, including those to incorporate trees into landscapes |

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|  | <p>and livelihoods. But the environment in which these decisions must be taken is anything but static. Climate warming, socioeconomic transformation and other factors are projected to lead to dramatic changes in water resources, land use, land cover, soil moisture and soil fertility, and to the frequency and amplitude of extreme events. Woody vegetation is already invading alpine rangelands, and extreme events are becoming more frequent, while development pressures on water, land and energy are increasing relentlessly. These changes present smallholder farmers with opportunities as well as threats. But many, particularly the disadvantaged, face a growing vulnerability that is made worse by the sluggishness with which regional governments have included local people in decision-making about their water, food and energy futures. It is in that context that the case for agroforestry must be evaluated and, if found promising, made. The services trees provide are widely recognized: they include erosion control, extreme weather buffering, soil fertility, biodiversity protection and income diversification. Each of these is potentially useful in the set of circumstances facing central Asia. For that reason, it is important to assess good examples these services in the central Asian context, to identify the most suitable agroforestry systems and to help development partners zero in on the most promising areas for intervention.</p> |
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| <b>Department:</b> | <b>Department of Animal Science and Food Processing</b> |
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| <b>1. Topic:</b>                                  | <b>Ecology of African ungulates</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Doc. Ing. Karolína Brandlová, Ph.D.  |
| <b>Supervisor-consultant:</b>                     |  |
| <b>Prospective funding:</b>                       | CIGA   |
| <b>Annotation:</b><br>(150-200 words recommended) | Large variety of ungulates inhabits all suitable habitats in Africa, antelopes being the most numerous among them. The aim of the proposed dissertation is to explore viability of selected species in savannah ecosystem, especially in the context of spatio-temporal overlap with livestock and agricultural activities which are becoming one of the major threats for the savannah antelopes. The results of traditional (line and point transects, ground census, direct observations) and modern (camera traps, satellite collars, drones) methods will be compared and optimized for a routine use for antelope monitoring and conservation in African savannah. |

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| <b>2. Topic:</b>                                  | <b>The Geographical Distribution of Parasitic Zoonoses in Europe and Asia: the Role of Wildlife in the Transmission</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Prof. MVDr. Daniela Lukešová, CSc.   |
| <b>Supervisor-consultant:</b>                     |  |
| <b>Prospective funding:</b>                       | IGA, CIGA  |
| <b>Annotation:</b><br>(150-200 words recommended) | The changes in rural landscapes due to urbanization have a huge impact on the transmission of zoonotic parasites. Since many wildlife species are unable to adapt to these alterations in their environment (decline of biodiversity in areas of urban development), in contrast, some wild animals are attracted to peri-urban and urban habitats (e.g. availability of an abundant |

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|  | <p>food supply). In many areas composition of wildlife communities differs between rural and urban areas. Some of these highly adaptable species are also hosts for a number of parasites of public health and veterinary importance (e.g. toxoplasmosis, toxocarosis, alveococcosis, trichinellosis, taeniosis/cysticercosis etc.) More than 80% of human diseases are of zoonotic origin. It will be important to understand the dynamics between wildlife and domestic animal species and human population. The main objective of this thesis is focused on the risk factors for various helminths with zoonotic potential from contrasting types of urbanized areas. Ecological changes significantly contributed to these trends: the high wild animal population and the high density of freely roaming predators (Canidae, Felidae) maintain a permanent infection pressure of these and other parasites. The direct method (necropsy of animals) and indirect method (serological investigation) will be used due to close cooperation with the State veterinary institutes in the Czech Republic, where we have got a strong support to solve this problems (e.g. study of interactions of vectors, reservoir hosts, the transmission of pathogens to humans and/or domestic animals, prevalence of diseases, biosecurity plans, etc). The supposed results can be used by: veterinary authorities (planning and implementing of effective prevention strategies and a close collaboration between veterinary and public health professionals in a 'One Health' concept); veterinary and pharmaceutical industries (monitoring the effectiveness of suitable therapeutic animal products); public health professionals (knowledge of prevalence of antibodies in animal population and health risks for humans) in different regions of the Czech Republic and EU countries.</p> |
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| <b>3. Topic:</b>                                  | <b>Characterization and improvement of the meat, goat and wool production of the local breed Meriz goat in Kurdistan</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Doc. Francisco Ceacero Herrador, Ph.D.  |
| <b>Supervisor-consultant:</b>                     |   |
| <b>Prospective funding:</b>                       | Application to CIGA.  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Meriz goats are an important agricultural resource in Kurdistan, since it is well adapted to the harsh conditions of the area. Their outercoat fibres are used in the manufacture of the Kurdish national costume, and additionally it is a source of meat and milk. The breed has not been adequately genetically characterized yet, information about their performance is scarce, and no attempt has been done to enhance its productivity following a scientific approach.</p> <p>The first goal of this thesis will be to characterize the current traditional husbandry techniques, main feedstuffs used, meat, milk and wool production, and an analysis of the market prices of these products. Several farms will be involved in observational studies where growth curves (average daily gains, maximum efficiency to slaughter weight, conversion rates, etc.), lactation curves, and wool production curves will be calculated. This information will be collected during the first two years. Thereafter, and according to the weaknesses in the production systems detected before, a set of experiments will be conducted in order to improve the observed production curves. These experiments will be mainly focused on the supplementation of the diet with certain key by-products available in the area at low cost.</p> |

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| <b>4. Topic:</b>                                  | <b>Development of analytical methods for detection of history of populations</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Doc. Francisco Ceacero Herrador, Ph.D.   |
| <b>Supervisor-consultant:</b>                     | Mgr. Barbora Černá Bolfíková, Ph.D.  |
| <b>Prospective funding:</b>                       | Project is partially funded by TACR gama and CIGA  |
| <b>Annotation:</b><br>(150-200 words recommended) | For sustainable management of bioresources, it is necessary to have detail knowledge about history of managed population, population structure and relatedness of individuals which are under the management. Such knowledge is essential under all possible climatic conditions including tropical ecosystems. Detection of population structure without any a priori knowledge of assignment of individuals may be solved by various methods like Bayesian clustering analyses or others. Results of these analyses may be tested and interpreted according to the biology of the tested species/populations. The most crucial part of this process is a marker selection. Aim of this project is to propose suitable combination of genetic markers to be able to recognize population structure of closely related groups and also recognize hybrid categories in recent past. Microsatellites and SNPs will be tested for dog breeds of known and unknown origin and for ungulates in captive breeding systems. These methods are applicable for breeders and also for nature protection in recognition of hybrid categories between wild and domestic animals, including tropics. Dog model is used because of ongoing project TACR gama and samples from this project may be used for more advanced analyses such as genomics. Free ranging dos which are threatening integrity of wild canids are worldwide problem for example hybridization of Ethiopian wolf with feral dogs. Ungulates are selected because of available specimens in our lab under project of CIGA. Antelopes inhabits various habitats mainly African savannahs but also tropical forests such as Bongo, which is also included in our analyses. We will use Illumina sequencer to detect single nucleotide polymorphisms. Illumina may handle various individuals and species in one run, so the combination of seemingly miscellaneous samples is possible. Project is partially funded by TACR gama and CIGA and is in concordance with targets of the lab of molecular biology of FTA which is research of hybridization events and genome interactions. |

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| <b>5. Topic:</b>                                  | <b>Nutritional landscape and competence among wild and domestic ungulates in the strictly protected area Gobi B, Mongolia</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Doc. Francisco Ceacero Herrador, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | Mgr. Martina Komárková, Ph.D.<br>Mgr. Jaroslav Šimek, Ph.D. (Prague Zoo)  |
| <b>Prospective funding:</b>                       | Applications to GAČR and CIGA grants.   |
| <b>Annotation:</b><br>(150-200 words recommended) | The Great Gobi B Strictly Protected Area is a nature reserve in Gobi desert, south-western Mongolia, established in 1975 and International Biosphere Reserve since 1991. The area comprises a variety of habitats including desert steppe, arid mountains, deserts and semi deserts. Mainly lowlands are used by a variety of wild (Przewalski's horses, khulans and goitered gazelles) and domestic ungulates (cattle, goat, sheep, horses and camels). Siberian ibex and argalis can be found in the mountains, and maral deer in the surroundings. Such variety of |

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|  | <p>herbivores in a nutritionally poor environment implies important human-wildlife conflicts which may increase in the future because (the strict protection of the wild species is leading to an increase in their numbers). In order to understand competition processes, anticipate conflicts, and ensure wildlife conservation and maximum profitability for local herdsmen it is necessary a deep knowledge of the ecosystem, but this information is missing. Main plant communities have been identified and mapped, but we don't have a clear idea about carrying capacity of the area or competition among the species.</p> <p>This project includes multiple approaches to achieve these goals. Intensive study of the grasslands will be based on line transects, in order to study plant availability across the area. For each plant detected, 4 specimens will be collected: two for herbarium, one for genetic determination, and one for the preparation of a microhistological library. Faecal samples of the ungulates' species will be collected during the same fieldwork. Stable isotopes in faeces will be used to study diet overlap. Diet composition will be studied by microhistology and by molecular techniques. Diet selection will be determined by comparison of plant availability and diet selection. Nutritional composition of the most important plants (used and selected) will be determined. Nutritional efficiency of each species will be determined from faecal nutrients. Exclusion parcels will help to understand the impact of ungulates on the ecosystem and to determine carrying capacity.</p> |
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| <b>6. Topic:</b>                                  | <b>Influence of selected amino acids in the performance and ecology of Cervids</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Doc. Francisco Ceacero Herrador, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | Ing. Radim Kotrba, Ph.D.  |
| <b>Prospective funding:</b>                       | Application to CIGA, ZEMĚ and Vysehrad funds. VVS s.r.o. will be involved as supplier of the necessary feed additives.  |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Supplementation of amino acids is a novel research area of great interest for ruminants. It has been traditionally assumed that supplementation is not necessary for them, but that's far from true. Recent research has shown that Methionine and Lysine are also limiting amino acids for cattle. Lysine seems especially interesting for Cervids because of its important role in the formation of collagen, precursor of bone tissue and therefore of antler. However, in fact we still don't know which are the limiting amino acids for Cervids, which is one of the first goals of this topic.</p> <p>Our preliminary data (we are already working in this topic for the last three years) show interesting results on the effects on body growth, meat quality, antler size and quality, and metabolism of proteins. However, these results are interesting especially from an ecological point of view: deer are not domestic animals subjected to centuries of selection for more productive breeds, but wild species recently farmed; thus, our preliminary results are totally different to those found in other domestic animals, with different patterns of deposition of fat or muscle tissue in different seasons.</p> <p>This thesis will study the role of amino acids in deer nutrition in depth. Different supplementation regimes will be supplied to pregnant fallow deer females, and its effect will be measured</p> |

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|  | <p>both in the hind and the calf at delivery. The experiment will continue during lactation, after weaning and up to the growth of the second antler in some males, and up to the first reproduction in certain females. Body weight, body condition and blood samples will be collected regularly along the experiment. Milk samples will be collected during lactation. Digestive efficiency will be compared among diet-treatments along the different stages of life. Meat quality and carcass traits will be measured at market culling age (around 15 months) after the long term supplementation experiment (in collaboration with the Institute of Animal Science). Sperm quality will be assessed in adult males. Similar experimental setting will be repeated for three years, using different supplementation treatments.</p> <p>The experiment will be replicated in several farms in Czech Republic, Poland and Slovakia, and at least in one population in some tropical country (probably Thailand) in order to detect differences between seasonal and tropical environments. The topic is also relevant for several tropical areas where deer farming is rapidly increasing as alternative food source.</p> |
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| <b>7. Topic:</b>                                  | <b>Performance of the introduced population of white-tailed deer in the Czech Republic: comparison with other local Cervids and native populations in USA</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Doc. Francisco Ceacero Herrador, Ph.D.  |
| <b>Supervisor-consultant:</b>                     | Ing. Radim Kotrba, Ph.D.<br>Dr. Bronson Strickland (Mississippi State University)   |
| <b>Prospective funding:</b>                       | Applications to CIGA, ZEMÉ and INTER-ACTION (USA) programs.   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>According to the constant population growth and the high antler quality of the white-tailed deer (<i>Odocoileus virginianus virginianus</i>) ranging in the Dobříš area (Czech Republic), it seems that this introduced species is doing well. That is surprising, considering the very different conditions in the native area of this subspecies (from Mississippi to Virginia, USA; humid subtropical climate). On the other hand, it is well known the great adaptability of the species to very different habitats (40 subspecies ranging from Alaska to Peru), and great nutritional adaptability (from fully browser to fully grazer, depending of the area).</p> <p>The main goal of this thesis is to clarify the reasons for such good performance in a double way: 1) understand differences with the local cervids, and 2) understand differences with the source animals (<i>i.e.</i>, adaptations to the conditions in the new ranging area). For the first goal, an exhaustive sampling will be done on hunted and road killed animals in the study area, including red, fallow, roe and white-tailed deer. For the second goal, similar samples will be collected on hunted white-tailed deer in Mississippi. Samples from captive individuals will be also available from both populations. The collection of samples in Czech Republic was already agreed with local hunters and land owners. The collection of samples from the original populations was already agreed with researchers from the Mississippi State University working with this species for long term.</p> <p>Some of the samples to be collected include: Biometrics (body weight, measurements, condition), antlers (measurements, tomography, mineralization), digestive tract content (parasitic</p> |

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|  | load, nutritional efficiency), ruminal content and fluids (nutritional efficiency, diet by microhistology, pH, microbes spectrum), blood samples (plasma biochemistry), fur (moulting patterns, diet overlap by isotopes, stress hormones), reproductive status (number of foetuses), liver samples (accumulation of heavy metals), external parasites, and a set of samples for the detection of some common diseases in wild cervids. |
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| <b>8. Topic:</b>                                  | <b>Habitat Use, Prey Preference, and Social Interactions in free roaming large carnivores on Sir Bani Yas Island, UAE</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Prof. RNDr. Pavla Hejčmanová, Ph.D.  |
| <b>Supervisor-consultant:</b>                     |  |
| <b>Prospective funding:</b>                       |  |
| <b>Annotation:</b><br>(150-200 words recommended) | Carnivores cherish their top rank in the food chain and are important indicators of healthy and functional ecosystems. At present, 73 percent of the larger members of this category are endangered globally, therefore increased dedicated efforts for in-situ and ex-situ conservation of these majestic animals are conducted. There are complex challenges towards the management of their feeding habits and natural predatory skills. The failure to adequately address these interventions may result in a severe impact on physiology and behaviour of the animals. It is a lot more complicated to maintain the predators in wildlife parks and safaris, where they are allowed to hunt on their own and where there is a mixture of high valued or rare species along with others. In such cases, it is vital to assess which species are preferred for predation compared to the species of particular interest. Sir Bani Yas Island is home to free roaming Northern Cheetah ( <i>Acinonyx jubatus soemmeringii</i> ) and Arabian striped hyaena ( <i>Hyaena hyaena sultana</i> ). These carnivores roam freely and predate at their own will. The proposed study is designed to develop a sound scientific baseline on their prey preference and use of different habitat types in the 4100 ha Arabian Wildlife Park on Sir Bani Yas Island, UAE. The animals will be continuously monitored for their movement, social interaction and predatory habits using direct observations, indirect signs, leftover, carcasses and camera traps. |

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| <b>9. Topic:</b>                                  | <b>Evaluation of feeding and welfare activities of wild animals on Sir Bani Yas Island, UAE</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Prof. RNDr. Pavla Hejčmanová, Ph.D.   |
| <b>Supervisor-consultant:</b>                     |   |
| <b>Prospective funding:</b>                       |   |
| <b>Annotation:</b><br>(150-200 words recommended) | Small or marginal nutritional deficiencies or excesses may lead to reduced fertility, suppression of the immune system and ultimately the death of captive wild animals. Feeding wild animals successfully in captivity requires knowledge of basic nutritional requirements, an understanding of different animal types and digestive physiologies, an appreciation for natural feeding behaviours, a familiarity with appropriate food sources, inter and intra specific conflicts and an awareness of potential diet related ailments. A general perception is that feeding wild animals does not conflict with conservation goals and contribute toward conservation; however, little research has focused on assessing these beliefs. The proposed study is designed to develop a comprehensive scientific baseline on the feeding practices and welfare of ungulate and ratite species on Sir |

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|  | BaniYas Island; including endangered and extinct in wild categories. The study will also provide data on the management of feeding activities and the importance of well-being in semi captive conditions. The study will focus on comparisons of selected species feeding on natural browse and those depending on supplemented feed; ways to reduce competition in mixed exhibits, and effect of enrichment on feeding behaviour and competition. This data will help to provide recommendations for animal husbandry in diverse exhibits and ex-situ conservation projects. |
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| <b>10. Topic:</b>                                 | <b>Trace elements bioavailability in the nutrition of wildlife</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Prof. RNDr. Pavla Hejčmanová, Ph.D.   |
| <b>Supervisor-consultant:</b>                     |   |
| <b>Prospective funding:</b>                       |   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Minerals act in the animal nutrition, reproduction, health and behaviour and perform in animals structural, physiological, catalytic and regulatory functions. Many functions can be performed simultaneously by the same element in the same animal and many take place in both the plants on which herbivores depend and the microbes or parasites that infect them. Trace elements such as zinc, copper, selenium, iron and manganese are highly sought-after by animals either in special dietary items or by geophagy of free ranging animals or are supplemented as supplementary mineral licks or feed additives to animals in the human care.</p> <p>The aim of the thesis is to investigate the role and bioavailability of trace minerals in the nutrition of wildlife species of large herbivores in human care. Specific aims will include testing effects of mineral feed supplements containing different concentrations of trace elements the tissue and fur mineral status in diverse species of deer (red deer, roe deer, fallow deer) and bovids (including antelopes) in the human care. The investigation will be conducted in cooperation with deer farms or wildlife reserves.</p> |

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| <b>Department:</b> | <b>Department of Economics and Development</b> |
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| <b>1. Topic:</b>                                  | <b>Promoting value-chains of neglected and underutilised species: Biodiversity, Markets, Living standard</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | prof. dr. ir. Patrick Van Damme  |
| <b>Supervisor-consultant(s):</b>                  | Ing. Vladimír Verner, Ph.D. (contact person)<br>dr. ir. Wouter Vanhove   |
| <b>Prospective funding:</b>                       | Czech ODA projects, BMBF project and IGA FTZ CZU   |
| <b>Annotation:</b><br>(150-200 words recommended) | Food security and economic development suffer from a declining number of domesticated plant or crop species. The recent focus on revamping/domesticating/using underutilised species would be one strategy to improve livelihood of poor households by supporting food security, improving nutrition and income generation via selling surpluses at local markets and/or international markets. Promotion of such value chains is always connected with local traditional knowledge and values, cultural |

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|  | and biological diversity, policies, markets, consumer behaviours, etc. Household preferences, biodiversity decline and changing demographic and socio-economic profiles of households are key points that need to be documented and analysed in order to promote the more sustainable value chains. Thus, the objective of the research will be to obtain insight in the structure and functioning of the value chains, incl. markets of underutilised plant species that are useful for local populations. Specifically, it will be necessary to (i) identify all chain actors involved in the value chains and describe their characteristics, activities and linkages, (ii) map and analyse the market chains of these products and (iii) formulate possible scenarios on how to add more value as well as how to better organise these market chains. |
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| <b>2. Topic:</b>                                  | <b>Role of traditional farming systems, agricultural practices and technology innovations on livelihood of rural and/or less developed regions worldwide</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová (contact person)   |
| <b>Supervisor-consultant(s):</b>                  | Ing. Vladimír Verner, Ph.D. (contact person)   |
| <b>Prospective funding:</b>                       | BMBZ project and IGA FTZ ČZU   |
| <b>Annotation:</b><br>(150-200 words recommended) | Traditional knowledge, farming systems, land-use and technologies still play important role in maintaining livelihood of many households worldwide, particularly in less developed regions. However, climatic dynamics, rapid economic growth as well as institutional and social changes put these traditions under pressure. These changes lead to migrations, biodiversity decline, traditional knowledge and systems degradation, and consequently to lower resilience of particularly minor farming systems, such as mangrove forests, mountains, arid areas or urban/peri-urban zones. Thus, the aim of the thesis will be to understand, describe and analyse current trends that influence agricultural production and biodiversity. |

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| <b>3. Topic:</b>                                  | <b>Consumer behaviour and household preferences towards tropical products: Lessons learnt from developed and developing regions</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová (contact person)   |
| <b>Supervisor-consultant(s):</b>                  | Ing. Petra Chaloupková, Ph.D. (contact person)<br>Ing. Vladimír Verner, Ph.D.  |
| <b>Prospective funding:</b>                       | Czech ODA projects, IGA FTZ CZU, Erasmus projects  |
| <b>Annotation:</b><br>(150-200 words recommended) | Consumer behaviour and preferences of household members influence are good starting point to understand what products offered on the market are more attractive for the people and what nutritional and economic consequences are behind the whole process. As well as collection of wild products is driven by cultural norms, economic situation or nutritional habits of households. The aim of the research will be to determine which demographic, social and economic indicators are main driving forces of demand and how supplies could modify them, and, to what extent these trends could result in positive/negative impact on living standard of the households in terms of financial balance, health situation or changes in food, cultural and agricultural diversity. |

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| <b>4. Topic:</b> | <b>The lack of young labour in agriculture: the case of the Ukraine</b> |
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| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics  |
| <b>Supervisor:</b>                                | Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová (contact person)   |
| <b>Supervisor-consultant(s):</b>                  | Ing. Petra Chaloupková, Ph.D. (contact person)   |
| <b>Prospective funding:</b>                       | Ukraine  |
| <b>Annotation:</b><br>(150-200 words recommended) | In many eastern European countries, young people, even if they do study agriculture, do not want to work in agriculture. Among important reasons for this are that young people migrate from rural areas and they prefer to work in another sectors. Because of this, the agricultural businesses are facing the lack of skilled labour. The objective of the study is to investigate both the demand and supply side of the problem, first: to investigate, if the problem of lack of young labour is prevalent in the Ukraine agriculture, using a survey among Ukraine agricultural businesses; second: to identify factors that affect national and international out-migration of Ukraine students of agriculture; third: to identify factors, that affect the students willingness to work in agriculture, with special attention to the gender aspect. Research approach will be based on both qualitative and quantitative surveys among agricultural businesses and students of agriculture in the Ukraine. The quantitative data will be analysed using descriptive statistics and regression analysis. The better understanding of the motives of young people with no interest in working in agriculture could help policy makers to implement measures that would help to attract more young people into agriculture in the future. |

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| <b>5. Topic:</b>                                  | <b>Application of Integrative Impact Assessment Framework for impact analysis of Fairtrade value chain certification and horizontal integration of cashew farmers in the coastal region of Kenya</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová   |
| <b>Supervisor-consultant(s):</b>                  | Ing. Jiří Hejkrlik, Ph.D. (contact person)  |
| <b>Prospective funding:</b>                       | EU Trust Fund for Africa, CIGA CULS or IGA FTA  |
| <b>Annotation:</b><br>(150-200 words recommended) | The third-party certification by various ethical standards and horizontal integration of farmers into producers' groups have become widespread practise of development of international agricultural value chains. It has become also popular tool for development projects of many international donors. The FTA/CULS is currently starting such project in coastal region of Kenya. The projects aims to support 15 000 small cashew farmers through Fairtrade and organic certification combined with establishment of producers' groups with market linkages to the local processing and EU traders.<br>However, the proliferation of externally executed responsible trade initiatives has also been met by strong criticism in terms of limited positive impact, low sustainability and effectiveness of used certification schemes. Therefore, there is a need for more empirical data and analyses to address such widespread credibility concerns.<br>Therefore, in this Ph.D. proposal topic, we want to study potential for innovation and consequent impact of such external development interventions. We envisage to use Rapid Appraisal of Agricultural Innovation Systems (RAAIS). RAAIS as a main diagnostic tool for guiding the baseline innovation capacity analysis of this complex development intervention. The RAAIS incorporate different dimensions of problems (e.g. biophysical, technological, socio-cultural, economic, institutional and political), interactions across different |

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|  | <p>levels (e.g. national, regional, local), and the constraints and interests of different stakeholder groups (farmers, cooperatives, government, researchers, etc.).</p> <p>As for the impact assessment, we will use modified Integrative Impact Assessment Framework that allows for the evaluation of positive and negative local-level impacts that will result from this “responsible trade” interventions and/or Social Life Cycle Assessment of Products - the assessment of social and socio-economic impacts of products life cycle.</p> |
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| <b>6. Topic:</b>                                  | <b>Assessing personality trait, cultural practices and moral principles as tools for improving natural resource management practices in Nigeria</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová   |
| <b>Supervisor-consultant:</b>                     | Ing. Jana Mazancová, PhD  |
| <b>Prospective funding:</b>                       | Internal grant agency (FTA, CULS)   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>Nigeria has emphasized sustainable resource management as one of its main goals for a next decade as rural population has been suffering from degradation of natural resources they are directly dependent on. Involving local communities while knowing their cultural context has been recognised as crucial for successful improvement in natural resource management. The aim of the thesis will focus on identification of inhibiting and stimulating personality traits, cultural practices and moral values among young generation of rural population in Nigeria. Based on that the framework linking the three sets of indicators (personality trait, cultural practices and moral values) to improve sustainable resource management in Nigeria will be proposed. The methodology will be based on a mixed-approach of quantitative and qualitative research using data collection tools as questionnaire surveys, focus group discussions, and interview with key informants.</p> |

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| <b>7. Topic:</b>                                  | <b>Evaluating Priorities on Socio-Economic Vs Environmental Development: A Comparative Assessment amongst Different Echelons of Youths in Nigeria</b>   |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová   |
| <b>Supervisor-consultant:</b>                     | Ing. Jana Mazancová, PhD  |
| <b>Prospective funding:</b>                       | Internal grant agency (FTA, CULS)   |
| <b>Annotation:</b><br>(150-200 words recommended) | <p>The population of Nigeria has reached 190 million (2017) of inhabitant with the median age of 17.9 years. More than 60% of population is created by youth under 25. The rural population consists of 49%. Rural youth are facing many challenges in forms of low access to education and limited amenities which are considered as main push factors for migration to urban areas in order to seeking better life. However, Nigeria report abundant natural and human resources to be harnessed for socio-economic development of rural areas. The aim of the thesis focuses on evaluation of the disparities in behaviour, if there are any, amongst Nigerian rural youths from different social ranks in order to understand and analyse the different perceptions of economic and environmental values within the framework of socio-economic development of rural areas. The methodology will use the assessment of pro-environmental behaviour using the theory of planned behaviour.</p> |

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| <b>8. Topic:</b>                                  | <b>Rural Women and Youth Empowerment through Agri-cooperatives in Selected Countries</b>  |
| <b>Study Programmes:</b>                          | Agriculture in Tropics and Subtropics   |
| <b>Supervisor:</b>                                | Dr. sc. habil., Dr. sc. agr., Ing. Miroslava Bavorová   |
| <b>Supervisor-consultant:</b>                     | Ing. Jana Mazancová, PhD  |
| <b>Prospective funding:</b>                       | Internal grant agency of CULS and FTA   |
| <b>Annotation:</b><br>(150-200 words recommended) | Cooperatives are, in general, considered as one of the tool for rural development, not only in developing countries, as they can provide several main benefits, such are better access to employment, improved conditions of work and social benefits. These are crucial for vulnerable social groups as women and youth. The main objective of the study is to find out possible contributions of agriculture co-operative enterprises to gender equality and women's empowerment in achieving the objectives of the Platform for Action from the Fourth World Conference on Women in 1995 and Women's empowerment principles in business. Further, the thesis aims at analysing the involvement of youth in cooperatives in selected countries/regions, their attraction for youth and the role in alleviation of rural-urban migration of youth in selected regions. The methodology is based on a mixed approach combining qualitative and quantitative data collection tools (questionnaire surveys, focus group discussion, persona interview with key informants.) |