



**MEMORANDUM OF UNDERSTANDING**  
between  
**UNIVERSITY OF PANNONIA (HUNGARY) and**  
**KHON KAEN UNIVERSITY, THAILAND**



University of Pannonia (UP), Hungary and Khon Kaen University (KKU), Thailand agree to enter into a formal collaborative agreement based on a foundation of trust for the mutual benefit and development of the two institutions and the promotion of international understanding and goodwill.

1. PU and KKU will jointly develop some or all of the following activities based on their respective academic and educational needs:
  - a. organization of joint research programs;
  - b. exchange of research materials, publications and information;
2. The implementation of activities under this Memorandum of Understanding shall be separately negotiated and determined by both institutions.
3. Nothing shall diminish the full autonomy of either institution, nor will any constraints or financial obligations be imposed by either upon the other in carrying out the agreement.
4. Use of the name or logo of either institution is restricted and must be approved by the other institution prior to release or publication.
5. This Memorandum of Understanding is subject to revision or renewal by mutual agreement. It is also understood that either institution may terminate the agreement at any time, although such action will only be taken after mutual consultation in order to avoid any possible inconvenience to all parties.
6. The Memorandum of Understanding will be valid for three years and become effective when the representatives of both institutions have signed and dated the document.

Authorized to sign and  
on behalf of University of Pannonia

Authorized to sign and  
on behalf of Khon Kaen University

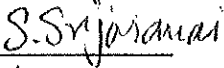
This MOU is signed by

Dr. Sándor Németh,  
Dean of the Faculty of Engineering,  
University of Pannonia (Hungary)

Signature: 

Date: 17/01/2020

Asst. Prof. Dr. Somkiat Srijaranal,  
Dean of Faculty of Sciences  
Khon Kaen University (Thailand)

Signature: 

Date: 26/05/2020

Prof. András Liker, project leader  
Department of Limnology,  
University of Pannonia (Hungary)

Signature: András Liker

Date: 15/01/2020

Dr. Nolwenn Fresneau  
Department of Limnology,  
University of Pannonia (Hungary)

Signature: Nolwenn Fresneau

Date: 15/01/2020

Asst. Prof. Dr. Wangworn Sankamethawee  
Department of Environmental Science  
Khon Kaen University (Thailand)

Signature: Wangworn Sankamethawee

Date: 20/05/2020

Asst. Prof. Dr. Sarun Keithimaleesatti  
Department of Environmental Science  
Khon Kaen University (Thailand)

Signature: Sarun Keithimaleesatti

Date: 25/5/2020

**MEMORANDUM OF UNDERSTANDING  
BETWEEN**

Department of Limnology, University of Pannonia (UP; Hungary)

**AND**

Faculty of Science, Khon Kaen University, (KKU; Thailand)

This Memorandum of Understanding (MOU) outlines an agreement between the Department of Limnology, University of Pannonia (UP; Hungary) and the Department of Environmental Science, Faculty of Science, Khon Kaen University, Thailand (KKU) for conditions of a collaborative scientific research on the pheasant-tailed jacana *Hydrophasianus chirurgus*, in Thailand.

Main collaborators include: Asst. Prof. Dr. Wangworn Sankamethawee (WS), Asst. Prof. Dr. Sarun Keithmaleesatti (SK), Prof. Andras Liker (AL) and Dr. Nolwenn Fresneau (NF).

**1. Objectives of the research:**

The proposed research, planned for the period of 2020 to 2021, will collect scientific data on the ecology and behaviour of pheasant-tailed jacanas. This species has a unique breeding system among birds (polyandrous pair bonds and reversed parental roles). The study aims to understand the ecological and social factors that lead to the evolution of this breeding system. Our current research suggests that the male-biased sex ratio of the adult populations may be an important demographic driver of role reversal in jacanas. To investigate this hypothesis, the project will document the details of the breeding behaviour of the birds (e.g. frequency of polyandry, involvement of male and female parents in various parental care activities), estimate their reproductive success, and collect basic demographic data for the study population (e.g. offspring and adult sex ratios, offspring and adult mortality rates, age of sexual maturity). The results will significantly contribute to the understanding of the evolution of different reproductive systems of animals. The project will also provide valuable data that can be directly used for the monitoring and conservation of the species.

**2. Main methods used in the project:**

The project will achieve the above goals by using standard, well established research methodologies developed for ecological field studies. The size of the study population and sex ratio of the breeding birds will be monitored by regular visual censuses during the reproductive seasons. The breeding of the birds will also be monitored by following the fate of the nests and the offspring after hatching until their independence. Adult birds and their offspring will be caught by standard methods (e.g. mist nets), ringed, and sampled for small amount of blood (about 20-30  $\mu$ l) for genetic analyses. Field observations will be conducted to monitor the pair bonds and reproductive success of ringed birds, and also to monitor their survival and movements. The genetic samples will be used to determine the sex of juvenile birds to estimate brood sex ratios and sex-specific juvenile survival and dispersal behaviour.

In all phases of the fieldwork the participants will pay special attention to conduct observations and bird catching and handling in a way that minimises disturbance and physical harm to the birds and their offspring.

### **3. Expected outputs of the project:**

The studies will provide new knowledge on the general biology, behaviour, and ecology of the pheasant-tailed jacana, which is a text-book example of polyandry and role reversal in birds but still a poorly known species in many respects including basic demographic information. The data collected in the studies will be analysed by the research team and the results presented on conferences and published in peer-reviewed international journals. These results will also be disseminated to the wider public, e.g. in forms of talks and interviews. Data and results will be available for use for the conservation of the species.

### **4. The participants from the University of Pannonia, and any of their associated foreign collaborators and guests (collectively UP team) declare that they will adhere to the following pre-agreed conditions through the project:**

- a. The UP team's visits are for academic purposes including conducting field studies and other related activities such as meetings and discussions with Thai scientists from faculty of Science-KKU and conservation NGOs, giving invited talks, collaborating in joint grant applications with faculty of Science-KKU, and promoting scientific and cultural exchanges between the participating parties.
- b. The UP team will follow the regulations on the permission for foreign researchers to conduct research in Thailand, inform and send all the requested forms on time as described in the B.E. 2550 regulation form.
- c. All study protocols and field procedures shall follow the current laws and regulations of Thailand regarding wildlife conservation, and approved ethical rules of proper animal treatments.
- d. No results in any forms generated from the study shall be put in commercial or personal interest uses.
- e. Any publications and conference talks or posters that are based on or contained data and results obtained during the study visits or generated from later analyses shall include the major collaborators (WS, SK, NF, AL), and other field participants as appropriate, in the authorship to properly reflect their contributions.
- f. Any publications, including conference presentations, reports, and interviews, that contain data and results obtained during the study visits or generated from later analyses shall acknowledge the associated supporting organizations and government agencies (UP, KKU and others).
- g. Any project related data (e.g. nest monitoring, observation data, individual tagging) should be shared between the main collaborators (WS, SK, NF, AL) and the use of these data for paper submission and conference paper, should not be done without the consent of all parties.

- g. Any project related data (e.g. nest monitoring, observation data, individual tagging) should be shared between the main collaborators (WS, SK, NF, AL) and the use of these data for paper submission and conference paper, should not be done without the consent of all parties.
- h. The UP team will cover all of their costs during the period of field work in Thailand (e.g. travel, accommodation, equipment).
- i. The faculty of Science-KKU team will help with practical matters for the field work in Thailand (e.g. administration, finding accommodation and equipments).
- j. Right to and interest in all intellectual Property that is made, conceived, developed, or created as a result of research conducted under this MOU shall be jointly owned by mutual agreement between the parties, taking into account the role and contributions of individuals involved in the development of the intellectual Property.

A violation of any of the above conditions in Item 4 will cause a premature termination of this collaboration and necessary legal responsibility. In the event that there shall be disagreement(s) among parties regarding the terms of this MOU or any agreement made in connection to it, parties agree to settle their differences amicably. If the aforesaid method will not be satisfactory to any party, such dispute(s) may be brought under the jurisdiction of Khon Kaen Provincial Court where the law of Thailand shall prevail.

This MOU is signed by

Dr. Sandor Nemeth,  
Dean of the Faculty of Engineering,  
University of Pannonia (Hungary)

Signature: *S. Nemeth*

Date: 24/04/2020

Prof. András Liker, project leader  
Department of Limnology,  
University of Pannonia (Hungary)

Signature: *A. Liker*

Date: 22/04/2020

Dr. Nolwenn Fresneau  
Department of Limnology,  
University of Pannonia (Hungary)

Signature: *N. Fresneau*

Date: 04/05/2020

Asst. Prof. Dr. Somkiat Srijaranai  
Dean of Faculty of Science  
Khon Kaen University (Thailand)

Signature: *S. Srijaranai*

Date: 03/04/2020

Asst. Prof. Dr. Wangworn Sankamethawee  
Department of Environmental Science  
Khon Kaen University (Thailand)

Signature: *W. Sankamethawee*

Date: 13/3/2020

Asst. Prof. Dr. Sarun Keithmaleesatti  
Department of Environmental Science  
Khon Kaen University (Thailand)

Signature: *Sarun Keithmaleesatti*

Date: 13/3/2020