



HOKKAIDO UNIVERSITY
**Graduate School of
GLOBAL FOOD RESOURCES**

Graduate School of
Global Food Resources
Hokkaido University 

2021 - 2022
Admission Guidebook



入試希望者向けガイドブック



なぜ今「国際食資源学院」なのか??



Why choose learning at the "Graduate School of Global Food Resources"?

① Learn how to deal with the global challenges

世界の問題にチャレンジする

Global demand for food is rapidly increasing. At the same time natural resources are under increasing pressure. Problems such as water shortages and pollution, loss of soil fertility and forests, degradation of coastlines and climate change are now becoming global challenges. This school aims to produce graduates who are ready to challenge these issues.

② "All English" curriculum

すべて英語で学ぶ

All the lectures will be given in English. For non-English speakers, it may be difficult at the beginning but learning in English will help you to develop a global career.

③ Studying in different countries while your studies

海外で学ぶ

Studying in different countries is a part of the course in this school. Learning different food production systems under different culture and climate help you understanding the issue of global food security and environment.

④ Develop broad knowledge and multifaceted perspectives

広い知識と大きな視野を持つ

Our curriculum covers very broad area, including social science, economics to molecular science. When you challenge different global issues in different parts of the world, the broad knowledge is very helpful to plan the strategies against them and to let different type of people act towards the solution.

⑤ Cutting-edge research in the food resources and environment

食資源に関する先端研究

Our faculty members carry out cutting-edge research in the area of the Production, Environment and Governance. Students will learn how to tackle current problems in the food resources and environment by conducting the research with our research team.

⑥ Beautiful campus and good facilities

美しいキャンパスと充実した環境の中で学ぶ

We are located 7 minutes from the biggest train station in Hokkaido, Sapporo. The New Chitose International Airport is approximately 40 minutes from Sapporo station. Hokkaido is a famous spot for delicious locally produced foods which means our research environment is perfect to study "food resources".

Master's course Curriculum/Program structure

修士課程カリキュラムの特徴と履修モデル

The Graduate School of Global Food Resources will provide an interdisciplinary international education that surpasses conventional curricular boundaries by integrating the humanities and the sciences. To acquire an overall understanding of the impacts of production, environment and governance on multi-layered food resource-related global issues, we will train international leaders with broad perspectives and high level of expertise who can identify, solve, and provide solutions to those problems.

A big feature of the curriculum is that students can learn at research institutes in Japan and abroad in "Wandervogel" study and from world level foreign faculty members invited from these institutes.

To complete Master's course, students have to acquire the required number of credits and to pass the examination for the research results of the master's thesis or of research on a specific theme.

32-credit master's degree

Students are required to complete 22 credits as compulsory subjects, 4 credits compulsory elective subjects and 6 credits from other subjects.

Some of the compulsory subjects

- ◎ Introduction to Global Food Resources
- ◎ Production in Global Food Resources
- ◎ Environmental Sciences in Global Food Resources
- ◎ Governance in Global Food Resources
- ◎ Ethics in Global Food Resources
- ◎ Wandervogel Study in Global Food Resources
- ◎ Seminar in Global Food Resources
- ◎ Dissertation Research in Global Food Resources (year 2)

Some of the compulsory elective subjects

Production

- ◎ Biotechnology in Global Food and Resources
- ◎ Diversity in Agriculture

Environment

- ◎ Environmental Science
- ◎ Environmental Management

Governance

- ◎ Analytical Economics
- ◎ Comparative Rural Sociology

Some of the elective subjects

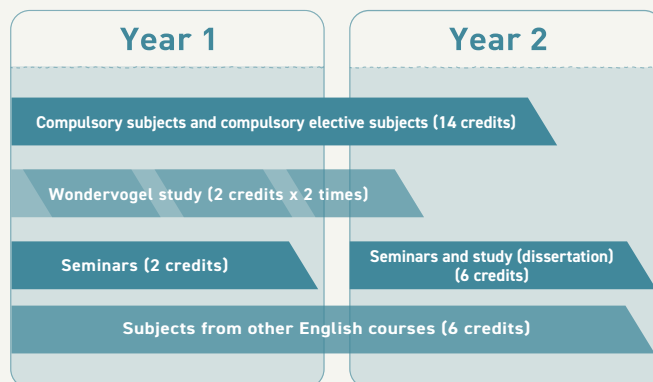
- ◎ Research Communication in Global Food Resources
- ◎ Food and Gastronomy
- ◎ Water-energy-food Nexus

Wandervogel (oversea) study

All students are required to attend multiple "Study Trips" in overseas.

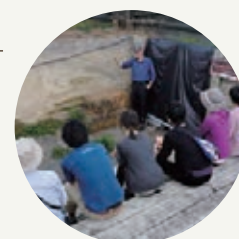


Example course structure



Dissertation Research Process

- Based on lectures and experiences you have during the 1st year, you will complete a research proposal and it will be read by your supervisors
- Once the proposal has been approved by your supervisor, you can start your own research.
- You may also apply for a fund to expand your research with your supervisor's help.



About Wandervogel Study

Wandervogel Study is a practical study facing and experiencing problems on global food resources on site. This will provide students opportunities of recognition of the problem and participation for the solution establishment, and many suggestions for study development by connecting those problems and interest of each student.

Denmark

Wandervogel Study I in Denmark

The aim of Wandervogel Study in Denmark is to give students insight into the roles of research, consultancy, and legislation in the integrated nutrient management in Denmark, how they contributed

to reducing the impact of agriculture on the water environment and what the future prospects are for further reducing nutrient loadings.



Goals and Activities

Students will acquire knowledge and experiences that can help themselves to describe the role of environmental concerns for the development of modern agriculture, describe what integrated nutrient management in agriculture means in the Danish agricultural context, and furthermore from

- Group Discussions, works, presentation with students from Aarhus University
- Lectures from various collaborators
- Field researches and etc.



Wandervogel Study I Report

Students will have an opportunity to report what they learn in Denmark.



ワンダーフォーゲル実習について

ワンダーフォーゲル実習では、食資源に関わる現実課題と向き合い、国外・国内の現場を体験します。世界の食資源問題を認識することで、これを自己の課題として取り組むためのきっかけとなり、また、主体的・積極的に自身の関心とも関連づけて学習を发展させていくための様々な機会になることを期待しています。

Myanmar

Wandervogel Study II in Myanmar

The aim of Wandervogel Study in Myanmar is to give students insight into current problems on agriculture, fishery, and environment in Myanmar, such as development of agricultural production technology, accumulation and

logistics of fishery products, and floods.



Goals and Activities

Students will acquire knowledge and experiences that can help themselves to learn the current problems on food resources on site, communicate and cooperate with foreign students using English, and furthermore from

- Group Discussions, works, presentation with students from Patheingyi University
- Lectures from various collaborators
- Homestay at villages
- Field researches and etc.



Wandervogel Study II Report

Students will have an opportunity to report what they learn in Myanmar.



ワンダーフォーゲル実習について

フォーゲル 2020-2021 はコロナ禍で国境が閉じてしまったため、国内でのワンダーフォーゲル実習になってしまいました。

Kyushu

Wandervogel Study II Kyushu

We visited at Kyushu Region located at southern part of Japan. Students studied about forestry, water environment, and agriculture. The forestry workers, farmers, and manufacturers directly gave lectures in their fields.

Forestry

Yakushima, Kagoshima



Shiiba, Miyazaki



Takachiho, Miyazaki



Wandervogel Study II Kyushu

Water environment

Mt. Aso, Kumamoto



Automated vineyard

Yame, Fukuoka



Traditional Rice farming

SakamotoTanada, Miyazaki



Food and health: Functional foods for animals and human

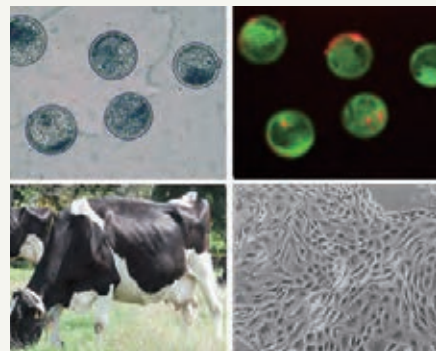
外部環境により引き起こされる活性酸素などの酸化ストレスによる傷害の低減は、健康な生活や食資源生産活動の継続に重要な課題です。私たちは、未利用生物資源などからの抗酸化物質の探索と酸化ストレス低減による健康増進や動物生産性の向上を目指しています。

Environmental stresses such as chemicals, foods, and high ambient temperature cause harmful effects to human health and livestock productivity. These harmful effects correlate with oxidative stress caused by reactive oxygen species (ROS). Increased ROS induces DNA damage, protein and lipid oxidations, alteration of gene expression, and epigenomic changes. These molecular and cellular damages might trigger diseases, aging, malfunction of both productive, reproductive performances to human and

livestock. Antioxidants are known to reduce ROS based oxidative stress to improve cell, tissue or organ functions. Natural resources such as plants, seaweeds or byproducts contain undermined potential antioxidants.

Thus our mission is to improve health and livestock productivity by reducing oxidative stress-related cellular damages with potential antioxidants from natural resources.

Researchers :
Prof. Takahashi Masashi,
Assoc. Prof. Takasuka Taichi



Biomass refinery: Development of novel crop & Enzyme

バイオマスリファイナリー技術の確立は未来の持続的なエネルギー確保に不可欠な問題です。私たちはバイオリファイナリー技術の実現を新しいバイオマス資源作物の作出と新規バイオマス分解酵素の発見および応用の両面から目指しています。

The world population is estimated to reach over the 10 billion in the next 50 years, and we need to ensure the food resources as well as energy supply for our future generations. However, the peak oil has been observed in the past 10 years, and the availability of fossil fuel is not expected to be adequate in the future.

Thus, our mission is to establish the ways to produce sustainable energy from nonedible feedstocks such as grass, strew, and new dedicate biomass crops, that are

readily degradable. Furthermore, the chemical pretreatment and enzymatic hydrolysis that suited to particular crops will be developed by both chemical and biochemical approaches.

Altogether, we will aim to produce sustainable and clean bioenergy to alter fossil fuel production to secure the future human life.

Reserchers :
Prof. Yamada Toshihiko,
Prof. Brian G. Fox,
Prof. Atsumi Shota,
Assoc. Prof. Takasuka Taichi



Winemaking: Influence of global warming on "Terroir"

ワインは最もシンプルな発酵プロセスで作られ原料ブドウの特徴が品質に大きく反映されるので、地域ごとの特徴「テロワール」を持ちます。地球温暖化がワインのテロワールに及ぼす影響を解析していきます。

Wine is one of the most popular alcoholic beverage produced and consumed worldwide. The fermentation process of wine is simple and reflects local characteristics of grapes and other factors, called "Terroir". The global warming will affect climate, one of the most important factors for the Terroir.

In the project, we will analyze many aspects of winemaking such as soils, vines, and fermentations using plant physiology,

microbiology and chemistry to find the variations caused by the climate change. These analyses will provide us novel knowledge on winemaking. Suggestion of suitable grape varieties for a particular location and water management, and microbial characterization of Terroir are the examples of expected outputs of the project.

Reseachers :
Prof. Roger Boulton,
Prof. Sone Teruo

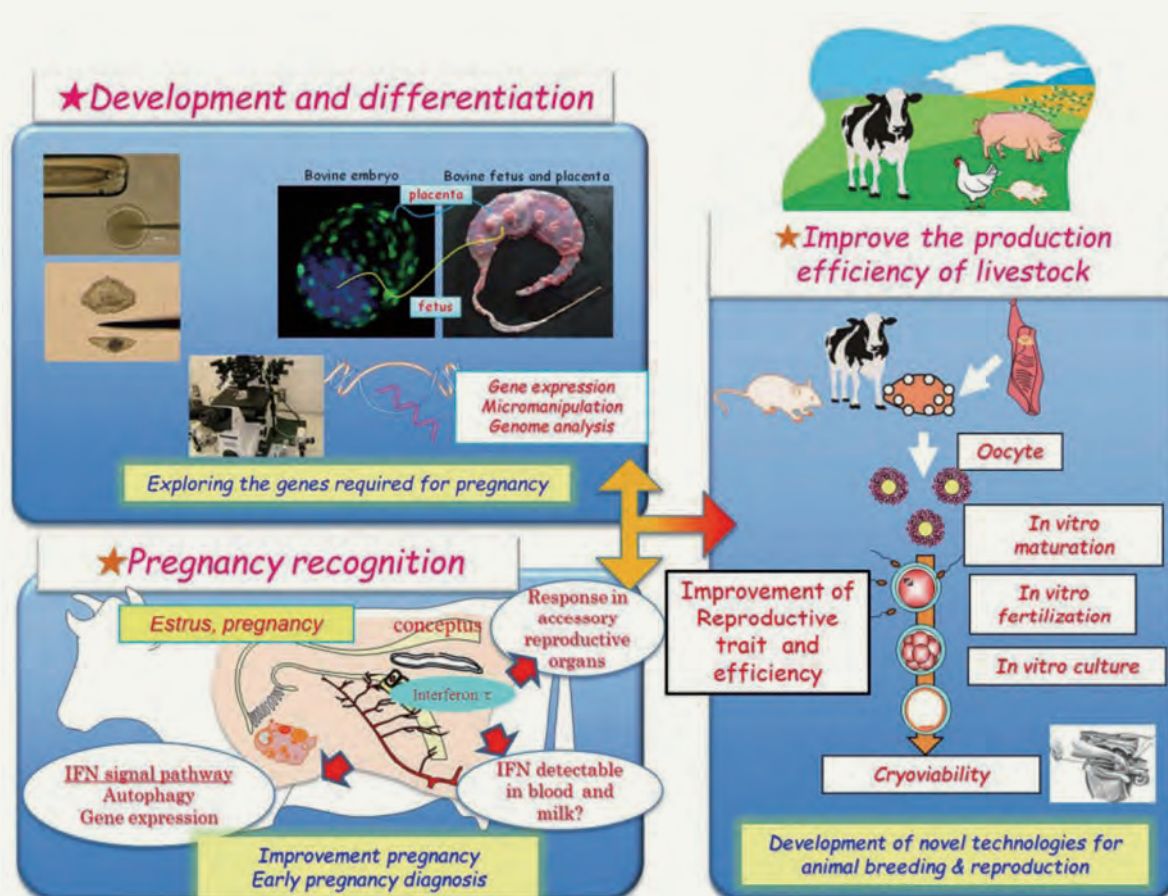


● Takahashi Masashi, Professor

E-mail: mmasashi@anim.agr.hokudai.ac.jp

Research programs

1. Molecular and cellular mechanisms of maternal and fetal recognition of pregnancy in livestock
 - 1) Detection and identification of novel genes and proteins induced by pregnancy signals in blood and milk
 - 2) Establishment of early pregnancy diagnosis
2. Oocyte maturation and development of preimplantation embryos
 - 1) Roles of lysosomal functions on oocyte maturation and preimplantation development
 - 2) Effect of antioxidants on development and differentiation



● Sone Teruo, Professor

E-mail: sonet@chem.agr.hokudai.ac.jp

Laboratory of Applied Molecular Microbiology

Laboratory for Nouvelle Vague of Hokkaido Wines

Research programs

1. Molecular genetic studies on pathogenicity and mutations of Rice blast fungus *Pyricularia oryzae*

- ✓ Mutation mechanism of host specificity genes and fungicide resistance
- ✓ Analysis on genes related to pathogenicity development
- ✓ Importance of DNA repair and recombination in pathogenicity

2. Microbial approach to the improvement of wine production in Hokkaido

- ✓ Studies on grape endophytes and utilization in wine production
- ✓ Development of simple analytical apparatus for wine production
- ✓ Microbial dynamics in wine fermentation
- ✓ Collection and basic analysis of microorganisms related to wine production

3. Study on microbes and their enzymes on food production

- ✓ Catalytic mechanism of inositol release by Phytase phy9-3B from *Klebsiella pneumoniae*
- ✓ Study on indigenous microbes in fermented foods and their roles
- ✓ Study on oil degrading microorganisms and utilization for food waste composting machine



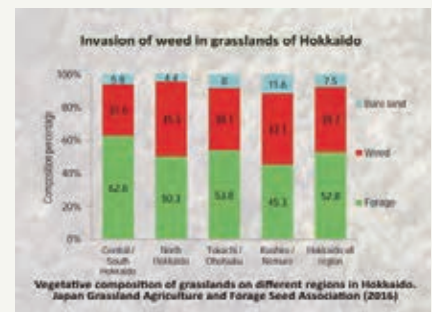
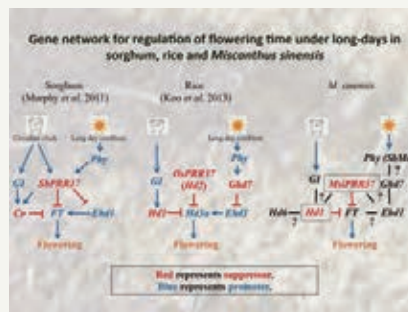
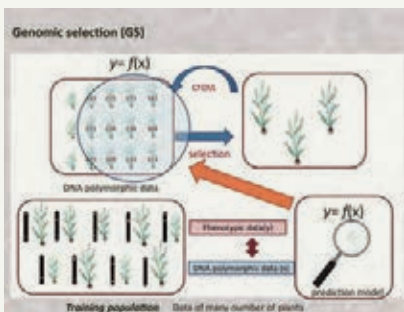
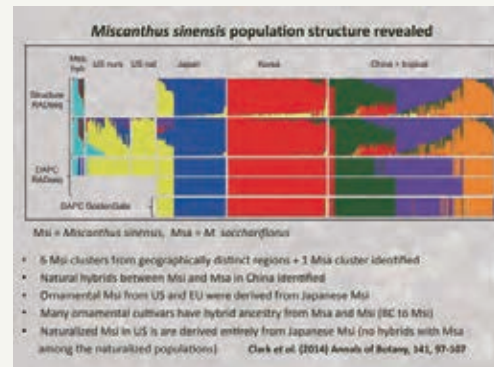
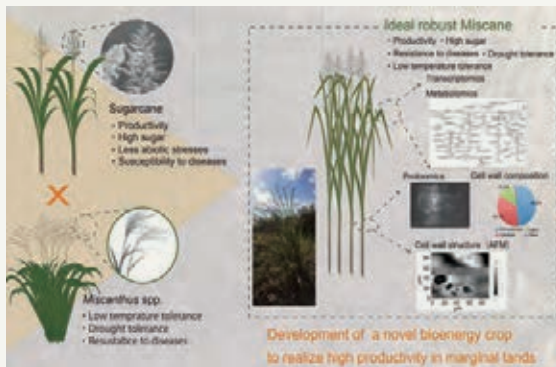
Applied Molecular Microbiology will connect microbes and Food production

Yamada Toshihiko, Professor

E-mail: yamada@fsc.hokudai.ac.jp

Research programs

1. Development of a novel bioenergy crops with robustness to environment stresses as well as refinery properties
 - Intergeneric hybrids (Miscane) by crossing between sugarcane and Miscanthus spp.
2. Genetic and breeding studies of Miscanthus spp. as a bioenergy crop
 - Analyses for the diversity and population structure of Miscanthus spp.
 - Gene network for regulation of flowering time in Miscanthus spp.
 - Genomic selection (GS) and precise and reliable breeding
3. Weed control for improvement of grassland quality in Hokkaido
 - Stable management techniques of grasslands mixed with timothy grass and Galega legume
 - Establishment of ecological control of invasive weeds



● Takasuka Taichi, Associate Professor

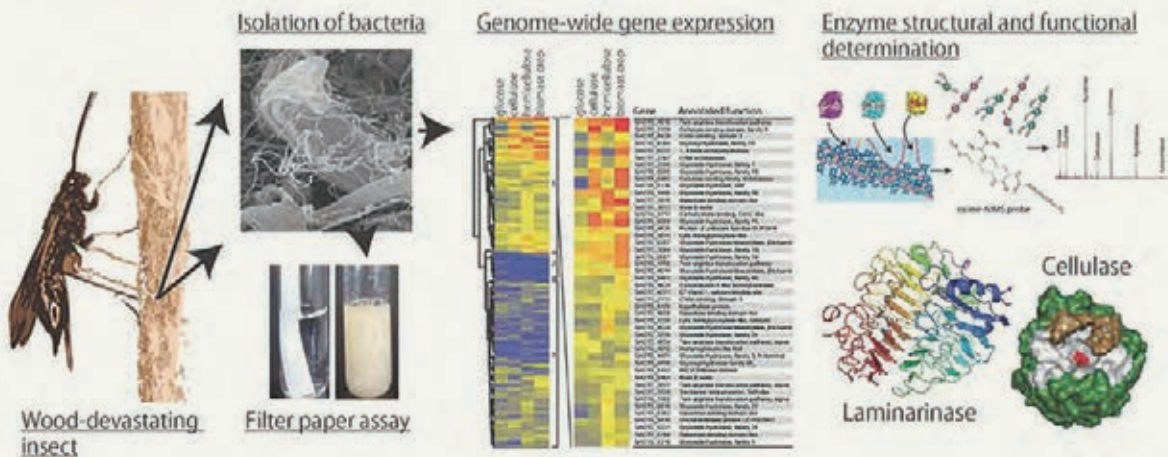
E-mail: takasuka@cen.agr.hokudai.ac.jp

Research programs

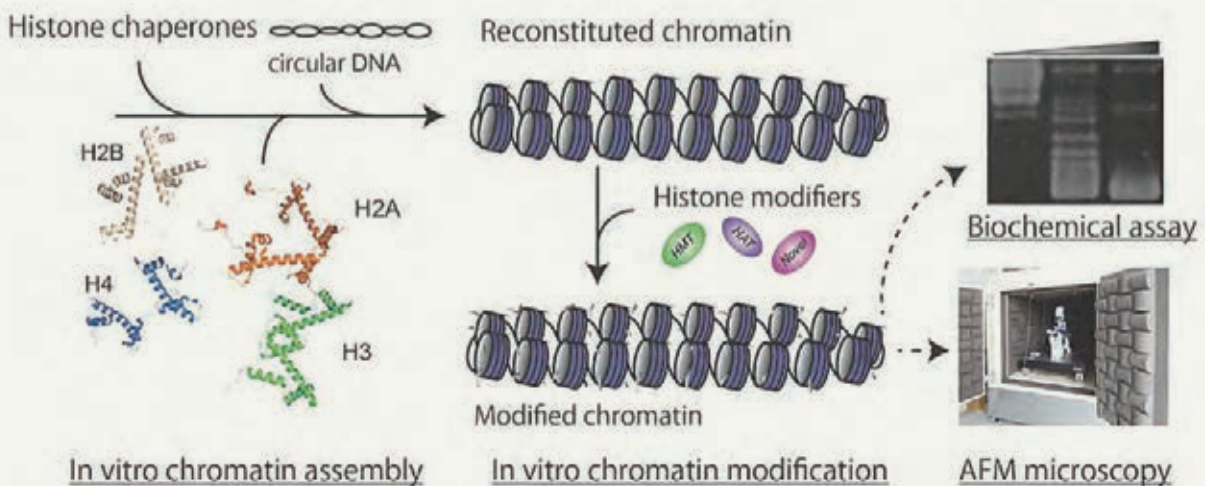
Biofuels production by insect symbiont bacteria



Discovery of novel biomass-degrading enzymes from new isolates



In vitro reconstitution of chromosome to understand "life"



Gowda Siddabasave B., Lecturer

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Research programs

Research programs

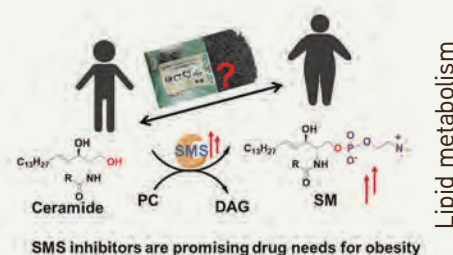
1. Global lipid fingerprinting by advanced liquid-chromatography/Mass spectrometry

- ✓ Biomarker discovery for early diagnosis of diseases: Myocardial infarction, Obesity, and Influenza.
- ✓ Discovery of functional lipids from food and their production



Gowda et al., Food Research International 2021

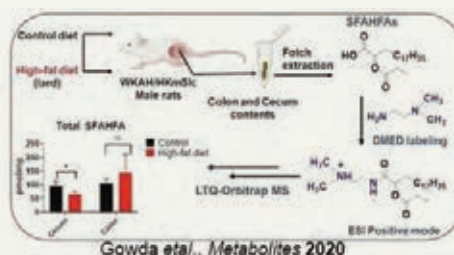
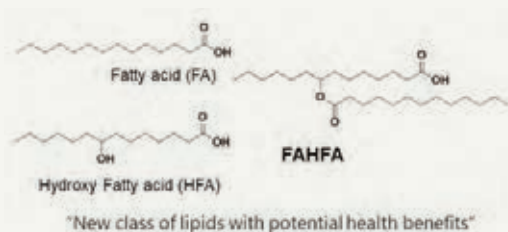
Anti-oxidants



Lipid metabolism

2. Elucidating the significance of Fatty acid esters of hydroxy fatty acids (FAHFAs) derived from food

- ✓ Analyses for the structural diversity of FAHFAs in dietary foods
- ✓ Chemical synthesis of functional FAHFAs
- ✓ *In vitro* evaluation of antioxidant effects of FAHFAs enriched foods.



Gowda et al., Metabolites 2020

3. Study on the formation of life-threatening oxidized lipids during cooking and their protection mechanisms

- ✓ Targeted LC/MS analysis of oxidized lipids: lipid peroxides, hydroxides.
- ✓ Methods of cooking (ex; seafoods) and their effect on lipid oxidation
- ✓ Protection of lipid oxidation during cooking ex; food coating, use of antioxidant, etc.

Skill set acquired



Chemical synthesis



LC/MS



Cell culture



Computational tools

● Takamura Itsuro, Lecturer

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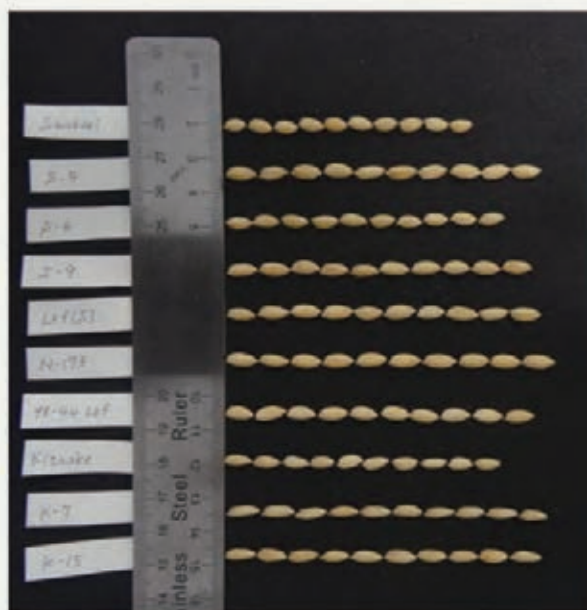
Research programs

The yield of rice is determined by four yield components (the number of panicles per unit area, the number of spikelets (seeds) per panicle, seed fertility and 1,000 grain weight).

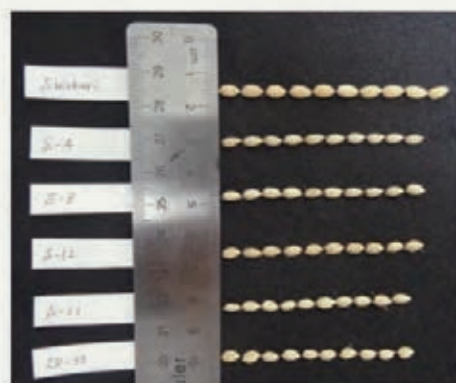
We have collected various mutants related to tillering number (number of panicles) and morphological mutants (shape and size) of spikelets in rice.

We are focusing on these genetic mutants to elucidate the genetic control mechanism of tillering and spikelet morphogenesis, which forms the basis of rice yield, using genetic and molecular genetic techniques.

1. Genetic and breeding studies on tillering number mutants in rice.
2. Genetic and breeding studies on grain size mutants in rice.
3. Genetic analyses of morphological mutants in rice.



(a) Large grain mutants derived from Shiokari and Kitaake.



(b) Small grain mutants derived from Shiokari.

Fig. 1. Comparison of spikelets size in the mutants.

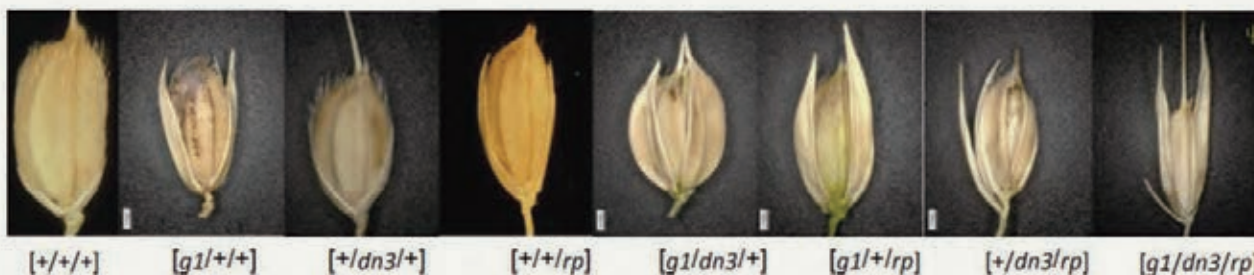


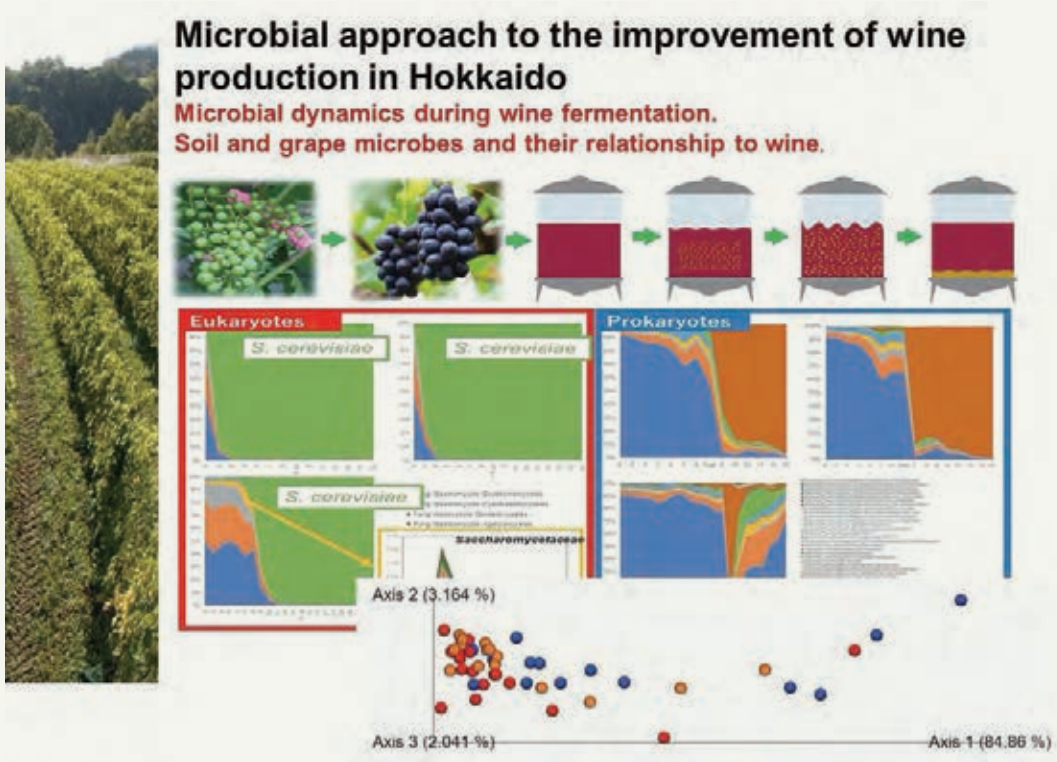
Fig.2. Spikelet phenotypes segregated in F2 population of the cross, 04-80 (dn3, rp) x H-176 (g1).

● Sato Tomoyuki, Specially Appointed Associate Professor

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Laboratory for Nouvelle Vague of Hokkaido Wines

Research programs



Utilization of winemaking by product

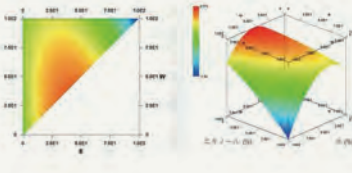
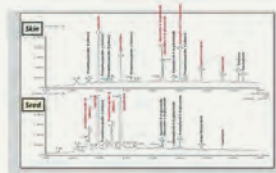
Identification of polyphenols and evaluation of functional properties.
 Optimization of the extraction of bioactive compounds from winemaking by product.



Pomace



Lees



Designing sanitation value chain

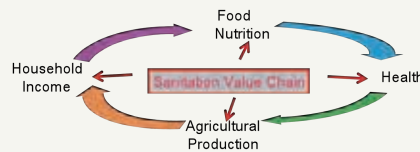
2050年の世界人口は約90億人と推定されています。「人の健康・環境負荷低減・食糧増産・資源管理の関係性の中で、し尿・排水をどう扱えばよいか？」この間の答えが必要とされています。

Sanitation systems are essential for promoting public health, preventing pollution of soil and water system, conserving ecosystem, and recycling resources.

The question of how to handle the excreta and wastewater from 10 billion people on the earth is therefore highly relevant to the global environment.

The goal of our project is to propose the concept of "Sanitation Value Chain" as a common solution

of both developing and developed countries. We have organized the project team with specialists from Global Health, Sanitary Engineering, Agriculture, Economics, Sociology and Anthropology.



Biosensing technologies to investigate small world

環境中の微生物・化学物質・重金属などの作用機序を解明するためには、生体細胞内あるいはその近傍における遺伝子・糖・タンパク質・酵素などの微小物質の挙動を理解することが重要です。センシング技術を開発するとともにバイオセンサの実用化を目指しています。

Our mission is to develop the practical biosensors under the collaborations with companies, institutes, and other universities.

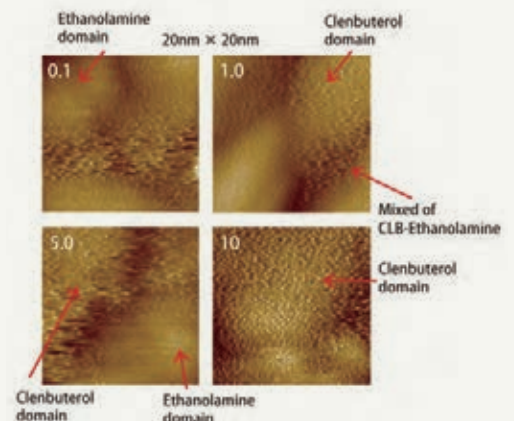
Biochemical reactions such as gene, sugar, protein, enzyme, chemicals etc., are not so complicated in an ideal condition, but it is very difficult to understand their behavior in practical condition.

For example, biochemical species forms a conjugate with a large matters in blood sample.

We aim to understand the basic response mechanism of biochemical species in ideal and practical conditions.



Researcher:
Assoc. Prof. Kawaguchi Toshikazu



Monitoring and predicting the effects of environmental changes

農地、森林などは、大気との間で熱、水、炭素などの物質を交換し、地球環境を整えるのに役立っています。この複雑なシステムを、プログラミングや野外観測、リモートセンシングなどを利用し研究しています。

Terrestrial ecosystem, composing of cropland, forest, rangeland, etc., is a quite large component in Earth's climate system.

Temporal and spatial distributions of exchange rates of heat, water, CO2 and other materials between ecosystem and atmosphere form global climate.

To know the current and future status of those materials' cycling, we conduct the field and satellite observations as well as ecological model simulation.

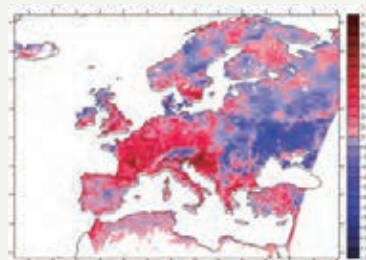


Fig. Simulated Future Vulnerability in Plant Production under Heat Wave

Researchers:
Assoc. Prof. Kato Tomomichi,
Assoc. Prof. Uchida Yoshitaka



● Inoue Takashi, Professor

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Research programs

1. Peatland management and conservation

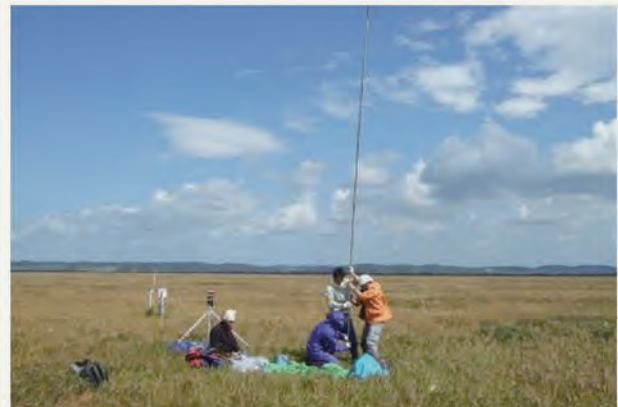
- ✓ Monitoring and evaluation of hydrological conditions of peatland.
- ✓ Peat subsidence study.

2. Study on rural infrastructure for sustainable agriculture and rural life

- ✓ High efficiency hybrid subsurface flow constructed wetland for water treatment in rural area.
- ✓ Innovation of farmland subsurface drainage system.
- ✓ Study on regional organization for responsible rural resource management



Land survey on peatland by using GPS equipment.



Peat boring (sampling) using hand borer (at Sarobetsu)



Using UAV (drone) for taking aerial photo of peatland surface.



Group photo at the workshop on constructed wetland.

Ishii Kazunobu, Associate Professor

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Research programs

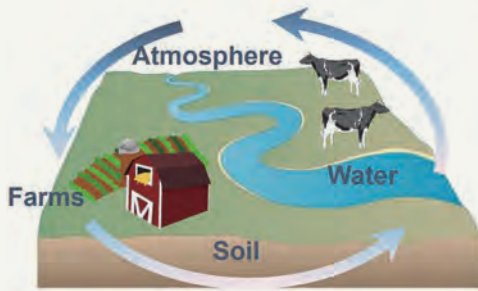
1. Multipurpose utilization of UAV remote sensing
 - ✓ Estimation of crop growth using various optical sensors (multispectral imaging sensor etc.)
 - ✓ Visualization of field space information using 3-dimensional sensor
2. Navigation of autonomous mobile robot for agriculture
 - ✓ Optimum operation method of multi robot tractors
 - ✓ Obstacle detection using laser scanner
3. Multipurpose communication system for agricultural mobile robot
 - ✓ Development of remote monitoring system for multi robot tractor
 - ✓ Communication system for inside and outside of robot tractor (CAN, ISO-BUS, wireless LAN, LTE, etc.)



● Uchida Yoshitaka, Associate Professor

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Research Theme



- Nutrients “cycle” on the earth. **Environmental biogeochemistry** aims to monitor this cycle and make sure it balances well.
- We often combine **field studies** with **microbiology** and **stable isotope studies**.

Team



Our team is very international!



Our Fields



Hokkaido

- We work with fertilizer companies and farmers.
- Agricultural issues are directly targeted (**fertilizer use, environmental impacts, plant disease**).

- We deal with soil degradation (**contamination, loss of fertility**).
- Collaboration with local scientists and students.



Sub-Saharan Africa

Our research technique examples



Spectral Data Collection

We take colour images of the soil surfaces. The data can be used to identify issues related to land use.



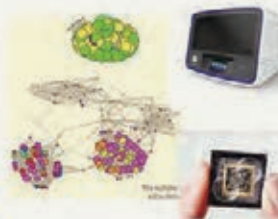
Farm interview/data collection

We interview farmers to calculate on-farm nutrient balances.



Field Data Collection

We collect soils/water/gases from any ecosystems in any countries in any seasons! Nutrient cycles are controlled by so many factors in nature.



Bioinformatics

Molecular data from soils and environmental data are analyzed using computer to fully understand the meaning behind it.



Environmentally friendly products

We collaborate with a cake company to produce a cheesecake, friendly to the earth!

Soil Microbial DNA

We investigate soil microbial community structures to investigate the relationship between their diversities and soil functions.

● Kato Tomomichi, Associate Professor

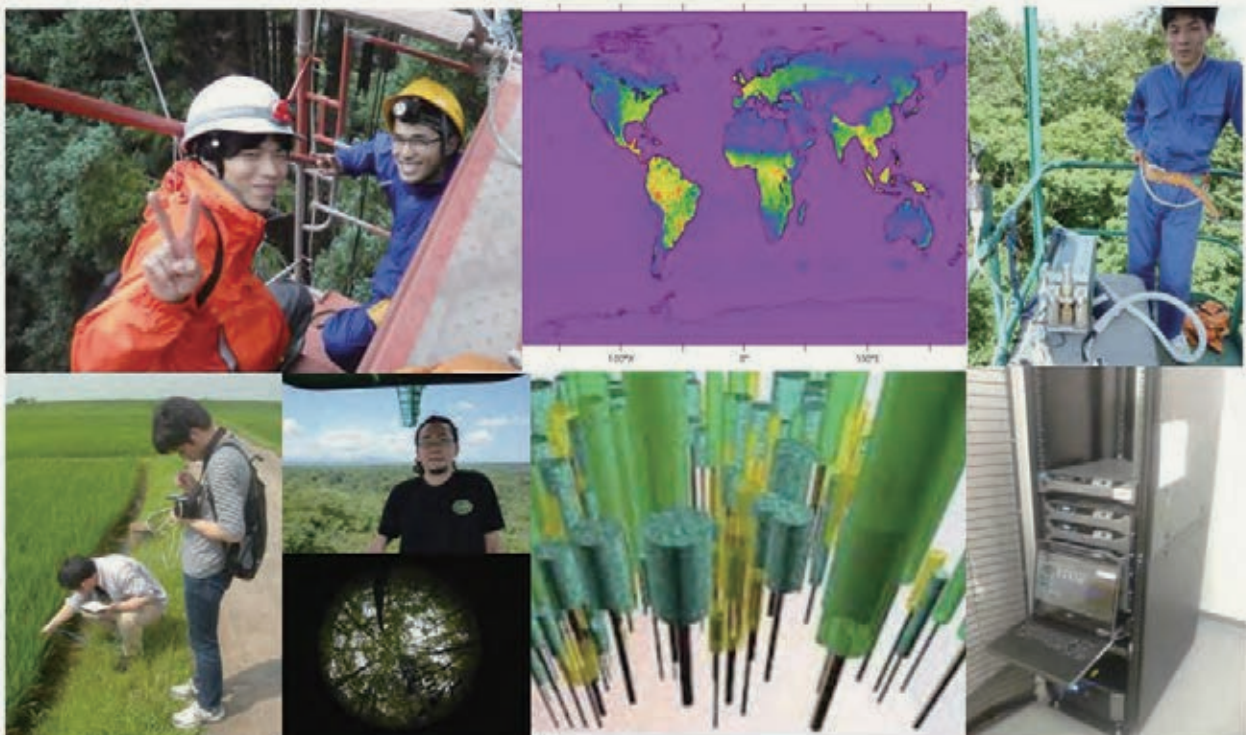
E-mail: tkato@cen.agr.hokudai.ac.jp

Research interests

1. How does terrestrial ecosystem affect climate system?
2. What is the important ecological factor for constraining environment?
3. Where is the threshold for terrestrial ecosystem to respond irreversibly to environmental change?

What are we doing?

1. Simulation of the interaction between vegetation distribution and climate change by terrestrial ecosystem modeling: SEIB-DGVM
2. Estimation of ecosystem-level photosynthesis by solar induced fluorescence by remote-sensing and ecosystem modeling
3. Estimation of the contribution by climate change to crop production by the inventory statistics



● Kawaguchi Toshikazu, Associate Professor

E-mail: t_kawa@ees.hokudai.ac.jp

Research programs

1. Biosensor Projects

Surface Plasmon Resonance Immunosensors for Life Science (IMURA Co.)

Optical Scope for Live Stock Production (JRA, Prof. Takahashi)

Electrochemical Biosensors for Food Safety (Hitachi Chem. Co.)

Fluorescence Biosensors for Evaluation of Cells and Tissues

(Partners: Takahashi group and group of Associate Prof. Yamada)

Spectroscopic Biosensors for Wine and Cheese (JST, Hitachi group, Prof. Sone)

2. Gas Sensor Projects

Analysis of Metabolism of Soil Bacteria, Sheep, and Cow

(Partners: the University of Sydney and Iowa State University)

Development of Highly Sensitive and Highly Selective Gas Sensor elements (Yabegawa Co.)

3. Water Projects

The Next Generation Water Supply System (JST, Hitachi group)

Studies of Catalysts and Absorbents for Environmental Mediation (Hitachi group. Takuma Co.)

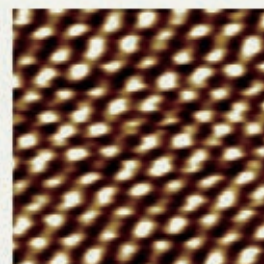
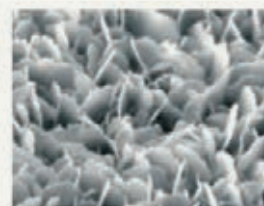
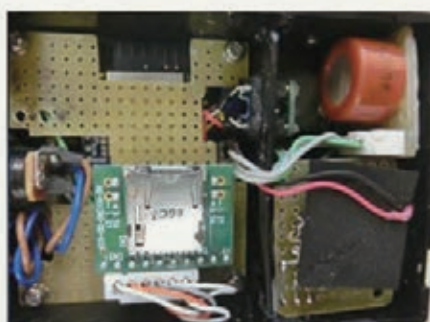
Recovery of Phosphate from Discharged Water of Potato Factory (JA Shihoro)

4. Energy Projects

The Next Generation Energy Devices Using Carbon and Semiconductors (NAZCA Co.)

5. Food Safety

Catalyst for Food storage (Partner: University of Sydney, NAZCA, Hitachi)



● **Kashiwagi Junichi, Lecturer**

E-mail: kashi@env.agr.hokudai.ac.jp

Research programs

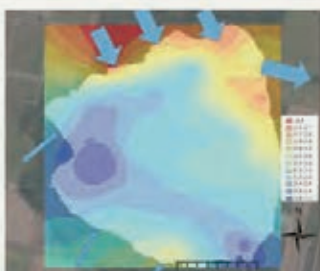
1. Soil management and improvement in the agricultural land
 - The effect of the under drainage system with flat pipes for field drainage and irrigation
 - Temporal changes in soil fertility and the measures to maintain the land productivity under slash-and-burn cultivation in the northern Laos
2. Soil materials movement and nutrients cycle through soil
 - Spatial variability analysis of the pyrite concentration in sediment in Miyajima swamp
3. Nutrients cycle in the paddy field cultivated with alternative system without fertilizer and chemical materials application



Basic concepts of Non Limiting Water Range (NLWR) in soil

Seeding process in Laos

A: aggregated soil, B: high bulk density soil, C: compacted soil (un-aggregated soil)



The distribution of sediments pH values in Miyajima-numa

Low pH zone was located close to drainage channel flow into this lake. The drainage water from agricultural land contributed to generate the pyrite in sediments.



Mid tillage weeding:

1, 16times

Rice yield: 287, 533 kg/10a

(Kasubuchi, 2015)



Fishery stock assessment in data poor situation

水産資源を持続的に利用していくために、資源量の把握が不可欠です。細かな漁獲物組成が得られれば、高度な解析ができますが、このような情報が得られない地域も少なくありません。データが不十分な状況でも、適切な資源管理を実施できるような資源量推定法を研究しています。

Population and its productivity of fishery stock are the key information for the sustainable fishery management.

Age based methods are widely used in northern countries, but are sometimes difficult to apply because of the difficulty of the age determination, and also the lack of the collecting system of fishery information.

We are examining the validity of Schaefer's production model applying to mixed species data.

The model is designed for single species, but in data-poor situation, catch statistics for each species is not available.

By using simulation study, we found that the recommended catch quota (MSY) calculated from the mixed data is near to the total of the single species MSY.

Researcher:
Prof. Matsuishi Takashi Fritz



Tragedy and Survival of Peasants in Developing Countries

今日の発展途上国の農村問題には、どのような政策矛盾が起因しているのか問題提起します。植民地から独立後の開発独裁の農業政策、つまり近代化によって、農村が変容を遂げた歴史的検証が必要になります。また、途上国の農村は、グローバル化の中で同族化し、格差に苦しみ、時に暴力的政治集団に巻き込まれています。

Why have the rural communities in the developing countries been marginalized by the Globalization today? We need to verify how the prototype of rural community in the developing countries did not adapt to the modernization during the colonization and development dictatorship. This contradictory process brought many economic problems and social and political conflicts.

Multidisciplinary approaches (political, anthropological, economical and sociological) are

used to criticize how the modernization (Nation State, production system, law and moral value) and agricultural policy of Development Dictatorship after the independence influenced the rural community's social structure.

Causality of this acculturation between internal and external elements will be clarified.

Researcher:
Prof. Nabeshima Takako



Agricultural Economics: Supporting Farmers with Evidence-based Policy Evaluation

農業経済学では、グローバル化する経済環境において小規模農家や事業者が国際市場で生き残る上で不可欠な、新たな市場の開拓や農村組織の強化、生産性の向上をおとした農村開発・地域振興策の提言を行います。また、様々な政策オプションがある中、データや統計分析にもとづく実証的な政策評価のできる人材を育成します。

Our goal is to find ways to improve the welfare of smallholder farmers in the globalization era. For instance, increasing their productivity, improving their access to global markets, and establishing organizations to provide agricultural services are considered to be effective to enhance their likelihood to survive the global competition. By learning economics and statistics necessary to evaluate economic impacts of such policy

measures, students in our program will develop their skills to engage in evidence-based policy-making.

Researchers:
Assoc. Prof. Kobayashi Kuniyuki,
Lecturer Saito Yoko

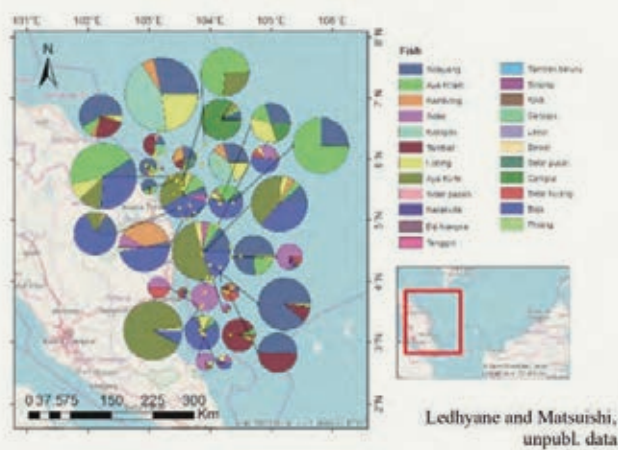


● **Matsuishi Takashi Fritz, Professor**

E-mail: phocoena@fish.hokudai.ac.jp

Research programs

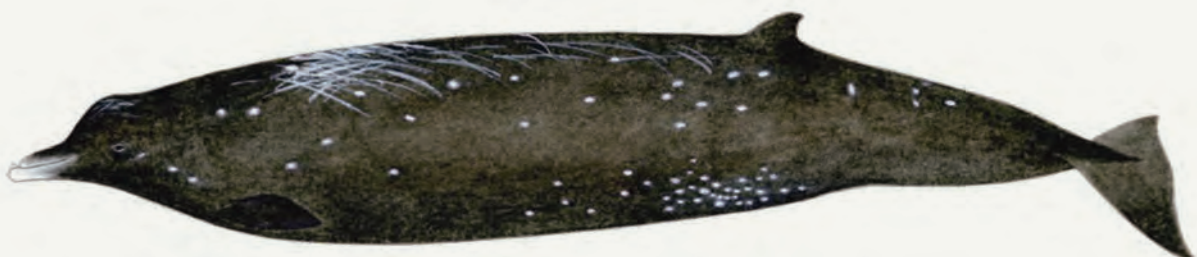
1. Fisheries management and stock assessment in data poor situation
 - ✓ Harvest control rule for mixed species data
 - ✓ Fisheries management for multi-species, multi-gears situation
 - ✓ Growth-curve free length-based fisheries management
 - ✓ Fisheries management assessment in developing country
2. Cetacean research for avoiding conflicts between marine animals and fisheries
 - ✓ Studies using stranded cetaceans
 - ✓ Passive acoustic monitoring of cetaceans around fishing gears



Result of FishMAT for Blue swimming crab fisheries in Kep, Cambodia

Categories/MCSA code	M	C	S	A	Total
① Basic information of current situation	😊	😊	😊	😊	😊 53%
② Maintenance Rehabilitation of the Ecosystem	😊	😊	😊	😞	😊 60%
③ Input-Control	😊	😊	😊	😊	😊 90%
④ Output-Control	😊	😊	😊	😊	😊 17%
⑤ Business improvement	😊	😊	😊	😊	😊 13%
⑥ Post-harvest treatment / processing	😊	😊	😊	😊	😊 13%
⑦ Human and organizational capacity	😊	😊	😊	😊	😊 73%
⑧ Assessment and analysis capacity	😊	😊	😊	😊	😊 71%
Total	😊 64%	😊 50%	😊 4%	😊 33%	😊 41%

😊 0-25% 😊 26-50% 😊 51-75% 😞 76-100% Monitoring, Control, Surveillance, Management Activities
Takano and Matsuishi, unpubl. data



クロツチクジラ *Berardius minimus* sp. nov. Yamada, Kitamura & Matsuishi, 2019

● Nabeshima Takako, Professor

E-mail: nabetaka@imc.hokudai.ac.jp

Research programs

1. Social change (acculturation) of rural community in developing countries (particularly in Africa) during the modernization.
 - ✓ Analysis and criticism of the agricultural policy and agrarian reform.
 - ✓ Historical description of colonization and development dictatorship.
 - ✓ Explanation of the gap between rich and poor in the context of globalization.
2. Social scientific planning of development project.
 - ✓ Research on the structural reason of social problem.
 - ✓ Mobilization of local population as human resource so that they can participate in their development.
 - ✓ Methodology of field survey (qualitative analysis).
3. International politics and African studies
 - ✓ Crystallization of political ethnicity in the marginalized rural community.
 - ✓ Misunderstanding between the elite and small peasants.
 - ✓ Reorganization of rural community that be confronted with transnational knowledge and technology

Baobab



Cloth of cotton made in Burkina Faso



● Kobayashi Kuniyuki, Associate Professor

E-mail: kobakuni@cen.hokudai.ac.jp

Research programs

1. Farmer's associations and cooperatives to develop rural economy and communities
 - ✓ Rethinking of principles of agricultural cooperative through international comparative studies
 - ✓ Attitudes toward cooperatives or collective works of younger generations
 - ✓ Networks of young people and women in agricultural sector
2. Creating new networks and collaboration of rural development
 - ✓ Community design based on collaboration with local communities;
 - ✓ Attoko region in Nemuro city
3. Communication between agricultural sector and general public
 - ✓ Risk communication
 - ✓ Education of food and agriculture to public "SHOKU NOU KYOIKU"



● Saito Yoko, Lecturer

E-mail: saitoy@agecon.hokudai.ac.jp
(Agricultural Resource Economics)

Research programs

1. Economics of Agricultural R&D

R&D is one of the most important sources for productivity growth in agriculture, however, because of its public goods nature, agricultural investment has difficulties of inviting private investment. Institutional setting is one of my research interests, thus, analyzing IPRs data.



2. Development Economics

Human capital is another important input in economic development, but investment to those capital depends on the household decision, which is usually a private decision. Recently, we have been working on those household decisions using available microdata from Myanmar, Cambodia, and Vietnam.



Voice from the MC Students of GFR

How is your life in GFR?

At first, I was worried about my English skill. However, there are English classes in a small group, so you don't have to worry. In the lecture, I can get knowledge about new fields that I haven't experienced. Professors teach us things targeted not only at domestic but also at worldwide food-related problems. Therefore, I can form a comprehensive view of them.

(C. N.)

Although school life is very busy, it is very satisfying with classes, Wondervogel study, and research of each type. In addition, the graduate school members are so active, funny, and powerful that anyone would be inspired.

(M. K.)

As a foreign student at the school, I can feel the kindness of classmates. They always help me a lot. There is always a smile on every classmate's face; everybody likes to make friends. The professor's method of teaching is very interesting. You can ask them questions at any time. School facilities are also very complete. There are lounges and a barbecue site, printers, drinking fountains, and even a party area for students. The life here is very convenient and beautiful.

(L. Y.)

Being a part of GFR is such a matter of pride for me. I've spent the best period of my life in GFR. The professors are kind and humorous. The students are talented and creative.

You will get far more chances to meet with foreign professors and work with global issues here than anywhere else in Hokkaido, probably even in Japan. For that reason alone, it's a great time to brush up your English skills!

(W. S.)

Jobs after graduation

1. Employment (ex.2020)

NTT、P&G Japan、日本農産工業株式会社、
日本工営株式会社、ダーレー・ジャパン・ファーム有限公司、
株式会社EVENTOS、株式会社メディロム、株式会社ウーオ、
本田技研工業株式会社、イヨスイ株式会社

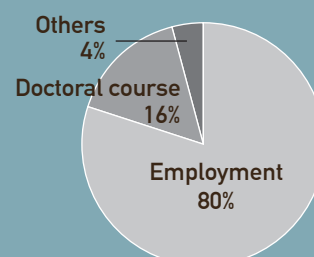
2. Doctoral course

GFR、東京大学、スウェーデン農業科学大学

3. Others

留学

Distribution of their carrier path
of the GFR student 2018-2020



Impression for WV1 in Denmark

It was a good opportunity for me to say my opinion in front of many people who are not Japanese. Though I had a difficulty in communicating with local students and lecturers in the beginning, finally those experiences made me more active and stronger-minded.

(M. K.)

It stimulated me very much, and I have changed my attitude of studying since then.

(C. N.)

I learned a lot about agriculture and livestock farming. Looking by my eyes was much easier to understand than reading at the desk. It was nice to visit LEGO land with crazily nice classmates on holiday!! I'd love to share this story with you, please come to ask me.

(W. S.)

Wandervogel Study in Denmark was the unforgettable experience for me. We were asked to have a presentation by a group. For each group, there were Danish students and German students were attended with us. We associated and cooperated to make slides for presentation. It was a good chance to practice our skills, such as communication and English researching, and presentation. Most importantly, we did the presentation just in front of Danish students and professors, so it was good experiences to get advises from them.

(X. Z.)

Impression for WV2 in Myanmar

It was a really good experience for me to know very unique way of communication by local people.

(C. N.)

You are supposed to meet a bit of surprises, incls. electricity failure, tap water down and stomach ache, to which you definitely can get used soon. Anyway, it was good experience to know how local people live and treat the foods.

(M. K.)

We've learnt lots of local agricultural practices and life culture, and found it difficult to meet both technological development and environmental protection in developing country. This on-site study in WF2 really impressed me more than textbook study in lecture room does.

(L. Y.)

It was a good chance to see the practical issues by our eyes instead of learning from both website and text book. We realized that more closely-cooperative relationships among the countries were needed for tackling the issues.

(W. S.)

I enjoyed Myanmar life because I could communicate with Myanmar students and I actually stayed Myanmar village. I could have precious experience and live the full time.

(M. M.)

Doctoral course Curriculum/Program structure

博士後期課程カリキュラムの特徴と履修モデル

The Graduate School of Global Food Resources aims to produce future world leaders who comprehend the diverse, multi-layered food resources issues the world is facing, and who can propose and implement specific solutions for those problems. Therefore, by providing advanced, interdisciplinary and comprehensive education and research opportunities that integrate both humanities and sciences, this graduate school sets its educational goal to foster individuals who have the extensive knowledge to comprehensively understand global food resources issues and who have the expertise to solve problems in a practical way.

By developing the ability to polish the various problem-solving skills acquired during their master's degree studies, students will have potential to independently take paths that lead to optimal answers to the global food resource problems they encounter.

14-credit Doctoral degree

Students must remain in school for at least three years, acquire 14 or more credits in compulsory subjects and pass the school's thesis defense and examination sessions.

Students take Wandervogel Research Internship in Global Food Resources VI, Seminar in Global Food Resources III and Dissertation Research in Global Food Resources II under their supervisors based on their own specialties and future aspirations.

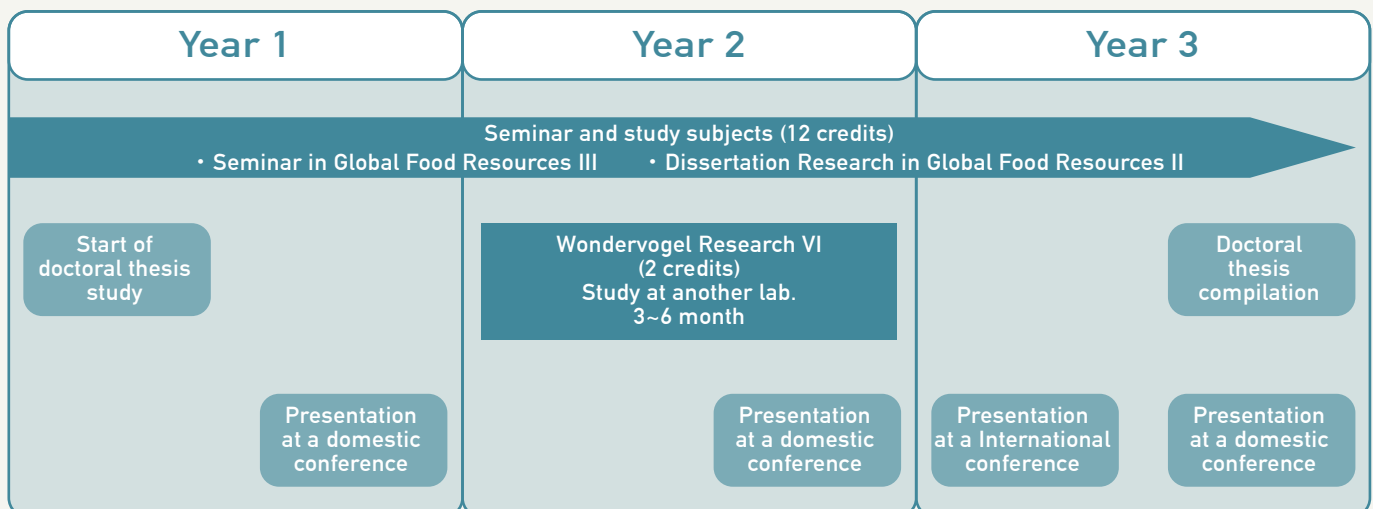
Compulsory subjects

- ◎ Wandervogel Research Internship in Global Food Resources VI
- ◎ Seminar in Global Food Resources III
- ◎ Dissertation Research in Global Food Resources II

Students set their own study subjects toward the resolution of global food resource problems, engage in fieldwork and collaboration with local researchers, and write doctoral theses proposing related solutions with guidance from their supervisors. Doctoral theses and associated defenses are presented in English.



Example course structure



Voices from Doctoral Course students

What made you enter the Doctoral Course?

The reflections of master study in GFR

Through the master course of the GFR, it was very impressive to meet and communicate with students in the class and professors at lectures who have a broad background, different nationality, expertise, culture and so on. Visiting on the fields and local area and discussion with them as a part of the Wandervogel activities, which gave me new perspectives and in-depth knowledge of the food-related global issues.

The reasons to continue graduate work for Ph.D. in GFR

I decided to study at the doctoral course in the graduate school of global food resources, because I would like to continue my research projects under the guidance of my supervisors. Besides this, this graduate school provides us an opportunity to interact with great researchers from foreign countries as well as from Japan. In this graduate school, I'm working on my projects, collaborating with domestic and international scientists, and I believe I can acquire what is needed for a competitive researcher during doctor course.

(K. O.)

The reflections of master study in the GFR

The GFR provides different styles and various options during graduate school life, which is very different from traditional graduate schools in Japan. During my master study, I learned many things not only about my research fields, but also other field's, and sometimes combined more than two different research areas. I received my lectures from professors from overseas to learn what researches are focusing on in other countries. It was a valuable experience for me, and I increased my knowledge. Meanwhile, I found out what I really want to do in the future during my master study in GFR.

The reasons to continue graduate work for Ph.D. in the GFR

Through my master study, I realized that what I really want to do in the future. I want to work in the research organization institute to continue my research in the present field. So that, the doctoral course is necessary obviously to me. During the master study, pretty much everything would be given and guided by your supervisor. In contrast during the doctoral course, all research are required by yourself ideas and creations. That can help me to learn more knowledge and improve personal quality; meanwhile, it helps to approach my career path.

(S. L.)

The reasons to pursue my Ph.D. in the GFR

There are several reasons why I chose GFR as my PhD course. One of the critical reasons is that the GFR in Ph.D. program offers the integrated curriculum that bridges the area of social sciences and STEM (Science, Technology, Engineering, and Mathematics), altogether required to solve the current and future global food resource problems. Additionally, the program aims to educate the world-class pioneers with broad perspectives and international negotiation skills, which altogether enable us to address challenges on various food resources challenges. For instance, in my hometown, Mekong Delta area in Vietnam, known as one of the most significant food (especially rice) supply areas for the country and the world, now people are facing on the issues like the climate change. To achieve these aims, I wanted to gain my experience and expertise from the GFR's faculty who are experts in a broad knowledge in production, environment, and governance, all related to the future global and food resources. Especially, GFR offers the Wandervogel fieldwork subjects that bring chances to students to take multiple study trips to learn about the real world food resources problems in Japan and other countries. Moreover, GFR also provides opportunities for students to study in an all-English curriculum to be able to do a global career.

(H. T. K. U.)

This school offers a Master's and Doctoral degree and the number of students to be admitted in year 2022 will be 15 for Master's degree and 6 for Doctoral degree.

本学院は修士課程学生を募集しており、2022年度は修士課程15名、博士後期課程6名の学生を募集しています。

We may not administer the second exam when the number of successful candidates has reached the capacity after the first exam. 合格者が定員に達した場合、2次募集を行わない場合があります。

Important dates (General Admissions) 入試日程(一般選抜)

Master's course

2021		2022	
		※Second exam 2次募集	
Mid June	Release Date	Mid Nov	Release Date
12 July - 16 July	Application period	13 Dec - 17 Dec	Application period
23 Aug 1 st day	Essay-type test	2 Feb	Essay-type test
24 Aug 2 nd day	Presentation and interview	2 Feb	Presentation and interview
3 Sept	Announcement of exam results	18 Feb	Announcement of exam results

Doctoral course

2021		2022	
		※Second exam 2次募集	
Mid June	Release Date	Mid Nov	Release Date
12 July - 16 July	Application period	13 Dec - 17 Dec	Application period
23 Aug	Presentation and interview	2 Feb	Presentation and interview
3 Sept	Announcement of exam results	18 Feb	Announcement of exam results

To keep you updated

最新情報はウェブでチェックしてください

The tables above are tentative thus please follow us on;

Twitter: @GFR_HU

Facebook: @GFR.HU

HP: <https://www.gfr.hokudai.ac.jp>



Application Procedure 出願から合格発表まで

1 Preliminary contact

事前に指導を希望する教員と入学後の学修について相談のうえでお願してください。

- Applicants are required to make contact with a preferred academic advisor before submitting application materials.
- Read "Research themes (p5-7)" and grasp the idea of this graduate school.
- Read "Meet the Faculty(p14)" and look at their websites, if available.

2 Take English proficiency test

Master's course

出願時、TOEFL又はTOEICのスコアの提出が必要です。下記の有効なスコアや取得しておくことが望まれる点数を確認し、必ず事前に受験してください。

- Submit copy of an official score certificate within the application period. Be sure to take the TOEFL or TOEIC test early enough to get your score in time.
- Valid Score Sheets for Admission in April 2022 (First-Term Exam): A score sheet on examination taken in or after August 1 2019.
(Second-Term Exam): A score sheet on examination taken in or after February 1 2020.
- Any of the followings:
 - 1) TOEFL-iBT
 - 2) TOEIC Listening & Reading
 - * TOEFL-ITP, TOEIC-IP, TOEIC Speaking & Writing Tests, TOEIC Speaking Test and TOEIC Bridge Test are not accepted.It is preferable that you have earned a score of 57 or higher on the TOEFL-iBT, or 550 or higher on the TOEIC L&R. The school offers all lectures, tutorials, and seminars in English.

Doctoral course

出願時、TOEFL、TOEIC又はIELTSのスコアの提出が必要です。下記の有効なスコアを確認し、必ず事前に受験してください(ただし、本学国際食資源学院修了(見込)者は提出不要です)。

- Submit copy of an official score certificate within the application period. Be sure to take the TOEFL, TOEIC or IELTS test early enough to get your score in time(However, applicants who completed or expect to complete courses at the Graduate School of Global Food Resources, Hokkaido University, do not need to submit this documents).
- Valid Score for Admission in April 2022 (First-Term Exam): A score sheet on examination taken in or after August 1 2019.
(Second-Term Exam): A score sheet on examination taken in or after February 1 2020.
- Any of the followings:
 - 1) TOEFL-iBT
 - 2) TOEIC Listening & Reading
 - 3) IELTS (Academic)
 - * TOEFL-ITP, TOEIC-IP, TOEIC Speaking & Writing Tests, TOEIC Speaking Test, TOEIC Bridge Test and IELTS (General Training) are not accepted.

3 Obtain the application form and prepare the documents for submission

募集要項は下記の窓口又は郵送で請求し、必要書類を準備してください。

- The application guidelines of general category are available at the address below.
- If you request the guidelines by mail, send an envelope with "Request for the application guidelines for the Master's or Doctoral Course of the Graduate School of Global Food Resources" written in red ink on the envelope to the address below. The envelope should contain a self-addressed stamped envelope (24 cm × 33.2 cm; be sure to write your zip code, address and name, and use stamps to the value of 210 yen for standard mail or 500 yen if you would like express mail).

郵送の場合は、郵便番号、住所、氏名を明記し、210円分(速達希望の場合は500円分)の切手を貼付した角形2号の返信用封筒を同封して下記宛てに送付してください。請求封筒の表面左下には「国際食資源学院修士課程(又は博士後期課程)学生募集要項請求」と朱書きしてください。

[Address] Student Affairs Section, Administrative Office of Agriculture and Global Food Resources, Hokkaido University
Kita 9, Nishi 9, Kita-ku, Sapporo 060-8589, JAPAN

北海道大学農学・食資源学事務部教務・学生担当
〒060-8589 札幌市北区北9条西9丁目

4 Apply directly or mail with TOEFL, TOEIC etc. score

出願期間中に指定の様式とTOEFL又はTOEIC等のスコアを含む必要書類を農学・食資源学事務部へ提出してください。

Applicants must submit the official application form and required documents to the Administrative Office of Agriculture and Global Food Resources within the application period.

5 Examination

Master's course

試験科目は小論文と口頭試問です。

- 1) Essay-type test with specific theme (English or Japanese)
- 2) Presentation and interview (English)
 - General theme of essay will be given prior to the admission, and specific theme will be given on the day of admission.
 - Presentation should include your past research experience and your intention of future research.

Doctoral course

試験科目は口頭試問です。

- 1) Presentation and interview (English)
 - Presentation should include your past research experience and your intention of future research.

6 Announcement of results

受験者に合否が通知されます。
Applicants will be informed of the exam results.

Meet the Faculty

Production



**SONE
Teruo**

Applied
Microbiology



**TAKAHASHI
Masashi**

Animal
Reproductive
Physiology



**YAMADA
Toshihiko**

Crop
Production
Science



**SATO
Tomoyuki**

Environmental
microbiology
Oenology



**TAKASUKA
Taichi**

Biochemistry,
Microbial Sciences
Protein Sciences
[www.agr.hokudai.ac.jp/
takasuka/index_en.htm](http://www.agr.hokudai.ac.jp/takasuka/index_en.htm)



**TAKAMURE
Itsuro**

Plant
Breeding



**Bomme Gowda
Siddabasave
GOWDA**

Lidmics
Lipids in functional
food
Disease biomaker
discovery
Analysis of oxidized
lipids

Environment



**INOUE
Takashi**

Land and
Water
Management



**ISHII
Kazunobu**

Applied
Bioproduction
Engineering



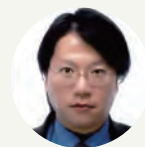
**UCHIDA
Yoshitaka**

Environmental
Biogeochemistry
www.uchidalab.com



**KATO
Tomomichi**

Plant Ecology,
Agricultural
Meteorology



**KAWAGUCHI
Toshikazu**

Sensor and
Environmental
Engineering
[http://env.world.coocan.jp/
env/Index.files/slide0003.htm](http://env.world.coocan.jp/env/Index.files/slide0003.htm)



**KASHIWAGI
Junichi**

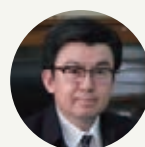
Soil
Conservation

Governance



**KUBOTA
Hajime**

International trace
Theoretical
Economics



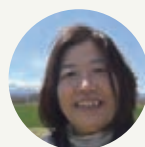
**NABESHIMA
Takako**

Political
Science of
Rural Community



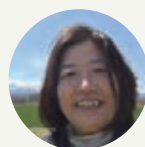
**MATSUISHI
Takashi Fritz**

Fish Stock
Assessment
<http://matuisi.main.jp/>



**KOBAYASHI
Kuniyuki**

Rural Development,
Food Network and
Cooperatives



**SAITO
Yoko**

Agricultural
Economics

※教員の連絡先は本学院ウェブサイト「教員紹介」から確認してください。
<https://www.gfr.hokudai.ac.jp/ja/staff/organization/>

* Contact information of each professor is listed on the "Staff" page of the official website:
<https://www.gfr.hokudai.ac.jp/staff/gfr-organizational-diagram/>

Access



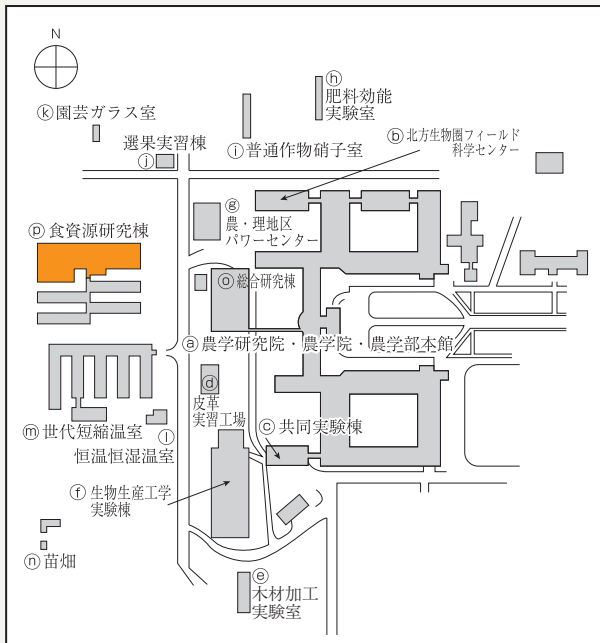
北海道大学大学院国際食資源学院

Hokkaido University
Graduate School of
Global Food Resources

Kita9, Nishi9, Kita-ku, Sapporo

大学院国際食資源学院

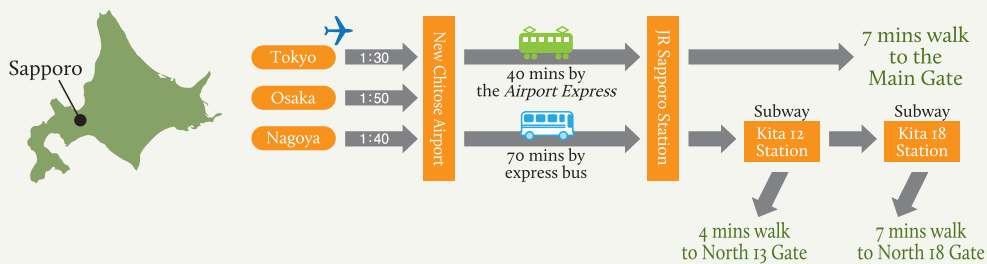
Graduate School of Global Food Resources



- Ⓐ Faculty of Agriculture
Graduate School of Agriculture
School of Agriculture
- Ⓑ Field Science Center for Northern Biosphere
- Ⓒ Common Experiment Building
- Ⓓ Practical Leather and Fur Workroom
- Ⓔ Laboratory of Wood processing
- Ⓕ Bioproduction Engineering Experiment Building
- Ⓖ Power Center
- Ⓗ A Manure Effect Laboratory
- Ⓘ Ordinary Crops Glass Room
- Ⓚ The Training Ridge Which Sorts Fruits (Experimental Farms)
- Ⓛ Gardening Glass Room
- Ⓜ Controlled Environmental Greenhouse
- Ⓝ Greenhouse for Forced Regeneration of Plants
- Ⓟ Experimental Nursery
- Ⓞ Bioscience and Biotechnology Building
- Ⓠ Food Resources Research Building



Getting to Sapporo Campus





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