



UNITED NATIONS  
UNIVERSITY  
**UNU-IAS**  
Institute for the Advanced Study  
of Sustainability



**Linking Biological and Cultural Diversity**  
UNESCO-SCBD Programme

A global knowledge platform linking local, regional, national and international practices and experiences

# Abstract Book

## 1st Asian Conference on Biocultural Diversity Thematic meetings and Poster Presentations

*Policies and Actions on Biocultural Diversity  
for Sustainable Communities*

[Electronic Version]





# Preface

This book of abstracts has been published for the 1st Asian Conference on Biocultural Diversity in Wakura-onsen, Nanao, Ishikawa prefecture, Japan. The conference has been organized by UNESCO, the Secretariat of the Convention on Biological Diversity, United Nations University, the Ishikawa Prefectural Government, and Nanao City.

The conference encompasses meetings in three thematic areas, composed of nine sessions and a poster session, around the general topic of “Policies and Actions on Biocultural Diversity for Sustainable Communities.”

The purpose of the thematic meetings is to develop policy proposals for sustainable communities through the sharing of effective practices and solutions to common problems in Asia. Specifically, we hope that the meetings will do the following:

1. Provide good practices and policies including strategy, policy integration, and planning for conservation and sustainable utilization of biological and cultural diversity at multiple levels, so as to enable community development while rebuilding the link between cultural practices and biodiversity
2. Promote intellectual exchange and discussion on practical challenges, policy issues, academic research, and field education related to sustainable community development through biocultural diversity and resource management
3. Identify lessons for community development that are applicable to the Asian context as well as international society and global networks, such as internationally designated areas, from the outcomes of the discussions

To achieve these goals, we wish to involve participants from various sectors, such as policy and decision makers at multiple levels (municipal, prefectural, state, national, international), academic researchers, local practitioners, and social entrepreneurs, as well as university students.

The outcomes of the thematic meetings and poster session are expected to help us chart a new pathway forward in several areas:

1. Inclusive strategy and planning at different administrative levels and academic evaluation of biocultural diversity and how it can contribute to sustainable development, including conservation and utilization in both urban and rural areas
2. Improving practices of field education and challenging new, creative small businesses to generate and utilize local biocultural resources and knowledge
3. Mutual learning platform development and collaboration for biocultural resource management among various internationally designated entities, such as in the Globally Important Agriculture Heritage Systems (GIAHS) program, biosphere reserves, world heritages, and other initiatives



“Policies and Actions on Biocultural Diversity for Sustainable Communities.”

Abstract Book of the thematic meetings and poster presentations of  
1st Asian Conference on Biocultural Diversity, on October 27–29, 2016  
Wakura-onsen, Nanao, Ishikawa prefecture, Japan [Electronic Version]

United Nations University Institute for the Advanced Study of Sustainability  
Operating Unit Ishikawa/Kanazawa (UNU-IAS OUIK)  
Shiinoki Cultural Complex, 3F, 2-1-1 Hirosaka, Kanazawa City, Ishikawa Prefecture  
JAPAN 920-0962 TEL +0081-76-224-2266; FAX +0081-76-224-2271; <http://ouik.unu.edu/en/>

ISBN: 978-92-808-4572-3 [Electronic Version]

Printed in Kanazawa, Japan

Copyright © 2016, UNU-IAS OUIK

Editor

Yoshihiko Iida, Ph.D.

Operating Unit Ishikawa/Kanazawa(OUIK), United Nations University Institute for the Advanced  
Study of Sustainability (UNU-IAS)

In cooperation with

Mikiko Nagai, Arita Norie, Satomi Kubo,

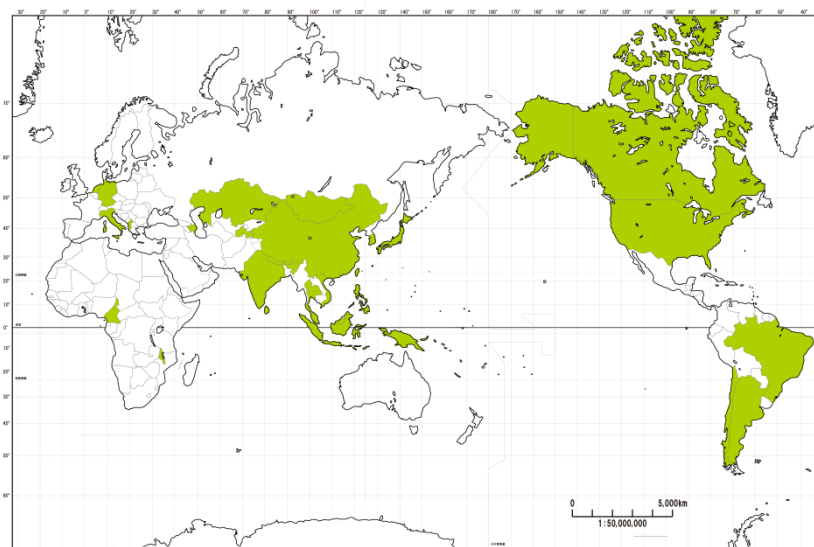
Juan Pastor-Ivars, Akira Nagata, Yiu Evonne, Tsunao Watanabe  
(UNU-IAS OUIK)

The abstracts of this book were NOT peer-reviewed but native-checked.

### Citation

Iida, Y. (ed.) (2016) *Policies and Actions on Biocultural Diversity for Sustainable Communities*.  
Abstract Book of the 1st Asian Conference on Biocultural Diversity, on October 27–29, 2016,  
Wakura-onsen, Nanao, Ishikawa prefecture, Japan: UNU-IAS OUIK , Kanazawa, Japan.146 pp.  
(ISBN 978-92-808-4572-3 [Electronic Version])

The abstract authors come not only from Asia but also from Africa, South America, and Europe.



Author's location

## Acknowledgement

We appreciate to be able to organize the thematic meeting and poster presentations with cooperation of following organizations of/related to the authors:

UNESCO; SCBD; American Museum of Natural History; Universiti Teknologi Malaysia; IUCN; UNU-IAS; UNDP; Ministry of the Environment, Japan; The Ministry of Agriculture, Forestry, and Fisheries of Japan; Ministry of Mahaweli Development and Environment, Sri Lanka; Natural Resources Office Sabah; Aichi Prefecture; Kanazawa City; Nirmanee Development Foundation, Sri Lanka; Society for Wetland Biodiversity Conservation Nepal; University of the Philippines Los Baños, Philippines; Ishikawa Prefecture; the University of Tokyo, Japan; University of Brawijaya, Indonesia; Wageningen University, The Netherlands; Applied Environmental Research Foundation, India; Kathmandu Forestry College; Ministry of Agriculture and Food Industry, Malaysia; Bogor Agricultural University; Nomadic community, Delger bag, Darvi sum, Khovd aimag, Mongolia; the community-based organisation Rushnoe, Rasht district, Tajikistan; Agency for Cultural Affairs, Japan; Tokamachi city, Niigata, Japan; Centre for Cultural Research & Documentation, India; Kanazawa University International Student Center, Japan; Satoyama Satoumi Project, Kanazawa University, Japan; Team Maruyama, Wajima, Japan; University of Toyama, Japan; FAO, Rome, Italy; Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China; Ifugao State University, Philippines; Council for the Promotion of the Globally Important Agricultural Heritage System in the Kunisaki Usa Area, Oita, Japan; Mount Hakusan Biosphere Reserve Council, Japan; Ministry of Agriculture and Forests, Royal Government of Bhutan; Management Coordination Forum of Taka Bonerate - Kepulauan Selayar Biosphere Reserve, Indonesia; Altyn Emel (aspiring) Biosphere Reserve, Kazakhstan; Ministry of Environment and Tourism, Government of Mongolia; Department of National Parks, Wildlife and Plant Conservation, Thailand; Langbiang Biosphere Reserve, Vietnam; Odai Town Office, Mie, Japan; Aya Town, Miyazaki, Japan; Yokohama National University, Japan; National Dong-Hwa University, Taiwan; Asia Climate Change Education Center, Korea; Jeju National University, Korea; World Heritage Studies, University of Tsukuba, Japan; Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah, Malaysia; Homestay Association of Sabah, Malaysia; Federal Institute of Education, Science and Technology of Rio de Janeiro, Brazil; Regional Agency of Protected Areas, Albania; Government of Chubut Province, Argentina; North Regional Delegation for Forestry and Wildlife, Cameroon; Pronativo, Concepción, Chile; Odisha Forestry Sector Development Project, India; Rourkela Forest Division, Rourkela, Odisha, India; NGO “3E-Education for Energy and Environment”, Kosovo; Ministry of Natural Resources, Energy and Mining, Malawi; Department of Fisheries, Sabah, Malaysia; District Soil Conservation Office, Tanahun District, Nepal; Ministry of Forests and Soil Conservation, the Government of Nepal; The Climate Change and Development Authority of Papua New Guinea; Ohno Charcoal Factory, Suzu, Japan; Kanakura Research Institution of Nature and Culture; Duesseldorf University, Germany; Institute of Noto Satoumi Education and Studies, Noto, Japan; Ishikawa prefectural university, Japan; Hakusan Tedorigawa Geopark Promotion Council, Japan; Ohta Farm, Torigoe, Hakusan, Japan; Fukui Prefecture Government; The Commemorative Foundation for the International Garden and Greenery Exposition, Osaka, Japan, 1990 (Expo '90 Foundation); Tohoku University, Sendai, Japan; Kyoto University, Japan; University of Hyogo, Awaji, Japan; and special thanks to Japan International Cooperation Agency (JICA).



# Table of Contents

## THEMATIC MEETING

### "Policies and Actions on Biocultural Diversity for Sustainable Communities"

**Keynote speech** -Koji Nakamura, Kanazawa University..... 1

## THEMATIC MEETING 1(Chair: Hellin Brink, UNESCO-SCBD Joint Programme)

### **Policy Coordination for the Promotion of Biological and Cultural Diversity**

Session A: International Programme on Biocultural Diversity..... 3-12  
Session B: Biocultural Policy at the National and Regional Level..... 13-22  
Session C: Local Partnership and Policy Implementation..... 23-30

## THEMATIC MEETING 2 (Chair: John Scott, Secretariat of the Convention on Biological Diversity)

### **Sustainable and Equitable Use of Biocultural Resources and Capacity Building**

Session D: Utilization of Local Biocultural Resources 1..... 31-38  
Session E: Utilization of Local Biocultural Resources 2..... 39-46  
Session F: Human Resource Development for Biocultural Approaches..... 47-57

## THEMATIC MEETING 3 (Chair: Masahito Yoshida, University of Tsukuba)

### **Biocultural Approaches for Sustainable Development of Internationally Designated Areas**

Session G: Local Community Development through GIAHS..... 58-63  
Session H: Involving Local People in Biosphere Reserves..... 64-67  
Session I: Local Management Using Multiple International Designations..... 68-76

POSTER PRESENTATIONS.....77-145

## 目次

### 分科会「持続可能なコミュニティのための生物文化多様性に関わる政策と行動」

基調講演 中村浩二/金沢大学..... 1

#### 第1分科会 生物文化多様性の展開に向けた政策調整

(座長：ヘレン・ブリック/ユネスコ-生物多様性条約事務局共同プログラム)

セッションA: 生物文化多様性に関わる国際プログラム..... 3-12  
セッションB: 国や地方レベルの生物文化多様性に関わる政策..... 13-22  
セッションC: 地域のパートナーシップと政策実践..... 23-30

#### 第2分科会 生物文化資源の持続可能で公正な活用と人材育成の好循環

(座長：ジョン・スコット/生物多様性条約事務局)

セッションD: 生物文化資源の活用①..... 31-38  
セッションE: 生物文化資源の活用②..... 39-46  
セッションF: 生物文化的アプローチのための人材育成..... 47-57

#### 第3分科会 国際認証地域における地域づくりのための生物文化的アプローチ

(座長：吉田正人/筑波大学)

セッションG: 世界農業遺産を通じた地域づくり..... 58-63  
セッションH: 地域の人びとのユネスコエコパークへの参画..... 64-67  
セッションI: 複数の国際認証を地域経営に活かす..... 68-76

ポスター発表..... 77-145

## THEMATIC MEETING 1:

### Policy Coordination for the Promotion of Biological and Cultural Diversity

第1分科会 生物文化多様性の展開に向けた政策調整

## SESSION A: International Programme on Biocultural Diversity

セッションA: 生物文化多様性に関わる国際プログラム

- 10:30-10:45 **UNESCO-SCBD Joint Programme on the Links between Biological and Cultural Diversity**  
Ana Persic<sup>1</sup>, John Scott<sup>2</sup>, Hellin Brink<sup>3\*</sup> / UNESCO<sup>1</sup>, SCBD<sup>2</sup>, American Museum of Natural History<sup>3\*</sup>  
ユネスコ-生物多様性条約事務局共同プログラム-生物多様性と文化多様性のつながり/アナ・パーシク<sup>1</sup>、ジョン・スコット<sup>2</sup>、ヘリン・ブリンク<sup>3</sup>/国連教育科学文化機関<sup>1</sup>、生物多様性条約事務局<sup>2</sup>、アメリカ自然史博物館<sup>3</sup>
- 10:45-11:00 **Revisiting the Asian Philosophy of Protected Areas from a Bio-Cultural Perspective**  
Amran Hamzah / Centre for Innovative Planning and Development Universiti Teknologi Malaysia; IUCN Regional Councillor  
生物文化多様性の視点から保護地域のアジア的思想に立ち戻る/アムラン・ハムザ/マレーシア工科大学イノベティブ計画開発センター; 国際自然保護連合地域理事
- 11:00-11:15 **The UNU-IAS ISI Project and Biocultural Diversity**  
William Dunbar / United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)  
国連大学サステイナビリティ高等研究所国際 SATOYAMA プロジェクトと生物文化多様性/ウィリアム・ダンバー/国連大学サステイナビリティ高等研究所
- 11:15-11:30 **A Community-Based Approach to Resilient and Sustainable Landscapes: Lessons from the COMDEKS Programme**  
Diana Salvemini / United Nations Development Programme (UNDP)  
回復力をもつ持続可能なランドスケープに向けたコミュニティベースアプローチ: COMDEKS (SATOYAMA イニシアティブのための地域開発と知識マネジメント) プログラムの経験から/ディアナ・サルヴェミニ/国連開発計画
- 11:30-11:45 **Multi-Dimensional Interactions for Biocultural Diversity: Making a New Pathway through UNU-IAS OUIK's activities**  
Yoshihiko IIDA/Operating Unit Ishikawa/Kanazawa (OUIK) United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)  
生物文化多様性に向けた多元的相互作用: 国連大学いしかわ・かなざわオペレーティング・ユニットの活動を通じた新たな展開/飯田 義彦/国連大学サステイナビリティ高等研究所いしかわ・かなざわオペレーティング・ユニット
- 11:45-12:00 **Discussions** 討議

## SESSION B: Biocultural Policy at the National and Regional Level

セッションB: 国や地方レベルの生物文化多様性に関わる政策

- 13:30-13:45 **The National Biodiversity Strategy and Local Biodiversity Strategies in Japan**  
Aya Yatumoto / Ministry of the Environment, Japan  
日本の生物多様性国家戦略と地域戦略/八元 綾/環境省 (日本)
- 13:45-14:00 **Biodiversity Strategy on Agriculture, Forestry, and Fisheries in Japan**  
Ichiro Nakagawa / The Ministry of Agriculture, Forestry, and Fisheries of Japan  
日本の農林水産業に関わる生物多様性戦略/中川 一郎/農林水産省 (日本)
- 14:00-14:15 **Living Within the Seasonal Rhythm of Nature: The Sri Lankan Biocultural Diversity Experience**  
R.P.L.C. Randeni / Biodiversity Secretariat, Ministry of Mahaweli Development and Environment  
自然のリズムと共に生きる: スリランカの生物文化多様性の経験/R. P. L. C. ランデニ/マハウエリ開発環境省 (スリランカ)
- 14:15-14:30 **Introduction and Policy Coordination for the Promotion of the Links between Biodiversity and Cultural Diversity in Sabah, Malaysia**  
Gerald J. Jetony / Natural Resources Office Sabah  
マレーシア・サバ州における生物文化多様性の促進に向けた政策調整と事例紹介/ジェラルド・ジェットニー/サバ州天然資源事務所
- 14:30-14:45 **Aichi's Strategy toward Conservation of Biocultural Diversity**  
Saori Yamashita / Natural Environment Division, Department of the Environment, Aichi Prefecture



14:45-15:00 生物文化多様性保全に向けた愛知の戦略/山下 沙織/愛知県環境部  
**Discussions** 討議

## **SESSION C: Local Partnership and Policy Implementation**

### **セッション C: 地域のパートナーシップと政策実践**

- 15:30-15:45 **Biodiversity and Community Development in Kanazawa**  
Hidetada Kuwahara / The Environmental Policy Section, Kanazawa City  
生物多様性の恵みと金沢のまちづくり/桑原 秀忠/金沢市環境局環境政策課
- 15:45-16:00 **Biocultural Diversity in Sri Lanka: Local Practice and Policy Implementation**  
Nimal Hewanila / Nirmanee Development Foundation  
スリランカの生物文化多様性：地域実践と政策/ニマル・ヘワニラ/ニルマニー・デヴェロップメント・ファンデーション
- 16:00-16:15 **Traditional Biocultural Diversity of Salpa Pokhari in Nepal**  
Kamal Kumar Rai / Indigenous Knowledge and People Network, Society for Wetland Biodiversity Conservation Nepal  
ネパール、サルパ・ボカリ山岳湖の伝統的な生物文化多様性/カマル・クマール・ライ/ネパール湿地生物多様性保全協会、伝統的知識と人のネットワーク
- 16:15-16:30 **A Lake of Tragedies and Opportunities: Good-Intentioned Policies that Drowned Local Communities, and What Rescue Opportunities Can Be Seized**  
Decibel V. Faustino-Eslava and fourteen others / School of Environmental Science and Management, University of the Philippines Los Baños, Philippines  
悲劇と好機の湖-ラグナ湖：コミュニティを疲弊させる優等生的政策、そしてどんな救済策が講じられるか/デシベル・ファウスティノ-エスラヴァ○ 他 14名/フィリピン大学ロスバニョス校 環境科学・マネジメント研究科
- 16:30-16:45 **Ishikawa Satoyama Promotion Fund**  
Akira Kitayama / Satoyama Promotion Office, Agriculture, Forestry and Fisheries Department, Ishikawa Prefecture  
いしかわ里山振興ファンド/北山 章/石川県農林水産部里山振興室
- 16:45-17:00 **Discussions** 討議

## THEMATIC MEETING 2:

### Sustainable and Equitable Use of Biocultural Resources and Capacity Building

第2分科会 生物文化資源の持続可能で公正な活用と人材育成の好循環

#### SESSION D: Utilization of Local Biocultural Resources 1

セッションD: 生物文化資源の活用①

- 10:30-10:45 **Nurturing Venison as a “New” Bio-culture in Japan: Perspectives from Food Security, Bio-ethics and Comparative Cultural Analysis**  
Toshinori Tanaka / Graduate School of Frontier Sciences, the University of Tokyo  
日本における「新たな」生物文化としての鹿肉利用: 食の安全保障、生命倫理、比較文化からの視点/田中俊徳/東京大学新領域創成科学研究科(日本)
- 10:45-11:00 **Participatory Learning to Diversify Fodder Crop Production in Small Dairy Farms surrounding the Natural Forest Area of Konto Watershed, Malang, Indonesia**  
Uma Khumairoh<sup>1,2\*</sup>, Adi Setiawan<sup>1</sup> and Egbert A. Lantinga<sup>2</sup> / Faculty of Agriculture, University of Brawijaya, Malang, Indonesia<sup>1</sup>; Farming Systems Ecology Group, Wageningen University, The Netherlands<sup>2</sup>  
小規模酪農場での牧草生産の多様化のための参加型学習: マレーシア・マラン県カント流域の天然林地域を事例に/ウマ・クマイロウ、アディ・セティアワン、エグバート・ランティンガ/ブラウウィジャヤ大学農学部(インドネシア)
- 11:00-11:15 **Conservation of Biocultural Diversity on Sacred Groves: Opportunities for Sustainable Future**  
Archana Godbole / Applied Environmental Research Foundation, India  
「鎮守の森」の生物文化多様性保全: 持続可能な将来のための好機/アルチャナ・ゴドボル/応用環境研究財団(インド)
- 11:15-11:30 **Integrating Wild Herbal Medicinal Plant Domestication into a Local Biodiversity Strategy and Action Plan as a Means for Improving Local Livelihoods**  
Bishnu Hari Pandit<sup>1\*</sup>, Federico Lopez-Casero Michaelis<sup>2</sup> / Kathmandu Forestry College<sup>1\*</sup>  
野生薬用植物の栽培化の取組を生物多様性地域戦略に統合する: 地域の生業を改善する方法として/ビシュヌ・パンディト、フェデリコ・ロペス-カセロミカエリス/カトマンズ森林大学(ネパール)
- 11:30-11:45 **Utilisation of Local Biocultural Diversity Resources – Traditional Knowledge in the Agriculture Ecosystem within the Crocker Range Biosphere Reserve, Sabah, Malaysia**  
Elizabeth Malangkig / Department of Agriculture Sabah, Ministry of Agriculture and Food Industry  
クロッカーレンジユネスコエコパークの農業生態系と伝統的知識/エリザベス・マランキグ/サバ州農業食品産業省農業局(マレーシア)
- 11:45-12:00 **Discussions** 討議

#### SESSION E: Utilization of Local Biocultural Resources 2

セッションE: 生物文化資源の活用②

- 13:30-13:45 **Biocultural Characteristics of Baduy People (Banten, Indonesia): Life History and Rice Farming**  
Bambang Suryobroto<sup>1\*</sup> and Eneng Nunuz Rohmatullayaly<sup>1</sup> / Bogor Agricultural University<sup>1</sup>  
インドネシア・バントンのパデュイ民の生物文化的な特徴: 生活史と稲作/バンバン・スリョプロト、エネング・ヌムズ・ローマツリヤリ/ボゴール農科大学(インドネシア)
- 13:45-14:00 **The Golden Interweave of “Human-Nature-Culture” as a Model of Community Development: A Case Study from the Pastoralist Landscape of Darvi sum, Khovd aimag, Mongolia**  
Bazar Losol / Nomadic herder, Delger bag, Darvi sum, Khovd aimag: Holding the title of the nation’s “shepherd of a thousand heads of livestock”  
地域づくりモデルとしての「人間-自然-文化」の紡ぎあい: モンゴル国ホブド県ダルヴィ郡の牧民民景観の事例から/バザール・ロソル/遊牧民(ダルヴィ郡デルゲル村)、モンゴル国認定「牧畜の名手」(モンゴル)
- 14:00-14:15 **Restoring the Roots and Co-creating Beauty: A Case Study on Reviving Cultural Landscape of Jaffr (the Rasht valley, Tajikistan)**  
Mirzoshoh Akobirov / Head of the community-based organization Rushnoe, Rasht district, Tajikistan:  
Awarded the title of the Best Orchard Keeper of Tajikistan in 2013  
ルーツの再興と美の共創: タジキスタン・ラシュト谷ジャフルの文化的景観の再生/ミルゾシヨフ・アコビロフ/ルシュヌ自治会(ラシュト郡)、タジキスタン国認定2013年「果樹栽培の名手」(タジキスタン)
- 14:15-14:30 **Creating Positive Cycle on Preservation and Utilization of Cultural Resources**

Kyoko Kanno / Department of Cultural Properties, Traditional Culture Division, Agency for Cultural Affairs,  
Japan

文化資源の保護と活用の好循環へ/菅野 恭子/文化庁文化財部伝統文化課 (日本)

14:30-14:45 **Daich's Modern Art Festival: Echigo-Tsumari Art Triennial**

Masanori Watanabe / Industry & Tourism Department, Tokamachi city, Nigata prefecture  
大地の芸術祭 越後妻有アートトリエンナーレ/渡辺 正範/新潟県十日町市産業観光部 (日本)

14:45-15:00 **Discussions** 討議

## **SESSION F: Human Resource Development for Biocultural Approaches**

セッションF: 生物文化的アプローチのための人材育成

15:30-15:45 **Community-Driven Initiatives as a Way to Strengthen Bio-cultural Traditions in Indigenous Communities: Experiences from Arunachal Pradesh in India's northeast**

Moji Riba / Centre for Cultural Research & Documentation, India

在地コミュニティの生物文化的伝統を強化する方法としての地域主導型イニシアティブ: インド北東部アルナッチャル・プラデッシュ州からの経験/モジ・リバ/文化研究・記録保存センター (インド)

15:45-16:00 **Development of the Integrated Education Fieldworks for the Biocultural Diversity: Learning from the Rural Areas of Ishikawa Prefecture**

Aida Mammadova<sup>1\*</sup> and Yoshihiko Iida / Kanazawa University International Student Center, Japan<sup>1\*</sup>

生物文化多様性のための統合的なフィールドワーク教育の開発: 石川の地域社会からの学び/アイダ・ママドヴァ<sup>1\*</sup>、飯田義彦<sup>2</sup> / 金沢大学留学生センター<sup>1</sup> (日本)

16:00-16:15 **Engaging the Youth in Revitalizing Biological and Cultural Diversity: Insights from the Philippines and Internationally**

Jocelyn Carino-Nettleton / Forest Peoples Programme, Philippine

生物文化多様性の活性化における若手人材の活用: フィリピンと世界からの洞察/ジョスリン・カリノ-ネットルトン / フォレスト・ピープル・プログラム (フィリピン)

16:15-16:30 **Human Capacity Building in the GIAHS "Noto's Satoyama and Satoumi" in Japan**

Shinsaku Koji\* and eight others / Satoyama Satoumi Project, Kanazawa University

世界農業遺産「能登の里山里海」における人材育成/小路晋作<sup>○</sup> 他8名/金沢大学里山里海プロジェクト (日本)

16:30-16:45 **"Forest of Yoboshi-go": Place-based Learning in the Satoyama in Noto**

Yuki Hagino<sup>1</sup>, Koji Ito<sup>1,2</sup> and Kiichiro Hagino<sup>1,3\*</sup> / Team Maruyama<sup>1</sup>, Noto's Satoyama Satoumi Research Project, Kanazawa University<sup>2</sup>, Department of Art and Design, University of Toyama<sup>3</sup>

「よぼし子の森」: 能登の里山地域における土地に根差した学びの場/萩のゆき<sup>1</sup>、伊藤浩二<sup>2</sup>、萩野紀一郎<sup>1,3\*</sup> / まるやま組<sup>1</sup>、金沢大学能登里山里海研究部門<sup>2</sup>、富山大学芸術文化学部<sup>3</sup> (日本)

16:45-17:00 **Discussions** 討議

## THEMATIC MEETING 3:

### Biocultural Approaches for Sustainable Development of Internationally Designated Areas

第3分科会 国際認証地域における地域づくりのための生物文化的アプローチ

## SESSION G: Local Community Development through GIAHS

セッションG: 世界農業遺産を通じた地域づくり

- 10:30-10:45 **Progress in Fifteen Years and Future Prospects of the GIAHS Program**  
Yoshihide Endo / GIAHS Coordinator, FAO  
世界農業遺産プログラムの15年の進展と今後の展望/遠藤 芳英/国連食糧農業機関・世界農業遺産事務局 (イタリア)
- 10:45-11:00 **Eco-Cultural Industrial Promotion through GIAHS in China**  
Qingwen Min\*, Wenjun Jiao / Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences  
中国における世界農業遺産を通じた生態文化産業の展開/ミン チンウエン〇、ジャオ ウェンジュン/中国科学院地理科学・資源研究所
- 11:00-11:15 **Promoting Biocultural Diversity through Human Development: The Case of Philippine-Japan GIAHS Twinning Satoyama Meister Training Program**  
Napoleon K. Taguiling / Ifugao State University  
人材育成を通じた生物文化多様性の展開: フィリピンと日本の世界農業遺産における里山マイスター研修プログラム間の連携を事例に/ナポレオン・タグイリン/イフガオ州立大学
- 11:15-11:30 **Pursuing Regional and Historic Evidence of the Coexistence of Human Activity and Nature for the Dynamic Conservation of Kunisaki Peninsula Usa GIAHS**  
Hiroaki Hayashi / Council for the Promotion of the Globally Important Agricultural Heritage System in the Kunisaki Usa Area  
人間活動と自然との共生を示す地域史的な事例の探求: 国東半島宇佐地域世界農業遺産の動的保全に向けて/林浩昭/国東半島宇佐地域世界農業遺産推進協議会 (日本)
- 11:30-11:45 **Agricultural Activities in Hakui city designated as GIAHS**  
Masamitsu Hachinota / Hakui city, Ishikawa, Japan  
世界農業遺産地域・羽咋市の農業の取組/八野田 正光/羽咋市 (日本)
- 11:45-12:00 **Discussions** 討議

## SESSION H: Involving Local People in Biosphere Reserves

セッションH: 地域の人びとのユネスコエコパークへの参画

- 13:30-13:45 **Involving Local People in Asian Biosphere Reserves: From the Case Study of Mount Hakusan Biosphere Reserve**  
Shinsuke Nakamura<sup>1\*</sup> and Yoshihiko Iida<sup>2</sup> / Mount Hakusan Biosphere Reserve Council<sup>1</sup>, United Nations University Institute for the Advanced Study of Sustainability, Operating Unit Ishikawa / Kanazawa<sup>2</sup>  
アジアのユネスコエコパークにおける地域の人々の参画: 白山ユネスコエコパークを事例に/中村真介<sup>1</sup>、飯田義彦<sup>2</sup>/白山ユネスコエコパーク協議会<sup>1</sup>、国連大学サステイナビリティ高等研究所いしかわ・かなざわオペレーティング・ユニット<sup>2</sup> (日本)
- 13:45-14:00 **Report 1 on On-the-field Workshop for Asian Biosphere Reserves' Local Practitioners in Mount Hakusan Biosphere Reserve**  
Phenden Gyamtsho<sup>1</sup>, Madina Salmenova<sup>2</sup>, Wimonmart Nuipakdee<sup>3</sup> / Ministry of Agriculture and Forests, Royal Government of Bhutan<sup>1</sup>, Altyn Emel (aspiring) Biosphere Reserve, Kazakhstan<sup>2</sup>, Department of National Parks, Wildlife and Plant Conservation, Thailand<sup>3</sup>  
白山ユネスコエコパークでの「アジアのユネスコエコパーク現場実務者対象現地研修会」報告①/フェンデン・ギャムツォ<sup>1</sup>、マディナ・サルメノヴァ<sup>2</sup>、ウィモンマート・ヌイパクディ<sup>3</sup>/ブータン王国農業森林省<sup>1</sup>、アルトゥン・エメルユネスコエコパーク申請地域 (カザフスタン)<sup>2</sup>、タイ王国国立公園・野生動物植物保全局<sup>3</sup>
- 14:00-14:15 **Report 2 on On-the-field Workshop for Asian Biosphere Reserves' Local Practitioners in Mount Hakusan Biosphere Reserve**  
Jusman<sup>1</sup>, Gal Chinbat<sup>2</sup>, Ton That Minh<sup>3</sup> / Management Coordination Forum of Taka Bonerate - Kepulauan Selayar Biosphere Reserve, Indonesia<sup>2</sup>, Ministry of Environment and Tourism, Government of Mongolia<sup>6</sup>, Langbiang Biosphere Reserve, Vietnam<sup>8</sup>  
白山ユネスコエコパークでの「アジアのユネスコエコパーク現場実務者対象現地研修会」報告②/ジュスマン<sup>1</sup>、ガル・シンバット<sup>2</sup>、トン・タット・ミン<sup>3</sup>/タカボネラテケブラウアンスラヤールユネスコエコパーク管理調整機構 (インドネシア)<sup>1</sup>、モンゴル国環境観光省<sup>2</sup>、ランビアンユネスコエコパーク (ベトナム)<sup>3</sup>

- 14:15-14:30 **What the Mount Odaigahara, Mount Omine & Osugidani Biosphere Reserve links**  
Satoru Nishide / Odai Town Office, Mie, Japan  
大台ヶ原・大峯山・大杉谷ユネスコエコパークが紡ぐコト/西出 寛/大台町（日本・三重）
- 14:30-14:45 **Utilization of the Ecosystem Services in the Past Half-Century of Aya Town**  
Nobuki Kawano/Aya Town, Aya Biosphere Reserve Promotion Office, Miyazaki, Japan  
綾町の生態系サービス利活用の半世紀のあゆみ/河野円樹/綾町ユネスコエコパーク推進室（日本・宮崎）
- 14:45-15:00 **Discussions** 討議

## SESSION I: Local Management Using Multiple International Designations

### セッション I: 複数の国際認証を地域経営に活かす

- 15:30-15:45 **Why We Encourage Multiple Designations of Biosphere Reserves with Others**  
Hiroyuki Matsuda<sup>1\*</sup> and Akiko Sakai<sup>1/</sup> Faculty of Environment and Information Sciences, Yokohama National University<sup>1\*</sup>  
なぜユネスコエコパークは複数認証を促進するのか/松田裕之、酒井暁子/横浜国立大学環境情報研究院（日本）
- 15:45-16:00 **Infusing the Satoyama Initiative Concepts into the National and Local Context: a Case Study of the Participatory Planning and Monitoring Process of an Indigenous Rice Paddy Cultural Landscape, Taiwan**  
Kuang-Chung Lee / National Dong-Hwa University, Taiwan  
里山イニシアティブの考え方を国や地域の文脈に位置づける：伝統的稲作の文化的景観における参加型計画立案とモニタリング/クアン-チュン・リー/国立東華大学（台湾）
- 16:00-16:15 **Human and Nature Interaction in Ifugao Satoyama Landscape: UNESCO-Inscribed Heritage Site and GIAHS**  
Vicky Cadalig-Madangeng / Ifugao State University  
イフガオ里山景観における人と自然の相互作用：ユネスコ世界遺産と世界農業遺産/ヴィッキー・カダリグ-マダンゲン/イフガオ州立大学（フィリピン）
- 16:15-16:30 **Establishment of an Integrated Management System for Multi-Internationally Designated Areas**  
Dai-Yeun Jeong / Asia Climate Change Education Center, Korea  
複数の国際認証地域の統合的なマネジメントシステムの構築/ジョン デヨン/アジア気候変動教育センター（韓国）
- 16:30-16:45 **Possible Multiple Nominations between World Heritage and Other International Conservation Instruments**  
Masahito Yoshida / World Heritage Studies, University of Tsukuba  
世界遺産と他の国際的な保全ツールとの重複推薦の可能性/吉田正人/筑波大学世界遺産専攻（日本）
- 16:45-17:00 **Discussions** 討議

## The List of Poster Presentations

Poster No.

- 1. Protected Areas in Bhutan: A conservation network - in pursuit of balancing development, conservation and livelihoods**  
Phenden Gyamtsho\*, Wangdi Dukpa
- 2. Involving Local Communities through Marine Ecotourism Development Initiatives: Experience in Taka Bonerate–Kepulauan Selayar Biosphere Reserve**  
Jusman
- 3. The Interaction of Local People with the Altyn Emel Biosphere Reserve, Kazakhstan**  
Madina Salmenova
- 4. Biosphere Reserves of Mongolia: Efforts for Proper Management with Local People**  
Gal Chinbat
- 5. Knowledge Transfer of the Micropropagation Technique of the Blue Vanda Orchid (*Vanda coerulea*) for Community-Based Conservation Projects in Mae Sa-Kog Ma Biosphere Reserve, Chiang Mai, Thailand**  
Wimonmart Nuipakdee
- 6. Biodiversity, Cultural Diversity and Payment of Environmental Services in Langbiang Biosphere Reserve**  
Ton That Minh
- 7. BORNEENSIS — a Central Collection of Biocultural Resources in Sabah Borneo**  
Charles S. Vairappan
- 8. Homestay Program: Benefits to the Local Community in Sabah**  
Duanis Magirong
- 9. Assessing Socio-Ecological Systems (SES): Visioning a Sustainable Future of Laguna de Bay**  
Maria Victoria O. Espaldon, Carmelita M. Rebanco\*, Sofia A. Alaira, Lourriel S. Macale
- 10. Biocultural Diversity, Law and Cities**  
Guilherme Cruz de Mendonça
- 11. Protected areas: Boosting ecotourism in Albania**  
Enea Zenuni
- 12. Biocultural diversity and conservancy education for primary school students in Patagonia, Argentina via the cosmogony of indigenous community representatives and park rangers' field experiences**  
Roberto José Bubas
- 13. Saving Wildlife Corridors in Bénoué National Park in Northern Cameroon**  
Simeu Walters Youbi
- 14. The Chepe Hill Case Study: Recovering Biological and Cultural Context**  
Alejandra Soto-Prado
- 15. Introducing *Thysanolaena maxima* (Hill Broom Grass) Cultivation and Developing Small Scale Business Activities in Kandhamal District**  
Prakash Chand Gogineni
- 16. A Community-Based Project for Sustainably Managing and Restoring a Degraded Forest Landscape in Rourkela Forest Division, India**  
Sanjeet Kumar\*, A.K. Pattanaik
- 17. Asian trees: Improving air quality in Kosovo**  
Emira Polloshka
- 18. Landscape Restoration through Farmers' Catchment Activities: Fighting Deforestation and Improving Crop Production in Mlauli and Damnbe Areas, Malawi**  
Emmanuel William Ngwangwa
- 19. Implementing an Ecosystem Approach to Fisheries Management in Sabah, Malaysia**  
Jessie Beliku
- 20. Local People's Participation in Watershed Management in Nepal**  
Nirmal Thapa
- 21. Developing a strategic framework to conserve and exploit biological diversity in Nepal**  
Manoj Chalise
- 22. The Tree Kangaroos of Papua New Guinea**  
Leilani Kambuou
- 23. Reforestation program for promotion of top grade charcoal production in the Noto Peninsula, Japan**  
Choichiro Ohno\*, Haruka Naya, Koji Ito, Shinsaku Koji
- 24. Management of Agricultural Tools as Local Biocultural Resources in the Noto Peninsula, Japan**  
Sakiko Kawabe

25. **An action of Kanakura community for restoration of the community by utilizing biodiversity and culture based on landscape of the terraced paddy fields**  
Shinya Nomura\*, Eijun Ishizaki
26. **How International Designation of Biocultural Diversity Can Support Marginalized Groups: The Case of Wajima City's Ama Community**  
Timo Thelen
27. **The introduction of "Satoumi learning" at schools in Noto**  
Makoto Urata\*, Kyoko Matsumoto, Koji Yachiguchi, Nobuo Suzuki, Kazuichi Hayakawa
28. **Experience Learning Programs of Noto's GIAHS: Development and Practice**  
Koji Ito\*, Shinsaku Koji
29. **Current Status and Issues of Environmental Education Related to Biodiversity at Schools within Noto GIAHS**  
Sayako Koyama\*, Yoshihiko Iida, Shinsaku Koji, Koji Ito, Mikiko Nagai, Koji Nakamura
30. **Cooperation with Farmers, Sake Brewers, and Students: Creating a New Brand of Sake**  
Shuichiro Kajima\*, Rodrigo Jose Mundo
31. **Possibility of Revitalization Activities Using SATOUMI Bioresources**  
Ryohei Yamashita\*, Mariko Kono
32. **Synergy between designated sites: The initiative of Mount Hakusan Biosphere Reserve and Hakusan Tedorigawa Japanese Geopark**  
Shinsuke Nakamura\*, Tsuyoshi Hibino
33. **Linking Geodiversity, Biodiversity & Cultural Diversity: The Geostory of Hakusan Tedorigawa Japanese Geopark**  
Tsuyoshi Hibino\*, Shinsuke Nakamura
34. **"Welcome back, fireflies": Rice farming in harmony with biodiversity**  
Yutaka Ohta
35. **Restoration of Ecological Networks in Agricultural Landscape: Linkage between Scientific Research and Policy Making**  
Ryuji Yonekura
36. **The Traditional System of Combining Fishing and Agriculture in the Mikata Five Lakes: - Sustainable Use of Satoumi, Satochi, and Satoyama- (Efforts in Order to be Designated as GIAHS)**  
Kouichi Sasaki
37. **Satoyama Culture for Future Generations: A Case Study in Sakihama**  
Noriaki Otsuki\*, Dai Oguri
38. **Geographical Pattern of Wild Edible Plants: Supply and Utilization in Tohoku District, Japan**  
Haruka Sasaki\*, Masahiro Aiba, Michio Oguro, Tohru Nakasizuka
39. **Interrelationships among Cultural and Provisioning Ecosystem Services tightly Linked to Tree Species**  
Chihiro Oka\*, Masahiro Aiba, Toru Nakashizuka
40. **Sustainably Exploiting the Natural Environment and Cultural Diversity through Community Initiatives: Two Case Studies in the City of Tanabe and the Town of Shirahama in Wakayama Prefecture, Japan**  
Miki Yoshizumi\*, Hirohide Kobayashi
41. **Abundant Knowledge of Wild Fruit Use among Elders: "Wisdom of the Elders" or "Loss of Experience" as a Mechanism Explaining the Pattern**  
Kaori Okui\*, Yoshihiro Sawada, Takehito Yoshida
42. **Impacts of Traditional Culture Inheritance on the Maintenance of Village Functions: A Case Study of Nouson Kabuki in Shodoshima, Japan**  
Moe Nonoshita\*, Izuru Saizen
43. **Efforts for Regional Revitalization through Utilizing Abandoned Farmland in Shitaru, Tsushima City, Nagasaki Prefecture, Japan**  
Natsuko Shigehara\*, Shozo Shibata





# Thematic Meeting



Keynote speech

## **Policy and Actions on Biocultural Diversity for Sustainable Development of Local Communities**

Koji Nakamura

Kanazawa University

**Contact:** kojink@staff.kanazawa-u.ac.jp

**Keywords:** Japan Satoyama Satoumi Assessment (JSSA), Multi-stakeholder, International designation, Human capacity building, Local initiative

### **Satoyama-Satoumi ecosystems and biocultural diversity**

The Satoyama and Satoumi, traditional rural landscape and seascape, respectively, of Japan, have been sustainably managed for long time by human activities, i.e. agriculture, forestry and fishery (Japan Satoyama Satoumi Assessment, JSSA, 2010, 2012). In Ishikawa Prefecture, biocultural diversity in Satoyama and Satoumi is very rich. So that "Noto's Satoyama and Satoumi" was designated as Globally Important Agricultural Heritage Systems (GIAHS) in 2011 and Mount Hakusan as UNESCO's Biosphere Reserve (BR) in 1980 (extended nomination in 2016).

These international designations have been encouraged local communities to be aware of the importance of biocultural diversity and sustainable development. However, Satoyama and Satoumi areas in Noto and Hakusan and also in other areas of Japan have been suffering from serious depopulation and ageing population, resulting the deterioration of ecosystem services and loss of traditional culture (JSSA, ditto). JSSA defined traditional rural ecosystems such as Satoyama and Satoumi as socio-ecological landscapes and seascapes (SEPLSs) for international comparison and sharing the problems and perspectives. SEPLSs are widespread over Asia and other regions of the world and are often facing the threats from population problems like in Japan and those from destruction and overexploitation in some developing countries. Japan finds itself in the position of a “developed” country, facing many serious challenges like Satoyama and Satoumi deterioration, which other countries will one day also be facing. In this meeting we Japanese like to share the issues through the discussions on biocultural diversity.

### **Contents of the thematic meetings**

Meeting 1: Policy coordination for the promotion of biological and cultural diversity.

Speakers are invited from international programs (UNESCO-SCBD, IUCN, UNU-IAS ISI, UNDP-COMDEKS, UNU-IAS OUIK), national and local levels in Japan, Malaysia, Sri Lanka, Nepal and Philippines.

Meeting 2: Sustainable and equitable use of biocultural resources and capacity building for biocultural approach.

Case studies from Japan, Indonesia, India, Nepal, Malaysia, Mongolia, Tajikistan and Philippines are reported.

Meeting 3: Biocultural approach for sustainable development of internationally designated sites.

(1) For Globally Important Agricultural Heritage Systems (GIAHS), reports from GIAHS Secretariat of FAO and the cases in China, Philippines and Japan (Kunisaki and Noto) will be presented.

- (2) For UNESCO's Biosphere Reserves (BR), reporters are from Japan (Hakusan, Odai and Aya) and from the participants, including Bhutan, Kazakustan, Thailand, Vietnam, Indonesia and Mongolia, of On-the field Workshop for Asian Biosphere Reserves.
- (3) Benefits of multi-international designation for local communities  
A particular site can be designated by multi-international certifications such as World Natural Heritage Sites (WNHSs), Ramsar Convention Sites, and UNESCO Global Geoparks (see Matsuda and Sakai in this meeting). There are 69 cases of double designations between BRs and natural or cultural World Heritage Sites (Yoshida, 2016) . Matsuda and Sakai (ditto) also discuss some potential merits of double designations of BRs with other global and national certification.

### **Expected outputs from this meeting**

Participants of this meeting come from various countries, composing of various kind of stakeholders, i.e. international, regional, national, and local practitioners. Their affiliations include UN, national governments, local municipalities, private sectors, researchers, NGOs, farmers and so on. This meeting is surely an excellent opportunity, providing the outputs below:

- (1) Understanding of importance of biocultural diversity with the knowledge of historical changes, present situation, problems and future perspectives. Rediscovering and sharing local values.
- (2) Utilizing resources of biocultural diversity for sustainable development of local communities.
- (3) Establishing linkages to the global networks and platforms. Twinning of internationally designated sites.
- (4) Acceleration of human capacity building.
- (5) Hopes for sustainable development of Satoyama Satoumi in Japan, contributing to the global sustainable development goals.

The outputs will be summarized into the Ishikawa Declaration and additional key recommendations on biocultural diversity 2016.

### **References**

- Japan Satoyama Satoumi Assessment (JSSA). (2010). Satoyama-Satoumi Ecosystems and Human Well-being: Socio-ecological Production Landscapes of Japan-Summary for Decision Makers. United Nations University, Tokyo, Japan, 36pp. PDF is available at:  
[http://archive.ias.unu.edu/resource\\_centre/SDM-EN\\_24Feb2011.pdf](http://archive.ias.unu.edu/resource_centre/SDM-EN_24Feb2011.pdf)
- Duraiappah, A. K., Nakamura, K., Takeuchi, K., Watanabe, M., and Nishi, M. (eds) (2012) Satoyama-satoumi ecosystems and human well-being: Socio-ecological production landscapes of Japan. United Nations University Press. 449 pp. Summary is available at  
<http://i.unu.edu/media/unu.edu/publication/18980/satoyama-sample-chapter.pdf>
- Berglund, B. E., Kitagawa, J., Lagerås, P., Nakamura, K., Naoko Sasaki, N., and Yasuda, Y. (2014) Traditional Farming Landscapes for Sustainable Living in Scandinavia and Japan: Global Revival Through the Satoyama Initiative. *AMBIO* 43: 559-578
- Nakamura, K. and R. R. Edpalina. 2015. Human capacity building for sustainable development of Ifugao rice terraces in the Philippines and Noto's Satoyama Satoumi in Japan. Proceedings of International conference "Developing sustainable and resilient rural communities in the midst of climate change: a challenge to disaster preparedness and mitigation strategies", 125-134. Dec.1-2, 2015, Quezon City, Philippines.
- Yoshida, M. 2016. Biosphere reserves heritage seeks deeper linkage to world heritage. Annual Report of the World Heritage, National Federation of UNESCO Associations in Japan. Kodansha, (to appear).
- Matsuda, H. and Sakai, A. 2016. Why we encourage multiple designations of biosphere reserves with others (this meeting).

## UNESCO-SCBD Joint Programme on the Links between Biological and Cultural Diversity

Ana Persic<sup>1</sup>, John Scott<sup>2</sup>, Hellin Brink<sup>3\*</sup>

UNESCO<sup>1</sup>, SCBD<sup>2</sup>,  
Center for Biodiversity and Conservation, American Museum of Natural History<sup>3\*</sup>

**Contact:** a.persic@unesco.org / john.scott@cbd.int / hbrink@amnh.org

**Keywords:** biodiversity, cultural diversity, CBD, UNESCO, Joint Programme

Reversing the current trends of dramatic loss of biodiversity and the weakening of cultural diversity clearly requires innovative approaches to bridge the artificial divide between biological and cultural diversity in management and policy-making processes.

Recognising the importance of the links between biological and cultural diversity, in June 2010, a conference co-organised by UNESCO and the Secretariat of the Convention on Biological Diversity pressed for biological and cultural diversity to be genuinely integrated into development cooperation strategies and programmes. The Conference resulted in the 2010 Declaration on Bio-Cultural Diversity and the draft Joint Programme of Work between UNESCO and the Secretariat of the Convention on Biological Diversity (SCBD). This UNESCO-SCBD Joint Programme on the Links between Biological and Cultural Diversity was acknowledged by the World Heritage Committee at its meeting in Brasilia in July 2010, and welcomed by the 10th meeting of the Parties to the CBD (CBD COP 10) held in October 2010 in Nagoya, Japan (Decision X/20).

The CBD COP 10 recognised the Joint Programme as a ‘useful co-ordination mechanism to advance the implementation of the Convention and deepen global awareness of the interlinkages between cultural and biological diversity’.

Acknowledging that biological and cultural diversity are not only closely interlinked but also mutually reinforcing, the key objective of the programme is to strengthen the linkages between biological and cultural diversity initiatives, and to enhance synergies between interlinked provisions of conventions and programmes dealing with biological and cultural diversity at relevant scales.

In the context of the Joint Programme, the different types of linkages between biological and cultural diversity have been grouped under broader categories, including languages and linguistic diversity, material objects, knowledge and technology, modes of subsistence, social and economic relations relating to natural resources, and value and belief systems.

Despite this, the current decision- and policy-making processes rarely take into account these fundamental links between biological and cultural diversity, and continue to compartmentalise them and treat them as separate entities.

Approaching biological and cultural diversity separately results in diverging and even conflicting agendas. Such dual approaches have led to varying interests within the same location; different competencies and designated domains of authority; different instruments policies, tools, and legal frameworks; different understandings of diversity among responsible

authorities; and different international movements dealing with biological and cultural diversity through individual agendas.

Since 2010, the Joint Programme has made significant progress in elucidating the interlinkages between biological and cultural diversity, thanks to generous contributions from the governments of Japan and Italy, as well as contributions from a broad range of partners from academic, community, international, non-governmental, and intergovernmental organizations.

Particular focus has been given to bringing together a number of relevant initiatives relating to the links between biological and cultural diversity, including in the context of the Diversity Liaison Group established to advise and support the work of the Joint Programme and the development of a dedicated web portal.

Furthermore, considerable efforts have been devoted to exploring the meanings and values of the links between biological and cultural diversity at the regional level. In April 2014, the government of Italy and the University of Florence, in partnership with SCBD and UNESCO, initiated the 1st European Conference for the Implementation of the UNESCO-CBD Joint Programme on Biological and Cultural Diversity, to explore the linkages between biological and cultural diversity and cultural landscapes in a European context.

Building on the success of the Florence regional conference, the 1<sup>st</sup> Asian Conference on Biocultural Diversity will take place in October 2016 in Japan, in collaboration with United Nations University, Ishikawa Prefecture, and Nanao City. Lessons learned from the regional workshops will be integrated into relevant capacity-building opportunities for national focal points and indigenous and local communities in future workshops, and will also contribute to the further development of web pages and tools, such as training materials for policymakers.

In addition, numerous outreach activities have been organised to raise awareness of the links between biological and cultural diversity and their contributions to the CBD Strategic Plan for Biodiversity (2011–2020), the Aichi Targets, and the Sustainable Development Goals more broadly. In this context, the Joint Programme organised a two-day programme of activities dedicated to the links between biological and cultural diversity, during the 12<sup>th</sup> Conference of the Parties of the CBD (CBD COP 12) held in Korea in 2012. The programme of activities was an interactive participatory experience, including multi-stakeholder international and local perspectives. A highlight of the programme included engaging with faith-based communities, on biological and cultural diversity: in this case, the Buddhist faith at Woljeong Temple. The programme was designed to bridge the gap between nature and culture in the context of the issues considered by COP 12.

Building on the success of the CBD COP12 weekend of activities dedicated to the links between biological and cultural diversity, UNESCO and SCBD are currently planning a major parallel event for CBD COP 13, which will take place in Cancun, Mexico in December 2016. In collaboration with the Mexican government and indigenous peoples and local communities, the four-day programme in Mexico will draw attention to and consider the possible contributions of biological and cultural diversity, community conservation, customary sustainable use, and the power of local action to the implementation of the Strategic Plan and the Aichi Targets, as well as providing advice on the four themes of COP 13 (agriculture, fisheries, forests, and tourism), and, more broadly, on achieving the Sustainable Development Goals.

## Revisiting the Asian Philosophy of Protected Areas from a Bio-Cultural Perspective

Amran Hamzah

Professor and Director, Centre for Innovative Planning and Development  
Universiti Teknologi Malaysia  
IUCN Regional Councillor

**Contact:** merang@utm.my

**Keywords:** Sacred natural sites, bio-cultural, Asian philosophy, protected areas

Protected areas are regarded as the best form of area conservation for safeguarding areas that contain high levels of biodiversity, for providing vital ecological services, and for public enjoyment. However, the protected area regimes adopted or inherited by many Asian countries were essentially colonial models of protected area management, in which local and indigenous communities were often displaced to areas outside the park boundary. Nonetheless, protected areas worldwide have evolved since the 1980s to be more inclusive, and co-management approaches and Indigenous and Community Conserved Areas (ICCAs) have been increasingly incorporated in the governance of protected areas.

In Asia, the philosophy of harmony between humans and nature led to the rise of traditional resource management approaches, such as *Satoyama*, *Subak*, *Tagal*, etc., which render ‘formal’ protected areas as being superfluous to the needs of traditional Asian societies. In addition, these supposedly pristine natural sites in Asia have actually been shaped by human adaptation for millennia, and are often associated with spiritual values.

In this light, natural sites are held in reverence due to their sacredness, and these sacred natural sites are now recognised as traditional forms of protected areas. Allerton (2009) wrote that Southeast Asian cultures have a common belief that the world inhabited by humans was intersected by an invisible spiritual dimension, which she calls the ‘spiritual landscape’. These spiritually- and religious-based phenomena have evolved traditionally, and are considered to be the fundamental pre-conditions that led to the conservation and protection of these areas. In many Asian countries, sacred natural sites have been shown to have a major effect on conservation, ecology, and the environment, due to the special precautions and restrictions associated with them. In this respect, mountains have always been special to humanity as spiritual symbols, as are forests and trees, in the form of sacred groves, *feng shui* forests, etc., which have spiritual relationships to the teachings and beliefs of Hinduism, Buddhism, Islam, Judaism, and Animism.

In essence, these sacred natural sites are said to contain ‘numina’ or sprits, deities, or some type of holy presence (Byrne, 2010), which are highly respected and protected by the community, even though they do not have legal jurisdiction over them. In the Asian setting, nature and culture have been woven together naturally, like a single tapestry that embodies the concept of a cultural landscape. More often than not, Asian traditions and beliefs have been shaped by the merging of indigenous animism with mainstream religions, such as Hinduism, Buddhism, Islam, and Christianity, which is especially evident in Thailand, India, Indonesia and the Philippines (Gottlieb and Natadetcha-Sponsel, 2004; Byrne, 2010; Sampang, 2010; Verschuuren *et. al*, 2010).

It should be highlighted that there have been doubts among sections of the scientific community about the ecological value of sacred sites natural, and their lack of legal protection mechanisms, especially in the light of increased visitation. However, Verschuuren *et. al* (2010)

and Pungetti *et. al* (2012) provide ample evidence that (1) sacred natural sites have been accepted by mainstream faiths, (2) they sometimes contain more biodiversity than formally protected areas, and (3) their contribution towards biodiversity value warrants inclusion in national conservation strategies. Ramakrishnan (1996) pointed out that, because sacred natural sites such as sacred groves in India were closely linked to taboos and prohibitions, they limited human activity and thus encouraged integrated nutrient cycling that resulted in the presence of many ecologically and socially valuable plant species. Dudley *et. al* (2010) conducted more than 100 scientific studies on sacred groves in Asia and Africa, and reported their global importance in terms of biodiversity conservation.

In essence, sacred natural sites and traditional resource management approaches in Asia, etc. resonate well with contemporary approaches such as Adaptive Management, to the extent that a convergence between both approaches has blossomed of late (Berkes, 2012). However, there remain serious challenges in applying Asia's traditional resource management approaches in the context of contemporary planning. Modern societies in Asia regard taboos and prohibitions as being backward, and mainstream religions are wiping out so-called animistic rituals among their congregations. Furthermore, the youth of Asia now have little appreciation for their rich cultural heritage, in favour of a homogenous 'global pop culture'. More importantly, sacred natural sites do not have legal protection, and rapid urbanisation has resulted in the loss of these important refuge for biodiversity.

In this light, there is a need to revisit Asia's philosophy of protected areas and resurrect its bio-cultural emphasis to achieve harmony between humans and nature. To this end, Asia needs a paradigm shift brought about by rediscovering and celebrating its ancient wisdom, traditional ecological knowledge, and philosophy in developing contemporary approaches in protected area management. The empowerment of local and indigenous communities is imperative for this paradigm shift to take place, as is learning from Asian (and non-Asian) countries. Last but not least, the inclusive governance models should include faith groups within Asia, so as to leverage the ecologically sustainable tenets of each major religion in Asia, such as the powerful notion of *khalifah* (custodianship) in Islam. By marrying science and religion, ethics-based conservation could complement scientific knowledge in providing some solutions for contemporary environmental issues, such as biodiversity loss, climate change, natural disasters, etc.

## References

- Allerton, C. (2009). Introduction: *Spiritual landscapes of Southeast Asia*, Anthropological Forum. Taylor and Francis. 19(3): 235–251.
- Berkes, F. (2012). *Sacred Ecology*, Routledge.
- Byrne, D. (2010). *The enchanted earth: numinous sacred sites*, in (Verschuuren, B., Wild, R., McNeely, J.A., and Oviedo, G. (eds.) *Sacred Natural Sites: Conserving Nature and Culture* Earthscan. 53–61.
- Dudley, N., Bhagwat, S., Higgins-Zogib, L., Lassen, B., Verschuuren, B. and Wild, R. (2010), *Conservation of biodiversity in sacred natural sites in Asia and Africa: a review of the scientific literature*, in Verschuuren, B., Wild, R., McNeely, J.A., and Oviedo, G. (eds), *Sacred Natural Sites: Conserving Nature and Culture* Earthscan. 19–32.
- Gottlieb, R. and Natadecha-Sponsel, N. (2004). *Illuminating darkness: the monk-cave-bat-ecosystem complex in Thailand*, in Roger S and Gottlieb, R. (eds.), *This Sacred Earth: Religion, Nature, Environment*, New York, NY: Routledge. 134–144.
- Pungetti, G. (2012). *Sacred species and sites: dichotomies, concepts and new direction in biocultural diversity conservation*, in Pungetti, G., Oviedo, G. and Hooke, D. (eds.). *Sacred Species and Sites* Cambridge. 13–27.
- Ramakrishnan P. S. (1996). *Conserving the sacred: from species to landscapes*, *Natural Resources* 32: 11–19.
- Sampang, A. G. (2010). *Towards a sustainable management and enhanced protection of sacred marine areas at Palawan's Coron ancestral domain, the Philippines*, in Verschuuren, B., Wild, R., McNeely, J.A., and Oviedo, G. (2010) (eds.) *Sacred Natural Sites: Conserving Nature and Culture*, Earthscan. pp. 254–262.



## The UNU-IAS ISI Project and Biocultural Diversity

William Dunbar

United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)

**Contact:** dunbar@unu.edu

**Keywords:** integrated landscape approach, *satoyama*, biocultural diversity

### The Satoyama Initiative

The Satoyama Initiative is a global effort to realize “societies in harmony with nature” with a focus on the concept of “socio-ecological production landscapes and seascapes” (SEPLS), referring to places where human production activities interact with ecosystems creating mutual benefits for both. Research has shown that good management practices actually result in higher biodiversity in human-influenced landscapes than in places where nature is left untouched.<sup>1</sup> With rapid urbanization, industrialization, climate change, and other threats in today’s world, however, landscapes and coastal seascapes affected by human production activities face degradation from causes including unprecedented overexploitation or abandonment, depending on their individual circumstances. The Satoyama Initiative is therefore an effort toward revitalization and sustainable management based on holistic, integrated landscape-level approaches, to realize truly “socio-ecological production landscapes and seascapes”.

### The UNU-IAS ISI Project and IPSI

To consolidate the academic basis for the Satoyama Initiative and further investigate its potential contributions to policy and the sustainable development agenda, a research project titled the International Satoyama Initiative (ISI) project was created at the United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS—at that time named the United Nations University Institute for Advanced Studies) in 2009. UNU-IAS ISI collaborates with researchers around the world to produce policy reports and other academic outputs investigating various aspects of the Satoyama Initiative and integrated landscape approaches in general, collecting and analyzing case studies and good practices, developing and working with indicators, and others.

In 2010, to facilitate the implementation of the Satoyama Initiative, the International Partnership for the Satoyama Initiative (IPSI) was launched during the Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP 10), with its secretariat hosted by UNU-IAS ISI. IPSI functions to bring together a wide diversity of governmental, non-governmental, academic, and other organizations who are working in some way toward integrated management approaches in production landscapes and seascapes. The partnership collects and disseminates SEPLS-related case studies on its website, fosters collaborative activities between its members, holds information-sharing and awareness-raising events, and is involved in a wide variety of other activities.

### The UNU-IAS ISI Project: Contributions to Biocultural Diversity

UNU-IAS ISI has the potential to contribute greatly to current efforts to link the benefits of biological and cultural diversity. After all, what is an integrated approach to human-influenced production landscapes and seascapes but an effort to make this link? SEPLS are inherently examples of biocultural diversity.

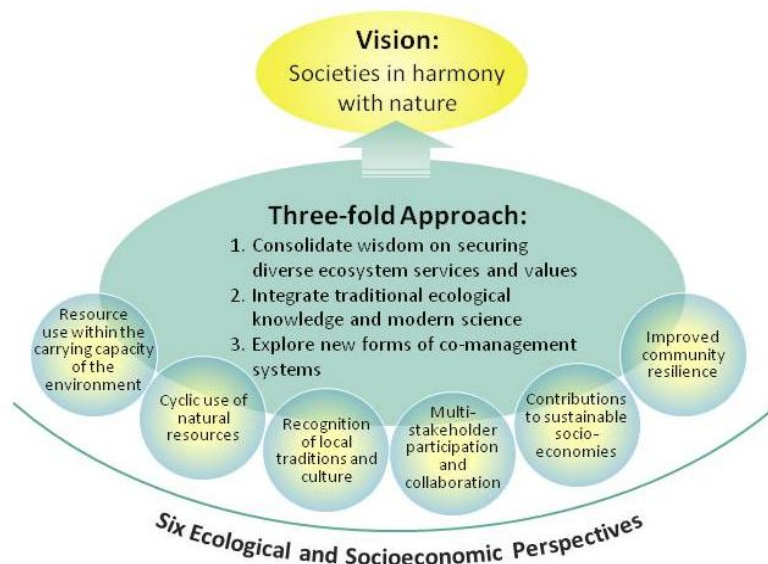
Some strengths that UNU-IAS ISI brings to this effort are:

- A landscape/seascape perspective on biocultural diversity. Landscape-level approaches have gained a great deal of attention in recent years, as “landscape” is recognized as an effective unit for understanding ecosystem processes and implementing resource-management programmes, compared to sector-based approaches or those based on administrative divisions. The Satoyama Initiative, with its concept of SEPLS, is essentially an effort to integrate biological and cultural diversity at the landscape scale.

- Mainstreaming and implementation of integrated landscape approaches. In its role as the IPSI secretariat, UNU-IAS ISI collaborates closely with a wide variety of organizations, from local NGOs working on the ground to national and global-scale policymaking bodies. The unique IPSI network facilitates mainstreaming—the incorporation of SEPLS-based concepts and approaches, based on proven landscape-scale practices and data, into policy and the wider public consciousness—on the one hand, while promoting on-the-ground implementation of the same concepts and approaches on the other. In this way, IPSI makes a real contribution to understanding and conservation of biocultural diversity around the world.
- Integration of traditional knowledge and modern science. Appropriate resource-management practices depend greatly on the particular circumstances of the landscapes where they are used, and are learned through long-term interactions between humans and the natural environment. At the same time, knowledge gained in this way may not be accepted for incorporation into policy, upscaling and replication unless it is verified through scientific research. UNU-IAS ISI's core mission includes the integration of traditional ecological knowledge and modern science in order to learn from and widely disseminate best practices from all sources. This means equal respect for diverse cultural practices found in the landscape and findings from biological and other scientific research in an attempt to bring them together with the concept of biocultural diversity.

UNU-IAS ISI looks forward to continuing our participation in the field of biocultural diversity, including the UNESCO and SCBD Joint Programme on Linking Biological and Cultural Diversity, as we believe that the Satoyama Initiative and its SEPLS-based approach add a unique and important landscape-level perspective that complements many others' work on this topic. We encourage anyone interested to look further into our publications, available on our website,<sup>2</sup> and contact us regarding any relevant issues.

### Conceptual Framework of the International Partnership for the Satoyama Initiative



### Reference

<sup>1</sup> Japan *Satoyama Satoumi* Assessment, 2010. *Satoyama-Satoumi Ecosystems and Human Well-being: Socio-ecological Production Landscapes of Japan—Summary for Decision Makers*. United Nations University, Tokyo, Japan.

<sup>2</sup> <http://www.unuias-isi.org/>

## **A Community-Based Approach to Resilient and Sustainable Landscapes: Lessons from the COMDEKS Programme**

Diana Salvemini

United Nations Development Programme (UNDP)

**Contact:** [diana.salvemini@undp.org](mailto:diana.salvemini@undp.org)

**Keywords:** *Satoyama*, landscapes, community, resilience, indicators

### **Introduction**

Funded by the Japan Biodiversity Fund, the Community Development and Knowledge Management for the Satoyama Initiative (COMDEKS) Programme (2011–2016) is a unique global effort implemented by UNDP in partnership with the Ministry of the Environment of Japan, the CBD Secretariat, and the United Nations University Institute for the Advanced Study of Sustainability. Working through the UNDP-implemented GEF Small Grants Programme, COMDEKS builds the capacities of community organizations to take collective action for adaptive landscape management in pursuit of social and ecological resilience, promoting knowledge sharing, and strengthening capacities for sustainable development toward achievement of the Aichi Biodiversity Targets.

COMDEKS is currently implemented in selected communities in twenty countries, representing a wide variety of landscapes and seascapes: watersheds in Cambodia, Ecuador, and Costa Rica; inland water systems such as lakes in Malawi, Niger, and Kyrgyzstan, and wetlands in Slovakia; agro-pastoral systems in Ethiopia, Cameroon, and Brazil; mountain ecosystems in Bhutan, Ghana, India, and Nepal; coastal seascapes in El Salvador, Fiji, Indonesia, and Turkey; and grasslands in Mongolia and Namibia.

The presentation will highlight one case study from the activities in one COMDEKS-participating country, showcasing local community activities that maintain and revitalize critical production landscapes and seascapes. The case study documents the knowledge and experience gained from successful on-the-ground actions by local communities to maintain and revitalize SEPLS and demonstrates how this work can be scaled and replicated in other parts of the world.

### **Community Consultation and Resilience Indicators**

The cornerstone of the COMDEKS community-based landscape management approach is supporting community organizations to revitalize their landscapes and seascapes through participatory land-use planning that builds their awareness and capacities for governance and innovation. COMDEKS communities practice an adaptive management cycle in which they first assess socio-ecological conditions, trends, problems, and potential opportunities in their landscape; identify desirable ecological, social, and economic outcomes as dynamic building blocks of resilience; plan activities in pursuit of these outcomes by boosting ecosystem productivity and sustainability, and improving organizational capacities of communities to execute projects and measure results; and finally, adapt their planning and management practices to reflect lessons learned and new conditions and opportunities.

*Resilience Indicators.* In the COMDEKS participatory planning phase, community members apply resilience indicators—developed by Bioversity International and UNU-IAS—to guide the assessment of socio-ecological production landscapes. Through interactive mapping exercises,

communities identify ecosystem features and land uses, and pinpoint resource access and management challenges. The use of resilience indicators is integral to conducting the participatory baseline assessment for each target landscape. For local communities to strengthen the resilience of their SEPLS, it is important for them to understand the current conditions of the landscapes or seascapes in which they live and work. To accomplish this, the baseline assessment uses a set of 20 resilience indicators designed to capture community perceptions of different aspects of key systems—ecological, agricultural, cultural, and socio-economic. The indicator set includes both qualitative and quantitative indicators, but measurement is based on the observations, perceptions, and experiences of the local communities themselves.

The indicators aim to provide communities with a framework for discussion and analysis of socio-ecological processes essential for SEPLS resilience. This relates to critical management objectives such as food security, agricultural sustainability, livelihood development, provision of ecosystem services and conservation of biodiversity, strengthening of community- and landscape-level organizations, and landscape governance for equity and sustainability. Discussion of the indicators within communities stimulates knowledge-sharing and analyses, which are key factors in creating social capital for landscape governance, planning and management, and which confirm community ownership of this process.

COMDEKS is one of the first programs of its kind to deploy resilience indicators as an integral part of its methodology and as an organizing principle for community participation. Nor are the indicators meant to be used only once and then forgotten. Rather, they are designed to be revisited periodically by the community, allowing community members to evaluate progress toward Landscape Outcomes and to identify priority actions for local innovation. As such, they are a primary mechanism for adaptive management and the sustainability of COMDEKS interventions. The latest version of the indicator set, along with guidance notes on its application in the field, can be found in a newly released Resilience Indicators Toolkit.

## **Reference**

- UNU-IAS, Bioversity International, IGES and UNDP. 2014. Toolkit for the Indicators of Resilience in Socio-ecological Production Landscapes and Seascapes (SEPLS).
- United Nations Development Programme. 2014. Communities in Action for Landscape Resilience and Sustainability - The COMDEKS Programme. UNDP, New York
- United Nations Development Programme. 2016. “A Community-based Approach to Resilient and Sustainable Landscapes: lessons from Phase II of the COMDEKS Programme”. UNDP, New York

## **Multi-dimensional Interactions for Biocultural Diversity: Making a New Pathway through UNU-IAS OUIK' Activities**

Yoshihiko IIDA

Operating Unit Ishikawa/Kanazawa (OUIK)  
United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)

**Contact:** iida@unu.edu

**Keywords:** biocultural resources management, meta-coordination, mutual creation,  
local authority, international dialogue

### **Cross-Cutting Issues Related to Local Biocultural Diversity**

Biological and cultural diversity are essential to support active life and foster sustainability in every generation. However, culturally developed adaptive skills and intellectual capital regarding the conservation and utilization of local natural environments and ecosystems have been threatened with the following events that cause a change in the original natural landscape and loss of native biodiversity.

The concentration of population and capital in urban areas has caused communities around the world to become increasingly homogeneous and unified with regard to social customs and economic values. More than half the world's population now resides in urban areas. The problem of inequitable distribution of wealth between urban and rural areas continues to make production–consumption structures more standardized and is contributing to the development of more powerful consumption-led markets. Rural communities are also facing serious local issues such as loss of intellectual capital and brain drain related to depopulation, population outflow, and aging. At the same time, the individuality of rural society, which has historically been valued, has recently received little attention at the global level.

Accordingly, rural residents face difficulties in maintaining their surrounding natural environment and their accompanying tangible and intangible culture, which has been generated over centuries. In other words, the historically cultivated diverse identities and knowledge systems of rural societies are rapidly being lost. Meanwhile, from an ecological perspective, many native fauna and flora suited to various environmental conditions in rural landscapes are in danger of extinction, due to changes in lifestyles and land use and technical modernization of primary industries such as agriculture, forestry, and fishery. Invasions by alien species have become a new ecological problem, because the alien species can replace native ones in the same ecological position and it is difficult for native species to adapt to and compete with the speed of the invasion.

Since biocultural diversity is inevitably a multi-dimensional issue, biocultural resources management as a methodology should involve “meta-coordination” that balances multi-dimensional relationships. These include (1) biological vs. cultural (as value systems), (2) global vs. community (as stakeholder systems), (3) academic vs. practical (as knowledge base), (4) urban vs. rural (as geographic locations), (5) past vs. present (as temporal domains), (6) policy vs. action (as behavior patterns), and (7) governance vs. finance (in terms of opportunity distribution).

### **A Multi-Dimensional Stakeholder Approach for Biocultural Resource Management**

There are several institutional strata in the field of biocultural resource management. The existing international conventions and institutions, such as networks of designated areas at the global level, and national policies on biological and cultural diversity aimed at conservation and sustainable utilization, are generally quite strong and efficient tools for addressing global issues in a financially viable way. However, local concerns about the benefits of biocultural resources tend to be ignored at these broader levels because they are too distant from people's daily lives.

In contrast, local authorities such as prefectural, city, town, and village government and other local entities have the ability to communicate with both the local community and national government (or even international sectors) simultaneously. They can thus offer a platform or play a coordinating role for establishing better local-level biocultural resource management with less conflict. As local government staff actually lives in the area where proposed measures will be applied, they can listen directly to local opinions and determine the basic outcome of policy implementation through the collection of reliable data, ideally enabling them to complete a Plan-Do-Check-Act (PDCA) cycle.

Moreover, especially in Japan, new practical actions to manage biological resources at the community level have been taken, as part of a major movement to revitalize rural society. Not only local residents but also some people from urban areas are playing active, vigorous roles in these efforts. For example, people are trying to rebuild rural communities and create new jobs so that these rural locations can sustain new families, and educators are trying to build capacity among rural young people so that they can become leaders in helping their community adapt to ecological and social changes in the community. Other people are providing key support for this movement through institutional and governmental contributions.

However, communication among the multiple stakeholders can be deficient and conflicts between the various efforts are sometimes observed. As a result, involving a combination of stakeholders from various levels becomes important to achieve both efficiency and objectivity in decision making. Therefore, opportunities for coordination among these initiatives should be created for sharing of issues and challenges along the pathway toward achieving more effective biocultural resource management.

### **Creating Options for Future Generations through OUIK's Leadership**

The strong linkage between local difficulties and global issues is readily observable in the field of biocultural diversity. Cross-cutting issues related to local biocultural diversity directly and indirectly contribute to global challenges, such as environmental problems (e.g., broader biodiversity issues, water and energy shortages) and social problems (e.g., war, poverty, and discrimination). In addition, the cultures and lifestyles prevalent in megacities—foods, fashions, pop culture, and value systems—can be easily reproduced and spread widely across the world through social media in our modern society. As a result, biocultural diversity can quickly vanish at the local level, thereby of course reducing diversity at the global level as well.

In this regard, preserving a diversity of lifestyles and ways of thinking in both rural and urban settings is essential to solving local and global issues alike. Our responsibility to future generations is to create mechanisms to continuously and creatively generate experience and knowledge of biocultural resource management, so that we can protect the seeds of various options for the future. Toward that end, multi-dimensional communication is needed, because only comprehensive interaction can fully protect a diversity of social values and opportunities.

UNU-IAS OUIK is a local authority-initiated UN flagship organization, established in 2008 and supported by Ishikawa prefecture and Kanazawa city. It is intrinsically multi-scale and functions in a multi-dimensional way. OUIK's capacity for "meta-coordination" of multi-dimensional relationships has been recognized in several recent works, on the Ishikawa-Kanazawa Biocultural Region (UNU-IAS OUIK, 2015), the Mount Hakusan Biosphere Reserve (Iida and Nakamura, 2016), and the Noto's Satoumi movement (in press).

One overarching theme in all such efforts should be capacity building and networking for the mutual creation of biocultural resource management initiatives that involve future generations and accumulate intellectual capital within local societies.

### **References**

- Iida, Y. and Nakamura, S. eds. (2016) Mount Hakusan Biosphere Reserve: Creating a new path for communities and nature, UNU-IAS OUIK, Kanazawa, Japan. 116pp.
- UNU-IAS OUIK (2015) The Ishikawa-Kanazawa Biocultural Region: A model for linkages between biological diversity and cultural prosperity. UNU-IAS OUIK, Kanazawa, Japan, 57pp. +annexes.

## **The National Biodiversity Strategy and Local Biodiversity Strategies in Japan**

Aya Yatsumoto

Ministry of the Environment, Japan

**Contact:** aya\_yatsumoto@env.go.jp

**Keywords:** NBSAP, LBSAP

### **The National Biodiversity Strategy**

The National Biodiversity Strategy of Japan is the government's basic plan for the conservation of biodiversity and the sustainable use of its components pursuant to the Convention on Biological Diversity (CBD). The strategy was not drafted by the Ministry of the Environment alone, but with the collaboration of all relevant ministries and agencies, and set as a Cabinet decision, following a discussion in the Central Environment Council, the hearing of opinions from local governments, experts, and private organizations, which are involved in the natural environment and conservation of biodiversity, as well as public comments, etc.

In 1995, the Government of Japan formulated its first National Biodiversity Strategy, which comprehensively compiled individual efforts made in line with the CBD. The strategy, thereafter, was revised in 2002 and 2007. In 2008, the Basic Act on Biodiversity was established, which stipulates the fundamental principles for the conservation and sustainable use of biodiversity as well as requiring that the government formulate a National Biodiversity Strategy.

The strategy was revised and approved by the Cabinet in 2010 as the first statutory national biodiversity strategy, which made the establishment of a society in harmony with nature the long-term target. And in the same year the 10th Conference of the Parties to the CBD (COP10) was held in Japan.

In 2012, the Government of Japan formulated a Strategic Plan for Biodiversity 2011–2020 in order to provide a Japanese road map for achieving the Aichi Targets, which were adopted at COP10, and the future direction of society in harmony with nature, based on the lessons learned from the Great East Japan Earthquake in March, 2011. Based on the plan, various measures are now being implemented.

### **Local Biodiversity Strategies and Action Plan (LBSAP)**

The Basic Act on Biodiversity requires that local governments and municipal governments must formulate Local Biodiversity Strategies and Action Plans (LBSAP). LBSAP are basic plans regarding the conservation of biodiversity and the sustainable use of its components, which are formulated by local governments, and it is required that local governments endeavor to independently or jointly provide for the following items: 1) The area, 2) Targets, 3) measures that should be implemented in a comprehensive and planned manner, and 4) necessary matters in order to promote those policies singly or jointly

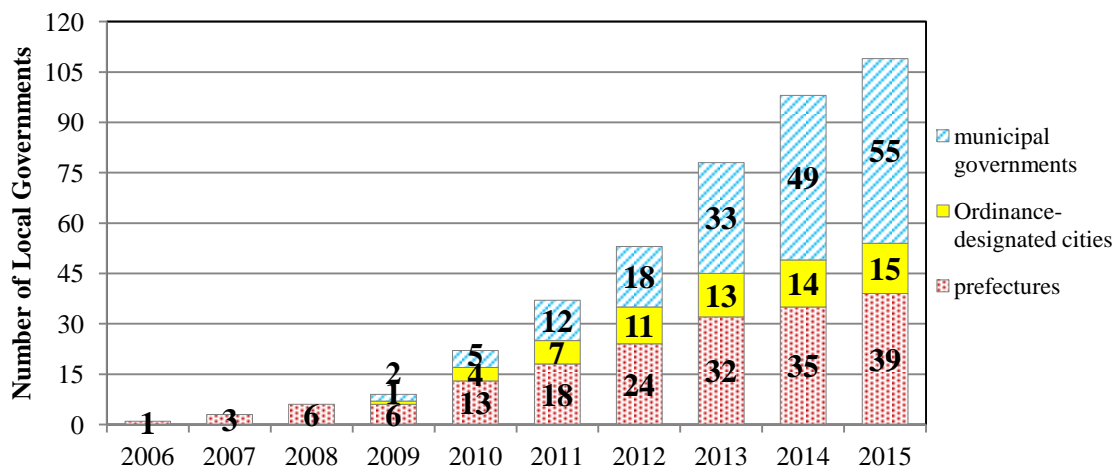
The potential effects of the formulation of LBSAP will be as follows.

- ① revitalizing regional communities and creating new forms of those communities
- ② developing community-based networks made up of various local parties
- ③ contributing to biodiversity conservation in a way that is not limited to local areas but includes national or world-wide areas
- ④ building public confidence in the region

As of March, 2016, the number of the local governments that have formulated LBSAPs were 39 prefectures (83% of 47 prefectures), 15 ordinance-designated cities (75% of all ordinance-designated cities), and 55 municipal governments (3% of 1,721 municipal governments). Amami-Oshima Island is the only area where the LBSAP has been jointly formulated by all of 5 municipal governments.

To think about the unique biodiversity of each region is to understand that various factors related to the lives of local residents, such as regional industries, lifestyles, histories, and cultures, are interrelated based on their local natures, and contribute to perceiving the unique value of the areas and to developing local communities, which will be a source of attachment and pride to the local residents.

[Formulation of Local Biodiversity Strategies and Action Plan 2006–2015] (cumulative total)





## **Biodiversity Strategy on Agriculture, Forestry, and Fisheries in Japan**

Ichiro Nakagawa

The Ministry of Agriculture, Forestry, and Fisheries of Japan

**Contact:** ichiro\_nakagawa570@maff.go.jp

**Keywords:** Biodiversity Strategy, Rural Areas, Biodiversity Conservation, GIAHS

### **Formulation of the “Biodiversity Strategy on Agriculture, Forestry, and Fisheries”**

Rural areas, which have been operated as places of food production and livelihoods, have developed unique and varied cultures through interactions with their ecosystems. It is necessary both to encourage sustainable primary industries that keep good production conditions, taking into account of biodiversity conservation, and to revitalise rural areas in order to respond to consumers’ desires for a stable food supply. The Ministry of Agriculture, Forestry and Fisheries made clear the issues and measures that should be taken regarding the biodiversity of Japan’s agriculture, forestry, and fisheries, and decided on the “Biodiversity Strategy on Agriculture, Forestry, and Fisheries” in 2007, in order to strongly promote agricultural, forestry, and fishery practices that take biodiversity conservation into account; the strategy was later revised in 2012.

### **Promotion of Activities by Various Groups with Originality and Ingenuity in Rural Areas**

There are various activities aiming to conserve biodiversity in rural areas, such as organic farming, reviving indigenous species, improving farm ponds as biotopes, setting up fish ladders and providing habitats for migratory birds, maintaining “Satoyama” to mitigate damage caused by wildlife, maintaining forests, afforestation, and maintaining seaweed beds and tidal flats to conserve fishing grounds.

These various activities of biodiversity conservation performed by primary industries in rural areas contribute to the promotion of primary industries and rural areas through, for example, increasing sales of the products of these activities.

### **Maintaining and Demonstrating Multifunctional Roles of Agriculture and Rural Areas**

In order to maintain and demonstrate these multifunctional roles, the government consistently implements Japanese agricultural direct payments (multifunctional payments, direct payments to farmers in hilly and mountainous areas, and direct payments for environmentally friendly agriculture) to support regional cooperation backing such roles, as well as agricultural production in hilly and mountainous areas, and effective farming for environmental conservation.

Direct payments for environmentally friendly agriculture support agricultural production activities, contributing to natural environment conservation.

### **Practical Activities of Biodiversity Conservation**

Furthermore, there are practical activities, such as the promotion of environmental education through joint examinations of farmland ecosystems between local farmers and non-farmers, and “Ikimono Mark” activities that enable communication with consumers by using products made through agricultural activities that take biodiversity conservation into account. It is desirable to take opportunities that help consumers understand biodiversity through activities such as eating rice, vegetables, and fish. Therefore, the government promotes these activities. The government also promotes fish eco-labels, which indicate that sustainable methods were used that take the ecosystem and resources into account. Furthermore, we are developing living indicators for

measuring the abundance of biodiversity, in order to grasp the effectiveness of, and make clear how agricultural, forestry, and fishery activities contribute to, biodiversity conservation.

### **Research on Sustainable Agriculture in Japan**

It has been pointed out that recent changes in agricultural activities have had adverse effects on wildlife and ecosystem services in agricultural landscapes. To develop sustainable agriculture in Japan, we aim to reconcile biodiversity conservation and crop production in farmlands, as well as to investigate the effectiveness of both environment-friendly farming on wildlife conservation and methods of assessing pollination services for agriculture.

Monitoring bird groups can be useful for evaluating the effectiveness of organic farming on several taxa in rice-paddy landscapes. The great egret achieves higher food intake and abundance in organic rice fields than in conventional fields, due to the higher abundance of loaches.

Two other bird species depend more on tadpoles, which may not be sensitive to the use of pesticides. Organic farming is a useful option to conserve fish-eating bird species in rice fields.

### **Globally Important Agricultural Heritage Systems (GIAHS)**

Japan has eight designated GIAHS sites as of September 2016. Designation further encourages local people to conserve biodiversity and environment through dynamic GIAHS conservation.

GIAHSs are defined as “remarkable land use systems and landscapes which are rich in globally significant biological diversity evolving from the co-adaptation of a community with its environment and its needs and aspirations for sustainable development” (FAO 2002).

GIAHSs are designated by FAO based on their importance for the provision of local food security, their high levels of biodiversity, their stores of indigenous knowledge, and the ingenuity of their management systems.

### **References**

- Biodiversity Strategy on Agriculture, Forestry, and Fisheries (Ministry of Agriculture, Forestry, and Fisheries, 2012)
- FY2015 Annual Report of Food, Agriculture and Rural Areas in Japan (Summary) (Ministry of Agriculture, Forestry, and Fisheries, 2016)



## **Living Within the Seasonal Rhythm of Nature: The Sri Lankan Biocultural Diversity Experience**

R.P.L.C. Randeni

Biodiversity Secretariat, Ministry of Mahaweli Development and Environment

**Contact:** leelr2001@yahoo.com

**Keywords:** bio-cultural diversity, production landscapes, Sun worshipping tribes, *Sooriyamandala*,

### **Srilankan Biocultural Heritage**

Linking biological diversity and cultural diversity in Asia, Sri Lanka has a significant role to play. Sri Lanka has one of the highest biodiversities per unit area in Asia. Its endemism is remarkable. Sri Lanka ratified the Convention on Biological Diversity (CBD) in 1994. It is a party as well to the biodiversity-related World Heritage Convention of UNESCO. Biodiversity functions on two scales, namely spatial and temporal. The variation and variety of life over time is a manifestation of the functional properties of seasonal biodiversity. Community-based and suasive tools for biodiversity conservation are advocated as complementary tools to mainstream spatial and temporal scales. The majority of Sri Lankan communities live in villages. The primary livelihood in such villages is farming and associated animal husbandry. Sri Lanka has inherited a great repository of collective bio-cultural heritage, stemming from people's experience through their livelihoods and customary sustainable use. This heritage includes ceremonies and festivals, rituals, taboos and sanctions, self-regulatory systems, food and healing recipes, traditional knowledge practices, and much more. The Sri Lanka National Focal Point for CBD, the Ministry of Mahaweli Development and Environment, has identified the need for linking biodiversity with cultural diversity for effective mainstreaming. This paper shares several initiatives in the above mission.

### **Conserving and Showcasing Unique Sustainable Production Landscapes**

There are *satoiyama*-like unique production landscapes still found in Sri Lanka, believed to be inherited from native indigenous peoples and local communities of Sri Lanka. This paper identifies several prominent landscapes and explains significant measures of biological and cultural diversity adopted for conserving and showcasing them among the global community. Dry-zone *ellangawa* tank cascade systems, intermediate-zone *kandian* forest gardens, wet-zone *ovita* agro ecosystems, and traditional *mavee* lands are prominent examples. The origins of either of agro-ecosystems go back to time immemorial. The Biodiversity Secretariat is executing two UNEP-funded projects for mainstream biodiversity to improve the climate change adaptive capacity and nutritional aspects. Some biocultural aspects, such as traditional knowledge of biodiversity, are covered.

### **Reviving Nature-Friendly Rituals, Ceremonies and Festivals**

Popular legend of the origin of the Sri Lankan nation speaks of four nature/sun-worshipping tribes, known as the *Yaksha*, *Naaga*, *Deva*, and *Raksha*. Collectively, all four tribes are known as *hela* tribes. *Hela* is a synonym for the sun. Thus, all four are held to be sun worshippers. Traditional customary practices even today pay great respect for the sun and nature. Traditionally before and after harvest, a sun salutation is practiced. However, such nature-friendly rituals have become eroded for several reasons. Therefore, the CBD-National Focal Point decided to revive nature/sun-worship techniques found in Sri Lanka's collective biocultural heritage. The popularization of the raw food *sooriyamandala* is the outcome of this approach.

### **Collective Rituals for Nature/Sun Worship**

*Sooryamandala* is made using seasonally available fruits and vegetables to educate participants how seasonal biodiversity can be mainstreamed towards a toxin-free Sri Lanka.

Preparing *sooryamandala* is a time-tested community biodiversity management practice. Seasonally available fruits and vegetables of different colors and shapes are arranged in a cyclic pattern in the core of which the periphery resembles the shape and function of the sun. More than 20 different varieties of *sooryamandala* are used. This is a participatory exercise, a type of a visual art, and a novel method of biodiversity prospecting. The participants, becoming aware of how nutritionally rich, toxin-free food can be found more cheaply, revive their community spirit with joy. The event was highly attractive and appreciated by the participants. Indigenous people and local communities in Sri Lanka worshipped the sun as a god, asking for the blessing of a bountiful harvest. It was expected that, *sooryamandala* made from raw food could help to revive eco-friendly rituals practiced in the past and develop social cohesion towards meaningful collective action.



Picture of a *sooryamandala* prepared during the World Environment Day Celebrations on June 05, 2015 at Medirigiriya National School, North Central Province, Sri Lanka

### **Eco-Mango Festival as an Interactive event showcasing Biocultural Diversity**

Sri Lanka has a long history of acculturation, inter-cultural dialogue, and mutual learning between cultures. Beyond the unique native dishes, Indian, Malay, and European cuisines co-exist. The people of Sri Lanka have greatly benefited from western allopathic medicine, adding a vast diversity of home remedies and local healers. Globalization, coupled with the advancements of information technology, has facilitated a South–South dialogue of mutual learning advocated by CBD. Mango (*Mangifera indica*) is a unique multi-purpose tree and a flagship species distributed throughout the country, which has a unique cultural value. It is a sacred fruit among the Hindus. Mango has been selected as an ambassador to link biological diversity with cultural diversity. Four eco-mango festivals showcase hundreds of different mango varieties and ecotypes from home gardens of Sri Lanka. Participants suggested that this event continue in future seasons.

### **Lessons Learned and Way Forward**

Sri Lanka, known as the “Pearl of the Indian Ocean” for its rich biocultural heritage, has many strengths as well as challenges that have been identified linking biological diversity with cultural diversity. The strengths include its collective biocultural heritage and committed individuals. Its challenges include long time horizons, lack of an appropriate business model, institutional gaps, lack of awareness and prospects, and inadequacies in financial markets and investment opportunities for biocultural products. The payments and rewards mechanism for Ecosystem Services linking biological diversity with cultural diversity, networking customary sustainable-use-based livelihoods through local exchange trading systems or appropriate complementary currency systems are suggested. As preparations are underway for signing the Nagoya protocol, developing biocultural community protocols as a means of trickling global benefits down to the rural poor is a great prospect. Through the above initiatives, there is a brighter path ahead for Sri Lanka. Biocultural diversity is the platform for people living within the rhythm of nature.

## **Introduction and Policy Coordination for the Promotion of the Links between Biodiversity and Cultural Diversity in Sabah, Malaysia**

Gerald J. Jetony

Natural Resources Office Sabah

**Contact:** Gerald.Jetony@Sabah.gov.my

**Keywords:** bio-cultural approach, community-based natural resources management, Tagal system, social forestry, indigenous community conserve areas

Sabah is a state within the federation of Malaysia with an area of 73,711 square km and a population of more than 3.2 million people. Sabah is rich in biodiversity. Its main exports are natural resource-based products. There are many good practices of bio-cultural diversity, but their existence faces a threat due to modernisation. The old way of life that sustained the livelihoods of people for generations is being phased out for a fast and easy way of life. However, recently, some agencies in Sabah are using bio-cultural approaches to promote sustainable livelihoods and the conservation of biodiversity in their respective organisations. The Department of Fisheries Sabah is using the Tagal System for sustainable management of aquatic life, social forestry is being practiced by the forestry department, Sabah Parks uses indigenous community conserve areas (ICCA) to promote connectivity of two park areas in Sabah, and, at present, Sabah Biodiversity Centre is documenting the community protocol under UNDP funding, for the purpose of access and benefit sharing under Article 8 (j) of the Convention of Biodiversity (CBD). Tagal is a unique system for the conservation of fish resources. It is done in a traditional way, through a culture that has been passed down from generation to generation. It is a system that prohibits anyone from catching fish in the river that has been designated by the community themselves, for a specific duration of time (usually one year), for the harvest of the fish resources (Wong, 2011). Anyone who is found guilty of breaching the prohibition is fined by the village head in accordance with Native laws. The concept of the Tagal system is now being introduced in forest reserves as social forestry. In Malaysia, “social forestry” is defined as the involvement of indigenous people and local communities in their own initiatives, or in collaboration with relevant stakeholders, in forest management from social, economic, cultural, and environmental aspects, for sustainable livelihoods. ICCA is implemented in Sabah through the gazettement of particular areas as “Native Reserve” under Section 78 of Land Ordinance Sabah, Cap 68. Local communities are therefore empowered to manage the areas by said Ordinance, in accordance with their needs (Norlina, 2015). For this concept to achieve success, we need strong leadership from the local communities. In general, bio-cultural practices in Sabah are being implemented through the recognition of rights and empowerment of local communities to conserve these designated natural resources.

Bio-cultural practices have been integrated in most of the action plans of the Sabah Biodiversity Strategy (SBS). Under SBS, establishment of ICCAs and implementation of the Tagal system are supported and promoted, and a number of social forestry programmes are implemented in support of the livelihoods of people who live adjacent to forest reserves. The state government also aspires to improve understandings of traditional ecological knowledge by encouraging more research on bio-cultural diversity in collaboration with local indigenous people.

Under the Sabah Biodiversity Strategy and Action Plan (2012–2022), a working group on Community-Based Natural Resources Management (CBNRM) is to be formed, and will be

chaired by the Secretary of Natural Resources. The members are relevant government agencies, non-governmental organisations (NGOs) both community-based and environment-based, and esteemed individuals to be appointed by the chairman. This committee will be the main platform for encouraging, facilitating, and strategising conservation efforts by local communities. Even though the working group has yet to be formally established, an ad-hoc committee for free, prior, and informed consent (FPIC) in community engagement for Sabah's 100% Roundtable on Sustainable Palm Oil (RSPO) Certified Sustainable Palm Oil by 2025 has already been formed.

## **References**

- Agama, A.L., Sanem, J., Nais, J., and Martin, G. (2011). A Biocultural Prospective for Heritage Conservation in Ulu Papar, Sabah: The Important of culture for Crocker Range Biosphere Reserve Nomination. Paper Presented at Asian Wetland Symposium in 2011, Kota Kinabalu Sabah.
- Norlina M.D. (2015). Ecolinc Initiative Project. Paper presented at Seminar Towards Sustainable Development in Harmony with Nature in Crocker Range Biosphere Reserve, in December, 2015 at Kota Kinabalu, Sabah.
- Sabah Government (2012). Sabah Biodiversity Strategy
- Sabah Government. Sabah Land Ordinance Cap 68.
- Wong, J.P. (2011). Sabah Tagal System (co-management) in Reviving and Conserving Many of the Depleted Fisheries Resources in Sabah, Malaysia. Paper presented at Asian Wetland Symposium in 2011, Kota Kinabalu Sabah.

## Aichi's Strategy toward Conservation of Biocultural Diversity

Saori Yamashita

Natural Environment Division, Department of the Environment, Aichi Prefecture

**Contact:** aichi.shizen@gmail.com

**Keywords:** ecological networks, various stakeholders, symbolic species, subnational governments, the Aichi Biodiversity Targets

### Aichi's strategy for biocultural diversity

As a co-host of the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD-COP10), held in 2010, Aichi Prefecture implements a variety of projects toward achieving the Aichi Biodiversity Targets. In 2013, a new regional strategy was developed that focuses on creating ecological networks and a unique scheme to mitigate negative impact of development for ecological networks. One major activity is the creation of "ecological network councils", one for each of the prefecture's nine areas. Each council cooperates with various stakeholders such as municipal governments, universities, NPOs and private corporations, and every council is engaged in different efforts according to their own road map of focus areas. While conservation of biodiversity is the main objective for these councils, they also aim to conserve and promote each area's own cultural resources. Below are three examples of the activities undertaken by the councils.

### Ecological Network Council activities

The Ecological Network Council of Chita Peninsula, created in 2010, is actively working under the theme "Chita Peninsula: where we can live with Gon the fox." This area is a setting of *Gongitsune* (or, "a fox named Gon" in English), a children's story famous in Japan about a red fox that is tightly linked to the local culture and cherished by residents. Chita Peninsula used to be a major breeding ground for foxes before the 1910s. In the 1940s, however, their local habitat was hugely degraded due to the modernization and industrialization; in addition, a rising prevalence of dog diseases decreased the number of foxes even further in the 1950s. By the 1960s, the red fox had disappeared completely from the peninsula. Since 1997, however, fox sightings began again in this area, but the number is still very small. The council's goal is to conserve the region's biodiversity not only to improve the number of foxes, but to create an environment with a high biodiversity rate, as foxes are at the top of the food chain among this area's wildlife. This council expects a great deal of support from local people when it comes to conserving the red fox, an iconic species in this area because it contributes to the local culture through *Gongitsune*. As one of its activities, the council is creating ecological networks around the coastal area of the peninsula, taking advantage of the "green belt," originally created to reduce pollution from nearby factories. This green belt is 10 km long and 100 m wide, and 11 companies are currently involved in this project. To date red foxes have been spotted around the green belt, with some being caught on video. This project is supported by a number of students who distribute free magazines at local facilities and shops. These magazines present information about local natural resources, the value of biodiversity and the efforts of the ecological network council.

The second example is the council located in Northern Owari, where there are many threatened animal species as well as famous cultural and historical resources, including the Castle of Inuyama and the Museum Meiji-Mura. This council, led by local municipal governments, NPOs and the prefectural government, is trying to develop a mutual strategy among their member cities to conserve both biological and cultural diversity. To this end, the

council has adopted the role of a learning platform, where knowledge and experience are shared in an effort to identify mutual challenges of conservation for biodiversity and assess local resources by mapping the local natural environment, major roads and also historical, cultural and industrial resources. This council's expected future projects include activities that contribute toward conservation of cultural diversity as well as biodiversity, such as a walk rally around areas with both natural and cultural significance, branding of local food, and adding value to the existing cultural resources by conserving rare species like the callery pear.

The third example is from Tobu-Kyuryo's council aimed at the conservation of *Drosera indica* of Toyoake, a plant designated as a prefectural natural treasure. In the Eastern Hills of Nagoya, the council aims to conserve this plant in cooperation with the local municipal government. This *Drosera indica* is red and has been found in this area for generations. Although its natural habitat has been degraded, its genetic diversity is now improving thanks to efforts such as restoration of the plant community through the manual burying and germinating of seeds. The conservation area for *Drosera indica* is open to the public in the summer so that visitors can learn the value of biodiversity.

### Global Actions and Networking

Finally, Aichi has shared experiences with other subnational governments throughout the world since COP10 toward achieving the Aichi Biodiversity Targets. Examples include the Biodiversity Summit for Cities and Subnational Governments and side-events held parallel to CBD-COP.

This coming December, at COP13 in Cancun, Mexico, Aichi Prefecture will hold a forum and make a joint statement with other leading subnational governments in biodiversity to promote similar actions to those above at a global level. The ability to act both locally, nationally and globally is a strong point for subnational governments and Aichi wishes to continue contributing to both biological and cultural diversity through various activities.

**Collaborative efforts toward "Coexistence between people and nature"**  
**The relationship between lives enhances bonds**  
 Aichi believes the realization of "coexistence between people and nature" is precious happiness. We then suggest various people begin to work together to restore ecosystems. Let's rehabilitate rich natural environment in our daily lives.

**Action Plan**  
 Effort toward realizing "coexistence between people and nature"  
 Aichi prefecture promotes actions in collaboration with residents, companies, civil societies and governments of municipalities as follows:

Category of action plan	Major items
A Creating positive ecological networks	A-1 Conservation of important habitats
	A-2 Conservation and restoration of habitats in various areas
	A-3 Promoting the positive ecological networks
B Promoting Aichi obligation	B-1 Promoting biodiversity conservation and maintenance on the prefecture
	B-2 Promoting biodiversity conservation and maintenance on the prefecture
	B-3 Promoting biodiversity conservation and maintenance on the prefecture
	B-4 Promoting biodiversity conservation and maintenance on the prefecture
C Preservation and control of wildlife	C-1 Preservation of rare birds and flora
	C-2 Enforcement of strict quarantine control
D Sharing the value of biodiversity	D-1 Promoting environmental education
	D-2 Promoting recognition and creation of biodiversity
E Participation and collaboration of various stakeholders	E-1 Promoting contact with nature
	E-2 Promoting participation and collaboration with various stakeholders
	E-3 Promoting comprehensive and interdisciplinary efforts

**Expansion into local communities**  
 Collaboration for awareness, conservation and networking  
 In order to promote comprehensive collaboration between diverse stakeholders for the conservation of biological diversity with common understanding of the future, we are promoting the establishment of ecological network councils within 9 subregions.

**Chita Peninsula Ecological Network Council**  
 Ecological network council was set up to promote stable ecological networks with local university, private company, civil society and citizens. For example, in the coastal area where major industries are located, 11 companies and students publish free magazine to widely disseminate the information of conservation of ecological networks to the public.

**Owari Tobu Hills Ecological Network Council**  
 23 of universities in this area set up lectures under the ecological networks theme in cooperation with residents, companies and public administration. In addition, restoration of this natural habitat has been undertaken.

**Nishi-Mikawa Ecological Network Council**  
 The project has promoted sustainable environment and positive economic cycle in the Nishi-Mikawa area.  
 Project to be raised native sashimi by local residents



## Biodiversity and Community Development in Kanazawa 生物多様性の恵みと金沢のまちづくり

Hidetada Kuwahara  
桑原 秀忠

Director of the Environmental Policy Section, Kanazawa City  
金沢市環境局環境政策課長

**Contact:** kuwahara\_h@city.kanazawa.lg.jp

**Keywords:** citizen participation, conservation and harmonization, supporting local economy, people building, Kanazawa regional biodiversity strategy  
市民参加, 保全と調和, 地域経済の支え, ひとづくり, 金沢版生物多様性戦略

金沢市は石川県のほぼ中央に位置し、亜高山地から日本海へと 1644mの高低差のある変化に富んだ自然環境を有している。このことが、他には類を見ない生活様式、文化、食などを育んできた。

例えば、豊富な河川水と伏流水である。江戸時代から防衛上の「壕」として整備されてきた用水は総延長距離 約 150km に及び、飲用、防火、排雪、灌漑、工業などの様々な用途で市民生活を支えてきた。一時期は水質悪化により水生生物が姿を消したが、下水道の普及と市民の努力により水質は改善し、現在では中心市街地にも、ホテルやアユ、カワセミなどの姿が見られるようになっている。

また、面積の約 60%を占める林野には多種の動植物が生息し、高低差のある地形からは多様な食材が供給されている。山間地、平野地、砂丘地では特徴ある農業が営まれ、日本海の荒波からは新鮮な魚介類がもたらされ、豊かな食文化が発達した。金沢の食文化の概念は食材のみならず、調理方法、食器、作法、しつらえなどを包含することから、伝統工芸、建築、建具、装飾、立ち振る舞いに至るまで固有の文化が根付いており、これらが産業として、地域経済を支えている。

このように、金沢では藩政期から、自然と文化が車の両輪の関係を築いてきた。近代においても、1968年に全国初の自治体独自の保全条例である「伝統環境保存条例」を制定して以降、景観条例、用水保全条例、斜面緑地保全条例、コミュニティ空間条例などの一連のまちづくり条例により、自然と文化の保全・発展を目指してきた。そして、これらを市民主体で推進するため、地域がまちづくり計画を策定し、市と協定を締結している。

今後も豊かな自然や、それを基盤とした文化・伝統を未来に継承するために、「自然や生きものを大切にしたい環境づくり」「生物多様性を未来に継承していくためのひとづくり」を基本目標とする「金沢版生物多様性戦略」を 2016年に策定した。その具体的なリーディング事業として、地域市民が自然に関する情報収集に参画する「市民ウォッチャー」や、団体等が相互に情報交換や活動協力を行うための「生物多様性ネットワーク」が始動している。また、文化から自然を考える逆アプローチとして、新たに、ホテルを題材とした金沢三文豪の作品朗読会をホテル観賞会と同時開催するなど、生物多様性に関する普及啓発の裾野の拡大にも取り組んでいる。

### Reference

Kanazawa city (2016) Kanazawa regional biodiversity strategy (in Japanese)  
(<http://www4.city.kanazawa.lg.jp/data/open/cnt/3/23326/1/honpen.pdf>)  
金沢市(2016)金沢版生物多様性戦略

## Biocultural Diversity in Sri Lanka: Local Practice and Policy Implementation

Nimal Hewanila

Nirmanee Development Foundation

**Contact:** flink@sltnet.lk

**Keywords:** Indigenous banana, rice, yams, leafy vegetable varieties, rituals, healers, indigenous products

### Sri Lanka in an Asian Perspective

Sri Lanka has been identified as a global biodiversity hot spot, namely as a country having a high biodiversity per unit area. Being an island nation in Asia, there is rich collective bio-cultural heritage still preserved in the country, despite the pressures of accelerated development. Climate and soil type variability contribute to higher endemism and species richness, with a mosaic of bio-cultural landscapes. Due to its isolation from Indian sub-continent by the sea, over history, the indigenous people and the local community (IPLC) inherited a unique lifestyle and culture nourished from nature. In history, Sri Lanka was on a world trade route. The influence of other cultures was introduced time to time. Subsequent colonial rule under the Portuguese, Dutch, and British influenced Sri Lankan culture as well. Today, although Sri Lanka looks like a mixed nation externally, indigenous culture, nourished from nature, is still preserved, playing a latent function. However, IPLCs have been marginalized due to the pressures of modernization. Mainstreaming its bio-cultural heritage concerns into national policy framework is a felt need. IPLC practices need to be appraised in a much broader natural and cultural context. Therefore, this abstract discuss bio-cultural practices and the existing policy framework to find gaps and inadequacies to suggest viable partnerships for better outcomes.



### Biocultural Heritage and IPLC Practices

In practice, IPLCs apply biocultural practices in their day-to-day livelihood activities in numerous ways. In farming and associated livestock-rearing livelihoods and in numerous functions from birth to death, biocultural practices are associated. People are used to consulting astrologers for auspicious times on such occasions. All in all, rituals relate. Most rituals are a type of thanksgiving to the deities and gods for their protection and benevolence. Some gods are worshipped throughout the country, while others have regional relevance. *Devala* is the local name for sacred places dedicated for gods. In *devala* seasonal festivals and ceremonies are performed to invoke the blessings known as *gammadu* and *devolmadu*. There are seasonal religious ceremonies found among the majority Sinhala–Buddhist people, Sri Lankan Tamils, Muslims, and other minority ethnic groups. Historical evidence and legends prove that indigenous people (four sun-worshipping tribes) merged into the Sinhalese–Buddhist people. According to indigenous knowledge there were nearly 3000 rice varieties in the county. After harvesting the paddy crop from the major season, the rice cooked from first harvest was offered to the Lord Buddha in a new rice festival, known as the *aluthsahalmangalyaya*. The island also had 62 indigenous yam varieties, 40 banana varieties, and 100 indigenous leafy vegetables. IPLCs were totally dependent on traditional livelihoods, such as *kithul* tapping, handicrafts, spectacles production, and midwifery. However, with modernization, the use of bio-cultural

practices was reduced. The Nirmanee Development Foundation, an organization of IPLCs committed to revitalizing country's biocultural diversity, has launched initiatives to achieve this mission. The revitalization of the traditional knowledge of cures for snakebite, the livelihood called traditional *kithul* tapping, and the conservation of traditional banana varieties have been some initiatives for the conservation of bio-cultural diversity in the island.

We are now in the process of developing official partnerships with a focal point. We are also able to lobby relevant policy makers and politicians regarding our initiatives and challenges.

### **Reciprocity between Practice and Policy in Biocultural diversity**

There is a need for strong reciprocity or mutual feedback from policy to practice and vice versa. For biological diversity, the Ministry of Mahaweli Development, as the National Focal Point for the UNCBD, is responsible for the policy aspects, while the UNESCO Secretariat comes under the Ministry of Education, which plays a key role for cultural diversity. Pursuant to Article 8(j) of the CBD, the Sri Lankan NFP has appointed a traditional knowledge expert committee for advice. A draft policy on Sri Lankan traditional knowledge policy was developed and is awaiting Cabinet approval. However, the need to apply a tools-based comprehensive participatory partnership to develop the inextricable link between biological and cultural diversity still exists as a gap.

### **Gaps and Trends**

On the practice side, from the IPLCs, although the older generation still incorporate their wisdom and knowledge in their livelihoods, the younger generation prefers cheap modern solutions. The fields of health and agriculture are good examples. Modern drugs are preferred over herbal preparations. Poisonous agrochemicals like pesticides are preferred over traditional nature-friendly *kem* methods of pest control. The traditional *gurukula* system of knowledge passed down from generation to generation is fast disappearing and the modern generation is not interested in it, preferring western-style education. The market system supports quick and instant non-bio-cultural products but deals with higher profits. The recently popularized fast-food culture, with additives and imported preservatives, is a good example. IPLC food styles are based on locally, seasonally available slow foods. There are no incentives for these. In some cases healthy eco-foods and the services associated with biocultural heritage are only available for much higher prices, which the majority cannot afford. Profit seekers extract raw materials from wilderness areas in an unsustainable way, leading to biodiversity degradation.

### **Lessons Learned and a Way Forward**

Biological diversity and cultural diversity together with their mutual linkages and a supportive policy framework can uplift IPLCs and preserve them for a better global future. Documenting indigenous knowledge outside its original context results in a reduced impact. Therefore, a comprehensive, participatory-tool-based strategy is needed. Bio-cultural protocols and a sui-generis system are strongly recommended. This will give more empowerment to IPLCs and appreciate their nature-friendly lifestyles. Some places, like Nagadeepa (the original place of origin of the pre-Buddhist sun-worshipping tribe), and other such places need to be preserved. There is little space in the present education system for learning about real bio-cultural diversity. Hence, indigenous-knowledge-based universities or educational institutions must be set up.

The ground-based network must strengthen and network among cultures making a greater awareness among IPLCs of the region. There will be a great impact for supporting field-based activities. Facilities must be provided for producing products using indigenous knowledge.

## **Traditional Biocultural Diversity of *Salpa Pokhari* in Nepal**

Kamal Kumar Rai

Indigenous Knowledge and People Network,  
Society for Wetland Biodiversity Conservation Nepal

**Contact:** biodiv\_rai@hotmail.com

**Keywords:** Origin, Bioculture and safeguard policy

### **Introduction of Nepal**

Nepal is a cradle of ancient civilisation, and a multicultural, multi-lingual, multi-religion, multi-ethnic independent Himalayan country. The country consists of 125 castes and ethnic groups with geographical diversity, according to the 2011 census, but only 59 indigenous nationalities have so far been legally recognised under the National Foundation for Development of Indigenous Nationalities (NFDIN) Act of 2002. Indigenous peoples are associated with biodiversity in their identities, including bio-cultural knowledge, traditions, customary systems, religions, folk songs, dances, dress, expressions, traditional occupations, and spiritual values.

The 2001 Census showed that 48.5% of the national population resided in the Terai (plains region), 44.2% in the hill region, and 7.3% in the mountain region, and that population growth rate was 2.27%. Though the socio-culture and economy are closely related to biological resources, the 2014 National Biodiversity Strategy and Action Plan (NBSAP) and the 2016 strategy of the Ministry of Culture, Tourism, and Civil Aviation pay little attention to the importance of biocultural diversity. However, the Convention on Biological Diversity in 1992 was recognised to respect, preserve, and maintain knowledge, innovations, and practices related to biodiversity, including the biocultural diversity of indigenous and traditional communities.

### **Salpa Pokhari Lake and Traditional Thought Coexisting with Ecosystems**

The Kirat Kingship began in 1500 BCE and continued for over 1000 years in Kathmandu (Dahal 1998), Kirant (indigenous inhabitants: Khumbo, Limbu, Thangmi and Sunuwar) have more than 29 diverse language, culture associate with biodiversity, and according to oral tradition, its place of origin was Salpa Pokhari (Rai 2005). The cup-shaped Salpa Pokhari lake, sacred in the Himalayas, is believed to be the origin of Kiranti ancestors, and bears oral traditions, bio-culture, religious and spiritual connections with ancient history in Kirant society (Rai, 2005). The Kirant people's (indigenous inhabitants') ancient animism consisted of cultural folklore, religious and spiritual beliefs, and ancestral origins that rely on the natural landscapes, or "Silichowhow," deeply rooted in air, earth, water, rivers, rivulets, mountains, snow, rocks, caves, forests, trees, animals, bird behaviours, biodiversity, ecosystems, and species. This animistic thinking was also co-related to conservation of nature.

The Kirant people visited the Salpa Pokhari lake to respect and worship the ancestor gods (Salpa Raja and Salpa Rani, the king and queen) and deities by singing sacred songs and dancing in Salipa and Silichow. People brought newly harvested crops, fruits, local fowl eggs, and released pairs of pigeons in Salipa for wishes of long life, as votive offerings to the ancestor gods. These societies demonstrate biocultural diversity through their ancient oral customs, animistic practices, beliefs and traditions, religions, folklore, customary systems, and cultures. The Salpa Pokhari lake bears a sacred meaning in Kirant societies and importance for other customs and biodiversity in the landscape. There were 36 ancestral languages, but only 26 different languages are still in use at present. Each language possesses its own set of bio-cultural knowledge associated with diverse flora and fauna, including at least four different edible frog species (Rai, 2003).

Non-formal traditional governance and social customary institutions looked after these biocultural heritage sites of indigenous peoples. In this sense, local communities played an important role for conservation and use (Rai 2013). These non-formal institutions were supported to regard freshwater sources, reservoirs, and biocultural practices as communal property. The customary law and order in respect to biocultural diversity provided, in particular, protection, management, and

sustainable customary use for the wellbeing of all. When the non-formal traditional customary and governing institutions of the Kipat (Kirant) system were abolished, it caused the disappearance of most of the customs, traditional knowledge, culture, and governing practices related to freshwater, biodiversity and other natural resources. Cultural diversity, such as folklore, animism, oral traditions, culture, religions, spiritual values, beliefs, and practices coexisted with the ecosystem. Though now endangered, these are Himalayan biocultural symbols of biodiversity conservation and sustainable customary use. The research shows that customs close to water, biodiversity, sacred sites, and traditional knowledge and practices are well studied and documented through the rapid disappearance due to lack of ownership.

### **Further Actions for Conserving Indigenous Biocultural Diversity**

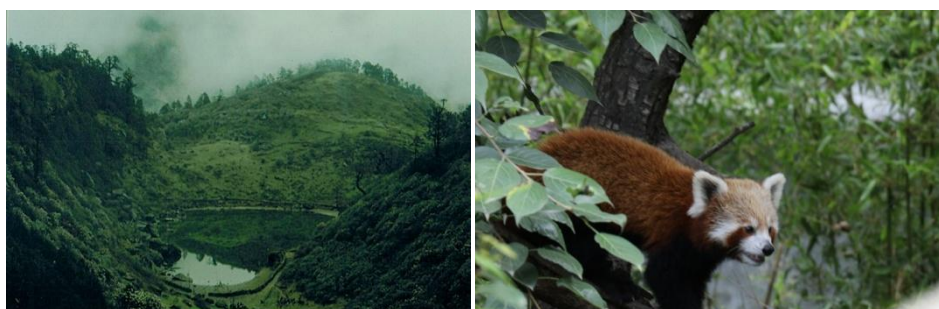
Existing beautiful natural resources and biocultural diversity are threatened by insufficient proper coordination, communication and conservation education, awareness raising, and strategic plans. Urgent conservation actions need to be taken through a multi-stakeholder approach for:

- research and documentation for folk and livelihoods in upstream and downstream fishery and farming
- conserving and restoring non-formal institution to transfer traditional or Biocultural knowledge transform
- protecting and promoting biocultural diversity for socio-economic development
- Good policy for Biocultural diversity to ensure meaningful participation of IPLCs
- Fellowship Initiative for study to protection and promotion of Biocultural Diversity

Indigenous People and Local Community (IPLC) organisations are willing to collaborate together with scientific bodies, civil society organisations, and conservation and business bodies. For IPLCs, the Mother Earth is alive and has been sacred since the days of their ancestors. IPLCs have been and are the stewards of nature, culture, and biodiversity in the world.

We have taken care of and preserved our resources for all future generations. If we are aware of the risks, challenges, and impacts, we therefore recommend ensuring Prior and Informed Consent, and respecting the human rights of non-contacted indigenous peoples before developing projects that will destroy the Mother Earth and biocultural diversity.

These safeguards should be taken in consideration of international obligations such as the UNDRIP; the Akwé: Kon voluntary guidelines; the Bonn Guidelines; the Code of Ethics; the community protocol; the CBD Article 8j, 10c; and the Aichi targets 11, 14, and 18. The equitable benefit sharing with IPLCs through clear national legal frameworks benefits IPLCs and enables the participation and empowerment of Indigenous women and youth.



Salpa Pokhari landscape and Kudo Red panda (*Ailurus Fulgens*)

### **Reference**

- Dahal, P. 2055.B.S. Kirant period, History of Nepal, AMK Bhotahiti Kathmandu Nepal Daes p. 255,  
Constitution 2015, Citizen and Constitutional Concern Committee, Singha Darawar, Kathmandu Nepal p. 118  
Ministry of Culture, tourism and civil aviation strategy 2016  
NBSAP 2014, National Biodiversity Strategy Action Plan of Nepal for CBD  
Rai, K. 2005, Culture, religious and spiritual significance for conservation Salpa Pokhari p. 24 WWF Nepal  
Rai, K. 2003, Role of Traditional Knowledge for Edible Frog Diversity Conservation in Nepal Thesis, Master of  
Science in Biodiversity, Swedish Biodiversity Centre, Uppsala, Sweden (Unpublished) p. 27, WWF Nepal  
Rai, K. 2013, Role of traditional Customary Institution for freshwater and biodiversity and culture conservation and  
management article (unpublished)

## **A Lake of Tragedies and Opportunities: Good-Intentioned Policies that Drowned Local Communities, and What Rescue Opportunities Can Be Seized**

Decibel V. Faustino-Eslava,<sup>1\*</sup> Maria Victoria O. Espaldon,<sup>1</sup> Carmelita M. Rebancos,<sup>1</sup> Nathaniel C. Bantayan,<sup>2</sup> Noelynna T. Ramos,<sup>3</sup> Betchaida D. Payot,<sup>3</sup> Sofia Alaira,<sup>1</sup> Lourriel S. Macale,<sup>1</sup> Clarisse Siababa,<sup>1</sup> Jeannette Avellano,<sup>2</sup> Carla B. Dimalanta,<sup>3</sup> Edanjarlo J. Marquez,<sup>4</sup> Karlo L. Queaño,<sup>5</sup> Vanessa Amor Israel,<sup>1</sup> and Michael Vincent Tubog<sup>1</sup>

<sup>1</sup>School of Environmental Science and Management, University of the Philippines Los Baños, Philippines\*

<sup>2</sup>College of Forestry and Natural Resources, University of the Philippines Los Baños, Philippines

<sup>3</sup>National Institute of Geological Sciences, University of the Philippines-Diliman, Philippines

<sup>4</sup>Department of Physical Sciences and Mathematics, University of the Philippines-Manila, Philippines

<sup>5</sup>Apex Mining Corporation, San Antonio, Pasig City, Philippines

**Contact:** dfeslava@up.edu.ph

**Keywords:** Laguna Lake, ecosystem service, integrated lake management

Laguna Lake, also known as Laguna de Bay, is the largest surface freshwater body in the Philippines with a total watershed area covering 2,903 km<sup>2</sup>. Urban areas, including Metro Manila and other rapidly industrializing and urbanizing cities, line its northern, western, and southwestern coasts. Sub-urban and agricultural regions dominate the lake's eastern and southeastern watersheds. Its size and location have led to both the growth and continued expansion of communities around it, and to the lake's evolution as an important multiple resource system for the region.

Ecosystem services derived from the lake span the entire range from supporting, provisioning, and regulating, to cultural services. The last comprehensive report on the lake produced as a Sub-global Millennium Ecosystem Assessment (Lasco and Espaldon, 2005) looked into the lake's services at various levels: the farm or village level (provision of food), the basin level (biodiversity and overall fishery production, and provision of water supply), and the global scale (the lake's influence on climate change). More recent assessments include the work on ecosystem accounting (WAVES, 2016), and the Japan Ministry of Education-funded "Managing Environmental Risks for Sustainable Food and Health Security in Watershed Planning in Lake Laguna Region (LakeHEAD Program)" (LakeHEAD, accessed October 6, 2016).

As expected, all these studies show that the multitude of resource-uses and users has led to numerous social conflicts within and between different sectors. As such, numerous institutional and policy responses have been designed to address some of these conflicts. These responses resulted from cross-institutional and multidisciplinary studies that looked into the lake's biophysical environment and the social dynamics involved. However, the same policy responses also led to untoward impacts on local communities, particularly the fishers and coastal neighborhoods. Hence, the current situation also presents numerous opportunities for improvements, particularly in the arena of local partnerships.

This presentation will introduce the various issues on the lake, the different policies that have been crafted to remedy them, what the resulting impacts have been, and what potential avenues for remedying the undesirable outcomes may be explored for a more inclusive, integrated, and sustainable management of Laguna Lake.

**References**

- Lasco, R.D, M.V.O. Espaldon, and M.A. Tapia, eds. (2005). *Ecosystems and People: The Philippine Millennium Ecosystem Assessment (MA). Subglobal Assessment. Synthesis Report.* Environmental Forestry Programme, College of Forestry and Natural Resources, University of the Philippines Los Baños.
- Managing Environmental Risks for Sustainable Food and Health Security in Watershed Planning in Lake Laguna Region (LakeHEAD Program), accessed October 6, 2016.  
<http://www.healthfuturesfoundation.com/projects/lakehead/>
- Wealth Accounting and Ecosystem Accounts (WAVES) (2016). *Laguna de Bay Ecosystems Account, Executive Summary.* World Bank Group.

## Ishikawa Satoyama Promotion Fund いしかわ里山振興ファンド

Akira Kitayama  
北山 章

Deputy Director of Satoyama Promotion Office,  
Agriculture, Forestry and Fisheries Department, Ishikawa Prefecture  
石川県農林水産部里山振興室次長

Contact: kitayama@pref.ishikawa.lg.jp

**Keywords:** Depopulation and aging, support for creation of new livelihood, creation of new values  
過疎高齢化、生業の創出支援、新たな価値の創造

### 能登を取り巻く課題「過疎高齢化」

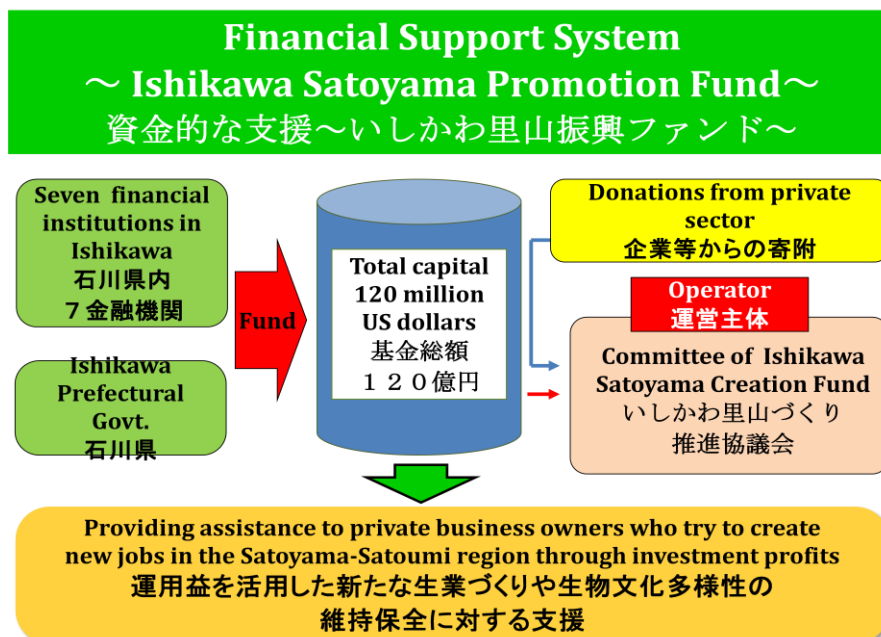
能登は、世界農業遺産に認定され、その価値を認められた一方で、過疎高齢化や若年層の都市への流出が続き、担い手が不足した結果、生物文化多様性を育んできた里山里海が荒廃の危機に直面している。

### 総額120億円規模のファンドによる生業の創出

担い手を能登に確保するためには、生業の創出が欠かせないことから、石川県では全国有数の規模のファンドを設け、運用益を用いて、地域住民や地元民間事業者が取り組む生業の創出の取組に対する支援を実施しており、その具体例を紹介。

### 新たな価値の創造の重要性

新たな生業を生み出すことが、担い手の確保につながり、そのことで地域社会の維持や生物文化多様性の保全が図られることにより、本県が目指す「元気な里山里海づくり」の推進に結び付いていく。





## **Nurturing Venison as a “New” Bio-culture in Japan: Perspectives from Food Security, Bio-ethics and Comparative Cultural Analysis**

Toshinori Tanaka

Graduate School of Frontier Sciences, the University of Tokyo

**Contact:** ttanaka@k.u-tokyo.ac.jp

**Keywords:** Deer, Food Security, Bio-ethics, Comparative Culture, Information Asymmetry

### **Introduction: Deer, food security and bio-ethics**

Skyrocketing populations of deer are a huge problem in Japan. Damage to agricultural products caused by wildlife is estimated to cost approx. \$200 million every year, with deer being the biggest factor, contributing almost 40% of the damage. The national and local governments spend approx. \$100 million annually on fencing agricultural land and killing deer to prevent damage. In addition to agricultural products, endangered species in protected areas, such as World Heritage Sites and national parks, experience serious damage from deer as well (Yumoto and Matsuda, 2006). Although around 200,000 deer are killed every year to reduce agricultural and ecological damage, more than 90% of them are estimated to be simply disposed of or abandoned because they are hunted for subsidies, not for meat.

This situation is ironic given that Japan’s self-sufficiency rate for food is only 40%<sup>1</sup> (the Ministry of Agriculture, Forestry and Fisheries, 2015). The situation is similar for meat. Self-sufficiency rates for beef/pork/chicken in Japan are 42/51/67%, respectively, but they decrease to 12/7/9% if they include their feed, because feed is generally imported from the US. We can say the self-sufficiency rate for meat in Japan is “very low” from a life-cycle aspect. Adding to this, the meat and feed imported from abroad consume a lot of fossil fuel and water for growing, transporting, and storing them. These are called “food miles” or “virtual water,” and causes a negative impact on the global environment. In particular, because Japan imports 60% of its food calories from faraway countries such as the US, Australia, and Brazil, food miles are estimated to be the worst in the world (Nakata, 2009). More than that, venison used to be a form of precious protein for people living in *Satoyama* and mountainous areas of Japan, and they maintained various bio-cultures related to deer as well: *Shishi-gaki*, *Shishi-odoshi*, or sword rack to name a few. Promoting venison is indispensable not only to prevent damage, but also to respect lives, to enhance food security, and to conserve the bio-cultural diversity in Japan.

This presentation will discuss why venison is not properly utilized in modern Japanese society from legal, economic, and cultural perspectives, and then argue a possible approach for nurturing venison as a “new” bio-culture in Japan.

### **Barriers for venison: cultural comparative analysis and legal and economic aspects**

Unlike in European countries, Japan’s strong Buddhist influences meant that the taking of animal lives used to be prohibited, and aristocrats and high-ranked *samurai* adhered to a general meat taboo. It was in the 7<sup>th</sup> century when Emperor Temmu formally banned eating meat for the first time in history; however, deer and boars were exempted from this prohibition, because these animals were harmful to the rice cultivation believed to be the very foundation of the country. While the aristocracy avoided eating meat, farmers kept hunting and eating deer for rice production and alimentation. On the other hand, hunting remained a part of elite culture for the aristocracy in Europe. Kawata (2011) argues that game meat can be regarded as a superior

good in European countries, while it is regarded as a rather inferior good in Japan. As economic terms, superior goods are consumed more as income rises, while the opposite applies to inferior goods. This point is supported by the literature: for example, Schaller (2013) mentions the status of hunters being very high in Germany, but a report by the Environment Agency (1983) points out it is very negative in Japan.

Because of the large-scale logging and high hunting pressure in the 1950s and 1960s, decades when there was huge demand for timber and protein after WWII, the number of deer largely decreased, and they were designated a “protected animal” in the 1970s in every prefecture of Japan. Although the consumption of meat rapidly increased from the 1960s to the mid-1990s, the era of high economic growth, this increase was due to imports from abroad and increased livestock production in Japan, not the consumption of venison. Meanwhile, the number of hunters largely decreased and the number of deer steadily increased, finally skyrocketing in the late 1990s to 2010s. The presentation will further discuss the legal and economic barriers for the utilization of venison in Japan, such as the Food Sanitation Act; issues of steady supply, price, and information asymmetry; and then introduce possible theoretical approaches and noteworthy cases from Yakushima, Wakayama, and Nagano, which include incentive mechanisms, certification, and branding through public-private collaboration.

### **Conclusion: New bio-culture for people and planet**

Promoting venison in Japan is indispensable, not only to prevent damage from deer, but also to respect lives, to enhance food security, and to conserve (or create) bio-cultures. In our analyses, we found legal, economic, and cultural barriers for the utilization of venison. Legal and economic barriers may be overcome by theoretical approaches, such as incentive mechanisms, traceability, and certificate systems, but deep-seated cultural barriers should be overcome by other efforts to nurture healthier lifestyles by raising awareness on food security, bio-ethics, and bio-cultural diversity. As Prof. Johan Rockstrom points out, “If we get it right on food, we can get it right for both people and planet... and the healthier you eat, the more you affect the world’s climate system, fresh water use, biodiversity loss and eutrophication” (EAT Food Forum, 2015). Various issues posed by deer in Japan are symbolic cases that lead us to consider the desirable relationship between people and nature.

<sup>1</sup>calorie base

### **References**

- EAT Food Forum 2015 Why EAT is Important. <http://eatforum.org/article/if-we-get-it-right-on-food-we-get-it-right-for-both-people-and-planet/> (accessed on Sep 15, 2016)
- The Environment Agency (1983) Shizenhogo Gyousei no Ayumi [in Japanese]
- Kawata, Y. 2011 Doushite Gibier Riyou ha Susuminikuinoka?, Sustainable Livestock Production and Human Welfare (Tikusan no Kenkyu), 65 (7), 747-753 [in Japanese]
- The Ministry of Agriculture, Forestry and Fisheries 2015 Self-sufficiency rate for Food in Japan [http://www.maff.go.jp/j/zyukyu/zikyu\\_ritu/attach/pdf/012-2.pdf](http://www.maff.go.jp/j/zyukyu/zikyu_ritu/attach/pdf/012-2.pdf) (accessed on Aug 31, 2016)
- Nakata, T. 2009 Food Mileage, Journal of the Japanese Society for Food Science and Technology (Nippon shokuhin kagaku kogaku kaishi) 56(5), 307-308 [in Japanese]
- Schaller, M.J. 2013 Germany: education, training and role of hunters in Kaji, K., Igoda, H., and Suzuki, M. eds. Science of Hunting for Wildlife Management in Japan (Yaseidoubutsu Kanri no tame-no Syuryou-gaku), Asakura Syoten [in Japanese]
- Yumoto, T. and Matsuda, H. 2006 Sekai-isan wo Shika ga Kuu, Bun-ichi Sougou Syuppan [in Japanese]

## Participatory Learning to Diversify Fodder Crop Production in Small Dairy Farms surrounding the Natural Forest Area of Konto Watershed, Malang, Indonesia

Uma Khumairoh<sup>1,2\*</sup>, Adi Setiawan<sup>1</sup> and Egbert A. Lantinga<sup>2</sup>

<sup>1</sup>Integrated Organic Farming Systems Research Centre (IORC),  
Faculty of Agriculture, University of Brawijaya, Malang, Indonesia

<sup>2</sup>Farming Systems Ecology Group, Wageningen University, The Netherlands

**Contact:** uma.khumairoh@wur.nl and uma.kh@ub.ac.id

**Keywords:** participatory learning, diversification, forage, dairy farms, livelihood

### Introduction

Increasing demand for livestock products in Indonesia has encouraged farmers to intensify their farming systems by multiplying their stocking rates. The largest increase of livestock and milk production has occurred in East Java, followed by West Java and Central Java, respectively (Morelink Asia Pacific, 2011). Although the livestock sector is currently intensifying, it has not been accompanied by improved management of fodder production. Farmers still depend on natural resources for fodder, which sometimes leads to overgrazing. Furthermore, the availability of forage from nature usually fluctuates from season to season. Thus, farmers also utilize by-products and wasted crops to feed their livestock. However, these are not only less nutritious, but sometimes also poisonous (Byrne, 2007). To face the constraints of forage availability at intensive dairy farms, growing fodder crops is very important. Nevertheless, this can also become a dilemma because farmer land ownership is very limited. On the one hand, it is urgent to support dairy farms' development by growing fodder, but on the other—if the forage growing areas are expanded into the productive land for food—it will reduce food production by subsistence farmers. In order to reduce land use competition between feed and food growing purposes, high-yielding and nutritious fodders that are also tolerant to marginal land conditions need to be identified and developed along with the application of the bio-diversification concept, to stabilize yield levels.

### Materials and Methods

The study was carried out in Sumber Agung village, Ngantang, Malang, at 7° 52' 50" 14 S, 112° 23' 13" 54 E. The total area of Sumber Agung is 756,688 ha, comprising 40% forest, 36% agro-forestry (coffee and fruit trees), and 15% rice fields and arable crops, with the remainder of the area made up of houses, cemeteries, and other purposes. The village is bordered by two mountains, its topography is hilly, and the mean elevation is 800 m above sea level. Kalikonto is the most important river, and it is used as the main source for irrigation and other livelihood activities (Village Profile of Sumber Agung, 2012). The majority of the inhabitants work in the agricultural sector, in either dairy or crop production. Next to the feed from natural areas, elephant grass is the dominant forage for dairy cows. The project introduced options for improving fodder quality, including diversification of cropping systems with legumes and growing fodder crops in underutilized spaces. A regional farmer field school (FFS) was organized as a participatory learning method. Twenty dairy farmers with 2–20 dairy cows participated in the FFS to learn the effects of legumes on milk quality and milk quantity, and to compare the performance of three legumes. These were *Lablab purpureus* (L), *Psophocarpus tetragonolobus* L., and *Crotalaria juncea*, under five cropping systems: (1) monoculture, (2) intercropped with elephant grass, (3) intercropped under fruit trees, (4) intercropped with coffee, and (5) intercropped with pine trees.

## Results and Discussion

The results of the experiment showed that *C. juncea* was more robust than the two other legumes due to (1) its fast growing habit, (2) its ability to regrow after cutting cuts, and (3) its adaptability to be intercropped with other plants. The harvested biomass of *C. juncea* during the study period is shown in Table 1.

Table 1. *Crotalaria juncea* biomass in different cropping systems (Mg ha<sup>-1</sup>).

Treatments	1 <sup>st</sup> cut	2 <sup>nd</sup> cut
Monoculture	3.6	3.2
Intercropped under agro-forestry	0.9	0.5
Intercropped with coffee	1.2	0.9
Intercropped with elephant grass	0.5	0.1
Intercropped with pine trees	1.1	0.8

Milk production was increased after one month by adding *C. juncea* to dairy cow rations. The highest increase (5–9%) was found with cows in the three-month lactation stage when they were fed with *C. juncea*. Balancing the feed composition by including also the legume *C. juncea* increased the quality of milk in terms of protein content. The highest increase (20–21%) was again found with cows in the three-month lactation stage.

Based on the interviews, 100% of respondents reckoned that it was easy to grow the three legumes. However, *C. juncea* had the highest score in terms of ease of growing, while *P. tetragonolobus* and *L. purpureus* were more difficult to manage. The respondents' opinions did not differ greatly between *L. purpureus* and *C. juncea*. However, overall, *C. juncea* was considered more preferable.

## Conclusions

The better quantity and quality of milk due to the inclusion of legumes in the cows' diets increased farmers' profits, leading to better incomes for their livelihoods. Participatory learning is an effective approach to transfer and share knowledge between farmers and stakeholders. It is also a good way for stakeholders to establish networks and for communities to communicate. The participants experienced positive impacts, including better performance of their dairy cows due to more balanced feed rations.

## Acknowledgement

We acknowledge financial support from the Nestlé Corporation, Kejayan, Pasuruan, Indonesia for the success of our activities.

## References

- Byrne, D. 2007. Dangers in feeding waste material to livestock. Prime Fact 311. New South Wales Department of Primary Industry. Australia. at: [www.dpi.nsw.gov.au/primefacts](http://www.dpi.nsw.gov.au/primefacts)
- Indonesian Statistics. 2012. Village Profile of Sumber Agung, Sub-District of Ngantang in Malang District.
- Morelink Asia Pacific. 2011. Indonesia Dairy Industry Development. Report to International Final Corporation. Australia. 59p. Available at <http://www.ifc.org/wps/wcm/connect/93f48d00470e3bf883ffd7b2572104ea/Dairy+Industry+Development-2011.pdf?MOD=AJPERES>
- Pete Smith, P., Gregory, P.J., van Vuuren, D., Obersteiner, M., Havlík, P., Rounsevell, M., Woods, J., Stehfest, E. And Bellarby, J. 2010. Competition for Land. *Phil. Trans. R. Soc. B.* 365:1554–2941-2957. Doi.10.1098/rstb.2010.0127

## Conservation of Biocultural Diversity on Sacred Groves: Opportunities for Sustainable Future

Archana Godbole

Applied Environmental Research Foundation, India

**Contact:** archanagodbole@aerfindia.org

**Keywords:** sacred groves, Ayurveda, certification, value addition, communities

Indigenous and local communities across the globe have used cultural norms for sustainable natural resource management since time immemorial. Traditional conservation practices, such as maintaining sacred natural sites, oral traditions of resource use, and benefit sharing are the best indicators of this strong link between culture and conservation. However, these ancient traditions are also changing due to the impact of development on change in culture. In India, the tradition of protecting groves and patches of forests in the name of gods has been a common practice, and these groves are the repositories of old growth forests. With varied ownership patterns and community-based management systems, there were well-laid rules and regulations in place guarding the resources within these groves. In the midst of the pressures of both a growing population and aspirations to develop, it is extremely difficult to continue the protection of sacred groves while engaging local people in the process. There are many threats to these ancient forests in the name of development. Therefore, an innovative approach of linking these spaces with markets and ensuring long-term protection to these forests and biodiversity within them has been developed and tried successfully in the north Western Ghats.

In the North Western Ghats of India, many sacred groves still have old growth *Terminalia bellirica* trees. These trees are flagships of forest biodiversity, as they provide nesting sites to three species of hornbills. These hornbills are responsible for the dispersal of many rare and endangered tree species from the north Western Ghats. Therefore, there is an urgent need to protect these trees and groves. The fruit of *T. bellirica* has been used in the Ayurvedic medicine system of India since time immemorial. There is a growing interest in using Ayurvedic medicine around the world, especially in western countries. Herbal product companies are interested in buying these fruits. Similarly, due to growing awareness about the conservation of biodiversity and social and cultural aspects while extracting non-timber forest products, many European pharmaceutical companies are interested in buying certified products. Certifications like FairWild have provided an opportunity to fetch better price for *T. bellirica* fruits. In the north Western Ghats, the Applied Environmental Research Foundation has developed a collaboration with the UK herbal product company the Fair Wild Foundation, and a few Indian pharmaceutical companies have invested together to protect these trees and sacred groves, with higher returns to local communities maintaining and protecting the groves. The process of forming such collaborations and engaging with other stakeholders in the process of conservation is discussed in this paper. It is interesting to see how the process and links with markets have strengthened the existing culture of worshipping and protecting nature. This successful on-going collaboration has created a win-win situation, contributing to conservation of both biodiversity and culture.

## **Integrating Wild Herbal Medicinal Plant Domestication into a Local Biodiversity Strategy and Action Plan as a Means for Improving Local Livelihoods**

Bishnu Hari Pandit<sup>1\*</sup>, Federico Lopez-Casero Michaelis<sup>2</sup>

<sup>1\*</sup> Chair, Kathmandu Forestry College, P.O. box: 9594, Kathmandu.

<sup>2</sup> Team leader, Institute for Global Environmental Strategies (IGES). Hayama, Japan.

**Contact:** bhpanidit29@gmail.com

**Keywords:** LBSAP, biodiversity, livelihoods, medicinal plants, NBSAP-Nepal

### **Background**

The rural landscape, which encompasses the agrarian economy, fragile ecology, and a complex and differentiated society, is changing rapidly in Nepal, creating new opportunities (a road link to the Chinese border) and competition among traders for extraction of medicinal plant resources. Despite this rapidly changing environment, the rural economy in Nepal is still based on subsistence agriculture. The preparation of Local Biodiversity Strategy and Action Plans (LBSAPs) has an important role to play in rural communities' conservation and livelihoods. This importance is due to the potential for medicinal plant resources to be conserved at the local level through effective implementation of LBSAPs, which can contribute significantly to the country's national-level biodiversity conservation strategy and people's livelihoods (Pandit et al. 2009, Rasul et al. 2012). Prior to the development of LBSAPs, the government and other stakeholders recognized that the goal and objectives of the National Biodiversity Strategy and Action Plan (NBSAP) could not be fully achieved without effective management of biodiversity at the local level (Pisupati 2007). The preparation and implementation of the LBSAP is the first step towards initiating and systematizing the efforts of local bodies, primarily village development committees (VDCs), which are the smallest local administrative units in Nepal, but also municipalities, towards meeting the requirements and goals of the NBSAP. The VDC is a local political body or administrative unit consisting of nine village wards, and it has the status of an autonomous institution and the authority to interact with the more centralized institutions of governance in Nepal. In order to promote local efforts in biodiversity conservation, there is a need for an institutional mechanism to engage VDC members in the development and implementation of conservation strategies.

### **Objectives and Methodology**

In view of the above objective, the domestication of wild herbal medicinal plants on cultivated lands is an important activity of the LBSAP developed in 2014 by the Government of Nepal. This study is based on a project conducted in three ecological landscapes (Saktikhor VDC—Inner Terai, below 1000 masl; Kusadevi VDC—middle hills between 1000 to 2000 masl, and Syafru VDC—high hills above 2000 masl) of Nepal in preparing LBSAPs. This is in accordance with the framework provided in the Nepal Biodiversity Strategy and Action Plan (NBSAP) of Nepal prepared in 2014. At least 2,300 households were supported in developing LBSAPs in three ecological landscapes. The objective of developing LBSAPs was to translate the NBSAP's vision, principles, strategies, and priority actions at the local level through a mixed methodological approach involving household surveys, key informant interviews, and focus group discussions for data collection. This study covers the LBSAP's four-fold objectives, including full integration of biodiversity conservation in the institutional planning process, conservation and sustainable utilization of local resources, community participation, and enhanced human wellbeing. The process involved four phases, including stakeholder consultations and analysis, constituting of a local biodiversity committee, defining roles and responsibilities of stakeholders, priority identification, and the implementation and adaptation of

LBSAPs. Of the three LBSAPs supported, the case of the high hills village Syafru VDC has already demonstrated the enhancement of the livelihoods of poor communities, particularly through one of the LBSAP's activities (domestication of medicinal plants).

### Findings

This study focuses on the initial activities under the LBSAP conducted in Syafru VDC, which concentrated on the domestication of medicinal and aromatic plant species to prevent their unsustainable use through illegal and excessive harvesting in the National Park area around the VDC. Five important wild herbal medicinal plant species (i.e., *Swertia chiraita*, *Valeriana jatamansi*, *Rheum austral*, *Paris polyphylla* and *Berginia ciliata*) that were almost at the verge of extinction locally were domesticated. The study revealed that the total annual income of the average beneficiary increased from NPR 147,942 to NPR 170,566 (1 USD = 106 NPR) in two years (2014–2016). Overall, beneficiaries' incomes increased by 10 percent in the two-year period. Income from medicinal plants alone was from NPR 25,021 in 2014 to NPR 45,943 in 2016, which is 92% of the total change. The LBSAP contributed to build the capacity of local communities to reduce poverty from 44% to 29% in the study area.



### References

- Pandit, BH, Adrian, A & Kumar, C 2009, 'Community based forest enterprises in Nepal: An analysis of their role in increasing income benefits to the poor', *Small Scale Forestry*, vol. 8, no. 4, pp 447-463.
- Pisupati, B 2007, *Effective Implementation of NBSAPs: Using a decentralized approach- Guidelines for Developing Sub-National Biodiversity Action Plans*, United Nations University Institute of Advanced Studies, Japan, <<http://cbc.iclei.org/Content/Docs/LBSAP%20Guidelines.pdf>. - 20 March, 2016 >.
- Rasul, G, Choudhary, D, Pandit, BH & Kollmair, M 2012, 'Poverty and livelihood impacts of a medicinal and aromatic plant project in India and Nepal', *Mountain Research and Development*, vol. 32, no. 2, pp. 137-148.

## **Utilisation of Local Biocultural Diversity Resources: Traditional Knowledge in the Agriculture Ecosystem within the Crocker Range Biosphere Reserve, Sabah, Malaysia**

Elizabeth Malangig

Department of Agriculture Sabah,  
Ministry of Agriculture and Food Industry,  
88632 Kota Kinabalu Sabah, Malaysia

**Contact:** Elizabeth.Malangig@sabah.gov.my

**Keywords:** biocultural heritage, MAB, biosphere reserve, JICA

The resilience of the indigenous communities in Sabah, Malaysia has largely been attributed to the practise of their biocultural heritage to manage their use of natural resources. Traditional land is developed according to their needs, and with the traditional ecological knowledge that supports continuous use of natural resources.

This paper discusses the efforts by the Sabah state government to enhance the utilisation of biocultural diversity resources through engagement with local communities. While food sovereignty is an important agenda item for the government, biocultural practices will ensure sustainability of the production system. The culture and beliefs of the indigenous community, which dictate their resource use, including the use of traditional seeds and livestock breeds, is considered conservation of agricultural diversity. The scaling up of good local practices, such as the *Tagal* system, is an ongoing process. An effort is also made to draw parallels with the *Satoyama* concept. The role of JICA in strengthening the knowledge base, including the documentation of local practices and capacity of key personnel in the management of the Crocker Range MAB Reserve in long-term biodiversity conservation, is also highlighted.



## **Biocultural Characteristics of Baduy People (Banten, Indonesia): Life History and Rice Farming**

Bambang Suryobroto<sup>1\*</sup>, Eneng Nunuz Rohmatullayaly<sup>1</sup>

Bogor Agricultural University<sup>1</sup>

**Contact:** suryobroto@ipb.ac.id

**Keywords:** biocultural, Baduy people, Indonesia, life history, rice farming

### **Baduy Tradition**

The Baduy people are one of the socio-cultural groups of ethnic Sundanese that live in Kendeng Mountain, Banten Province, Indonesia. The present population size is about 12,000 individuals occupying a hilly area of 5,136 ha at altitudes 400–600 m above sea level. The area comprises a forest preserve ( $\pm 3000$  ha) and settlement consisting of 60 hamlets ( $\pm 2,100$  ha). Their traditional duties and taboos result in geographical and cultural isolation that effectively creates a barrier to the network of social services, economic, and national politics of Indonesia.

The traditions of the Baduy are coded in the Sunda Wiwitan religion, which determines daily obligatory duties centering on swidden rice farming. The duties consist of clearing the land (*nyacar*) in April–May, cutting and pruning trees (*nuaran*) May–June, burning dried leaves and branches (*ngadurug*) June–July, sowing (*ngaseuk huma*) July–October, planting (*ngaseuk pare*) July–January and harvesting (*panen*) the rice January–April (Iskandar 2015). The religion prohibits formal education as one of their taboos. They must also not use technology and its products, such as electricity, electric equipment, transportation devices (even footwear), and modern household utensils. Before the 1970s, the Baduy people also refused medical assistance provided by the Indonesian government. Marriage of the Baduy people follows an endogamy system. If they marry people from outside, they must leave the Baduy area (Lubis 2009). They implement strict monogamous marriage. This endogamy system would lead to genetic distinctness because of the absence of migration.

The unique cultural and genetic isolations are expected to shape their life history as well as environment where they live.

### **Life History**

The body size of Baduy people may be categorized as pygmoid because their average male height is less than 160 cm. They have a slow growth rate at the child to juvenile transition, and a low and long growth spurt with prolonged growth well beyond reproductive maturation. Prolonged somatic growth offsets the slow growth rate at the child to juvenile transition and low growth spurt. The low growth spurt, which leads to small body size in the growing period, may save on body maintenance costs due to hilly terrain and farming practices.

On average, Baduy girls experience menarche (first menstruation) at age 14.3 year (range 10.0–18.8 y). The delay between the ages at menarche to first marriage of females is relatively short; they only need one year to get married at age 15.3y (12.0–24.0 y) followed by first reproduction about two years later at age 17.2 y (14.0–26.0). In a simple society without mortality pressure like the Baduy, life centers around family so early reproductive maturation is socially advantageous for them. As for males, the age at first marriage, at 18.9 y (15.0–25.0y), is relatively older than females. Baduy males need the time to be prepared as a husband and father because they should demonstrate themselves as socially and economically eligible to marry by working in the fields for approximately six months before getting married. In addition,

the delay between ages at first marriage to first reproduction is three years, which is longer than the delay for females.

Ages at first marriage and first reproduction of both genders are well below that of uneducated and some secondary schooling cohorts of Indonesian nationals. This also shows that populations with less education tend to have early reproductive maturation.

### **Rice Farming**

The Baduy people maintain a traditional system of swidden farming as a religious obligation. In their stratified society, depending on ownership, they differentiate six kind of swidden. However, all of them keep their harvested rice in special storage houses and do not use them. Their dry rice landraces are used mainly for performing rituals and the feasts accompanying them. In addition to refusal of planting high yield varieties imposed by the Green Revolution in the 1960s, the varieties of their local landraces are conserved. The Baduy people have developed a complex knowledge relating to the creation and maintenance of rice diversity. A study (Iskandar and Ellen 1999) found 89 different names of landraces.

The Baduy people also put high cultural and spiritual values to forests. They see forests as the land of their ancestors, and as an important resource to provide material for cultural events, products to meet daily needs such as food and medicine, and material for construction and housewares. Baduy people could name approximately 55 species of plants inside forests and surrounding their settlements (Hakim 2006).

### **References**

- Hakim, N. 2006. Cultural and Spiritual Values of Forests In Baduy Region, Banten, Indonesia. Master thesis, Wageningen University.
- Iskandar, J and Ellen, R. 1999. In situ conservation of rice landraces among the Baduy of West Java., J. Ethnobiology 19(1): 97-125
- Lubis, D. 2009. Memberdayakan suku Baduy (Empowering Baduy people). Ilmiah Populer.

## The Golden Interweave of “Human-Nature-Culture” as a Model of Community Development: A Case Study from the Pastoralist Landscape of Darvi sum, Khovd aimag, Mongolia

Bazar Losol

Nomadic herder, Delger bag, Darvi sum, Khovd aimag  
Bazar Losol holds the title of the nation’s “myangat malchin,” or “shepherd of a thousand heads of livestock.”

**Contact:** mariaumnik@yahoo.com (c/o)

**Key words:** traditional knowledge, biocultural diversity, Mongolia, nomadic pastoralism, community development.

*The summit of princely Sutai robed in silver white snow,  
The 108 eternal crystal spring headwaters of the Delger,  
Imprinted with the little feet of growing and playing children,  
Stretched across the wide steppes of Darvi –  
Cradle of the eight baatars (heroes) whose names are enshrined forever.  
The majestic mountains of Altai always the purest blue  
Graced with herds scattered across verdant pastures,  
Swiftly galloping horses raise clouds of dust,  
Ayaa, how beautiful is my native Sutai...*

This poem was written by Buyanbadrakh, my young compatriot and a native of my Darvi sum. It describes our motherland, a pastoralist mountainous landscape of the Mongolian Altai, very well. Darvi sum is a modern-day administrative unit of the Khovd Province of Mongolia. It consists of 725 households and has a total population of 2,718. The territory of the sum is 560,460 ha, including 336,000 ha farming land, 54,000 ha grasslands, and 6,400 ha forests. This beautiful land mosaic creates the amazingly beautiful and unique biocultural landscape of Darvi. The magnificent sacred mountain, Sutai Khairakhan, crowns our native land, giving force to numerous streams and springs.

Since time immemorial, the people of Darvi have been keeping and taking care of the “five jewels,” that is, the five types of domestic animals: horses, sheep, goats, cows/yaks, and camels. Today, 725 families in our sum have 156,400 heads of livestock, or an average of 215 animal heads per family. Darvi is famous for its special native breed of white sheep called Sutai. Darvi is also famous for the extraordinary people born here. For example, we have seven herders who were recognized as “Nation’s Hero” herders. We have 43 herders that have the honorary title of “myangat malchin,” or “shepherd of a thousand heads of livestock.” In 2014, we celebrated a special achievement: The Festival of a Hundred Thousand Sheep; this was the second time in modern history when we were able to reach such a significant number of sheep—144,755, to be precise. This is a great achievement, but it does not mean that we are overgrazing and pushing the limits of the carrying capacity of our pastures. We live on this Earth with a deep understanding of the interconnectedness of all forms of life and deep reverence for nature. Perhaps the secret of our success is our constant aim to reinforce the “golden knot”—an unbreakable interweave of human-nature-culture. We are a nomadic people and have never been separated from nature; we co-exist in productive reciprocity and mutual dependence, staying true to our ancestors’ noble culture of celebrating nature and living in harmony and reconciliation. The golden knot is a model of sustainable community development that Darvi and its people offer to the planet.

## **Restoring the Roots and Co-creating Beauty: A Case Study on Reviving Cultural Landscape of Jaffr (the Rasht valley, Tajikistan)**

Mirzoshoh Akobirov

Head of the community-based organisation Rushnoe, Rasht district, Tajikistan, a master farmer, awarded the title of the Best Orchard Keeper of Tajikistan in 2013

**Contact:** alibekbut@gmail.com

**Keywords:** traditional knowledge, cultural landscape, biocultural diversity, Tajikistan, local communities

This case study addresses the community-based initiative focused on the restoration and revitalisation of cultural landscapes in the Rasht valley of Tajikistan. Agricultural practices have played a significant role in the formation of cultural landscapes in the area, and rich orchards and gardens have always been the central elements of these beautiful mountainous landscapes.

Tajikistan remains mired in considerable rural poverty in the aftermath of the Soviet Union's collapse and the subsequent civil war (1992–1996). Historically diverse and sustainable farming systems and associated traditional knowledge have been substantially eroded since the 1930s, when the centrally-planned socialist economy, with its industrial models of agriculture, and large-scale forced population relocations transformed the country.

We at the community-based organisation Rushnoe initiated farmer-led processes, using revived traditional techniques of sustainable land use, for the ecological and cultural restoration of our land, as well as to reactivate deep spiritual relationships with nature. Our work started with the establishment of new experimental gardens as educational, cultural, and agrobiodiversity spaces. Today, our re-created cultural landscape is composed of the biocultural parks and community gardens of the Rasht valley: they contain more than 50 local varieties of apple, more than 30 varieties of pear, and 24 varieties of apricots, as well as many varieties of decorative plants and herbs, many of them at risk of becoming extinct under the huge pressure from markets and industrial approaches to agriculture. To date, the total area of Rushnoe's impact is 10 ha of restored forest landscape (designated as biocultural parks), and 16 ha representing a constellation of community gardens. We have also started working on 70 ha of canyon land. However, our work is not measured only in hectares of restored native landscapes: tens of thousands of local varieties of fruit trees have been planted, many of them saved from near extinction. There are also almost 100 young men and women trained in grafting and other traditional farming and horticultural techniques. There is also a beautiful biocultural museum, reflecting the history and rich heritage of Tajik farmers from time immemorial. There is also a group of 10 old men, united by their passion for music, who still can sing songs in a unique ancient style/genre known as "Qissakhoni," which originated in and is currently practiced only in our valley.

The essence of Tajiks' cultural identity is the deep understanding of the land, seeds, and plants that were long ago domesticated by their ancestors. Through cultural and educational programs, the community gardens of Rushnoe aim to help to strengthen this identity, which, in turn, will help to sustain the incredible agrobiodiversity of these landscapes. The quality seeds and planting materials provided to farmers from the neighbouring communities enhance local self-sufficiency, contributing to the improvement of livelihoods. Each year,

Rushnoe sells 4,000 to 5,000 fruit seedlings. To grow such numbers of trees, farmers have arranged new gardens with total area of 20–30 hectares of land, and at least 320 jobs have been created by these family gardens. The yield received from each garden is five to ten tons of fruit. In addition, Rushnoe provides training on intercropping and other effective traditional methods of agriculture that increase soil productivity. Innovative solutions based on traditional knowledge for using the abandoned and degraded slopes of the mountains as orchards are gaining interest and popularity among farmers, and prevent further wind and water erosion. Reducing dependence on chemicals and pesticides improves the overall ecological conditions, as well as the health and food security of local communities.

The initiative is based on crafting and promoting the “new old” ways of being, meaning a rich combination of knowledge and agricultural heritage with creative modern farming innovations. It has significantly improved these communities’ abilities to adapt and respond to environmental, social, and economic change. By concentrating and experimenting with local crop and fruit varieties, and the conscious selection and promotion of drought-, frost-, and pest-resistant varieties, Rushnoe provides the opportunity for local people to have their own choice of what to grow and experiment with themselves, in the context of climate change and the need for increased adaptability. The initiative’s conscious focus on diversity is one of the most important mechanisms to increase the resilience of local communities in the face of uncertainty and external pressure. The very institutional arrangement of Rushnoe as a unifying organisation of several village communities is, in a way, a local collective adaptation strategy to deal with changing levels of threats and problems. Most importantly, though, Rushnoe’s work on the restoration of the cultural landscape of Jaffr powerfully reminds us of our responsibility as local communities to care for the land, and of our ability to co-create beauty on this Earth.

## **References**

- Akobirov, M. 2014. Gardens of the Jafr (Rasht Valley, Tajikistan) as a Model of Sustaining Cultural Landscapes for Future Generations. In *Conserving Cultural Landscapes: Challenges and New Directions*, pp. 358–368. Routledge, 2014

## Creating Positive Cycle on Preservation and Utilization of Cultural Resources

### 文化資源の保護と活用の好循環へ

Kyoko Kanno

菅野恭子

Deputy Director of Department of Cultural Properties, Traditional Culture Division, Agency for  
Cultural Affairs, Japan

文化庁文化財部伝統文化課課長補佐

**Contact:** denbun@bunka.go.jp

**Keywords:** Culture properties Preservation, Protection and Utilization, Japan heritage

文化財保護、保存と活用、日本遺産

#### 文化資源の活用による経済活性化

文化芸術資源は、観光地の魅力や、産業の付加価値などを産み出す源であり、文化芸術への投資は、文化分野だけではなく教育やまちづくり、観光・産業等他の様々な産業分野への経済波及効果を生み出す。

我が国には、地域における文化財や、マンガ・アニメ・ゲーム等のメディア芸術、舞台芸術や各地の芸術祭をはじめとする文化芸術活動など、多様な文化資源が全国に存在する。ここでは、多様な文化資源のうち特に文化財の保存と活用に焦点をあて、具体的な取組を紹介する。

#### 文化財保護制度の概要

文化財は、我が国の歴史や文化を正しく理解するためにはなくてはならないものであると同時に、将来の文化の向上発展の基礎となるものである。国は、文化財保護法に基づき、文化財のうち重要なものを指定・選定し、現状変更、修理、輸出などに一定の制限を課す一方、有形の文化財（建造物、美術工芸品、有形の民俗文化財等）については保存修理、防災、買上げ等、また、無形の文化財（芸能、工芸技術、風俗慣習、民俗芸能等）については伝承者養成や記録作成等に対して助成するなど、保存と活用のために必要な措置を講じている。

#### 観光関連施策の動向と文化財の一体的な活用

政府では「明日の日本を支える観光ビジョン構想会議」を開催し、平成 28 年 3 月に新たなビジョンを取りまとめた。2020 年に訪日外国人旅行者数 4000 万人（2015 年の約 2 倍）等の新たな目標を定めるとともに、必要な施策を整理している。

この中で文化財については「保存優先」から観光客目線での「理解促進」、そして「活用」へと従来の取組を飛躍的に発展させることとしている。

我が国の文化財行政は、これまで、文化財保護法に基づき文化財の指定等を行うことにより、一定の規制の下、いわば“点”として保存・活用を図ることを中心に展開してきた。今後は、文化財を核に当該地域の産業振興・観光振興等とも連動して一体的なまちづくり政策を進めることが、地域住民のアイデンティティの再確認や地方創生に資するものと期待される。

これらを踏まえ文化庁では、地域の文化財を総合的に把握し、ストーリー性を持たせて魅力を発信する取組を推進するなど（「日本遺産」等）、文化財単体ではなく地域の文化

財を一体として活用する取組を推進するとともに、文化財の修理・整備・美装化の推進、分かりやすい解説の充実等に取り組むこととしている。



## 文化財活用・理解促進戦略プログラム2020の策定について (概要)

「明日の日本を支える観光ビジョン」を踏まえて、  
文化財を貴重な地域・観光資源として活用するために2020年までに取り組むアクションプログラムを策定しました。

目指すべき将来像	現状・課題及び今後の対応
<p><b>○文化財を中核とする観光拠点の整備</b></p> <p><b>大内宿の茅葺き民家群再生 (福島県)</b></p> <ul style="list-style-type: none"> <li>地域の文化財の一体的整備を計画的に行い、観光中心の産業構造へ転換</li> <li>観光客数は20年間で約100万人増加</li> <li>収益が修理につながる循環型の文化財保存・活用事業の継続、地元技術者の育成</li> </ul> 	<p><b>現状・課題</b></p> <ul style="list-style-type: none"> <li>個々の文化財を点として保存</li> <li>日本人でも理解が困難な、専門家にしか分からない解説</li> <li>修理遅れによる価値の低下・劣悪な外観</li> </ul>
<p><b>○投資リターンを見据えた文化財修理・整備の拡充と美装化</b></p> <p><b>姫路城天守の大規模改修 美装化</b></p> <ul style="list-style-type: none"> <li>総事業費30億円</li> <li>観覧料収入 2.9億円 (H26) → 18.7億円 (H27)</li> <li>修理中もガイドダンス施設を設置</li> </ul>  	<p><b>プログラムのポイント</b></p> <p>2020年までに、以下の取組を1000事業程度実施し、日本遺産をはじめ、文化財を中核とする観光拠点を全国200拠点程度整備。</p> <p><b>○支援制度の見直し</b></p> <ul style="list-style-type: none"> <li>支援に当たり観光客数等を指標に追加</li> <li>地域の文化財を一体的に整備・支援</li> <li>適切な修理周期による修理・整備</li> <li>観光資源としての価値を高める美装化への支援</li> <li>修理現場の公開(修理観光)や、修理の機会をとらえた解説整備への支援 等</li> </ul>
<p><b>○分かりやすい解説と多言語対応</b></p> <p><b>日光東照宮新宝物館</b></p> <ul style="list-style-type: none"> <li>東照宮の歴史や徳川家康の生涯をビデオ等を用いて分かりやすく解説</li> <li>全ての展示品は、日本の歴史を知らない外国人でも理解できる英語解説がされている</li> </ul>  	<p><b>○観光コンテンツとしての質向上</b></p> <ul style="list-style-type: none"> <li>分かりやすい解説の充実・多言語化</li> <li>宿泊施設やユニークベニュー等への観光活用を促進</li> <li>学芸員や文化財保護担当者等に対する文化財を活用した観光振興に関する講座の新設、質の高いHeritage Manager等の養成と配置</li> <li>全国の文化財等の情報を発信するポータルサイトの構築</li> <li>美術館や博物館における参加・体験型教育プログラム等への支援、ニーズを踏まえた開館時間の延長</li> <li>文化プログラムをはじめとする文化芸術活動との連携 等</li> </ul>
<p><b>○歴史的建造物の活用促進</b></p> <p><b>西日本工業倶楽部会館</b></p> <ul style="list-style-type: none"> <li>国指定重要文化財を結婚式場等に活用</li> </ul>  	<p><b>○文化財をユニークベニューとした文化イベント</b></p> <p><b>姫路城でのオペラ上演</b></p>  



**ECHIGO-  
TSUMARI**  
ART FIELD

## Daich's Modern Art Festival: Echigo-Tsumari Art Triennial

大地の芸術祭 越後妻有アートトリエンナーレ

Masanori Watanabe  
渡辺 正範

Head of Industry & Tourism Department, Tokamachi city, Niigata prefecture  
新潟県十日町市産業観光部長

Contact: watanabe1162@city.tokamachi.lg.jp

**Keywords:** depopulation and aging × satoyama × vacant house × abundant school × modern art  
= regional revitalization

過疎高齢化・里山・空家・廃校×現代アート＝地域創生

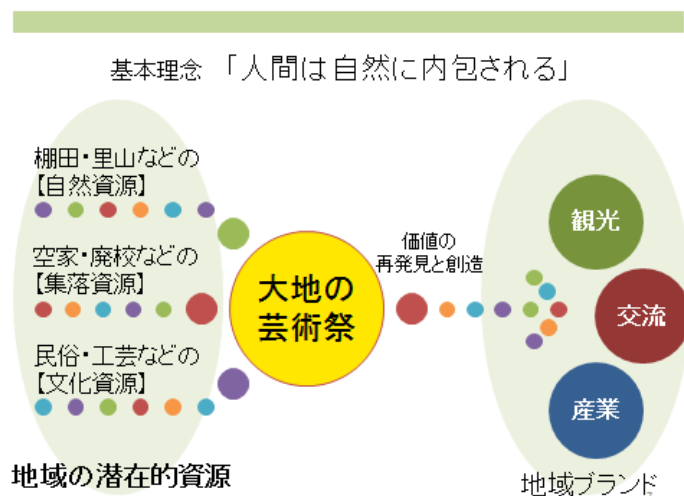
### 大地の芸術祭とは

過疎高齢化が進む越後妻有（新潟県十日町市・津南町）を舞台に、2000年から始まった自然・文化・芸術による地域づくりのプロジェクト。

地域に内在するさまざまな潜在資源（負の財産を含む）を、アートを媒介に地域・世代・ジャンルを越えた人々の協働を通して再資源化し、その魅力を世界に向けて発信することで、新たな地域ブランドの構築を目指すもの。

### 大地の芸術祭の特徴

- 普遍の理念  
「人間は自然に内包される」  
(基本理念)
- 3年に1度の開催  
2000年から3年ごとに過去6回開催。
- 協働での開催  
作品制作や運営は、アーティスト、住民、こへび隊（主に首都圏サポーター）が担う。住民が作品制作や運営に関わる点で、通常の実術展などとは異なる。
- 多様な交流  
作品制作後も含めたアーティストと地域の交流のほか、住民同士、こへび隊、諸外国との交流も生まれている。



### 芸術祭がもたらした効果

- ・ 交流人口の増加（第1回展 16万人 ⇒ 第6回展 51万人）
- ・ 大きな県内経済波及効果（過去6回で422億円）※6回展は51億円
- ・ マスメディア掲載による地域情報発信（第6回展の広告料換算30億円）
- ・ 地域産品とクリエイターのマッチングにより商品パッケージを一新。
- ・ 地域の誇りや集落内の互恵が生まれ、随所に地域活性化の新しい芽が出ている。



## **Community-Driven Initiatives as a Way to Strengthen Bio-cultural Traditions in Indigenous Communities: Experiences from Arunachal Pradesh in India's northeast**

Moji Riba

Centre for Cultural Research & Documentation  
1st Floor, Takar Complex  
Naharlagun, Arunachal Pradesh  
India, 791110

**Contact:** [mojiriba@gmail.com](mailto:mojiriba@gmail.com)

**Keywords:** Cultural Landscapes, Community Traditions, Link to Conservation, BCPs and other tools, Participation of Youth

Moji Riba is a filmmaker and cultural activist from India's northeast and recipient of the Rolex Awards for Enterprise (Associate Laureate, 2008). Rolex recognized Moji for 'helping to preserve and document the rich cultural heritage of India's Arunachal Pradesh'.

As founder Executive Director of the Centre for Cultural Research & Documentation (CCRD) he has been engaged in understanding how communities in the north east region of India are adapting to the processes of cultural change; using film screenings, outreach programs in schools and colleges, workshops, cross-regional dissemination of films, photo-documentation and exhibitions, scholarships, collaborative projects, research and filming and archive building.

In this time, he has made over 30 documentaries that look at issues from a culture-centered perspective and also explores the linkages between cultural practices and biological diversity and its sustainable management. The CCRD houses an audio-visual archive of this material.

These films have been screened at various national and international venues and film festivals like the London School of Economics, The British Museum, School of Oriental and African Studies, The Nehru Centre, the Kathmandu International Mountain Film Festival, Mumbai International Film Festival, etc.

Currently he also teaches documentary film at the Department of Mass Communication, Rajiv Gandhi University, Itanagar that he helped set-up. He has also been a core team member of various research projects with SOAS (London), UNESCO, UNDP and is part of the 8-member Expert Group of the National Round Table on Protection and Preservation of Indigenous Traditional Knowledge and Endangered Languages, under the Ministry of Human Resource Development, Govt of India.

In addition to his work on documenting traditional resource management practices and disseminating them in various forums for almost 2 decades, he has also worked on issues of sustainable management of bio-resources and has extensive experience in studying and implementing linkages between culture and biodiversity. In partnership with the UNDP, he has worked on publishing a bio-cultural protocol of the Men-Hing (medicinal plants) of the Sartang tribe of Arunachal Pradesh and has undertaken CEPA activities on ABS mechanisms, bio-cultural practices and community interface.

Through his sustained engagement with young people, he has been instrumental in generating a larger dialogue on issues of cultural diversity, identity, language and bio-cultural heritage in the northeast region.

The presentation will seek to explore the linkages that exist between cultural traditions and biological diversity and practices amongst the tribal communities of Arunachal Pradesh, India. It will highlight some examples of how these traditional practices have depended on cultural expression to survive.

The presentation will also share experiences of how contemporary tools like Bio-Cultural Community Protocols and the participation of youth can help create awareness on such traditions and create respect for them.

### **References**

- P.S. Ramakrishnan, Cultural Landscapes for Biodiversity Conservation and Sustainable Development
- R. Boojh, Ziro Valley and the Surrounding Hills: A Mega-cultural Landscape
- G. Pangging, J. Dutta, D. Balasubramanian, O. Muang, A. Arunachalam and M.L. Khan The ‘Tani’ Mega-cultural Landscape
- J. Dutta, O.Muang, D. Balasubramanian, F.M. Wann, G. Pangging and M.L.Khan , Biodiversity Linked Value Systems of the Monpas and Sherdukpens of Arunachal Pradesh
- Mihin Dollo, Prasanna K. Samal and Darwin Megejee, Culture Linked Biodiversity Conservation Values of Monpas and Sherdukpens of Aurnachal Pradesh

## **Development of the Integrated Education Fieldworks for the Biocultural Diversity: Learning from the Rural Areas of Ishikawa Prefecture**

Aida Mammadova<sup>1\*</sup>, Yoshihiko Iida<sup>2</sup>

Kanazawa University International Student Center, Japan<sup>1\*</sup>,  
United Nations University Institute for the Advanced Studies of Sustainability, Operating Unit  
Ishikawa/Kanazawa, Japan<sup>2</sup>

**Contact:** mammadova@staff.kanazawa-u.ac.jp

**Keywords:** Biocultural Diversity, Educational Fieldworks, Sustainability, Conservation, Community

### **Background**

Rural areas of Ishikawa Prefecture are facing major challenges in biocultural loss due to the aging and declining population, environmental changes, economic instability, and other factors. To attract more attention for regional regeneration, local governments and academic institutions are trying to implement new educational approaches. However, in most of these cases, educational methodologies do not implement integrated practical approaches for biocultural diversity, but rather apply practical education with separate biodiversity or cultural approaches.

To raise awareness about urban biocultural diversity and sustainable development, we have previously conducted fieldwork activities where we linked biodiversity with the cultural diversity of Kanazawa City, Japan, and monitored the importance of human capital for the preservation and management of natural resources (Mammadova and Iida, 2016). In this study, we decided to create a biocultural diversity training course in the rural areas of Ishikawa Prefecture and monitor how nature and culture function in an integrated manner, for the sustainable development of the community. The objectives were to acquire integrated natural knowledge and skills, through fieldwork and direct collaboration with local communities to address local biocultural issues.

### **Methods**

The participants were 23 international students with different backgrounds. The training course was divided into three main parts. During the first part, students experienced only nature activities, where they learned about nature through the five senses: watching, smelling, touching, hearing, and tasting. We visited different natural ecosystems with different habitats, such as low-altitude mountains, forests, and coastal areas. Next were community learning activities, where we visited three main areas of Ishikawa Prefecture: the Mount Hakusan region, the Noto Seaside area, and the Komatsu region. In this fieldwork activity, students met directly with the local communities and learned how nature is used to create culture. The third and final part was a one-day overnight experience, together with local people, to experience their sustainable rural lifestyle, sharing direct hands-on experiences with them. Pre- and post-surveys were conducted for each of the nature and community learning activities. After the course, we conducted one final workshop, where the students were divided into three groups: Hakusan, Noto, and Komatsu. Students presented the issues of the regions and gave some proposals about the preservation and sustainable utilization of natural resources for further regional development.

### **Results**

Most of the students provided similar feedback. The post-nature activities survey showed that 20 students agreed that the nature activities helped them to understand the natural

environment and culture more deeply and precisely. They submitted reports describing how, even outside the classes, they became more conscious about the sounds, the colours, and the smells of nature that they experienced, and how those natural appearances are related to the culture of our daily lives. The post-community survey showed that 19 students became more concerned about the future of the region, and that their attitudes and perceptions of the rural lifestyle had changed for the better. In the final workshop, students presented on issues that were similar for all regions, such as aging, depopulation, no young followers to hand down culture to and no job opportunities, humans' negative interactions with nature and the depletion of natural resources, invasive species, and other issues. For future actions, students suggested increasing voluntary work in the communities due to the lack of manpower, and raising public awareness; setting up core areas for biodiversity protection; and involving different stakeholders, such as authorities and local communities, to cooperate and promote regional ecotourism.

### **Conclusion**

According to our study, it was clear that the educational policies and programmes for biocultural diversity should not be conducted separately, and that the fields of nature, culture, and community must be learned about in an integrated manner, in order to achieve regional sustainability. Further educational programmes should promote the utilization and revitalization of traditional knowledge, and further emphasise the role of human capital to sustain biocultural diversity.

### **Reference**

Mammadova, A., & Iida, Y. 2016. Development of educational fieldwork activities for the International Students: Case of awareness raising in biocultural diversity of Kanazawa City. *Research Bulletin, International Student Center Kanazawa University*, 19, 88–106.

### **Acknowledgement**

This program was funded by the Kanazawa University COC (Center of Community) Programme 2016.

## **Engaging the Youth in Revitalizing Biological and Cultural Diversity: Insights from the Philippines and Internationally**

Jocelyn Carino-Nettleton

Forest Peoples Programme, Philippines

**Contact:** [joji@forestpeoples.org](mailto:joji@forestpeoples.org)

**Keywords:** forest, indigenous people, rights, policy improvement, youth education

### **About Forest Peoples Programme**

Forests cover 12% of the planet and nearly all are inhabited. Many of the peoples, who live in and have customary rights to their forests, have developed ways of life and traditional knowledge that are attuned to their forest environments. Yet, forest policies commonly treat forests as empty lands controlled by the state and available for ‘development’ – colonisation, logging, plantations, dams, mines, oil wells, gas pipelines and agribusiness. These encroachments often force forest peoples out of their forest homes. Many conservation schemes to establish wilderness reserves also deny forest peoples’ rights. Forest Peoples Programme (FPP) advocates an alternative vision of how forests should be managed and controlled, based on respect for the rights of the peoples who know them best. We work with forest peoples in South America, Africa, and Asia, to help them secure their rights, build up their own organisations and negotiate with governments and companies as to how economic development and conservation are best achieved on their lands.

### **History**

Forest Peoples Programme (FPP) was founded in 1990 in response to the forest crisis, specifically to support indigenous forest peoples’ struggles to defend their lands and livelihoods. It registered as a non-governmental human rights organization with its main office in the UK.

FPP’s focus, in the beginning, came from the expertise and relationships that the small founding team had with specific communities, primarily in the Guyanas and in South and South East Asia. Forest Peoples Programme has grown into a respected and successful organisation that now operates right around the tropical forest belt where it serves to bridge the gap between policy makers and forest peoples. Through advocacy, practical projects and capacity building, FPP supports forest peoples to deal directly with the outside powers, regionally, nationally, and internationally that shape their lives and futures. Forest Peoples Programme has contributed to, and continues supporting, the growing indigenous peoples’ movement whose voice is gaining influence and attention on the world-wide stage.

### **Vision**

Forests are owned and controlled by forest peoples in ways that ensure sustainable livelihoods, equity and well-being based on respect for their rights, knowledge, cultures and identities.

### **Mission**

Forest Peoples Programme supports the rights of peoples who live in forests and depend on them for their livelihoods. We work to create political space for forest peoples to secure their rights, control their lands and decide their own futures.

## **Goals**

- Get the rights and interests of forest peoples recognized in laws, policies and programmes
- Support forest peoples to build their own capacities to claim and exercise their human rights
- Counter top-down policies and projects that threaten the rights of forest peoples
- Promote community-based sustainable forest management
- Ensure equity, counter discrimination and promote gender justice
- Inform NGO actions on forests in line with forest peoples' visions
- Link up indigenous and forest peoples' movements at the regional and international levels

## **References**

<http://www.forestpeoples.org/>

## **Human Capacity Building in the GIAHS “Noto’s Satoyama and Satoumi” in Japan**

Koji S\*, Ito K, Shukur R, Koyama S, Kasei K, Kishioka T, Uno F, Kawabata H, Nakamura K

Satoyama Satoumi Project, Kanazawa University

**Contact:** s.koji@staff.kanazawa-u.ac.jp

**Keywords:** Capacity building, Noto Peninsula, Satoyama and Satoumi, Regional revitalization

### **Background**

Satoyama and Satoumi in the Noto Peninsula of Japan are nurtured by a harmonious relationship between agriculture, forestry, fishery and nature. Landscapes and seascapes, as products of longstanding interaction between human and nature, have received international acclaim as Noto’s Satoyama and Satoumi, which were designated as Globally Important Agricultural Heritage Systems (GIAHS) in 2011. However, Noto’s Satoyama and Satoumi face deterioration, as recent human depopulation and aging demographics have led to less capacity for their management. Human capacity building is therefore essential to the revitalization of Noto’s Satoyama and Satoumi.

### **Noto Satoyama Satoumi Meister Training Program**

In 2007, Kanazawa University implemented the “Noto Satoyama Meister” training program, with the aim of preparing young professionals up to 45 years old to start up environmentally friendly businesses in agriculture, forestry, fishing, and related industries, or to take on leadership roles within the Noto area. The course is a one-year curriculum of classes held on the 1st and 3rd Saturday of each month, on basic subjects and practical activities. In order to graduate from the program, Meister trainees must give a presentation on their graduation thesis, based on their own research interests.

People with various backgrounds meet and study together at the Noto campus once in every two weeks, commuting from the Noto region, Kanazawa city, or even from Tokyo. Trainees taking the program include (1) those who would like to settle in the Noto region and study its nature and culture, (2) those who would like to learn more about Satoyama and Satoumi and (3) those who would like to make the best use of Satoyama and Satoumi for their businesses.

The course is made up of two parts: basic subjects (lectures and training) and practical subjects (graduation thesis). Through basic subjects, trainees have the opportunities to learn about and experience local activities to revitalize Satoyama and Satoumi. Examples of topics include ecological services of Satoyama and Satoumi, branding strategy utilizing local resources, new tourism (e.g. eco-tourism and green tourism), utilization of abandoned arable fields, strategy and planning of social businesses, environmental and biological monitoring, and fieldwork of community research.

Meister trainees also have to give a presentation on their graduation thesis, based on their own research interests. Each Meister trainee selects his/her own theme, conducts research, summarizes the findings, and gives a presentation with the help of their fellow students and staff members. Each student reviews his/her own activities through research for this graduation thesis, and makes proposals for the challenges faced by the local areas. There are various themes, including (1) establishing and managing a business, (2) exchange and community development,

(3) farming and processing techniques, (4) community and environmental research, and (5) development of agriculture, forestry and fisheries. Each thesis is evaluated by three referees, and Meister graduates receive a Satoyama Satoumi Meister Certificate, issued by Kanazawa University.

As of 2015, a total of 128 people have completed the program. Graduates are expected to be: (1) able to widen their activities through the collaborative networks they have built through the program; (2) leaders of community development by their improved planning, proposing and implementing skills; and (3) pioneers of the future of Noto, with the knowledge and wisdom to make the best use of Satoyama and Satoumi. One hundred and twenty-eight graduates may not sound like a lot, considering the whole population of Noto Peninsula, but their activities could play a central role in the revitalization of the communities in this area.



## “Forest of Yoboshi-go”: Place-based Learning in the Satoyama in Noto

「よぼし子の森」-能登の里山地域における土地に根差した学びの場

Yuki Hagino<sup>1</sup>, Koji Ito<sup>1,2</sup>, Kiichiro Hagino\*<sup>1,3</sup>

萩のゆき<sup>1</sup>, 伊藤浩二<sup>2</sup>, 萩野紀一郎\*<sup>1,3</sup>

Team Maruyama<sup>1</sup>, Noto’s Satoyama Satoumi Research Project, Kanazawa University<sup>2</sup>, Department of Art and Design, University of Toyama<sup>3</sup>

まるやま組<sup>1</sup>, 金沢大学能登里山里海研究部門<sup>2</sup>, 富山大学芸術文化学部<sup>3</sup>

**Contact:** notomaruyama@gmail.com, k-itou@staff.kanazawa-u.ac.jp

**Keywords:** Satoyama, ESD, Traditional knowledge, Place-based Learning, Forestry  
里山, ESD 教育, 伝統知, 土地に根ざした教育, 林業

### Background and Team Maruyama

Education on local tradition and nature is necessary to create feelings of attachment to, and self-confidence in, local Satoyama villages, especially in ones that suffer from low birthrates, aging, and population decline. However, it is difficult to pass on local traditions and knowledge of nature among families and local communities because of the drastic changes in lifestyles. Teaching systems for biodiversity and sustainable lifestyle have not been established.

Today, children in Satoyama areas have hardly any farming opportunities or experiences, and they do not even have the chance to get together to play outside.

Since 2011, Team Maruyama has developed various activities related to food, farming, design, education, and surveys, such as the “Monitoring Site 1000 Satoyama Study” organized by the Ministry of Environment.

Through these activities, Team Maruyama has gathered information about local traditional agriculture, forestry, food, ceremonies, and various aspects of Satoyama lifestyle through interviews and interaction with locals, and it has also conducted workshops where local traditional knowledge can be learned and practiced.

To enhance the knowledge of biodiversity and pass on traditional knowledge, Team Maruyama has collaborated with Mii Elementary School, a local public school designated as a UNESCO School since 2012. Owing to the school’s small student size (only 21 students), the school is flexible about its curriculum and has allowed Team Maruyama to hold open-air classes on education for sustainable development (ESD) in the Maruyama area 10 to 15 times per year for the past five years.

### “Forest of Yoboshi-go”: Place-based learning in the Satoyama in Noto

Located in the mountainous area of Noto, the forests of Mii were cultivated during the Edo period or even earlier. Wood from the forests has been used for construction, firewood, charcoal, and for various crafts, including urushi lacquerware, which is the main industry in Wajima. This area is famous for the *Thujopsis dolabrata* (“hiba” or “ate” tree). Along with the modernization of Japan, Mii’s forest industry developed and flourished from the late 19th century to the 1960s and 1970s.

The lifestyle in Mii has been closely tied to the forests. The landlords of the forest obtained power and wealth and offered young adults a foster-parent system that provided them with financial support, discipline, personal development, and occupational training in forestry. This system was called “Eboshi-oya/Eboshi-go,” or “Yoboshi-oya/Yoboshi-go” in Mii.

Borrowing the name of this system, a new program was planned called “Forest of Yoboshi-go.” In this program, children learn about forestry and lifestyles in Mii from the elderly, who still have knowledge of forestry. Nine classes and a field trip to Toyama were planned for the

2016 school year, and each class was based on the following themes: 1) the blessings of the forest and familiar uses of wood, 2) biodiversity in the forest, 3) the relationship between humans and forest environments, 4) traditional tree cutting/transportation techniques, 5) economic value of trees, and 6) connection of our forests and other areas.

For example, through theme of “the blessings of the forest and familiar uses of wood,” students minutely observed trees and learned the traditional uses of *Eurya japonica* (“Hisakaki”) branches, which are used for offerings in Shinto shrines; of *Magnolia obovate* (“Hou”) leaves which are used for wrapping food, making Japanese yams, which are edible; etc.

Each class interacted with the next one. After the students experienced branch cutting with handsaws, the trees cut in class were used for showing traditional ways of transportation and were later brought to wood chip factories. During the field trip, students would observe how the wood chips were used to make pulp or paper.

This program not only passes down the traditional knowledge of the elderly but also teaches knowledge of biodiversity, such as knowledge of species and characteristics of trees, plants, and technology. This combination of traditional knowledge and scientific knowledge is what is believed to be the genuine form of ESD.

The program was established with the cooperation of the school, teachers, local villagers who possessed traditional knowledge, academic researchers who taught scientific knowledge, and local chip and pulp factories who offered the technology.

The information of classes were shared with people in Mii through direct contact and community newsletters. Also, the class was reported on social media services, local TV news, and newspapers.

The forestry branch of Ishikawa Prefecture has also been supporting this program by giving an activity grant.

### **Future issues**

To keep this program sustainable, Team Maruyama has established a close relationship between children, parents, the school, local residents, the government, universities, research facilities, and factories. This program is made available by collecting and connecting what each person and organization can provide.

ESD is not only for the wealthy, but also for all children. It is especially aimed at children in depopulated Satoyama areas, which often have hardly any choice of alternative education. An opportunity for higher-quality education is crucial to making the local community and lifestyle maintainable.

Satoyama is valuable from many perspectives, such as economics, biodiversity, and the ecosystem. It is important to teach children about these different viewpoints and to show them that the Satoyama area is full of treasures.

The concept of ESD should be understood by teachers and local educational committees, which usually focus only on academic achievements. Educating local residents who can teach traditional knowledge is an urgent task, as currently, the people with traditional knowledge are mostly elderly residents. The availability of residential researchers who can support activities with their scientific knowledge is another problem. Financial support from the government is necessary in order to obtain expertise in forestry and agriculture. It is imperative that the Ministry of Education, Ministry of the Environment, and Ministry of Agriculture, Forestry and Fisheries break the barriers to establishing cooperative ESD systems throughout Japan.



## **Eco-Cultural Industrial Promotion through GIAHS in China**

Min Qingwen\*, Jiao Wenjun

Institute of Geographic Sciences and Natural Resources Research,  
Chinese Academy of Sciences, 100101 Beijing, China

**Contact:** minqw@igsnr.ac.cn

**Keywords:** Globally Important Agricultural Heritage Systems (GIAHS), Nationally Important Agricultural Heritage Systems (China-NIAHS), product marketing, branding, China

In response to the global trends that undermine small-scale family agriculture and traditional agricultural systems, FAO started a global partnership initiative on the conservation and adaptive management of Globally Important Agricultural Heritage Systems (GIAHS) in 2002. After more than 10 years of continued efforts, progress on the dynamic conservation and adaptive management of GIAHS has been widely achieved, and the influence of the GIAHS initiative has been greatly expanded. In June 2015, the GIAHS initiative was endorsed as a corporate programme at the FAO 39th Session, ushering in a whole new stage for GIAHS conservation and global management of GIAHSs.

China was one of the first countries to respond to the GIAHS initiative, witnessed by the designation of Rice-Fish Culture in June 2005. In March 2012, the Chinese Ministry of Agriculture initiated the identification and conservation of China-Nationally Important Agricultural Heritage Systems (China-NIAHS), which enabled China to become the first country in the world to select and conserve these agricultural heritage systems at the national level. In August 2015, the Ministry issued and implemented the Procedures on the Administration of Important Agricultural Heritage Systems, which was the first legal document on the administration of agricultural heritage systems in the world. By the end of 2015, the number of GIAHS designations in China had reached 11, accounting for nearly one third of the worldwide total of 36. The total number of China-NIAHS rose to 62 by the end of 2015, distributed across 25 provinces, municipalities and autonomous regions throughout mainland China.

To realise the dynamic conservation of agricultural heritage systems, a mechanism of eco-cultural industrial promotion has been established that is derived from the multi-functionality of agricultural heritage systems. This mechanism is built upon agricultural production functions, and can be extended to other functions like agricultural product processing, biological resources utilisation, cultural creativity, and rural tourism. It also seeks synergies between different functions. For instance, with the increasing requirements on food safety in modern society, more and more farmers in heritage sites have begun to utilise local biological resources and ecological conditions to produce high-quality agricultural products with cultural connotations, which are specialty products, and which in turn promotes the conservation of their agricultural heritage systems. Leisure agriculture and/or rural tourism has also been considered an effective path to activate local residents to participate in the conservation of agricultural heritage systems while solving local employment and maintaining social stability. For example, leisure agriculture and/or rural tourism development of agricultural heritage systems has brought positive effects on the conservation of Rice-Fish Culture in Qingtian County, Zhejiang Province, where labour shortages and land abandonment caused by urbanisation has threatened the sustainability of the rice-fish system.

**Promoting Biocultural Diversity through Human Development:  
The Case of Philippine-Japan GIAHS  
Twinning Satoyama Meister Training Program**

Napoleon K. Taguiling

Ifugao State University

**Contact:** naptag@yahoo.com

**Keywords:** human development, Satoyama, Ifugao, biocultural diversity

Ifugao remains rich in biological and cultural diversity, particularly in areas designated as part of the Globally Important Heritage System (GIAHS). However, like a number of GIAHS sites, Ifugao faces challenges in terms of declining biological and cultural diversity. A number of development programs have been and are being implemented to curb this decline on a global level, one of which is the Philippine-Japan GIAHS Twinning Satoyama Meister Training Program. This paper highlights the Ifugao Satoyama Meister Training Program as an example of a human development approach to the promotion of biocultural diversity in GIAHS designated sites in Ifugao.

## **Pursuing Regional and Historic Evidence of the Coexistence of Human Activity and Nature for the Dynamic Conservation of Kunisaki Peninsula Usa GIAHS**

Hiroaki Hayashi

Council for the Promotion of the Globally Important Agricultural Heritage System  
in the Kunisaki Usa Area

**Contact:** shikaneki@yahoo.co.jp

**Keywords:** Kunisaki Peninsula Usa, GIAHS, *shichitoui*, coexistence

### **Introduction**

Three years have already passed since the Kunisaki Peninsula Usa area was listed on the Globally Important Agricultural Heritage Systems (GIAHS) by the Food and Agriculture Organization of the United Nations (FAO). Last summer, the Japanese Ministry of Agriculture, Forestry, and Fisheries started monitoring for the implementation of action plans for Japanese GIAHS sites, with the Kunisaki Peninsula Usa GIAHS as a start. The members of the national steering committee pointed out several weaknesses of the scientific evidence for the Kunisaki GIAHS circulation that was brought about by our running agriculture, forestry, and fishery, though they appreciated the high quality of posterity education.<sup>1</sup>

Here I will show several pieces of evidence of the coexistence of human activity and nature in the Kunisaki Peninsula Usa area.

### **The Activity of *Shichitoui* (*Cyperus malaccensis* Lam.) Production<sup>2</sup> Played an Important Role in the Maintenance of the Sandy Beaches of the Kunisaki Peninsula.**

The Kunisaki peninsula is the only remaining production area of *shichitoui* in Japan. *Shichitoui*, which has a unique triangular stem, is planted in paddy fields in May and harvested about 90 days after planting. Harvested *shichitoui* stems are sliced vertically into two equal halves and dried. Finally, these dried *shichitoui* stems are woven into *tatami* facing and other mats. Although *tatami* facing is now mainly made from mat rush grass (*Juncus effusus* L. var. *decipens*, Juncaceae), rather than from *shichitoui* (*Cyperus malaccensis* Lam., Cyperaceae) in Japan, we take great care of the *shichitoui* industry as a way of treasuring our GIAHS.

The Kunisaki Peninsula was famous for the beauty of its sandy beaches. However, a considerable amount of the sandy beaches were eroded, were covered with garbage, and were surrounded with concrete walls and tetrapods used for protection from wave damage. Now, many volunteers participate in beach conservation activities. In the near future, they may be able to bring the sandy beaches to their former state, where many loggerhead turtles (*Caretta caretta*) returned regularly to lay eggs.

I came to hear stories about how the sandy beaches of the Kunisaki peninsula were maintained beautifully by the *shichitoui* industry from several local aged people after the GIAHS authorisation as follows. (1) The sandy beaches were used as a drying field for sliced *shichitoui* stems after harvest. (2) The sandy beaches used as a drying field were kept clean by farmers. (3) During the 1970s and 1980s, these beautiful sandy beaches disappeared when they were not used as drying fields, due to the development of drying machinery and the decline of the *shichitoui* industry. However, no historic materials that directly back up these stories are available.

The history of land use in Shioya, Aki Town in the Kunisaki Peninsula was investigated just before the land readjustment project for rice fields, and was published as a report by the Aki

Town board of education in 2001.<sup>3</sup> This report included the detailed excavation and research of the structural remnants and remains there from between the Yayoi period (300 BCE to 300 CE) and the Middle Ages, with scientific studies of plant opals and soil profiles, and clarified the establishment of the Jori paddy fields and their change process.

Together with the results of this research, this report includes an appendix that includes detailed land use maps of not only the paddy fields, but also the beaches in Shioya, Aki Town of the Kunisaki Peninsula in 1888 and 2001. In the 1888 land use map, I found that the whole sandy beach in Shioya was divided into elongated rectangles, which were used as drying fields by individual farmers, as shown by figure captions. Several drying fields were established adjacent to rice fields on the small hills, suggesting that the drying fields on the beach were not enough for the *shichitoui* production in this area. In the 2001 map, there were no drying fields on the beaches nor adjacent to rice fields, because of the development of drying machinery and the decline of the *shichitoui* industry.<sup>2</sup> Moreover, the 2001 map also showed the eroded beach, which was surrounded by tetrapods. These facts clearly suggest that human activity, like the *shichitoui* industry, was important in maintaining the beauty of the sandy beaches of the Kunisaki Peninsula.

In 2010, the Kunisaki Council for the Promotion of *Shichitoui* was established by farmers, *tatami* makers, supporters, and local administrative officers, to protect this industry that seems likely to disappear. After our GIAHS authorization in 2013, some members of the Council started to revive the drying of *shichitoui* stems on the beach, known as “*Hamaboshi*”, as a ceremony under the leadership of Ms Chika Iwakiri. Many people have once again noticed the importance of the beautiful sandy beaches through this voluntary activity, in cooperation with NPO activity that maintains the beautiful sandy beaches for the regular return of loggerhead turtles.

## Conclusion

*Shiitake* mushrooms (*Lentinus edodes*) cultivated on dried log wood are one of the main products of our GIAHS. The activity of this *shiitake* production has also facilitated biodiversity by supplying artificial ponds or puddles for several species of endangered amphibians at the Kunisaki Peninsula Usa GIAHS.<sup>4</sup>

We will continue to rediscover evidence of a mutualistic relationship between human beings and nature for the dynamic conservation of our GIAHS. These activities will encourage regional people by shining light on the parts of everyday life that people were not aware of.

I thank Ms Keiko Matsumoto (Kunisaki city board of education) for providing the book of Shioya Jori Iseki and partly analysing it.

## References

- 1) Hiroaki Hayashi. 2016. The monitoring by the expert was important to make Kunisaki Peninsula Usa Globally Important Agricultural Heritage System' action plan a more effective plan (submitted)
- 2) Hiroaki Hayashi. 2014. Kunisaki Peninsula Usa integrated forestry, agriculture, and fisheries system, which is one of the Globally Important Agricultural Heritage Systems (GIAHS), values *shichitoui* (*Cyperus malaccensis* Lam.) by the devoted cooperation from regional agricultural experimental stations, *Fertilizer Science*, 36, 1–25 (in Japanese)
- 3) Aki Town board of education. 2001. Shioya Jori Iseki (The Shioya Jori remains) (in Japanese)
- 4) Hiroaki Hayashi. 2014. Understandings of relationships between agriculture and biodiversity in Kunisaki GIAHS, *J. Resour. Ecol*, 5, 395–397

## Agricultural Activities in Hakui city designated as GIAHS 世界農業遺産地域・羽咋市の農業の取組み

Masamitsu Hachinota  
八野田 正光

Hakui city, Ishikawa, Japan  
羽咋市 (日本)

**Contact:** nourin@city.hakui.lg.jp

**Keywords:** GIAHS, agriculture, natural farming, new farmers  
世界農業遺産、農業、自然栽培、新規就農者

### 世界農業遺産への認定

2011年(平成23年)6月、能登4市4町で構成する能登地域 GIAHS 推進協議会(珠洲市、輪島市、七尾市、羽咋市、能登町、穴水町、志賀町、中能登町)が申請した「能登の里山里海」が、「トキと共生する佐渡の里山(新潟県佐渡市)」とともに、日本で初めて世界農業遺産に認定された。2013年5月に宝達志水町が加わり、現在、能登地域 GIAHS 推進協議会は能登地域4市5町で構成されている。

### 羽咋市の概要

羽咋市は、日本海に突出する能登半島の入口に位置し、東西及び南北とともに約11km、面積81.85km<sup>2</sup>のコンパクトな都市である。また、日本で唯一車が走れる海浜「千里浜なぎさドライブウェイ」や白鳥が飛来する邑知潟などの自然環境に恵まれ、世界農業遺産認証を契機に自然との共生のための環境保全型農業に取り組む稲作地帯といった「能登の里山里海」と、北陸随一の五重塔を誇る妙成寺や能登一ノ宮気多大社などの歴史・文化が融合した地方都市である。

### 農業の成長産業化に向けた取組：のと里山羽咋自然栽培「聖地」化プロジェクト事業

世界農業遺産に認定されて5年が経過し、羽咋市では、今までの取組み成果を踏まえながら、能登の里山里海を再評価し、持続可能な資源管理に関する未来への取り組みを進めている。

その取り組みの一つに、羽咋市とJAはくい、自然栽培の聖地化を目指し、無肥料、無農薬、無除草剤により自然が持っている力を最大限に引き出して栽培を行う自然栽培農業の普及を行っている。自然栽培農法は、農作物の高付加価値化と「土壌微生物などの目に見えない生物多様性」、水生昆虫・鳥類等の「目に見える生物の多様性」保全を目指している。

羽咋市とJAはくいが相互に連携・協力し、農産物の高付加価値化による農業者の所得向上をはじめ、移住・定住の促進と新規就農者の確保による雇用の創出に取り組むことで、耕作面積100ha、新規就農者50人を2019年度末の目標としている。



プロジェクト事業の主な内容は下記のとおりである。

- 生産計画：空き家賃補助や新規就農者への補助などの移住支援、のと里山農業塾での技術指導、生産者による農業法人「はくい式自然栽培合同会社」の設立等
- 加工計画：集出荷加工施設の設置、商品開発 等
- 流通計画・販売計画：アンテナショップ「能登みらい農業はくい放送局（東京）」、「道の駅のと千里浜」（2017年7月オープン予定）の開設、農産物の認証制度 等
- 交流・PR計画：食育による学校給食等への自然栽培農産物の提供、イベントによるPR活動 等

羽咋市では、新しい特産物の創造により、地域のなりわいを創出することで、自然栽培農業だけではなく、羽咋市全体の農業の活性化を目指し、取り組んでいる。

また、近年、イノシシによる農作物の被害が目立っており、イノシシの獣害対策とともに、里山の恵み「のとしし」として、その肉や皮などを特産化し、有効活用するため、2015年10月「羽咋市獣肉処理施設」を稼働させるなど、世界農業遺産「能登の里山里海」を守る取り組みを進めている。



自然栽培実践  
Natural farming in action



のと里山農業塾  
Noto satoyama farming workshop

## **Involving Local People in Asian Biosphere Reserves: From the Case Study of Mount Hakusan Biosphere Reserve**

Shinsuke Nakamura<sup>1\*</sup>, Yoshihiko Iida<sup>2</sup>, Phenden Gyamtsho<sup>3</sup>, Jusman<sup>4</sup>, Madina Salmenova<sup>5</sup>,  
Gal Chinbat<sup>6</sup>, Wimonmart Nuipakdee<sup>7</sup>, Ton That Minh<sup>8</sup>

Mount Hakusan Biosphere Reserve Council<sup>1\*</sup>, Operating Unit Ishikawa Kanazawa, United Nations University Institute for the Advanced Study of Sustainability<sup>2</sup>, Ministry of Agriculture and Forests, Royal Government of Bhutan<sup>3</sup>, Management Coordination Forum of Taka Bonerate - Kepulauan Selayar Biosphere Reserve, Indonesia<sup>4</sup>, Altyn Emel (aspiring) Biosphere Reserve, Kazakhstan<sup>5</sup>, Ministry of Environment and Tourism, Government of Mongolia<sup>6</sup>, Department of National Parks, Wildlife and Plant Conservation, Thailand<sup>7</sup>, Langbiang Biosphere Reserve, Vietnam<sup>8</sup>

**Contact:** [ecopark@city.hakusan.lg.jp](mailto:ecopark@city.hakusan.lg.jp)

**Keywords:** biosphere reserve, Mount Hakusan, local initiative, mutual learning

### **Emphasizing the local initiatives within biosphere reserves**

Biosphere reserves (BR) are areas where ecosystem conservation and sustainable use are carried out in harmony. BRs have been designated under UNESCO's Man and the Biosphere (MAB) Programme since 1976, and as of March 2016, there are 669 BRs in 120 countries, of which 142 BRs are in Asia and the Pacific region.

In 2015, the General Conference of UNESCO endorsed the new "MAB Strategy 2015-2025", followed by the "Lima Action Plan for UNESCO's Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves (2016–2025)," endorsed by the 4<sup>th</sup> World Congress of Biosphere Reserves held in Lima, Peru in March 2016. The strategy and the action plan have emphasized the contribution of BRs toward the Sustainable Development Goals, and especially the role of local initiatives.

Regarding this point, the UNESCO Office, Jakarta, the Regional Science Bureau for Asia and the Pacific, has organized an International Workshop, "The Role of Local Governments in Implementing the Lima Action Plan for Biosphere Reserves," held in Wakatobi, Indonesia in June 2016, which concluded with the "Wakatobi Recommendations to MAB-ICC for Strengthening the Roles of Local Governments in Implementing the Lima Action Plan".

### **Sharing the experience of Mount Hakusan Biosphere Reserve**

Regarding the importance of local initiatives, the Mount Hakusan Biosphere Reserve Council (Japan), in collaboration with the United Nations University Institute for the Advanced Study of Sustainability, Operating Unit Ishikawa/Kanazawa is carrying out their "Mutual Learning Platform for Asian Local Practitioners of UNESCO's Man and the Biosphere (MAB) Programme" project in 2016. This project, which is financially supported by the (FY 2016) Official Development Assistance Grants for UNESCO Activities from Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT), aims to create a learning platform through the interrelation of local practitioners at BR sites to achieve sustainable development in Asia.

Mount Hakusan Biosphere Reserve is an area where the local people have lived with deep gratitude to Mount Hakusan, conserving and sustainably using the natural abundance of this mountain, which should be a very good example of the harmony between conservation and use. In order to share the experiences that belong to the people, the Mount Hakusan Biosphere Reserve Council is inviting Asian BR practitioners to the On-the-field Workshop for Asian

Biosphere Reserves' Local Practitioners: “Involving local people in biosphere reserves” as a part of this project.

During this workshop, the participants are expected to meet with various local people carrying out many activities in the field. We will introduce some concrete examples of activities carried out by the people of Mount Hakusan Biosphere Reserve, and discuss what points would be applicable for Asian BRs.

### **Reference**

Iida, Y. and Nakamura, S. eds. 2016. Mount Hakusan Biosphere Reserve: Creating a new path for communities and nature, UNU-IAS OUIK, Kanazawa, Japan. 116pp.

## What the Mount Odaigahara, Mount Omine & Osugidani Biosphere Reserve Links

大台ヶ原・大峯山・大杉谷ユネスコエコパークが紡ぐコト

Satoru Nishide  
西出 寛

Odai Town Office, Mie, Japan  
大台町（三重県）

**Contact:** nishide337@odaitown.jp

**Keywords :** biosphere reserve, nature, life, interrelation

### はじめに

大台ヶ原・大峯山・大杉谷ユネスコエコパーク（BR）は、日本の紀伊半島の東部、大峯山系と、奈良県と三重県の県境付近の台高山系にまたがる区域である。この区域は、紀伊半島の主要な河川である宮川・熊野川・紀ノ川の水源地となっている。

しかしながら、当地域内は、シカの食害などによる森林の荒廃、顕著な過疎化・少子化・高齢化が進んだ現状を抱え、持続可能な地域の姿を模索し続けている。

### 自然環境と産業

標高差、気温差が大きく、国内有数の多雨地域でもあり、トウヒ、ウラジロモミ、シラビソなどの森林をはじめとした重要な植生が見られる。

山岳地帯であるため、林業（吉野林業発祥の地）を主とした暮らしと、自然環境を利用したアクティビティ（マラソン・自転車・登山・スキー・SUP など）など交流事業が盛んに行われている。

### BR 拡張登録がもたらしたもの

BR 拡張登録を機に、人と人とのつながり、人と自然とのつながりが始まっている。BR 登録を誇りとし、商品開発や事業展開が小さな出来事として起こっており、このような持続可能な地域を目指した取り組みを紹介する。

## Utilization of the Ecosystem Services in the Past Half-Century of Aya Town 綾町の生態系サービス利活用の半世紀のあゆみ

Nobuki Kawano  
河野 円樹

Aya Town, Aya Biosphere Reserve Promotion Office, Miyazaki, Japan  
綾町ユネスコエコパーク推進室（宮崎県）

**Contact:** aya.BR.2012@town.aya.lg.jp

**Keywords:** biosphere reserve, perspective on nature, traditional knowledge, sustainable society, diversity

宮崎県綾町は、日本最大級の面積で照葉樹自然林が残されており、その恵みを生かした自然生態系農業を中心に、およそ半世紀近くかけて「自然と共生した地域づくり」を全国に先駆けて行ってきた。また、綾町には伝統的生活文化の知恵を大事にし、行政と22の自治公民館の人々がスクラムを組んだ独特の歴史がある。こうした長年の取り組みが評価され、2012年には、国内で32年ぶり、国内で5番目のBiosphere Reserve登録地となった。本発表では、半世紀にわたって綾町が地元の生態系サービスを利活用しながら持続可能な地域づくりを行ってきたその歴史を中心に紹介する。



## Why We Encourage Multiple Designations of Biosphere Reserves with Others

Hiroyuki Matsuda<sup>1\*</sup>, Akiko Sakai<sup>1</sup>

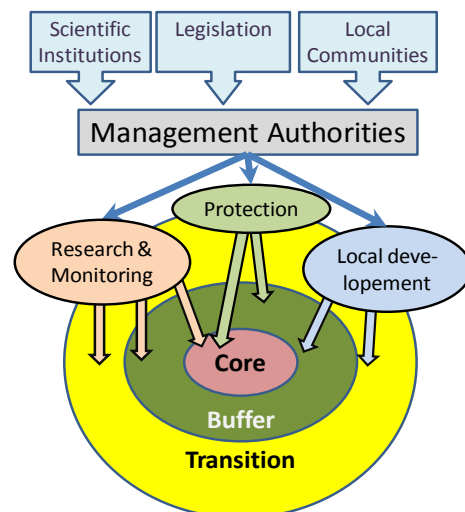
Faculty of Environment and Information Sciences,  
Yokohama National University<sup>1\*</sup>,

Contact: matsuda-hiroyuki-vj@ynu.ac.jp

**Keywords:** Protection, Conservation, Participatory approach, Co-management

### Biosphere reserves as models of sustainable development

Biosphere reserves (BRs) designated by the International Coordinating Committee (ICC) for UNESCO's Man and the Biosphere (MAB) Programme are models of sustainable development for other sites elsewhere. BRs consist of three zones: core, buffer, and transition areas (see figure, modified from Choi Chung-II). BRs set core areas surrounded with buffer zones to protect biodiversity and natural capital existing in the core area. In addition to protecting nature, BRs encourage sustainable use of natural resources, especially in transition areas. The ICC-MAB requires the legal instrument to protect natural capital in core areas, but does not need legal instruments in buffer/transition areas.



### Role of biosphere reserves for local communities

On the other hand, local stakeholders often expect to receive financial support for BRs and economic benefits by designating BRs, such as increasing the number of tourists, branding of agricultural products, or visits by international scientists and students to research BRs. The MAB-ICC expects that good practices of BRs will be models of sustainable development in the World BR Network (WBRN) and other regional or thematic networks. As in other international schemes of nature reserves, like World Natural Heritage Sites (WNHSs), Ramsar Convention Sites, and UNESCO Global Geoparks, networking in BRs is very important for sharing their experiences toward common goals. Although goals differ somewhat between institutions, there is substantial overlap. A typical difference exists between WNHSs and BRs. WNHSs seek protection of the outstanding universal value that exists at the site, which is similar to the role of core areas in BRs. There are 69 cases of double designations between BRs and natural or cultural World Heritage Sites (Yoshida; see also <http://whc.unesco.org/en/activities/497/>). In these cases, the core area of the BR is usually designated as a WNHS. Core areas are protected under national laws. Management costs of WNHSs are usually supported by governments, because it is a mission of the State member (national government). In contrast, core areas are usually managed by national governments. Therefore local stakeholders, including municipal governments, have few chances to manage WNHSs. In addition, the WNHS system does not explicitly encourage sustainable use of natural capital. UNESCO's MAB Programme encourages a participatory approach and engagement of local stakeholders. Therefore, double designations as both WNHSs and BRs are probably beneficial to local stakeholders.

### **Potential competition between international certification systems**

UNESCO Global Geoparks, the Ramsar Convention, and BRs have similar goals: to seek models of sustainable development depending on activities of local stakeholders. There are some competitive relationships between them, though double designations probably benefit the sites of double designations. Global Geoparks do not willingly encourage double designations with other international certifications, including World Heritage. In contrast, ICC-MAB merely does not explicitly welcome double designation of BRs with others. This is because the goal of BRs is to be a model of sustainable development, and double designations are also one of the methods of sustainable development.

### **Case study of Yakushima Island**

Yakushima Island is the only case of double designation as both WNHS and BR in Japan. Yakushima was designated as a BR in 1980, and designated as a WNHS in 1993. In 1980, the Yakushima BR did not have a transition area, nor did Kuchinoerabu-jima Island, but involved terrestrial areas of the core area and a buffer zone on Yakushima Island. In 2016, this BR was extended and renamed to the Yakushima and Kuchinoerabu-jima BR, which includes Kuchinoerabu-jima Island: it now consists of core, buffer, and transition areas on Yakushima and Kuchinoerabu-jima Islands, and three areas in both marine and terrestrial areas. Local stakeholders on Yakushima Island decided to extend the BR because (1) renaming to include Kuchinoerabu-jima is possible in BR, while extension of the WNHS to Kuchinoerabu-jima is difficult and Japan's Ministry of the Environment did not agree to add the name of Kuchinoerabu-jima into Yakushima National Park, and (2) the BR can manage the whole island, including transition areas and marine areas (Matsuda et al. 2015). We also discuss some potential merits of double designations of BRs with other global and national certification institutions: The Most Beautiful Villages in Japan and the Covenant of Mayors, both of which Takayama village in Shiga Highland BR also belongs to.

### **Reference**

- Yoshida, M. 2016. Biosphere reserves heritage seeks deeper linkage to world heritage. Annual Report of the World Heritage, National Federation of UNESCO Associations in Japan. Kodansha, (to appear).
- Sakai, A. and Matsuda, H. 2017. Local Communities Connecting to International Actors – Case Studies of Biosphere Reserves Network in Japan. In Tetsu, S. (ed.) “Transformations of Social-Ecological Systems: Studies in co-creating integrated knowledge toward sustainable futures”, Research Institute for Humanity and Nature, Kyoto (to appear).
- Matsuda, H., Yumoto, T., Okano, T., Tetsuka, K., Fujimaki, A., Shioya, K. 2015. An extension plan of Yakushima Biosphere Reserve as a case study of consensus building of islanders. *J Ecol Env* 3:241-247.

## **Infusing the Satoyama Initiative Concepts into the National and Local Context: a Case Study of the Participatory Planning and Monitoring Process of an Indigenous Rice Paddy Cultural Landscape, Taiwan**

Kuang-Chung Lee

National Dong-Hwa University\*, No. 1, Sec. 2, Da Hsueh Rd. Shoufeng, Hualien, Taiwan 974

**Contact:** kclee2000@gmail.com

**Keywords:** Socio-ecological production landscape; Satoyama Initiative; collaborative planning; indicators of resilience, participatory evaluation

The idea of landscape/seascape conservation was introduced into the amended Cultural Heritage Preservation Act in 2005 as a new legal subject entitled a “Cultural Landscape” in Taiwan. Unlike traditional strictly protected areas, namely the IUCN protected area categories I–IV, the Cultural Landscape is a new concept to Taiwan that emphasises the interaction of local people and the land. In order to help stakeholders of governmental authorities and local communities to apply this new instrument, the research team employed a community-based participatory approach to enhancing partnership among them. The research has especially learnt from the concepts of World Heritage Cultural Landscapes, the “three-fold approach” of the Satoyama Initiative, as well as the operational guidelines of IUCN protected area category V (protected landscapes/seascapes). A study area of rice paddy production landscape in the indigenous Fengnan Village, Hualien County, was selected as a potential Cultural Landscape site. Two-year participatory action research, from May 2011 to June 2013, was commissioned by the Hualien County Cultural Affairs Bureau (HCCAB) and conducted by the research team, drawing on collaborative planning theory and qualitative methods to analyse interactions and enhance partnerships among the villagers, the local authority officers, and experts.

Various formal and informal forums and workshops were conducted in the local area to achieve stakeholder consensus on the designation of the Cultural Landscape and the formulation of its management plan. As a result of the above consensus, built through a series of stakeholder meetings, local people voluntarily set up a Local Management Committee in July 2011 and drew up a local Code of Conduct in November 2011 for the future management of the Cultural Landscape. The local authority (HCCAB) officially designated the site as a legal Cultural Landscape in May 2012, approved the Management Principles in November 2012, and completed the mid-term Management Plan for Cihalaay Cultural Landscape in June 2013. The Management Plan comprises 23 tasks closely related to the five perspectives of the three-fold approach of the Satoyama Initiative.

In order to help local stakeholders to monitor the progress of the implementation of the Plan, the research team worked with the indigenous community again from 2015 to 2016 on participatory evaluation of indicators of resilience and strategic planning of the Cihalaay Cultural Landscape. The research team adopted the indicator system and evaluative procedure from UNU-IAS’s “toolkit for the Indicators of Resilience in Socio-ecological Production Landscapes and Seascapes (SEPLS).” For the first stage, from June to August 2015, the research team recruited an indicator development working group comprising six key local people. In total, six working group meetings were conducted to review the suitability of UNU-IAS’s 20 indicators of resilience and to evaluate the indicators for the current situation of the Cihalaay Cultural Landscape. Second, the research team invited all 25 households in the Cihalaay Cultural Landscape to participate in a village meeting. The outcome of the evaluation



of the resilience indicators for the Cihalaay Cultural Landscape was explained and discussed at the village meeting. For the second stage, from October 2015 to January 2016, five working group meetings and the second village meeting were held by the research team. The meetings were designed to help residents come to strategies to enhance each indicator, based on the outcomes acquired during the first stage. In total, 36 enhancement strategies were worked out by the working group members, and then explained to and discussed with all of the villagers at the village meeting.

The findings show that, first, a landscape approach can be welcomed by local people and create a new style of “living” protected landscape in Taiwan’s national protected area system. Second, the recruitment of a small local working group can be an effective way for the research team to explore more in-depth understandings of local people about the indicators of resilience of the area. In general, the participants agreed that the indicator system of resilience of the local area, based on landscape scale, was workable and the outcomes would be helpful to the future management of the Cihalaay Cultural Landscape.

## References

- Elcome, S. & Baines, J. 1999. Steps to success —Working with residents and neighbors to develop and implement plans for protected areas, IUCN, Commission on Education and Communication/ European Committee for Environmental Education, IUCN, Switzerland.
- Healey, P. 1997. Collaborative planning: Shaping places in fragmented societies, Macmillan, London.
- Healey, P. 1998. ‘Building institutional capacity through collaborative approaches to urban planning’, *Environment and Planning A*, vol. 30, pp. 1531–46.
- Huberman, A.M. & Miles, MB 1994. ‘Data management and analysis methods’, in *Handbook of qualitative research*, eds NK Denzin & YS Lincoln, Sage, London, pp. 428–44.
- IUCN 1994. Guidelines for protected area management categories, IUCN, Cambridge.
- Lee, K.C. 2016. Identification and Evaluation of Indicators of Resilience in the Cihalaay Cultural Landscape of Fon-nan village, Fu-li Township, Hualien County of Taiwan. Hualien County Cultural Affairs Bureau. (In Chinese)
- Lee, K.C., Hsu, T., Chiang, S.Y., Kacaw, L. & Lee, B.S. 2016. ‘Conservation and management strategies for cultural landscapes: a case study of a continuing landscape in Taiwan’, *Journal of Cultural Heritage Conservation*, vol. 34, pp. 66–92. (In Chinese)
- Morimoto, Y. 2011. ‘What is Satoyama? Points for discussion on its future direction’, *Landscape and Ecological Engineering*, vol. 7, pp. 163–171.
- Phillips, A. 1995. ‘Cultural landscapes: an IUCN perspective’, in *Cultural landscapes of universal value: components of a global strategy*, eds B. von Droste, H Plachter & M Rössler, G Fischer, Jena, pp. 380–92.
- Phillips, A. 2002. Management guidelines for IUCN category V protected areas: Protected Landscapes/Seascapes, IUCN, Gland, Switzerland and Cambridge, UK.
- Silverman, D. 2000. *Doing qualitative research — A practical handbook*, Sage, London.
- UNU-IAS 2010a. Biodiversity and livelihoods: the Satoyama Initiative concept in practice, Institute of Advanced Studies of the United Nations University and Ministry of Environment of Japan, Tokyo, p. 2.
- UNU-IAS 2010b. Satoyama-Satoumi ecosystems and human well-being: Socio-ecological Production Landscapes of Japan — Summary for decision makers, Institute of Advanced Studies of the United Nations University, Tokyo.

## **Human and Nature Interaction in Ifugao Satoyama Landscape: UNESCO-Inscribed Heritage Site and GIAHS**

Vicky Cadalig-Madangeng

Ifugao State University

**Contact:** vikiCAD@yahoo.com

**Keywords:** Rice Terraces, inscribed Heritage Sites, Land use systems and landscapes.

The photography of Satoyama landscapes was made to document and appropriately label the different heritage sites and GIAHS in Ifugao to include the various human interactions with regards to their series of activities in the rice terraces.

The Satoyama landscapes found in Ifugao were built and developed through prolonged interaction between humans and their surrounding ecosystems, and this was one of the grounds for which Ifugao is included among the UNESCO Heritage Sites (In 1996, the Ifugao Rice Terraces were declared a World Heritage site by UNESCO), and is the only Globally Important Agricultural Heritage Site in the Philippines (GIAHS), as well as being among the world's first GIAHSs listed. GIAHSs are defined as “remarkable land use systems and landscapes which are rich in globally significant biological diversity evolving from the co-adaptation of a community with its environment and its needs and aspirations for sustainable development” (FAO 2002).

The IRTs symbolise not only Ifugao's industry and engineering skills, but also their love of freedom and respect for nature, notwithstanding that the IRTs have been traditionally managed by their ancestors, for their survival and existence. National recognition of the need to protect the IRTs began back in 1973, when the late President Ferdinand E. Marcos signed into law Presidential Decree No. 260, recognising the IRTs as a national landmark having a high value from the viewpoint of world culture, considering them an “irreplaceable treasure of the country.”

This study was conducted in the four chosen municipalities of Ifugao from the eleven registered municipalities. The Satoyama landscapes covered in the study are the following rice terraces in the municipalities recognised by the United Nations as a World Heritage: the whole of Hungduan Rice Terraces, the Batad Rice Terraces and Bangaan Rice Terraces of Banaue, the Central Mayoyao Rice Terraces of Mayoyao, and the Nagacadan Rice Terraces of Kiangan.

In the Ifugao Satoyama landscape, what the people make out of their given environs determines the kinds of beliefs, customs, and traditions they have. In this way, the type of landscape determines, to a large extent, towards conservation and preservation of the heritage and culture of the people.



The major characteristics of the Ifugao Rice Terraces landscape are the series of terraced rice paddy constructed along the contours of the mountain slopes, and the forest, locally called a *muyong*, on the upper portion of terraced paddies (*payoh*). The *payoh* is privately owned and primarily planted with traditional varieties of irrigated rice, as documented. There are two types of rice terraces-forest coupled agroforestry systems: stonewalled rice terraces and non-stonewalled rice terraces.

Within the Satoyama, swidden farming, or *habal*, is practiced, and it is said to be the oldest form of agroforestry wherein portions of land on mountain slopes, in valleys, or on plains which are not irrigated are used for swidden farming by the farmers. The land is cleared, burned, then planted with crops other than rice to supplement whatever harvest they have in the rice terraces. This is practiced by the Ifugaos on a limited scale. In the village, a household may maintain one or two *habal* at a time when management practices include traditional mixed planting, minimum tillage for soil conservation, and enhanced fallow. During the fallow periods, or *ublag*, seeds from the adjacent *muyong* will regenerate the *umah/habal*, and new *muyong* are later allowed to develop.

“*Muyong*,” in the village, simply means “forest.” After the *hapfar* has been abandoned and there are trees grown in the area, the next operation will be cleaning under the trees as a demonstration of ownership. The owner can plant additional seedlings if there is more space. Nobody can cut down trees in the area unless permitted by the owner. When mature trees are cut in the *pinuchu*, the owner or children has to replace them with new seedlings.

The rivers are the natural streams of water and mostly are larger than creeks found in Ifugao. The river systems flow from high mountains and follow a north-to-south path overall. In the province, all of the rivers drain into the Magat River and into the Cagayan River. Water from Wael and Wangwang includes inland bodies of water like rivers, lakes streams, and springs that give life to the Ifugao Rice Terraces. The Ifugaos have stories of the origin of the different water forms in their localities.

The boundaries of residential areas have been defined since then. Even after a long period of time has passed, the current owner, inheritor, or possessor can recount how that particular piece of land came to be. The people in the village can identify the present as well as previous occupants, because the close family and village ties are still evident at present. This is the area or a piece of land where the houses of the people are built. In Ifugao, the people live together in villages because, long ago, they believed that doing so was a deterrent from attack by either people or animals. Generally, the villagers are interrelated, either by blood or by affinity.

Villages and hamlets are situated in such a way that people are near the rice fields that are their main workplace, and not very far from the forests, which are the source of fuel and materials for handicrafts and other necessities.

Finally, the Boleh prefer to live in a place a little away from the community to be near their rice fields or kaining, forests, or next to a river or spring, because they are individualistic by nature and they love to be free.

There is a need to preserve our cultural traditions and conserve our heritage landscapes. The ancestral knowledge and ingenuity that built the rice terraces should be handed down to future generations. Through documentation, people will learn to appreciate and understand these heritage sites, respect the people, and treasure the cultural practices in the rice terraces communities, thus this Ifugao Satoyama landscape photography project.

## **Establishment of an Integrated Management System for Multi-Internationally Designated Areas**

Dai-Yeun Jeong

Director, Asia Climate Change Education Center, Korea  
Emeritus Prof. of Environmental Sociology at Jeju National Univ. Korea

**Contact:** jeongdy@jejunu.ac.kr

**Keywords:** Internationally Designated Area, Multi-Internationally Designated Area(MIDA)  
Benefits of MIDA, Challenges of MIDA, Integrated Management System for MIDA

An Internationally Designated Area (IDA) is a natural area internationally recognized by a global or regional designation mechanism. As of 31 October 2015, there are 3,313 IDAs that have been listed as Ramsar Sites under the Ramsar Convention; natural and mixed World Heritage properties, as well as cultural landscapes, under the World Heritage Convention; Biosphere Reserves recognized within the World Network of Biosphere Reserves of the UNESCO Man and the Biosphere (MAB) Programme; and UNESCO Global Geoparks as part of the UNESCO International Geoscience and Geoparks Programme (IGGP).

These include 2,218 Ramsar Sites; 197 natural World Heritage properties, 32 mixed World Heritage properties based on both cultural and natural criteria, as well as 95 World Heritage cultural landscapes; 651 Biosphere Reserves; and 120 UNESCO Global Geoparks throughout the world.

Among these, there are 263 areas where different IDAs fully or partially overlap thus carrying double, triple or even quadruple international designations. These areas are named Multi-Internationally Designated Areas (MIDAs). Among MIDAs, there are 215 Ramsar Sites wholly or partially embedded in 169 Biosphere Reserves; and 109 Biosphere Reserves which overlap with 100 World Heritage sites. Ninety-seven Ramsar Sites are also inscribed wholly or partially in 70 properties of the World Heritage List, while 22 Ramsar Sites are part of five UNESCO Global Geoparks. 16 Biosphere Reserves are embedded in 14 UNESCO Global Geoparks, and 15 UNESCO Global Geoparks overlap with 13 World Heritage sites. Apart from these double designations, triple and quadruple designations have also been given to specific areas.

Each IDA has a specific unique profile of nature or culture, with the purpose of designation in terms of conservation and sustainable use. Thus, the current situation is that each IDA is managed separately without any relationship with other IDAs, even in regions where MIDAs exist.

As a solution to the disadvantages inherent to this separate management, the IUCN World Conservation Congress held in September 2012 in Jeju, South Korea adopted the establishment of an integrated management system for MIDAs as a resolution (Resolution WCC-2012-Res-052). In accordance with this, Jeju's government is developing the draft of the resolution that will be submitted to IUCN. IUCN has a plan to finalize the draft and submit it to UNESCO and the Ramsar Secretariat for examining the feasibility of integrated management for MIDAs all over the world.

In such a context, this paper aims at introducing the integrated management system for MIDAs being applicable to the regions where MIDAs exist. The case of Jeju Island, which has four MIDAs (Biosphere Reserve, Global Geopark, World Natural Heritage and Ramsar Wetland) will be introduced, following the steps as below.

1. Overview of IDAs and MIDAs all over the world.
2. Benefits and challenges of multi-internationally designation to sites
3. Introduction of MIDAs in Jeju Island.
4. A paradigm of integrated management system for MIDAs
5. Recommendation for
  - Site managers of MIDAs at the local level
  - Authorities of MIDAs at the national level
  - Designating bodies of MIDAs at the international level

## **Possible Multiple Nominations between World Heritage and Other International Conservation Instruments**

Masahito Yoshida

Professor, World Heritage Studies, University of Tsukuba

**Contact:** yoshida\_masahito@heritage.tsukuba.ac.jp

**Keywords:** multiple nomination, world heritage, biosphere reserve, Ramsar wetland, landscape approach, nature-culture linkage

Adopted in 1972, the World Heritage Convention (a convention concerning the protection of world cultural and natural heritage) is thought to be the most successful conservation measure in representing the most significant natural features and ecosystems of outstanding universal value, covering almost 10% of protected areas in the world. However, multiple nominations by both world heritage and other international conservation instruments are considered to be even more effective in achieving the more comprehensive and integrated protected area system stated in Aichi biodiversity target 11.

Currently, 69 world heritage sites are nominated simultaneously as biosphere reserves under UNESCO's Man and the Biosphere (MAB) Programme, including Yakushima, Hakusan, and the Kii Mountains in Japan. Ninety-five Ramsar wetlands of international importance are located in 69 world heritage sites. Besides these examples, there are many multiple nominations by world heritage and other international networks, such as Global Geopark and the Global Important Agricultural Heritage System (GIAHS).

Advantages of multiple nominations are that they 1) improve conservation measures, 2) integrate conservation efforts to create sustainable development in surrounding areas, and 3) connect cultural values and natural values in protected areas. Since the World Heritage Convention requires only buffer zones around world heritage properties, double nomination of biosphere reserves will require protected areas to involve their surrounding communities to achieve sustainable development goals in transitional zones. The separation of natural and cultural values is one of the critical issues in world heritage. However, multiple nomination will integrate the values of nature and culture in and around world heritage areas.

# Poster Session





## **Protected Areas in Bhutan: A conservation network - in pursuit of balancing development, conservation and livelihoods**

Phenden Gyamtsho\*, Wangdi Dukpa

Nature Recreation and Ecotourism Division, Department of Forests and Park Services,  
Ministry of Agriculture and Forests, Royal Government of Bhutan\*

**Contact:** phengyamtsho@hotmail.com

**Keywords:** Conservation, decentralization, protected areas, resources

For centuries, livelihoods of the Bhutanese people have been supported by natural resources; consequently, people have developed intimate relationships with nature, a concept further supported by Buddhist philosophy that advocates respect for all forms of life.

In connection to this philosophy, Bhutan adopted a “middle path” approach to development that supports the integration of conservation and sustainable development. For the last few decades, Bhutan has achieved unprecedented conservation success. The legal framework established in the Forest and Nature Conservation Act of 1995 allows farmers to live inside certain protected areas. Furthermore, it is enshrined in the constitution of Bhutan that at least 60% of the total geographical area shall be maintained indefinitely as forests.

Bhutan is a small country with a significant protected-area story. The country began establishing protected areas in the 1960s, with Royal Manas National Park designated as the country’s first protected area in 1966. Bhutan now has 10 protected areas in the form of parks, sanctuaries and strict nature reserves, which are all connected by a network of biological corridors. Out of its total geographical area of 38394 km<sup>2</sup>, 51.44% falls under the designation of protected areas.

Within some of these protected areas are farming communities whose livelihoods are derived from natural resources. They are considered “conservation partners” to safeguard these resources. With the advent of a decentralization policy, farmers are empowered to make decisions about any developmental activities at the grassroots level. This enables them to balance development, conservation and their livelihoods.

As globalization continues, Bhutan faces difficulties in managing its protected areas. The Royal Government of Bhutan and the World Wildlife Fund (WWF) are working together to create an innovative conservation strategy called “Bhutan for Life” to ensure that Bhutan remains economically and environmentally sustainable. This will be the country’s primary long-term innovative solution to manage its protected areas.

Although the protected areas in Bhutan are managed through the support of people residing within them, sustained flow of financial support is of the biggest concern. Establishment of biosphere reserves in the country is expected to draw international donors through networking at the international level. This would enable the protected areas in Bhutan to conserve their rich biodiversity and also interlink natural and social sciences, economics and education to not only perk up the human livelihoods and fair sharing of the benefits but also protect natural and managed ecosystems, thereby promoting inventive approaches to economic development that are socially and culturally appropriate and environmentally sustainable.

Bhutan has identified one of the protected areas – Jigme Dorji National Park—as the country’s first Biosphere Reserve. Bhutan is fervently looking for partner countries to assist in declaring its first Biosphere Reserve by the end of 2017.

### **References**

- 1) Forest Development in Bhutan: Policies, programmes and institutions, 2011.
- 2) Forest and Nature Conservation Act, 1995.

## **Involving Local Communities through Marine Ecotourism Development Initiatives: Experience in Taka Bonerate–Kepulauan Selayar Biosphere Reserve**

Jusman

Director Taka Bonerate National Park  
Vice Chairman Coordination Forum and Management  
of Taka Bonerate-Kepulauan Selayar Biosphere Reserve, Indonesia

**Contact:** jusmantakabonerate@gmail.com

**Keywords:** conservation, sustainable development, local communities

### **Introduction**

Taka Bonerate–Kepulauan Selayar Biosphere Reserve is located in the Selayar Islands District, South Sulawesi Province, Republic of Indonesia. Taka Bonerate–Kepulauan Selayar is one of eleven Biosphere Reserves in Indonesia, confirmed on June 9, 2015 at the meeting of the ICC (International Co-ordinating Council) MAB Programme–UNESCO in Paris, France. The biosphere reserve management conducted by the Coordination Forum and Management of Taka Bonerate–Kepulauan Selayar Biosphere Reserve was instituted in 2015. The Selayar Islands Regency consists of 130 islands, both large and small, with an area of ± 4,410,736 ha. Some islands are mostly uninhabited (106 islands), and some are inhabited (24 islands). An important aspect of the development of the Taka Bonerate–Kepulauan Selayar Biosphere Reserve is optimizing the management of fishery resources, the development of the marine tourism sector, and the marine laboratory that supports the sustainable preservation of the environment.

### **Challenge**

Challenges in implementing the management concept of Taka Bonerate–Kepulauan Selayar Biosphere Reserve include:

1. Great threats to the sustainability of the area.
2. The low involvement of local communities in the implementation of the concept of sustainable development.
3. Limited baseline data on biodiversity and the socio-cultural community.
4. A shortage of local initiatives to increase the utilization of environmental services and natural resources in a sustainable manner.

### **Step-by-Step Strategy**

Responding to the challenges in the high level of threat to the preservation of the area, the strategic steps that have been undertaken are:

1. Collaboration with law enforcement agencies in the Selayar Islands District.
2. Ensuring the protection and security of the area in the form of routine patrols, joint operations related agencies, special operations, and the community partners forest police.

To answer the challenge of the still low public involvement in the implementation of the concept of sustainable development, the strategic steps undertaken are:

1. The involvement of local communities in protective activities.
2. Enhancing the role of local communities in participation in the development of marine tourism to train locals to become tour guides, homestay providers, and producers of economic activity and souvenirs, as well as other roles.

Responding to the challenges of the limited baseline data of biodiversity and social culture, strategic steps have been taken to garner initiatives in collaboration with NGOs, among others,

the WCS (Wildlife Conservation Society) Indonesia Program, WWF (World Wide Fund for Nature) Indonesia, and Rare Indonesia. The WCS Indonesia Program conducted a study of coral reef ecology, and socio-economic and area-management effectiveness. WWF Indonesia conducted research activities and capacity building in human resources, and its development of marine tourism is responsible. Rare Indonesia performed data preparation and a management of sustainable fisheries pride campaign.

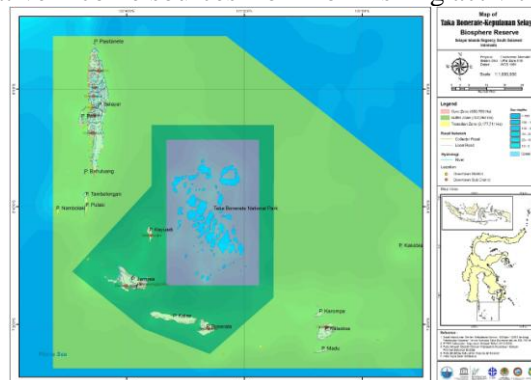
Responses to the challenges of limited local initiatives to increase the utilization of environmental services and natural resources in a sustainable manner by involving the public in the activities of nautical tourism services include:

1. Preparation of facilities and infrastructure such as a dive center, information center, and homestay.
2. Capacity building through training tour guides, facilitating obtaining licensing as guide divers, institution-building in communities through the establishment of a Selayar-Taka Bonerate activists tourism association, facilitating the establishment of an ecotourism operator group in the village on the Conservation Village Model in Taka Bonerate National Park, as well as facilitating the establishment of Indonesian Guides Association in the Selayar Islands District.
3. Coordination of transportation services and development marine transportation security standards for ships communities.
4. Training people to represent cultural tourism attractions.

Taka Bonerate–Kepulauan Selayar Biosphere Reserve works collaboratively with some stakeholders, namely, among others, the Ministry of Environment and the Forestry Directorate General of Conservation of Natural Resources and Ecosystem, the Taka Bonerate National Park Office, the District Government of the Selayar Islands, Hasanuddin University, The Institute of Sciences Indonesia, local communities such as Kerukunan Pemuda Pelindung Penyu (Turtle Village), Sileya Scuba Divers, and the Yayasan Econatural Society and Indigenous Leaders of Selayar Islands.

**Output Expected**

1. Maintenance of ecosystems and biodiversity, including fisheries resources in the National Park of Taka Bonerate.
2. Increased involvement of local communities in the management of marine tourism.
3. Increasing the number of interest tourist destinations and the number of visits to the Taka Bonerate National Park.
4. Increased alternative income sources from non-fishing activities.



**Figure:** Map of Taka Bonerate–Kepulauan Selayar Biosphere, Bonerate



## **The Interaction of Local People with the Altyn Emel Biosphere Reserve, Kazakhstan**

Madina Salmenova

Altyn Emel BR

**Contact:** Altynemel\_m@mail.ru

**Keywords:** Biosphere reserve, Altyn Emel, March of Parks, interaction, socio-natural environment

The territory of the Altyn Emel Biosphere Reserve (BR) represents a unique socio-natural formation, which is composed of different elements. The social component is based on the natural, so we first characterize, the nature of our biosphere reserve.

The geological structure of the park is unique. It is characterized by a wide variety of exotic forms of relief, including volcanic and aeolian formations outputting colored clay and black gravelly coated desert areas. The park has two extinct volcanoes (Mounts Small and Large Kalkany), which are separated the unique array of sands called the - "Singing Dunes". Thus, virtually all of our biosphere reserve can be considered a geopark.

Of particular note is the uniqueness of our territory for the protection of wild animals (such as the gazelle, kulan, ibex, snow leopard, and Turkestan lynx.), as well as many species of rare birds, including the wetland. The ancient mountains of Sholak are rich in relict endemic species of plants that are found almost nowhere else. Along the rivers through gorges are oases of trees and shrubs with species of relict trees like *Malus sieversii*, *Celtis caucasica* and a variety of shrubs.

In the mountains there are unique caves, grottos, and petroglyphs that are attractive to tourists. The shore of coast Kapshagai reservoir has good sandy beaches and comfortable places for recreational fishing and other recreation. Spacious, views are found over the long distances of the park, thanks to the peculiar structure of the terrain with its abundance of exotic forms, providing an attractive landscape for recreation and tourism.

The socio-natural environment creates a certain mentality in the local population. In particular, nature, is generally regarded by the locals as the mother nurse, which to a certain extent, is embodied in the concept of traditional land use. This includes hunting, fishing and harvesting of medicinal plants, berries, and mushrooms. In addition, nature – holds recreational potential for the local population. The shores of the reservoirs and rivers are areas of haymaking. Thus, the population ensures the existence of a natural economy due to nature's bounty, considering this way of life a historically established fact. Socio-economic changes in the country and the world's population have many effects without changing the attitude towards natural resources.

Our experience with the local population allows us to identify some common problems, among which are the following: the threat of environmental interests of different groups to the local population, the social passivity of the population, and the unwillingness to accept real socio-economic and environmental changes in the surrounding world.

The above problems complicate the process of interaction. It requires the search for adequate forms and methods of work with local communities first and foremost, in order to prevent the development of socio-environmental conflicts, as well as involving the local population in the process of harmonious interaction with the BR.

One of the most interesting and effective ways people and the biosphere reserve interact occurs in Altyn Emel which hosts the international event March of Parks. Every year the event March of Parks in the Altyn Emel BR increases its scale and bears fruit. The proof of this is the reduction of the number of violations, the increase in public interest in the protection of nature, the increase in the flow of tourists every year, and the greater number of young people each year who participate in campaign activities. The nature of the relationship of citizens to the BR is also changed if before the park was presented to them as a place for recreation in recent years, schoolchildren and university students actively assist in clean-up, landscaping, and planting, and tourists are becoming more attentive and leave behind less garbage. More and more local students are involved in the environmental patrol, which shares out days of environmental sanitation work in the areas where students live. The great success of the March of Parks is also a manifestation of the growing interest of sponsors to the challenges and problems of the biosphere reserve; their technical support helps improve environmental work to improve the quality of environmental information among the population, school children, and students, and to raise scientific a work new level.

Every year, our biosphere reserve attracts locals, and not only them, to a variety of sharing events available to the larger public, such as Bird's Day, during which students and schools make birdhouses to hang, and a day of pure springs and clean beaches. We carry out various environmental lessons and lectures for students and schoolchildren, as well as competitions dedicated to environment protection and our BR. To educate people about natural and historical sites, flora and fauna ecological excursions are conducted. During Land Day saplings of apple, apricot, cherry, and other fruit and decorative trees are planted.

No event in our BR happens without the active participation of the local population.

It is the duty of every citizen of our republic, and it is an honorable task, to preserve the country's natural resources, including its beautiful corner, the Altyn Emel BR as a huge natural heritage, for themselves and for their descendants.

## **Biosphere Reserves of Mongolia: Efforts for Proper Management with Local People**

Gal Chinbat

Department of Protected Areas Management,  
Ministry of Environment and Tourism, Mongolia

**Contact:** chinbat.gal@gmail.com

**Keywords:** Biosphere Reserves of Mongolia

Mongolia is a landlocked country in Central Asia with extreme continental climate conditions and borders Russia to the North and China to the South. Since 1990 Mongolia has been actively involved in MAB program and its activities and registered 6 sites in the UNESCO's biosphere reserves network (Great Gobi, Bogd-Khan Uul BR, Uvs Nuur Basin BR, Hustain Nuruu BR, Dornod Mongol BR and the Mongol Daguur BR).

### **Great Gobi Biosphere Reserve**

Trans Altai Gobi of the Altai is the unique ecosystem of the Gobi desert sustaining untouched natural state which is important habitat for endangered species of fauna and flora not only in Mongolia as well as in the World including mammals such as wild Bactrian camel, the Gobi bear, Asiatic wild ass, Argali wild sheep, Goitered gazelle and Siberian Ibex. Great Gobi Biosphere Reserve's administration cooperated with international and national organizations and researchers to conduct relevant studies on the ecology, including migration, breeding and feeding of the Bactrian camel, wild ass and grey wolf and Gobi bear telemetry and genetics studies.

### **Bogd-Khanuul Biosphere Reserve**

Bogd Khan Uul Biosphere Reserve is located in the south of Ulaanbaatar city, in the southern most forest steppe zone and the Khentii Mountain area. The northern slopes of the mountains are covered by dense coniferous forest and the southern slopes by bare rocks. Among the most threatened animal species in the biosphere reserve are the Musk deer, Roe deer, Sable and Artic hare. There are more than 500 different kinds of plant species, 47 species of mammals and 160 species of birds in the park. With the aim to improve population and increase the head of wild goats inhabiting in the Bogd Uul Mountain a Project on wild goat acclimation was developed and approved by the Ministry of Environment, Green Development and Tourism.

### **Uvs Lake Basin Biosphere Reserve**

Uvs Nuur Basin is located in the north-western part of Mongolia covering wide magnitude of areas in Great Lakes Depression and mountains belonging to Altai Mountain range. It is considered to be northern edge border of Central Asian desert area with unique ecological landscape, hence the area was taken under protection as an entire ecosystem. The area has a combination of Gobi desert, desert-steppe, steppe, forest steppe, mountains and glaciers featuring extreme continental climate. In addition, the areas belong to International Geo-Biosphere Research Region and serve as international standard model in Central Asia. The main income for herders comes from livestock husbandry. The Snow leopard enterprises project trains local herder woman on producing handcrafts using sheep wool, giving extra income to the families. Argali sheep trophy hunting is managed by local conservation communities.

### **Hustain Nuruu Biosphere Reserve**

The Mongolian Government declared Hustain Nuruu Biosphere Reserve (HNBR) as a Specially Protected Area in 1993, one year after the initiation of the reintroduction project of the Takhi to the Hustain Nuruu. The HNBR extends through the Khentii Mountains and includes the western edge of the Mongolian steppe at the boundaries of Altanbulag, Argalant and Bayankhangai Soums of Tov province. The HNBR is about 95 km from the capital city of Ulaanbaatar to the west. With well planned and prepared reintroduction program, in 2015 our Takhi number reached more than 340 in 32 breeding harems and more than 95 of them were born in Mongolia.

### **Dornod Mongol Biosphere Reserve**

The biosphere reserve, situated in the eastern corner of Mongolia, is one of the largest intact grassland ecosystems in the world. It is situated on the Mongolian Plateau with an average altitude of about 800 meters above sea level. The main characteristic is rolling steppe, extending for over 200 kilometers along the Chinese border. The landscape is characterized by gently rolling hills with scattered mountains and sand dunes unique to the region. One of the main objectives of the BR is to preserve important spring, winter and autumn habitats of the Mongolian gazelle.

### **Mongol Daguur Biosphere Reserve**

The specific Mongol Daguur's steppe and wetlands territory represents mainly low-mountainous landscapes that support a variety of fauna and flora species. The Mongol Daguur biosphere reserve provides nesting and breeding grounds to globally endangered species i.e. White-naped Crane and there are many rare or critically threatened birds that use the steppe for migratory stopover sites. Situated in the furthest eastern tip of Mongolia and bordered with Russia, the biosphere reserve ecosystem has transboundary distinction. WCS, TNC, WWF and international environmental protection organizations jointly conducted wildlife studies and explorations at the Mongol Daguur eco-zone and on their basis respective protection management actions are carried out within the Mongolian-Russian-Chinese joint actions surveys of Swan Goose, White-naped Crane, Relic gull, Chinese or Reed Parrotbill and other bird species were conducted around the Mongol Daguur Reserve Buir Lake, Onon river basin. The Chinese and Mongolian sides conducted joint studies of the Mongol Daguur transition zone's insects and floral specifics.

## **Knowledge Transfer of the Micropropagation Technique of the Blue Vanda Orchid (*Vanda coerulea*) for Community-Based Conservation Projects in Mae Sa-Kog Ma Biosphere Reserve, Chiang Mai, Thailand**

Wimonmart Nuipakdee

Department of National Parks, Wildlife and Plant Conservation

**Contact:** w.nuipakdee@gmail.com

**Keywords:** Blue Vanda, Micropropagation, Community-based

### **Background**

The blue vanda (*Vanda coerulea*) is an epiphytic native orchid in Thailand found wild in Pong Krai village, located in the Mae Sa–Kog Ma biosphere reserve, Chiang Mai, Thailand. Its population has rapidly declined from being commonly found in the wild to currently appearing at less than 25 stems per hectare, due to illegal harvesting and over exploitation. The Queen Sirikit Botanical Garden located close to this village, has determined to encourage Pong Krai villagers, who usually grow Blue Vanda in their homes for decoration, to get involved in the conservation and a reintroduction program for this native orchid in order to increase its population. Moreover, the village will be promoted as a unique blue vanda village for tourism benefit in the future.

### **Blue Vanda Conservation**

In 2008, the staff of the Queen Sirikit Botanical Garden began by reintroducing 76 mature blue vanda stems to the forest area of the village. Later in 2009, the research team of the Queen Sirikit Botanical Garden, together with a lecturer from Ram Kam Hang University, began conducting a training program on conservative orchid micropropagation for villagers. The process of micropropagation by tissue culture impressed the villagers and led them to create a small group to learn more about blue vanda micropropagation. Knowledge and technology of the entire process of orchid tissue culture, starting from orchid pollination, pod selection technique, the culture medium, the preparation of a stock solution, pod preparation, the subculture technique, and orchid acclimatization, were transferred by the Queen Sirikit Botanical Garden staff to villagers who were interested in being trained. After being well trained and getting used to all required materials and equipment, the villagers themselves conducted blue vanda micropropagation with a good survival rate.

Moreover, a researcher from the Queen Sirikit Botanical Garden conducted further study on the ecology and biology of the blue vanda in order to gain greater knowledge of blue vanda survival in the natural forest. The findings of the study were applied to the reintroduction of blue vanda in forest area of the village, which was assessed as having the best survival rate. The first experiment, which was conducted in 2010, found that the survival rate of 260 stems of blue vanda from a tissue culture technique placed on five different species of local host trees was 98.48 percent, and no significant difference in survival rate between different host tree species was found. The next experiment monitoring the reintroduction of Blue Vanda in hill evergreen forest in 2010–2011, found that the survival rate was 87.62 percent. The survival rate of micropropagated blue vanda placed on *Heliciopsis terminalis*, *Aporusa villosa*, and *Dalbergia cultrate* were 100 percent. The Queen Sirikit Botanical Garden later provided 2,374 stems of blue vanda from the micropropagation technique for villagers to grow by placing it on host trees or growing it in a decorative basket in the village. The blue vanda grown made the



village's image into that of the blue vanda village. These blue vanda are used as a source for the next pollination for the tissue culture process by villagers.

The laboratory of blue vanda micropropagation at Pong Krai village was developed from a small storage room to a small functional laboratory with the support of the local administrative office in providing financial assistance and basic infrastructure. Currently, the village's blue vanda micropropagation has been registered as a community small business enterprise run by conservation group consisting of six local laboratory technicians and around 20 villagers who grow blue vanda at home for sale or reintroduce to the forest. The product of the enterprise was divided into two parts, which are: 1) product for sale to tourists and the general public and 2) product for reintroduction to wild forest. The villagers consequently extended their capacity to other species of orchid, such as *Anoectochilus burmannicus*, reintroducing them and transfer their knowledge to those who are interested, such as Thai university students and Bhutanese officers.

### **The Challenge and the Next Step**

Native blue vanda has a very slow growth rate. It takes at least 3 years to produce a first flower. Villagers must wait for such a long time to get a product for sale. However, the villagers are patiently waiting for the product due to their intention to reintroduce this orchid to the natural forest than the to receive an economic return. To add value and for sustainable yield, the Mae Sa–Kog Ma biosphere reserve office has been trying to encourage the application of a Payment for Ecosystem Services principle between the blue vanda conservation group and a zip line company. Tourism enterprises are playing a role as payer for blue vanda orchids by creating a zip line for tourism. Moreover, the biosphere reserve office has been trying to apply biosphere-reserve branding to add value to the blue vanda tissue cultural product. The study of potential PES and biosphere reserve branding for blue vanda is planned to be conducted in 2017. Meanwhile, the extension of this knowledge to other species of orchids to increase biological diversity has been suggested.

### **References**

- Santi Watthana, Kanok-orn Srimuang, Henrik Ae. Pedersen, Attipong Keratikolkul, Udomsin Kuna and Mongkol Phaengphet. 2012. Ecology and biological Conservation of *Vanda coerulea* Griff. ex Lindl. Report of Ecology and biological Conservation of *Vanda coerulea* project in Thailand, 31 pages (inThai)
- Santi Watthana and Attipong Keratikolkul. Blue Vanda village. 4 pages (inThai)

## **Biodiversity, Cultural Diversity and Payment of Environmental Services in Langbiang Biosphere Reserve**

Ton That Minh

Langbiang Biosphere Reserve, Vietnam

**Contact:** tontminh@yahoo.com

**Keywords:** endemic, indigenous knowledge, payment environmental services

Langbiang biosphere reserve (total area of 275,439 hectares), located in the north of Lam Dong province, in the Southern Highland region of Vietnam, is named after Langbiang peak, where a legend was set of a romantic love story between Lang and Biang of the K'Ho indigenous ethnic group. The biosphere reserve holds global values of biodiversity and diverse natural landscape together with a gong cultural space unique to the Central Highlands. Establishing sustainable financing mechanisms for conservation based on payment for environmental services has been completed successfully.

### **Biodiversity**

The Langbiang biosphere reserve contains diverse areas of tropical forest ecosystems that form a part of the bio-geographical area of the India–Pacific tropical rainforest. The biosphere reserve covers a large area of primary forests, with its core zone in Bidoup Nui Ba National Park, which is considered one of the four main biodiversity centers in Vietnam. Biodiversity values contained in the biosphere reserve are globally important. It has been recorded that this area hosts 153 species listed in the Red Book of Vietnam (2007) and 154 species listed in the IUCN Red List (2012). The World Wildlife Fund has also identified the park as first conservation priority area (SA3) in the conservation program of the Southern Annamite Mountains of Vietnam. There is a plentiful botanical system, especially a semi-tropical botanical system including not only Fagaceae, Lauraceae, Theaceae, etc. but also gymnosperms, with 14 species all over the highland. Some of these have high scientific value, such as *Pinus krempfii*, *Pinus dalatensis*, *Taxus wallichiana*, and *Podocarpus nerifolius*. Langbiang biosphere reserve is not only a place for gymnosperm conservation but the largest gymnosperm area in Vietnam. It is also a host to the Vietnam orchid, with 305 species. There are 1940 vascular plant species belonging 825 genera and 180 families belonging to 4 phyla with 8 endemic species, 64 species listed in the Vietnam Red Data Book (2007) and 34 species listed in the IUCN list (2010).

There are 820 animal species in 507 genera, 123 families, and 6 classes, with 14 endemic species, 45 species listed in the Vietnam Red Data Book (2007), and 60 species listed on the IUCN Red List (2010), of which some species are of high conservation value or endangered, such as *Nycticebus pygmaeus*, *Pygathrix nigripes*, *Nomascus gabriellae*, *Cuon alpinus*, *Ursus thibetanus*, *Helarctos malayanus*, *Panthera pardus*, and *Bos gaurus*. According to the International Bird Organization, the Langbiang plateau is one of three endemic bird areas (EBA) in Viet Nam with 6 important bird areas (IBA), namely Chu Yang Sin (VN030), Bidoup (VN036), Langbian (VN037), Phuoc Binh (VN038), Tuyen Lam (VN048), and Cong Troi (VN056). Endemic bird species needing to be conserved include *Garrulax vassali*, *Garrulax melleti*, *Garrulax yessini*, *Rheinardia ocellata*, *Jabouilleia danjoui*, *Carduelis monguilloti*, and *Sitta solangiae*.

### **Cultural Diversity**

Langbiang is home to certain ethnic groups having diversified cultures and still preserving traditional cultural practices, such as houses on stilts and brocade weaving. The hill tribe people still use labor tools and traditional instruments with typical indigenous culture.

The biosphere reserve holds global values of biodiversity and diverse natural landscapes in a mixture with a gong cultural space unique to the Central Highlands, nominated by UNESCO as a nonmaterial cultural heritage of humanity. This is a specific characteristic of local culture, and it is an attractive destination for tourists to develop eco-tourism, culture, creating livelihoods for the local people as well. The Da Lat Flower Festival is a festival event held twice a year in the city of Da Lat. The Festival is an opportunity for this city of flowers to exhibit flowers from the locality as well as from many parts of the country and some neighboring countries.

### **Payment for Environmental Services**

The utilization of the integrated values of ecosystem services of which development of tourism and services is the premise for sustainable development of Lam Dong province. The ecosystem values of the Langbiang biosphere reserve have brought sustainable livelihoods to local communities through a program of payment for forest environmental services (PFES) of the Vietnamese government. There are more than 8,000 households benefitting from PFES in this biosphere reserve through their contributions to the protection and maintenance of ecological values.

Langbiang Biosphere Reserve aims to harmonize natural landscapes and biodiversity with sacred, cultural intangible heritage and to conserve and develop within National Agenda 21. A national policy of payment for environmental services (PES) is being conducted, and new approaches of payment for ecosystem services, forestry allocation for farmers, and forestry hire for tourism companies and ecotourism have been implemented to meet the balance of “conservation for development



and development for conservation,” within the Agenda 21 context. This biosphere reserve is also applied in the Man and Biosphere of Vietnam’s SLIQ (System thinking, Landscape planning, Inter-sectorial coordination, Quality economy) approach to designing and implementing a management plan, including the zoning and function of the biosphere reserve.

The SLIQ approach has been used to establish Da Lat as a center of tourism, education, and scientific research for the country as well as an international research center for tropical forests. This also helps to promote the development of hi-tech agriculture, focusing on producing and exporting vegetables, flowers, and organic agricultural products. Langbiang biosphere reserve also creates more opportunities for indigenous communities to participate in economic development activities and environmental protection, thereby improving their livelihoods. In addition, the positive contribution of the Vietnamese government is acknowledged in the implementation of international commitments to biodiversity conservation, climate change, and sustainable development for millennium goals initiated by the United Nations.

### **References**

1. Abramov A.V., Kruskop S.V., and Shchinov A.V. (2009). Small mammals of the Dalat Plateau, Southern Vietnam. *Russian Journal of Theriology*, 8(2): pp. 61-73.
2. Adler G.H., Mangan S.A., Suntsov V. (1999). Richness, abundance, and habitat relations of rodents in the Lang Bian mountains of Southern Vietnam. *Journal of Mammalogy*. Vol.80(3): pp.891-898.
3. Eames J.C. Endemic birds and protected area development on the Da Lat plateau, Vietnam. *Bird Conservation International*. (1995) Vol. 5(4). pp.491-523.
4. Tran Thi Thu Trang (2006). Conservation of the Threatened Conifers in Dalat Plateau, Vietnam. Report to BP Conservation Programme Project .

## **BORNEENSIS — a Central Collection of Biocultural Resources in Sabah Borneo**

Charles S. Vairappan

Institute of Tropical Biology and Conservation,  
Universiti Malaysia Sabah, Kota Kinabalu, 88999, Sabah, Malaysia

**Contact:** csv@ums.edu.my

**Keywords:** BORNEENSIS, natural sciences, biodiversity, traditional knowledge

Sabah is located in the northern part of the island of Borneo. It has a mild climate, and supports a mega-diversity of plants and animals that has helped Malaysia to earn its status as one of the 17 mega-diversity countries. Most of Sabah's biodiversity is found in the forest reserves, which occupy about half of its total landmass of 7.34 million hectares. Sabah's forest reserves are an integral part of the 20 million hectares of equatorial rainforests demarcated under the "Heart of Borneo" tri-government initiative (among Malaysia, Indonesia, and Brunei Darussalam) aiming to sustainably conserve and manage tropical forest biodiversity.

The BORNEENSIS collection centre was established at the Institute of Tropical Biology and Conservation in 2002, and it houses collections of Bornean flora and fauna specimens. It serves as a reference centre and as a centre of knowledge dissemination. The importance of these natural science-based specimens is further enhanced by the incorporation of Bornean traditional knowledge, which is derived from the many indigenous tribes. BORNEENSIS also plays an important role in sharing this knowledge with the people who are directly involved with conservation, and with communities and society. The collection at BORNEENSIS is an important biocultural heritage that belongs to the land and people of Sabah, and the role of the institute and university is to document, safeguard, and disseminate its knowledge.

## **Homestay Program: Benefits to the Local Community in Sabah**

Duanis Magirong

Homestay Association of Sabah, Malaysia

**Contact:** djuanis@yahoo.com /djuanismo@gmail.com

**Keywords:** Homestay program, Rural tourism industry, Ecotourism, *Tagal* system

The rural tourism industry has been developed through a homestay program to provide benefits to the local community in Sabah. The homestay program was introduced in Sabah in early 2000, and has helped many communities improve their socio-economic status. Community homestays provide a good opportunity to maximise the benefits of biological diversity as sources of attraction and provide a package of attractive tourism products to tourists.

To ensure the continuity of this program, the management, development, and conservation of this diversity should be maintained with the full involvement of the community itself. This is a very effective conservation measure to reduce the impact of global destruction of both biological and cultural diversity.

The establishment of the river *Tagal* system, for example, has brought many visitors to the villages to enjoy package tourism products beyond enjoying the river, that are well maintained by the community. Tourism-based ecotourism is beneficial in the long term if the local community maintain the environment wisely.



## **Assessing Socio-Ecological Systems (SES): Visioning a Sustainable Future of Laguna de Bay**

Maria Victoria O. Espaldon<sup>1</sup>, Carmelita M. Rebancos<sup>1\*</sup>, Sofia A. Alaira<sup>1</sup>, Lourriel S. Macale<sup>1</sup>

School of Environmental Science and Management,  
University of the Philippines Los Baños<sup>1\*</sup>

**Contact:** cmrebancos@up.edu.ph

**Keywords:** socio-ecological system, Laguna de Bay, visioning and scenario-building, participatory modeling

A socio-ecological system (SES) is a system integrated between nature and human society or between the social and biophysical agents on multiple temporal and social scales. The SES was used in this project as a platform for synthesizing integrated information from biophysics (geophysical hazards, pollution, and watershed management) and the social component of the southern bay of Laguna de Bay. The southern bay is composed of Calamba City, and the municipalities of Los Baños and Bay. Baseline information has been synthesized through conducting a comprehensive literature review using secondary data from 2005 to 2015.

In the assessment of the SES aspect of Laguna de Bay, two methodologies, namely, visioning and scenario-building, and participatory modeling, were employed when conducting surveys and focus group discussions. Through random sampling, 17 barangays (villages) representing coastal and upland barangays from the three municipalities were selected as the study areas. From each barangay, 30 respondents were selected. The target respondents include heads of households, government officials in the local units, farmers, fisherfolk, and members of local organizations involved in the lake's management. The project aims to determine the views, knowledge, and perceptions of the local communities concerning the use of Laguna de Bay, to discuss the development issues in the area by creating "visions" and future images of the lake, and to provide measures to address the social and environmental issues in the area. It also aims to provide policy recommendations for the sustainable management of Laguna De Bay. Biological assessment through identification of key indicator species is also being conducted as part of the project to complete the profiling of the lake.

### **References**

- Halliday, A. and Glaser, M. (2011). A Management Perspective on Social Ecological Systems: A Generic System Model and Its Application to a Case Study from Peru. *Human Ecology Review*, Vol. 18, No. 1, 2011. p. 2.
- Janssen, M.A. and Ostrom, E. (2006). *Handbook of Computational Economics: Governing Socio-ecological Systems*. (Tesfatsio, L. and Judd, K.L. eds.). Chapter 30. Elsevier B.V. p.1466.
- Lasco, R.D., M.V.O. Espaldon, and M.A. Tapia (2005). *Ecosystems and People: The Philippine Millenium Ecosystem Assessment (MA)*. Subglobal Assessment. Synthesis Report. Environmental Forestry Programme, College of Forestry and Natural Resources, University of the Philippines Los Baños.

## **Biocultural Diversity, Law and Cities**

Guilherme Cruz de Mendonça

Federal Institute of Education, Science and Technology of Rio de Janeiro, Brazil

**Contact:** guilherme.mendonca@ifrj.edu.br

**Keywords:** biocultural diversity, cities, environmental law, implementation

### **Introduction**

This paper presents the main results and continuations of the PhD research titled “Biocultural Diversity, Law and Cities: Legal framework implementation in the city of Rio de Janeiro, Brazil” submitted in 2014 to the Interdepartmental Program in Environmental Sciences of Rio de Janeiro State University, with a visiting PhD research fellowship at the Institute of Advanced Studies of United Nations University, Yokohama (2012–2013). The research goals of the original study were to analyze nature–society relationships as expressed through the concept of biocultural diversity (BCD) in urban areas, and to investigate the existence and implementation of a legal framework and public policies for BCD in cities. The research questions were as follows: Biocultural diversity, considered as an expression of the relationship between nature and culture, can be found in cities among “modern” social groups, or only among “traditional” people located in rural areas? In the case of an affirmative response, does the law recognize biocultural diversity in cities? If so, what is the legal framework, and what are the dynamics of implementation of the legal framework for biocultural diversity in the selected case study?

### **Literature review**

The research is anchored in four main theoretical dimensions: biocultural diversity and the trajectory of nature–society relationships in Western thought; sustainable urbanism; implementation and effectiveness of international environmental regimes; and critical theory and political ecology. Existing literature indicates that a rupture among culture, nature and unsustainable development models are related to environmental crises. As such, articulating biological and cultural diversity in cities falls under the umbrella of strategies to reconnect links between nature and culture, facing environmental crises.

### **Methodology, data collection and case study**

Quantitative, qualitative, field work and interdisciplinary methods were used in this research. Anthropological and environmental perception methods were necessary to observe the construction of biocultural diversity as an expression of nature–society relationships in cities, especially in the case selected. Furthermore, the study identified and described the international legal framework that established rights and obligations related to biocultural diversity. In Rio de Janeiro, Brazil, States Parties are tasked with establishing conservation policies and mainstreaming them along with other public policies, such as development policies, at the national level. The Constitutions of countries with the highest rates of biocultural diversity were analyzed to assess the alignment between international and national frameworks for biocultural diversity. At the local level, the city of Rio de Janeiro, Brazil, was selected as a case study for three primary reasons. First, it contains a significant level of biocultural diversity, which is under pressures from development and sports mega-events hosted by the city. Second, in 2012, the “Rio de Janeiro: Carioca Landscapes between the Mountain and the Sea” site was inscribed into the UNESCO World Heritage List, becoming the first megacity inscribed within the cultural landscape category. Third, Rio de Janeiro contains an innovative Master Plan, which is

the basic tool for local development policies. Institutional, financial and political discourse data were collected in order to analyze the dynamics of biocultural diversity as well as legal and public policy implementation.

### **Results and discussion**

The research revealed that biocultural diversity is present in megacities such as Rio de Janeiro, which is under pressure from outdated development models and gentrification. Further, non-traditional people, or modern and urban social groups, also can hold environmental knowledge and be actors engaged in promoting biocultural diversity. In addition, the law does recognize biocultural diversity and the robust, innovative and multiple relationships between society and nature. Research identified and described international, national and local levels of law regarding biocultural diversity; therefore, a biocultural diversity legal framework is complex and requires multiple-scale approaches. Locally, in the case of Rio de Janeiro, it was observed that the Master Plan brought the following three innovations: a local policy for cultural landscapes, the right to the landscape, and mainstreaming of policies for biocultural diversity into urban policy. Legally, the Master Plan is aligned with international and national rules on biocultural diversity; however, this legal approach has limitations because it does not mean that all factors that endanger biocultural diversity and protected cultural landscapes of “outstanding universal value” , such as recognized by 1972 UNESCO Convention on World Natural and Cultural Heritage, are being properly addressed or the behavior of actors has changed. The list of programs, budget, discourses and practices of local government reveal gaps between the law and its implementation, despite the existing legal framework and innovations. Such responses are partially implemented according to the actors’ interest, because the law is limited by power relationships and considered an instrument of status quo maintenance, increasing pressure on biocultural diversity. The transformation of this scenario may happen with the neutralization of the Theatrical State, reducing power asymmetries through social re-appropriation of nature and culture, but it will also likely require involvement from the law and the State. Therefore, participation and use of the emancipatory potential of the law can be seen as strategic.

### **References**

- Cocks, M. L. 2006. Bio-cultural diversity: Moving beyond the realm of ‘indigenous’ and ‘local’ people. *Human Ecology* 34(2), 185-200.
- Ingold, Tim & Kurttilla, Terhi. 2000. Perceiving the environment in Finnish Lapland, *Body Society* 6, 183.
- Leff, Enrique. Cortez Editora. 2002. *Epistemologia Ambiental*.
- Little, Paul. 2006. *Ecologia Política como etnografia: um guia teórico metodológico*. Horizontes Antropológicos, jan-jun, ano 12, n25, pp 85-13.
- Puppim de Oliveira, Jose Antonio; Balaban, O.; Doll, C.N.H.; Moreno-Penaranda, R.; Gasparatos, A.; Iossifova, D.; Suwa, A. 2011. Cities, Biodiversity and Governance: Perspectives and Governance Challenges for the Convention on Biological Diversity at the City Level, *Biological Conservation*, 144(5), 1302-1313.
- UNESCO. 2007. Links between biological and cultural diversity. Report of the international Workshop.
- Young, O.R. (ed.). MIT Press.1999. The effectiveness of international environmental regimes:causal connections and behavioral mechanisms.



## Protected areas: Boosting ecotourism in Albania

Enea Zenuni

Regional Agency of Protected Areas

**Contact:** eni\_cs@hotmail.com

**Keywords:** protected areas, ecotourism, sustainable development, stakeholders, cultural heritage

The relationship between tourism and the environment has occupied an important place in studies on tourism in recent years. Ecotourism is a major component of economic growth, especially in Albania's coastal zone where there is an incentive for sustainable development. Coastal ecotourism and tourism in general largely depend on an environment that visitors find attractive. Although there are many negative impacts of tourism that lead to various economic, social, and environmental problems, it still has a significant positive effect on the community and contributes to sustainable growth. This paper aims to show how tourism boosts sustainable development in Albania, examines potential threats to long-term economic viability, explores the role of government in tourism, and identifies the main characteristics of the economy. What kind of ecotourism is expected to unfold in Albania? It is difficult to establish a solid answer since tourism is a new phenomenon in the country and is always changing. Yet it is certain that the future development of tourism in Albania relates to a new culture that is able to re-introduce people to their cultural identity and enhance their relationship with the natural environment. This new culture is based on both human and social aspects, is less unpredictable, and more conscious and organized. Ecotourism provides an alternative, sustainable model for developing Albania's travel sector because it brings together different types of ecotourism that share a general concept of the natural environment.

### Introduction

This study investigates ecotourism in Albania and the politics surrounding it. How does ecotourism fare in the country today? In short, the reader can anticipate what will unfold below. The criteria for Global Sustainable Tourism represent an attempt to explain the comprehensive nature of tourism, and are the minimum benchmarks that a tourism business should aspire to meet. Albania could mold its image as a new resort destination. The author's analysis shows Albania's potential; it can use its resources in tourism-related interests much more than it currently does. The Sector Strategy describes the strategic concept of tourism development by providing deliberate direction and expansion of tourist products; for example, Albania is an upcoming destination in the international tourism market, which draws foreigners to the country. Sustainable tourism is on the rise and consumer demand for it is growing. Companies have increasingly been creating "green" travel programs, and governments are forming new policies to encourage ethical practices or ecological tourism. Yet what does it mean to have true "ethical tourism?" Sustainable Global Tourism Criteria (TGB) are organized into four main themes: (1) effective planning and sustainability; (2) increasing social and economic benefits for local communities; (3) improving cultural heritage; and (4) reducing negative impacts on the environment. Although these indices were initially conceived for the hotel industry, they can be widely implemented throughout the tourism sector. They are part of the community response to the challenges of global tourism.

### Objective

Tourism today is one of the most powerful industries in the world and as such, has a negative impact on economic and social development in many countries, especially developing ones, where it is seen as one of the most important sources of income, job opportunities, economic diversification, environmental protection, and intercultural exchanges. In Albania, especially in

recent years, countless investments have been made in road infrastructure, water resources, and enhancing the water supply and sewage system. Other factors affecting the improvement of conditions for tourism are the rise in living standards, the quality of food, and reducing transportation costs by continuously making infrastructure better. These and numerous other indirect measures have caused the necessary and viable tourism industry to develop rapidly. Albania is a developing country with a growing economy and positive dynamic – which is rare in the region and the times we are living in. Considering the fact that income from tourism has exceeded Albanian exports in value, and that for the first time in history, the number of visitors has exceeded the population, it seems that tourism will become a main branch of the economy in the years to come. However, are there risks to growth in this new sector? How much are we prepared to reduce our environmental impact in order to simultaneously ensure sustainable development of the industry and environmental protection? Pressure on the environment develops in any other field. Tourism not only contributes to rapidly wasting natural resources such as water, energy, oil, food, and other substances. This industry multiplies the population in popular destinations, but also increases pressure on the ecosystem, seas, lakes, wetlands, and wildlife. Ecotourism generates pollution, ranging from air contamination following the rapid growth of transport, increased noise levels, as well as greater amounts of solid rubbish and urban waste water.



Photo by the Regional Agency of Protected Areas, Shkoder, Albania

## Conclusion

At one time, a widespread rumor underlying Albania's tourism boom showed what all those working in the sector feared: things are not going as well as expected. Perhaps the main reason is the abolition of visas for Albanians, who have already made tourism in the area comparable to the Mediterranean for the general population, and who were previously unable to move because of the old regime. Albanians travel for many reasons: curiosity, meeting with relatives, but also enjoying fame. In Albania, everything is normal and acceptable, even justifiable, yet it is troubling that this year, there is likely to be a significant decrease in the number of tourists.

## References

- Country in Europe, Annex to the Programme Framework Document – Environment  
Hall D. R. (2000): "Tourism as Sustainable Development? The Albanian Experience of "Transition"", in the *International Journal of Tourism Research*, 2: 31-46  
J. (2000): "Consensus and Conflict: The Socio Economic Challenge Facing Sustainable Tourism Development in Southern Albania," in the *Journal of Sustainable Tourism*: 510-524  
UN Albania (2007): One Environment Albania: Integrating Environmental Sustainability in Development Priorities of a "One UN" Country in Europe

## **Biocultural diversity and conservancy education for primary school students in Patagonia, Argentina via the cosmogony of indigenous community representatives and park rangers' field experiences**

Roberto José Bubas

Principal Park Ranger, Secretariat of Conservancy and Protected Areas,  
Government of Chubut Province, Argentina

**Contact:** rbubas@hotmail.com

**Keywords:** Aboriginal cosmogony wisdom, environmental education, biocultural diversity

Indigenous knowledge has been explored and used in educational programs in Chubut Province, Patagonia, Argentina in order to create environmental awareness in schools and the broader society.

Park rangers are working with aboriginal chiefs and shamans toward this goal, the main aim being to integrate ancient indigenous wisdom and cosmogony into modern society in order to teach people how to interact with nature in a harmonious way.



## **Saving Wildlife Corridors in Bénoué National Park in Northern Cameroon**

Simeu Walters Youbi

North Regional Delegation for Forestry and Wildlife

**Contact:** s\_wal2000@yahoo.com

**Keywords:** wildlife corridors, northern Cameroon, endangered species,  
local population, community development

Bénoué National Park (180,000 ha) in northern Cameroon harbors very important wildlife species such as elephants, buffalos, and giant elands. The park draws many foreign tourists for safari and hunting expeditions. Today, the Sudanian Savanna is facing numerous threats from the local population; for example, poaching, gold mining, tree felling, charcoal production, cattle grazing, and farming, which has resulted in the extinction of key species such as the black rhinoceros (*Diceros bicornis longicipes*) and the African wild dog (*Lycaon pictus*). This project, put in place to manage the local population's use of the wildlife corridors (in terms of community hunting concessions), is geared towards liberating these corridors to allow wild animals to move freely and naturally. This zone acts as a buffer to Bénoué and comprises 7 main corridors that link the two other major parks in the region: the Faro and Bouba Ndjida national parks. During this project, the local community has been involved in protecting the corridors by fighting poaching, ecological monitoring, capacity building for income generating activities (for instance, in areas such as apiculture, market gardening, ecotourism), and the proper management of wildlife royalties to effectively develop social amenities (such as bore holes and health centers).

The limits of the corridors were clearly demarcated using sign boards and forest tree species planted all along them. The village anti-poaching team carries out regular patrols, the management team for proper implementation and evaluation holds regular planning meetings, and 30 villagers and 10 rangers are trained to carry out ecological monitoring.

This plan for proper land use has greatly contributed to preserving the animals that use these corridors to migrate, (Giraffes, elephants, buffalos, giant elands), and also plant species that constitute the wildlife habitat. Furthermore, this initiative should be extended to other hunting concessions in this region.



### **References**

Mbamba Mbamba Jean Paul Kevin, Bénoué National Park Report 2016, Cameroon.

## The Chepe Hill Case Study: Recovering Biological and Cultural Context

Alejandra Soto-Prado

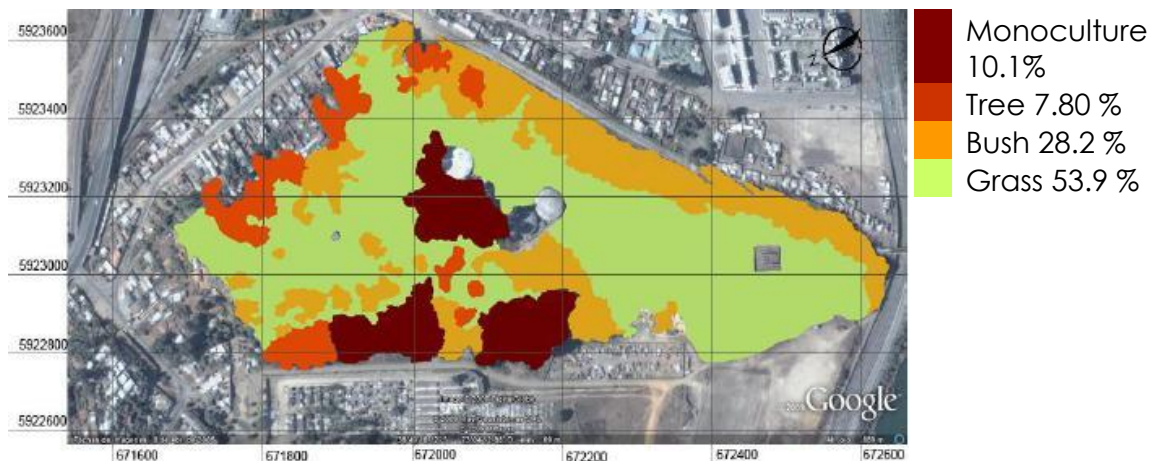
Pronativo, Concepción, Chile.

**Contact:** alejandra@pronativo.cl

**Keywords:** metropolitan park, urban hill, flora, fauna recovery

The city of Concepción, Chile is located on the Pacific coast. The topography is mostly plain and surrounded by the Cordillera de la Costa, a chain of medium-high hills. Among them is Chepe Hill, a historic site right next to the Biobío, the widest river in Chile. For many years, this important geographic and historic hill has been left unattended and forgotten, subject to many forest fires, the introduction and spread of exotic and invasive species, and destroyed by the local population. In 2013, the local government presented a plan to the community to recover the hill and build a metropolitan park. The idea was very well received and many organizations started working alongside the local government to study the actual state of the hill and plan strategies to recover native flora and fauna. The organizations have produced an extensive inventory of flora and fauna, a study of vegetable coverage, and designs to construct gazebos and infrastructure for tourism activities.

### Vegetable coverage on Chepe Hill



### References

- Municipalidad de Concepción, Plan Estratégico Municipalidad de Concepción 2014-2016.
- White. 1952. Planning Toronto: The Planners, The Plans, Their Legacies, 1940-80. UBC Press
- Parks, R. and Oakerson, R. 1989. Metropolitan Organization and Governance: A Local Public Economy Approach, *Urban Affairs Review*, 25(1), 18-29.

## Introducing *Thysanolaena maxima* (Hill Broom Grass) Cultivation and Developing Small Scale Business Activities in Kandhamal District

Prakash Chand Gogineni

Odisha Forestry Sector Development Project, India

Contact: chandgp2007@gmail.com

**Keywords:** Hill Broom, Kandhamal, *Thysanolaena maxima*

### Introduction

The tribes of Odisha have traditionally collected hill broom grass (*Thysanolaena maxima*) from forests and sold it in local markets through middle men. Over the years, the availability of hill broom in natural forests has declined, and collectors have had to travel long distances to gather it. Therefore, this project was created to develop a package of practices for cultivation on marginal farmlands owned by tribes, and to develop a business model for the tribal communities of Kandhamal district so they can add value and market hill broom grass.



Women SHG members making broom sticks in Badeguda village in Kandhamal district,

### Methodology

To develop a package of practices, sites were selected in all 12 administrative blocks of Kandhamal district. Trials were conducted to standardize the spacing of planting slips, fertilizer dose applications, agronomy practices, harvesting, and yield levels. All sites were placed under rain-fed conditions, and no irrigation was provided. Simultaneously, 50 tribal dominated villages were chosen that had Joint Forest Management (JFM) committees, formed under the JICA-assisted project of Odisha Forest Department. In all villages, one self-help group (SHG) of women was selected to conduct small business activities with hill broom production. Each SHG had a minimum of 10 members and a maximum of 15. The groups received training in capacity building in the form of design development, accounting, and book keeping. The groups were also given a revolving fund of Rs 1 lakh to run their enterprises. The Forest Department provided the financial support through the JICA-assisted project in 2012. The first batch of purchases of hill broom occurred from February-March of 2013. Marketing was initially arranged at the district level through meetings with buyers who organized the sale.

### Conclusion

The package of practices for cultivation was standardized and the best trial yielded 50q/ha. The 50 SHGs involved in small-scale businesses completed a total turnover of 250 quintals of raw brooms, and made a total profit of Rs 5lakh. The businesses' goals were completed in a span of 2 months. The practice of cultivating hill broom grass on the farmlands of tribal villages in Kandhamal district and the production of broom sticks via small businesses has yielded good results; household income can be increased, especially for female members of the community.

### Reference

OFSDP Publication 2014, Hill broom success story in Kandhamal, OFSDP News Letter, Volume 12, pages

## A Community-Based Project for Sustainably Managing and Restoring a Degraded Forest Landscape in Rourkela Forest Division, India

Sanjeet Kumar<sup>1\*</sup>, A.K. Pattanaik<sup>2</sup>

<sup>1\*</sup> Divisional Forest Officer, Rourkela Forest Division, Rourkela, Odisha, India

<sup>2</sup> Principal Chief Conservator of Forests & Project Director, Orissa Forestry Sector Development Project, SFTRI Campus, At/P.O. Ghatikia, Bhubaneswar 751003, Odisha, India

**Contact:** drsanjeet@gmail.com

**Keywords:** OFSDP, JFM, Community, Forest, Rourkela

Odisha State in East India has a wealth of natural forests ranging from coastal mangroves in the Bay of Bengal, to dry and moist types of tropical deciduous forests in the Eastern Ghats. The last century has experienced much forest degradation due to increased biotic pressure in terms of increased population size, the technological revolution, and the unsustainable exploitation of natural resources. Rourkela is one of the major industrial towns of Odisha State in the mineral belt bordering Jharkhand, and has faced one of the highest levels of human interference leading to forest degradation. Much of the remaining forest is under huge pressure from forest fires, livestock grazing, slash-and-burn agriculture, wildlife poaching, and illegal or unregulated collection of fuel wood, timber, and other forest products. Although the Participatory Forest Management approach has a long history in Odisha but is not yet dynamic in its present form, the Joint Forest Management (JFM) initiative resulted from the Orissa Forestry Sector Development Project (OFSDP) beginning in 2006. The JFM started to focus on providing inclusive support to local communities living within and around degraded forest zones by promoting and enhancing alternative livelihoods through community participation, the goal being to reduce dependence on forest resources. This case study describes the participatory process and mechanisms that evolved in Rourkela forest division with 174 *van suraksha sameetee* (VSS), demonstrates how management interventions can effectively restore the forest landscape, and outlines the process of the community sustainably administering natural resources. Socio-economic indicators have been empirically compared in this study. Lessons learned include the importance of developing a shared vision at the outset, and joint government-community collaboration in terms of building capacities. The enhancement of women's socio-economic conditions is one of the major outcomes of the project in Rourkela forest division.



### References

- OFSDP (2007b) Van Samrakshyan Samiti (VSS), Management Manual, Orissa Forestry Sector Development Project, Department of Forest and Environment, Government of Orissa, 75p
- Michael J.B. Green, Manoj Misra, Arun K. Bansaland, & R. Raghu Prasad, "Eco-development in Orissa's protected areas: A participatory approach to conserving forest biodiversity and alleviating poverty piloted in Satkosia," *Tropical Conservancy*, 62-70

## Asian trees: Improving air quality in Kosovo

Emira Polloshka

NGO “3E-Education for Energy and Environment”

**Contact:** emira.polloshka@gmail.com

**Keywords:** *Paulownia*, Energy, Environmental Protection, Air Pollution

### Background

Humanity is facing many major problems such as increasing welfare, which results from sustainable economic development and strengthening national security. Both of these issues overlap and are affected by many other factors that impact the social and economic development of any country, but one issue remains: the main elements are sustainable energy and environmental protection. Electricity is an inevitable part of our lives. We are connected to electricity and technology at all times; nowadays, it seems impossible to live without them. Electricity is one of the most used forms of energy because it is relatively simple to transfer and exploit in different forms. There are different ways of generating electricity and depending on natural resources, each country defines priorities and strategies to generate it to fulfill consumer demand.

### Electricity Generation

Electricity can be created in various ways through power plants as well as hydro, wind, solar, and nuclear power. In Kosovo, the main source of electricity is coal; although Kosovo has a very large supply of coal, it is a finite resource, meaning it will not last forever. To produce just one megawatt of electricity in Kosovo, a power plant needs 1.63 tons of coal. For example, power plant “Kosova A” uses 1.83 tons to yield one megawatt, while power plant Kosovo B uses 1.43 tons. Knowing that Kosovo A generates 30% of the electricity produced in Kosovo and Kosovo B produces 70%, of the total output of the country’s power plants, the value of consuming coal to create one megawatt in power plants is 1.63 tons/MW. Given the great amount of lignite in Kosovo and the possibility of increasing production capacity, we have to find the most efficient way to lower environmental pollution. In 2015, Kosovo power plants produced 5360.99 GWh of electricity. Eight thousand gigatons of carbon dioxide were released, totally disregarding any international law on environmental protection or sustainable life.

Air quality and environmental protection in Kosovo have not been priorities for a long time. A lack of generating capacity necessary to fulfill customers’ needs in the country has caused electricity to be produced regardless of environmental impact.

### Improving Air Quality

Recently, the Ministry of Agriculture and the Ministry of Environment have been writing a platform on environmental protection, with a focus on planting trees in public spaces and offering grants and donations to farmers willing to cultivate products declared a priority by the Ministry of Agriculture.

One of the main areas of focus is *Paulownia*, a genus of 6 to 17 species of flowering plants in the family *Paulowniaceae*. They originated in many regions of China, southern and northern Laos, Vietnam, and have been cultivated for a long time elsewhere in eastern Asia, most notably in Japan and Korea.

This genus has an extraordinary growth rate and huge air filtering leaves that convert carbon into oxygen at a higher rate than almost any other type of tree. *Paulownia* trees are rapidly becoming an important part of the solution to fight global warming. They can consume and



convert polluted air at 3-4 times the rate of other trees. *Paulownia* produce more oxygen than just about any other tree due to their extra-large leaves and rapid growth rate. They are one of the most valuable kinds of trees for releasing oxygen back into the atmosphere. They grow 10-15 feet a year, and can yield harvestable-size timber in 7-10 years. The tree should be cut back to the ground in early spring of year two for even faster growth. *Paulownia* trees can regenerate up to 7 times from 1 stump. The leaves of the *Paulownia* are high in protein (21%) and nutrients, providing good fodder for livestock. They are excellent for growing together with different crops in the same field. They are used widely in China by farmers who plant them in fields and grow grain crops beneath them. The roots go very deep and do not compete with crops for water and nutrients. Grain crops planted beneath *Paulownia* trees have a higher yield because the trees improve the climate and reduce the damaging effects of strong winds. When the leaves drop, they decompose quickly and release valuable nutrients back into the soil. After 8-10 years the trees can be cut for timber and provide farmers with extra income. They will regenerate again from cut stumps, saving the cost of replanting fields.



*Paulownia* Tree cultivated in Kosovo (Radavc), 2016

### **Conclusion**

By investing parallel in deforestation and renewable energy, Kosovo will declare a war against air pollution and non-renewable energy. However, by investing in biodiversity, and foresting public spaces such as forests and protected zones, government institutions will be spend less and be more practical for a small country such as Kosovo. This pilot project is proof that biodiversity does not recognize nations, continents, or global warming.

### **References**

- Balanca vjetore e energjisë në republikën e Kosovës (2015), Kosovo Agency of Statistics  
<http://www.primevalgardens.com/Environment.html>  
<https://en.wikipedia.org/wiki/Paulownia>

## **Landscape Restoration through Farmers' Catchment Activities: Fighting Deforestation and Improving Crop Production in Mlauli and Dambe Areas, Malawi**

Emmanuel William Ngwangwa

District Forestry Officer, Ministry of Natural Resources, Energy and Mining, Malawi

**Contact:** engwangwa50@gmail.com

**Keywords:** landscape restoration, catchment, deforestation, crop production

### **Introduction**

Deforestation, which occurs through human activities, poses a threat to Malawi's natural resources. Wood for construction, fuel energy, environmental protection, traditional medicine, and curios are becoming scarce and unreliable. Government policy allows individuals, communities, governments, and non-governmental organizations (NGOs) to own, manage, and sustainably use the natural resources of trees and forests for their benefit.

Reasons for deforestation include human activities such as carelessly cutting down trees to make charcoal, creating new spaces for cultivation, brick burning, and uncontrolled bush fires. Inadequate alternative sources of fuel for heating and cooking are making charcoal production the main cause of deforestation. An initiative to restore the landscape in the areas of Mlauli and Dambe is bearing fruit for short, mid, and long-term solutions.



People mobilized to plant trees to restore graded areas

### **Objective and Methodology**

To look at strategies being put in place to cope with the current circumstances in the absence of alternative energy sources, and the role of the government and communities in containing the problem in the short, mid, and long term.

Communities identify the challenges they face and brainstorm solutions with assistance from Government Extension Workers/officials. In the areas in question, they are implementing activities as a package to restore the landscape. They are taught to carry out tasks aimed at managing catchment activities such as growing trees, soil conservation, and gully reclamation. There are also loans and grants available for communities who realize natural resource management activities.

### **Results and Conclusion**

In turn, this gives them their own forest resources, which reduces pressure on protected areas. Crop production for increasing both food and cash results from good farming methods.

Trees and forests are the backbone of all natural resources. Without trees and forests, other natural resources suffer and eventually disappear. Landscape restoration expands forest cover, the availability of water resources, game/animals, and soil fertility. This leads to increased crop yield and assured environmental protection.

Landscape restoration is best done by the communities themselves, with assistance from the government, NGOs, and other development partners. This will allow them to own and benefit from the initiative, in turn helping them improve their livelihoods.

## Implementing an Ecosystem Approach to Fisheries Management in Sabah, Malaysia

Jessie Beliku

Department of Fisheries, Sabah, Ibu Pejabat Perikanan, Aras 4, Blok B, Wisma Pertanian Sabah, Jalan Tasik Luyang (Off Jalan Maktab Gaya), 88624, Kota Kinabalu, Sabah

Contact: Jessie.beliku@gmail.com

**Keywords:** Ecosystem Approach to Fisheries Management, Food and Agriculture Organization, Integrated Fisheries Management Plan, inter-agency cooperation, stakeholder consultations

Malaysia is moving forward in line with a call by international organizations, such as the Food and Agriculture Organization (FAO), to implement the Ecosystem Approach to Fisheries Management (EAFM) in fisheries resources and marine ecosystems. Malaysia was appointed as the First Chair of the Regional EAFM Working Group for 2011-2013 for the multilateral partnership of six countries – comprised of Indonesia, Malaysia, Papua New Guinea, the Philippines, the Solomon Islands, and Timor-Leste (The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security, or CTI-CFF) – with the Department of Fisheries Sabah (DOFS) as the implementing agency. The DOFS is also the leader of the Sub Technical Working Group (TWG) for Goal 2 (“EAFM and other marine resources fully applied”). There are currently 3 districts in Sabah that have been selected as the demonstration and replication sites: Kudat, Semporna, and Sandakan. The DOFS is currently implementing 5 EAFM Projects and will carry out an additional two starting in 2016. There are 3 EAFM Projects in Semporna; their targeted species are small pelagics (sardines or *Sardinella lemuru*), bigeye scad (*Selar crumenophthalmus*), tunas (yellowfin tuna or *Thunus albacares*), skipjack tuna (*Katsuwonus pelamis*), albacore tuna (*Thunus alalunga*), and coral trout (*Plectropomus leopardus*). As for Kudat, the small pelagic EAFM Project is now under way; the targeted species are Indian mackerel (*Rastrelliger kanagurta*) and shortfin scad (*Decapterus macrosoma*). For Sandakan, the prawn EAFM Project is currently being realized; the targeted species are banana prawn (*Penaeus merguensis*), tiger prawn (*Penaeus monodon*), and yellow prawn (*Metapenaeus brevicornis*). As for 2016, two new EAFM Projects will be executed in Sandakan; the targeted species are Indian mackerel (*Rastrelliger kanagurta*) and shortfin scad (*Decapterus macrosoma*) for the small pelagic EAFM Project, and soft shell crab (*Scylla seratta*) for the soft shell crab EAFM Project. The final objective of each EAFM project is to strengthen awareness and knowledge of resource management through EAFM, as well as to introduce fisheries concepts, principles, and indicators. In addition, the EAFM projects aim to generate a localized management plan for a strong legislative, policy, and regulatory framework, the goal being to realize EAFM initiatives that addresses common trans-boundary policies and regulatory concerns, such as over-fishing. The formulation of each Integrated Fisheries Management Plan (IFMP) follows a method of collecting secondary data and conducting a literature review; gathering primary data entails surveys and interviews, scientific studies involving biological and ecological research, and stakeholder consultations. Obstacles to program implementation include insufficient funding, a lack of human capacity, and the lack of a succession plan. Carrying out EAFM projects poses a challenge as they require commitment from other agencies, which need to come together to identify issues and provide suggestions for the way forward. Inter-agency cooperation is essential, since most issues underlying the EAFM Projects overlap. In order to overcome these problems, it is important to choose the right personnel to

steer both current and future projects. Personnel and upper management should also clearly understand the entire process of planning, protocol, negotiating, implementing, and monitoring the EAFM projects.

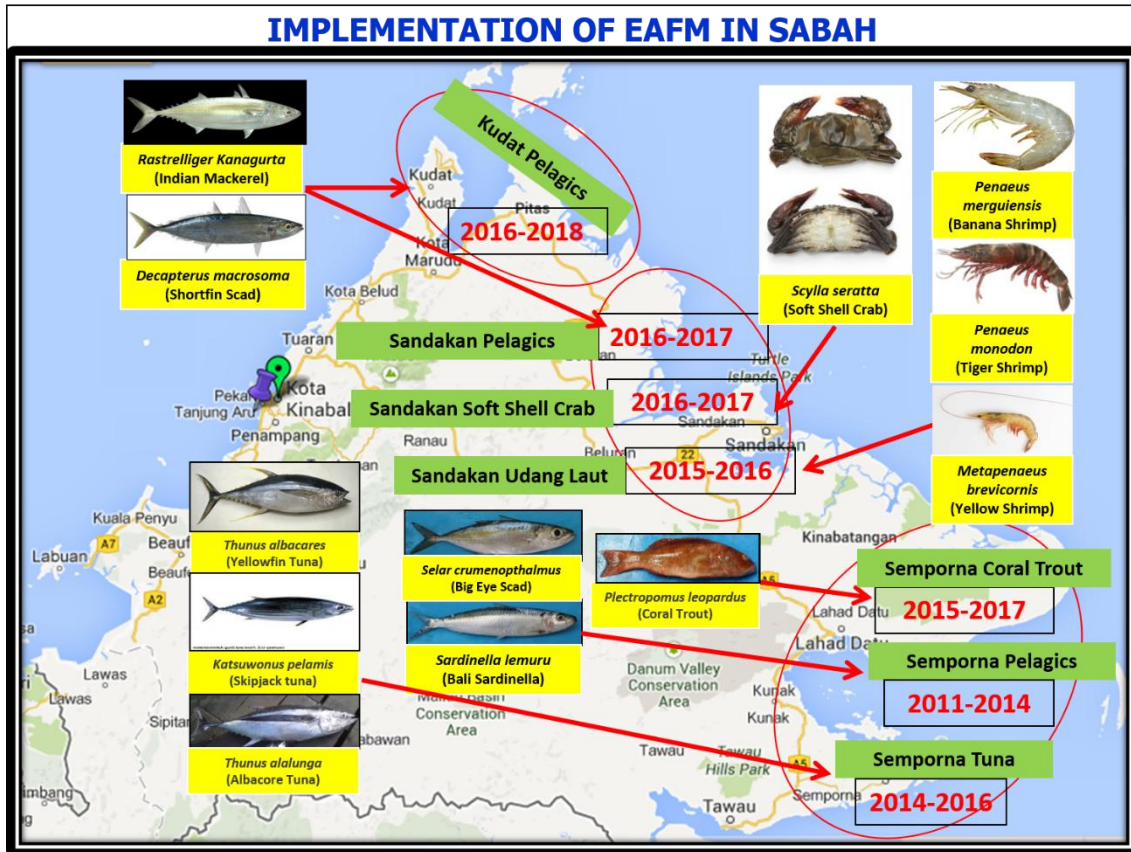


Figure 1: Approximate locations of project sites and selected species in Sabah, Malaysia

## References

<http://www.fao.org/docrep/005/y4470e/y4470e00.HTM>

## Local People's Participation in Watershed Management in Nepal

Nirmal Thapa

District Soil Conservation Office, Tanahun District, Nepal

**Contact:** nirmalthapa119@gmail.com

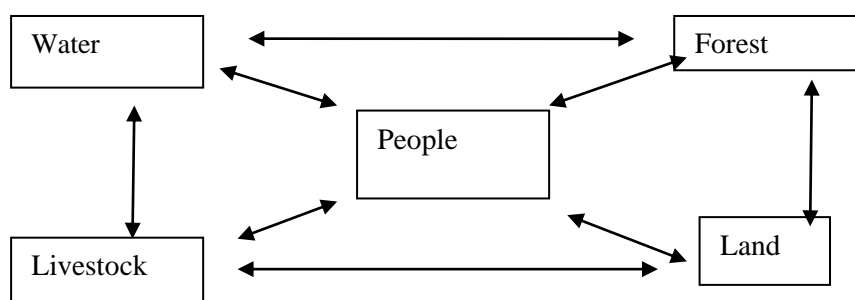
**Key words:** local participation, livelihoods, collaboration, stakeholders, prioritized watershed planning

Local people's participation is inevitable in any kind of development work. In watershed management, residents play a vital role in all stages, from planning to evaluation. The District Soil Conservation Office (DSCO) is carrying out programs in prioritized watershed planning, in turn enhancing active participation among citizens. The strength of the Ward Coordination Committees (WCCs) differs from each others. The DSCO provides funds and technical support to all WCCs on an equal basis. In all situations, activities were not completed on time and did not have the expected quality. Residents who did not actively take part in WCCs could not complete their duties as planned. It was common that those who were involved more did not finish their tasks.

Without local participation, we could not conduct any activities in watershed planning, as legal provisions are necessary. The percentage of people who are participating is not clear in terms of specific activities. The question remains as to how many people could appropriately work in WCCs. Thus, this paper tried to find out the average number of people taking part in development activities inside the watershed.

This case only covered 72 user groups (WCCs) from the prioritized watershed of Tanahun District which includes 4 Village Development Committees (VDCs). Group discussions, meetings with elite figures, an analysis of estimated costs, and meetings with line agencies occurred during the study.

Watershed management is an integrated approach in which all of the following components (shown below) are managed in conjunction with livelihoods and promoting natural resources. Watershed management is fully focused on human livelihoods, along with natural entities and simultaneous components such as land, livestock, forests, and water, the goal being to achieve synergistic outcomes.



Watershed management is a complex system. Multidisciplinary, technical human resources are critical to planning, organizing, implementing, and monitoring a high level of local participation. Without active participation from residents, watershed management cannot

function properly. Only multisectorial efforts can boost watershed management; it is an integral part of livelihoods in rural areas, where the social structure is changing. Youth are leaving villages and only the elderly, women, and children remain, responsible for earning a living. In this context, local participation is very difficult to achieve, and it is challenging to carry out developmental activities in rural communities.

The study was limited to a prioritized watershed. The DSCO provides all necessary goods and technical support to all WCCs on an equal basis. Some WCCs could not complete the programs on time. This situation created an uneasy relation between the WCCs and the DSCO. Tasks were completed when the proportion of local participation was less than 20% of the total programmed cost. Others consistently failed to complete their tasks on time. They were always busy trying to earn a living. They could not set aside or manage time for developmental activities, which they prioritized second to earning a living.

Workshops were conducted in VDCs and involved all stakeholders. It was concluded that programs or activities must be planned with participation from all stakeholders, who must be committed to their efforts in all ward groups. The VDCs started to maintain complimentary funds for WCCs each year. The amount of residents involved must be kept below 20%. Other line agencies also managed the complimentary funds. Afterward, all programs should run smoothly inside the watershed and on time according to designed specifications.

Collaborative efforts help complete any development work at the local level. The involvement of all stakeholders during all stages with a minimum number of participants and regular monitoring maintains quality. Unless local people feel a sense of ownership, no programs will be successful in the local area.

## **Developing a strategic framework to conserve and exploit biological diversity in Nepal**

Manoj Chalise

The Government of Nepal, the Ministry of Forests and Soil Conservation

**Contact:** manojchalise.88@gmail.com

**Keywords:** biological diversity, conservation, strategies, NBSAP

Biological diversity refers to all living beings on earth and the ecological processes associated with them. It is often described hierarchically as ecosystem diversity, species diversity, and genetic diversity. Biological diversity is important in a number of ways including its utilitarian, ecological, and intrinsic values; preserving it is important for safeguarding the planet's life support systems. In Nepal, the livelihoods and well-being of millions of rural people directly and indirectly depend on it. Therefore, Nepal developed and carried out the Nepal Biodiversity Strategy (2002) and the Nepal Biodiversity Strategy Implementation Plan (2006) in order to protect and sustainably exploit biodiversity while fulfilling international obligations (MoFSC, 2002, MoFSC, 2006). Based on lessons learned from implementing these approaches, the Government of Nepal recently came up with the Nepal National Biodiversity and Action Plan (NBSAP) 2014-2020.

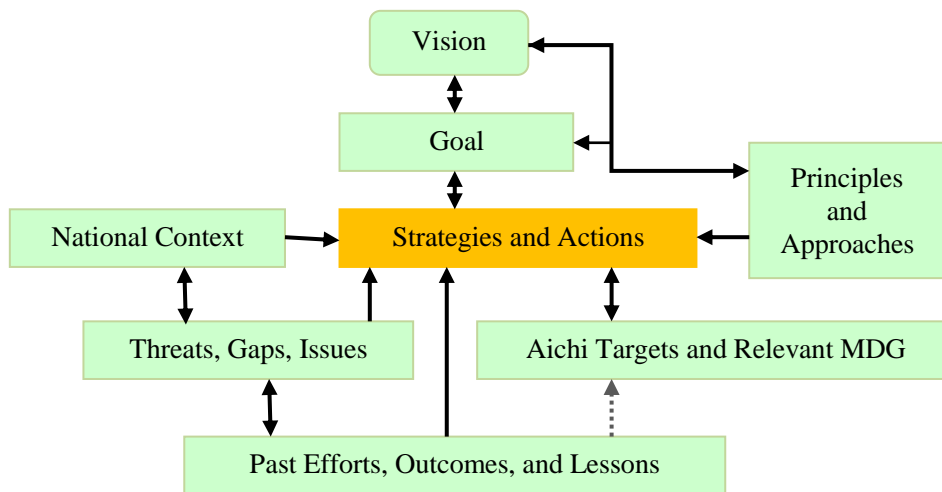
The NBSAP provides an overarching framework for overseeing Nepal's biological diversity. It has been prepared to meet the national needs for managing biodiversity on a sustainable basis to benefit present and future generations, and also to fulfill the country's international obligations. It has a long-term vision (i.e., 35 years) and includes specific short-term (up to 2020) strategies and priorities for action.

The methodology for preparing the NBSAP was primarily an extensive review of the current situation through relevant literature, analysis of available secondary data, and broad consultations with stakeholders and experts at various levels. The primary data was comprised of views, perceptions, and opinions. The Convention on Biological Diversity's Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets provided a broad theoretical framework and technical guidance.

The NBSAP covers the following: (i) the national context; (ii) threats to biological diversity in Nepal; (iii) efforts, outcomes, and gaps in managing biological diversity; (iv) a strategies for administering biological diversity; (v) arrangements for carrying out the plan; and (vi) a framework for a Local Biodiversity Strategy and Action Plan.

The vision for 2050 set by the strategy is "Conservation of biodiversity for sound and resilient ecosystems and national prosperity." The overall goal is to significantly enhance the integrity of Nepal's ecological systems by 2020, thereby contributing to human well-being and the country's sustainable development. NBSAP aims to provide a strategic framework for conserving and sustainably exploiting Nepal's biodiversity and biological resources, in turn enhancing local livelihoods and eco-friendly national development; furthermore, NBSAP strives to ensure that the benefits of biological resources are equally shared among all sectors of society.

The NBSAP is a key milestone in the history of biodiversity conservation in Nepal. Successfully implementing it is essential to achieving the targets.



**Figure 1:** Approach adopted in forming the strategies, goal, and vision (GoN/MoFSC 2014)

#### References

- GoN/MoFSC, 2014. Nepal National Biodiversity and Action Plan 2014-2020. Government of Nepal, Ministry of Forest and Soil Conservation, Kathmandu, Nepal
- MoFSC, 2006. Nepal Biodiversity Strategy Implementation Plan 2006-2010. MoFSC, Kathmandu
- MoFSC, 2002. Nepal Biodiversity Strategy. Ministry of Forest and Soil Conservation (MoFSC), Kathmandu.



## The Tree Kangaroos of Papua New Guinea

Leilani Kambuou

The Climate Change and Development Authority of Papua New Guinea

Contact: lkambuou44@gmail.com

**keywords:** *tenkile* conservation, tree kangaroo, Papua New Guinea

### An Introduction to Tree Kangaroos in Papua New Guinea

The tree kangaroo is commonly known as *tenkile* in the local language of The Toricelli Mountain Range, West Sepik Province, Papua New Guinea. The *tenkile* is endemic here in this vast tropical forest north of the island of New Guinea. The *Kangaroo family* is only found on the Austronesian continent; the world's remaining 14 species of tree kangaroos (*Dendrolagus*) are found in Australia (2 species) and Papua New Guinea (12 species) of which 3 species co-exist in the Toricelli Mountain Range. Two of these species is threatened that includes the *tenkile* or Scott's Tree Kangaroo (*Dendrolagus scottae*).

The tree kangaroo's main sources of food include tropical evergreen leaves, wild fruits and berries, and small insects on the forest floor. It has long limbs and a long tail that it primarily uses for climbing and firmly grasping tree branches; it spends most of its time on top of tall and large evergreens to feed.



*Tenkile* loves trees

Source: Tenkile Conservation Alliance, 2016

### The Relevance of Conservation Efforts for Tree Kangaroos

The biodiversity value is clear, given that the *tenkile* is endemic to mostly western slopes of The Toricelli Mountain Range of Papua New Guinea. It is the only species of tree kangaroo on the planet. The *tenkile* helps maintain the biodiversity of plants and tree species, which it uses to survive via seed germination, pollination, and the number of small insects that it eats.

The *tenkile* is part of the forest peoples' local customs and culture. It is a totem for multiple communities, which results in traditional conservation of natural habitats since some sites are sacred (these places are called *tambu* in Tok Pidgin, a language widely spoken in Papua New Guinea). Furthermore, its fur is used in ceremonies for adornments through respective beliefs in its spiritual powers. Historically speaking, it used to be a main source of meat for locals.

### The Importance of Conserving Tree Kangaroos

The number of tree kangaroos has decreased due to overpopulation and increasing demand for its various uses, especially culturally and as a source of food.

The Tenkile Conservation Alliance a leading non-governmental organization (NGO) that has made good progress in terms of increasing Papua New Guinea's *tenkile* population through conservation. This NGO has done so via efforts at maintaining biodiversity and strong community involvement, together with assistance from the local government as it strives to expand the tree kangaroo population in order to help it stabilize, and preserve the overall biodiversity of the plants and animals in which the *tenkile* interacts in the area.

### References

The Tenkile Conservation Alliance website, <http://www.tenkile.com/the-alliance.html>  
The Climate Change and Development Authority, Papua New Guinea, 2016

## Reforestation program for promotion of top grade charcoal production in the Noto Peninsula, Japan

能登でのお茶炭の産地化を目指した植林活動

Choichiro Ohno<sup>1\*</sup>, Haruka Naya<sup>1</sup>, Koji Ito<sup>2</sup>, Shinsaku Koji<sup>2</sup>  
大野 長一郎<sup>1\*</sup>, 納谷 春佳<sup>1</sup>, 伊藤 浩二<sup>2</sup>, 小路晋作<sup>2</sup>

Ohno Charcoal Factory<sup>1\*</sup>, Noto's Satoyama Satoumi Research Project, Kanazawa University<sup>2</sup>  
大野製炭工場<sup>1\*</sup>, 金沢大学能登里山里海研究部門 (珠洲市)<sup>2</sup>

**Contact:** notohahaso@gmail.com

**Keywords :** Charcoal production, abandoned arable field, oak reforestation, tea charcoal, charcoal-making promotion  
製炭業, 耕作放棄地, クヌギ植林, お茶炭, 産地化

### 背景と経緯

能登では古くから製炭業が盛んであり、木の生育サイクルに合わせた伐採を行うことで、資源が持続的に利用できるように里山を管理していた。それにより、多様な動植物の生態系の維持・保全と豊かな里海をつくりだしてきた。しかし、昭和 30 年代のエネルギー革命により、木炭の需要が減少し市場価格も下落したため、炭焼き職人は激減した。里山の利用者が減少したことで、下草刈りやツル切りなどの手入れ不足や更新伐の遅れによる巨木化、カシノナガキクイムシによるナラ枯れの被害拡大により、能登の里山は荒廃が進んでいる。

当工場は昭和 46 年に創業したが、木炭の市場価格の下落により経営難に陥っている。経営改善のためには高付加価値商品の開発が必要であったため、日本の伝統的な文化である茶道で使われるお茶炭の生産を決意した。お茶炭の原料はナラ類やクヌギであり、切り口が菊のように見えるクヌギ炭が最高級のお茶炭とされている。しかし荒廃した里山のナラ類はお茶炭には向かず、また良材に適した若いクヌギの群生地もないため大量生産は難しい状況であった。

そこで、工場近くの耕作放棄地にクヌギを植林することを始めた。道路沿いのため管理、搬出などの生産コストが削減され、適正管理により良材も確保でき、植林・育林ストーリーがお茶炭のブランド化に向けた付加価値になると考えたからである。また、景観を損ね、有害鳥獣の隠れ場所にもなる荒れた耕作放棄地の広がり、過疎地の深刻な農業問題であると同時に、里山保全上の重要課題にもなっていた。

2004 年、実際に 1000 本の植林を行ってみると、整地や植える作業、植えた後の管理に多大な作業と投資額がかかることが分かり、自分たちだけの力では難しいことが分かった。さらに、売上げ目標とクヌギが成長して伐採できるようになるまで 8 年かかることを考えると、毎年 1000 本の植林を 8 年続けなければならないと判明した。そこで植林を体験交流事業にし、ボランティアの協力を呼びかけたイベントを企画した。

### 植林活動の概要

植林場所として想定していた耕作放棄地は、かつて国営農地開発事業により里山林を造成した農地であったため転用には制約があり、簡単に植林はできなかった。しかし、県知事の許可を得て、2008 年に自らが主催となり、初めての植林イベントを行った。2009 年からは「人の手で里山を育み、活かす」といった里山本来の機能を取り戻し、日置地区で古くから伝わる「炭作り」を後世に受け継ぐことを目的として、活動

に賛同した地元の NPO 団体「能登半島 おらっちゃんの里山里海」と共催で、植林イベントを開催するようになった。2015年には第7回を迎え、これまでに6000本のクヌギ植林を達成した。

7年間の参加者数は延べ730名を超え、今までに市役所職員、地元青年団体、大学生、ボランティア団体、連合石川、漁業関係者、郵便局員、茶道関係者、里山里海マイスタープログラム修了生等の幅広い層の参加があった。また、環境教育の場として、高校生や小・中学生も参加している。そのうち市外からの参加者は300名近くとなり、交流人口の拡大にもつながっている。参加者には、クヌギを育てることや製炭、茶道におけるお茶炭の価値、里山保全について伝えている。実際に体験することで、より深く里山と地域産業、文化などのつながりを感じるきっかけになっていると考えられる。

耕作放棄地でのクヌギ植林は、生態系にもプラスの効果をもたらしている。金沢大学の調査では、植林8年後のクヌギ林床に、耕作放棄地では見られなかった森林生植物種の再生が確認され、種多様性の保全効果があることが示された。同様に、地表徘徊性昆虫の回復状況も検証中である。また、筆者による「能登里山マイスター」養成プログラムの卒業課題にて、LCA（ライフサイクルアセスメント）手法により木炭生産と植林が大気中のCO<sub>2</sub>固定効果を生み、地球温暖化防止に貢献していることも確認している。

## 展望と課題

この活動を続けることで、能登の里山を再び人の利用できる資源として蘇らせ、炭焼きを生業として確立させること、そして地域産業にすることを目標にしている。私の住んでいる集落は、世帯数が24世帯、人口50人（2016年4月時点）の限界集落である。ここをお茶炭の産地にすることで、集落の存続にもつなげたいと考えている。子どもを産み育てる場所としての「豊かな自然環境」を残し、誇りをもって命を繋げていける循環型地域社会を実現することが私の大きな夢だ。

そのための課題としては、まず植林地の拡大とイベントの継続が挙げられる。1人の炭焼き職人が生計を立てられるようになるには、8年間で毎年1000本のクヌギが必要だ。現在、植林本数は6000本であり、私一人分にも足りていない。産地化を目指すには、私以外の炭焼き職人が使うためのクヌギも必要なので、今後も植林を続けるために、植林地の確保とボランティアの協力を得なければならない。また、担い手の育成も課題となっている。炭焼きという仕事の魅力を伝え、能登で炭焼きをしたいという若人をいかに探し、育てるかが重要である。

クヌギの森づくり運動とお茶炭の産地化を通して、お茶炭を利用する側である茶道関係者、新たな里山ビジネスとしてのクヌギ植林を行う山主など、炭焼きを通して里山里海の保全・再生することの多様な価値を共有する人々の力をさらに得ることで、一人ではなし得ない大きな夢を実現させたい。



(写真) 地元の中学生と取り組むクヌギ苗づくり

## **Management of Agricultural Tools as Local Biocultural Resources in the Noto Peninsula, Japan**

Sakiko Kawabe

Kanazawa University Graduate School

**Contact:** sakikok125@gmail.com

**Keywords:** local biocultural resources, heritage management, farming village culture, agriculture

Agricultural tools are a significant medium through which to see how people interact with nature and develop their culture. Hence, researchers and national and local museums have collected and preserved these tools as historical and folklore artifacts in Japan. Recently, farming village culture and agriculture have been rediscovered and are now considered an important element of the region's heritage. This is evident in the increasing ecotourism market and more cultural or natural elements in farming villages that are designated as official national and international heritage.

Nevertheless, the collection of agricultural tools is often said to be disregarded in many municipalities and local museums. Although the expectation is that the museums would preserve and hand over the collections to the next generation as heritage or folklore artifacts, many of the collections end up merely being stored and nearly abandoned in poor-conditioned repositories. As such, this paper seeks to discover how agricultural tools can be managed and utilized as local resources.

This paper focuses on pre-mechanized agricultural tools that are kept not only by municipalities or museums but also communities and individuals, even after the tools were no longer used in agricultural practices following mechanization. Utilization of folklore artifacts, including agricultural tools, is often discussed only as an issue of museum or governmental policy; however, this paper argues that management of local resources is an issue for the wider regional society. The research area of this paper is the Noto Peninsula in Ishikawa Prefecture, Japan, where the farming village culture and nature are increasingly appreciated and designated as international heritage (e.g., UNESCO Intangible Cultural Heritage, "Oku-noto no Aenokoto," and a Globally Important Agricultural Heritage Systems (GIAHS) site, "Noto's Satoyama and Satoumi"). Although pre-mechanized agricultural tools are a part of the group of elements that compose local heritage, they seem not to be recognized as an important cultural property, especially at the municipal government level. For example, a city folklore museum was closed in 2007 and all items of the abundant collection were returned, sold, or donated to different places. I conducted a questionnaire survey and interviews there to clarify the current situation of pre-mechanized agricultural tools at the site and to gain insights for management of these tools as a local biocultural resource.

As a result, although all of the nine municipalities in the peninsula own collections of agricultural tools, in many of them, the collection is stored in inappropriate repositories such as closed school buildings because of facility shortages. Data collection, investigations and research are not conducted sufficiently because of labor shortages. Most of the items were found to not be utilized at all and even, in some cases, abandoned. Conversely, it was also found that pre-mechanized agricultural tools are sometimes actively utilized in dynamic and diverse relationships with people near the site. There are three ways to utilize agricultural tools as a local biocultural resource. First, agricultural tools are preserved and utilized as historical or

folklore artifacts to tell the past. This is similar to what museums do, but local communities and individuals do it in more diverse ways; for example, some tools are utilized for learn-by-doing of rice cultivation or for reproduction of singing traditional songs about rice cultivation. Second, agricultural tools are preserved and utilized as living heritage; for example, *tawara-ami-ki* and *tsutsunoko* (a wooden stand and wooden blocks to wave straw bags) are reused for *aenokoto* rituals; *korogashi-waku* (a wooden ruler to line a paddy field to plant rice) and *furo-guwa* (a hoe with wooden head armed with iron) are reused to conserve the landscape of a traditional terraced rice paddy fields; and tools to harvest rice which were formerly items in now-closed museums are being reused in a natural farming practices. Finally, agricultural tools are utilized as simple materials to manufacture something else; for example, a local group is making lampshades with local traditional paper and *korogashi-waku*, and a local resident utilizes *korogashi-waku* and other tools to display flowers at local events such as an elementary school's graduation ceremony.



**Photo:** Straw bags made for *aenokoto* ritual using *tawara-ami-ki* and *tsutsunoko* by a local resident. The old *mi* (a winnowing basket) made of woods and vines is also continuously used for the ritual.

Through this research, two important insights were found in relation to the diverse ways in which local communities and individual residents use pre-mechanized agricultural tools. One is that, in many cases, the communities and individual residents do not intend to preserve the agricultural tools themselves; rather, they utilize them for their own purposes, though this ultimately leads them to preserve the tools in a holistic biocultural context at the site. This suggests against dividing these resources into cultural and natural heritage, or tangible and intangible culture, but rather to consider each element in a holistic biocultural context of the site. The other insight is that the diverse ways of utilization can occur because the tools are not strictly preserved but actively used as tools in farming fields or modified to be used for different purposes than agriculture. This type of “loose preservation” allows diverse and alternative ways of utilization to fit the situation of the site. Cultural management by museums or government tend to follow unified rules even if the rules are not suitable and even impossible for unique regional situations. If museums and government try to observe what is happening to agricultural tools in the relationships with people and in a holistic biocultural context at the site, they can find effective and suitable solutions for the management of agricultural tools as local biocultural resources. Although some of the utilization activities by communities or residents can be difficult to continue if they do not have successors, if museums and government recognize these activities, they may be able to provide support through networks or suggesting innovative solutions. Hints toward the proper management of local biocultural resources are typically found at the site, if one is looking.

## **An action of Kanakura community for restoration of the community by utilizing biodiversity and culture based on landscape of the terraced paddy fields**

棚田景観に根差した生物多様性と文化を活用した、  
集落再生の為の金蔵集落の取り組み

Shinya Nomura<sup>1\*</sup>, Eijun Ishizaki<sup>2</sup>

Kanakura Research Institution of Nature and Culture<sup>1\*</sup>, Kanakura community<sup>2</sup>

野村進也<sup>1\*</sup>, 石崎英純<sup>2</sup>

金蔵自然文化研究所<sup>1\*</sup>, 金蔵集落<sup>2</sup>

**Contact:** cybisterjaponicus@live.jp

**Keywords:** Noto peninsula satoyama biotope, natural experience

能登半島、里山、ビオトープ、自然体験

金蔵集落は輪島市の中山間地に位置する農村である。金蔵は白雉年間（650年～654年）開基とされる金蔵寺を含む五ヶ寺と呼ばれる5つの寺と、12個のため池、棚田により形成された景観および生物多様性が評価され、世界農業遺産（GIAHS）ポータルサイトにおける「美しい日本の歩きたくなるみち500選（社団法人日本ウオーキング協会）」および「日本の里100選」（朝日新聞社・森林文化協会）に選出される他、集落中に蝋燭を灯す「万燈会」を初めとした各種のイベントや大学による研究活動などにより多くの団体が来訪しており、交流活動の場となっている。

一方で生物多様性については、2009年に能登半島里山里海自然学校および金沢大学による調査以外の取り組みは不足してきたことから、2014年からは輪島市内での親子を対象とした自然体験活動団体「輪島親子昆虫クラブ」と共同での自然体験および米作り体験、大学による生物学実習など様々な自然体験および保全活動を実施した結果、2015年には約150名以上が自然体験および保全活動に参加した。更に保全活動として2015年に造成されたビオトープでは2016年現在で絶滅危惧種8種を含む52種の水生動物が確認された。集落全体では16種の絶滅危惧種を含む71種の水生動物が確認されており、特に全国的に気象とされる大型水生甲虫類も見つかったことにより、金蔵集落の豊かな生物多様性が改めて確認されると共に、継続的な保全およびモニタリングの重要性が示された。

一方で集落は高齢化率55%を超え、過疎高齢化の進行と共に棚田景観の維持、集落の存続はますます難しくなっていることから、新たな担い手獲得は急務である。金蔵集落は前述の生物多様性を活用した活動に加え、従来より実施してきた体験観光の受け入れ、

集落の産物を販売する直売所「寄り道パーキング金蔵」の開店、集落内の伝統的な食材を活用した「金蔵御前」の提供、野草ちゃぷりんなどの特産品開発と販売、万燈会の継続などにより、地域の自然と文化を活用した地域の魅力を発信すると共に、新たな集落の担い手となる移住者獲得および、移住者を支える為の生業創出を目指すものである。



図 1. 「輪島親子昆虫クラブ」との共同による、田植え体験

#### 参考文献

- 赤石大輔・宇都宮大輔・石原一彦・中村浩二（2009）4. 奥能登地域の水生動物の多様性と生息環境について. 能登半島里山里海の生物多様性調査 2006-2008. 能登半島・里山里海自然学校.
- 堀内美緒・中村浩二（2013）輪島市町野町金蔵における昭和初期～昭和40年代. (1920年代後半～1970年代前半)の棚田と里山の利用・管理. 日本海域研究, 44号, pp99-115.

## How International Designation of Biocultural Diversity Can Support Marginalized Groups: The Case of Wajima City's *Ama* Community

Timo Thelen

Duesseldorf University, Department of Modern Japanese Studies

**Contact:** [tthelen@phil-fak.uni-duesseldorf.de](mailto:tthelen@phil-fak.uni-duesseldorf.de)

**Keywords:** marginalization, othering, TEK, GIAHS, ama

### Introduction

This presentation uses an anthropological perspective to illustrate how international designation of biocultural diversity such as GIAHS (Globally Important Agricultural Heritage Systems) can help a previously marginalized group (i.e., one that has suffered from othering by the local majority group) rebuild their own identity and pride. By using the example of Wajima City's *ama* community, and based on a literature review and qualitative research work, I show that the recognition of biocultural diversity, in particular so-called "traditional ecological knowledge" (TEK) (Berkes 2012), can contribute not only to the sustainable use of natural resources, but is also effective in overcoming sociocultural segregation in local societies.

### The *Ama* Community of Wajima City

The *ama* community of Wajima City, Ishikawa Prefecture, was settled about 400 years ago by people from Kysuhu to Noto. They received special fishing rights from the Maeda Clan, who ruled the Kaga Domain (Kaga-han) during the Edo period (1600-1868). They were permitted to dive for precious sea snails such as abalone (*awabi*), which were used in religious rituals and as gifts (*noshi awabi*). Although their profession underwent several improvements through new equipment, such as goggles and wetsuits, their working patterns and resource management, including strict rules against over-fishing, have remained rather unchanged to the present time. As other *ama* communities in Japan decreased in number due to over-aging of the general population, the *ama* of Wajima City remained, with around 200 actively diving individuals (most female), becoming Japan's biggest local *ama* group (Ishikawa Prefecture 2014). Until recently, most of the active divers and their families used to spend the summer on Hegura Island diving for shells and seaweed, and stayed the winter period in Ama Town (Ama Machi), their own part of Wajima City.

### The *Ama*'s Marginal Status

When this *ama* community settled in Wajima City, they also brought with them their own dialect, religious traditions, and customs, such as rarely wearing clothes in summer. Their lifestyle differed dramatically from that of the natives. In consequence, they remained a rather segregated group for centuries, with only limited exchanges with other locals. Although the *ama* are Japanese people, they fit into Barth's (1969) four criteria to describe an ethnic group: 1) being largely biologically self-perpetuating, 2) sharing fundamental cultural values, 3) using particular communication/interaction, and 4) having a distinguishable membership. Eventually, the *ama* community became marginalized as outsiders, similar to other wandering fishermen groups in East Asia (Bartz 1959). Their marginal status has not changed over time. Records of Wajima City dating back to 1922 describe the *ama* community in a pejorative manner and their discrimination is manifested through other locals of the city's majority. After World War II, they became an exotic and rather passive subject for the study of Japanese native anthropologists (Segawa 1970) and even foreigners (Maraini 1962), who admired their nudity, in particular. Individuals of Wajima City's *ama* community (male as well as female) who are now in their forties or older, admit to remembering past experiences of othering and discrimination by the local majority group. For instance, some remember not being able to find friends outside of their community during childhood, since the children from the native neighborhood were told not to play with "those dirty *ama* kids."



However, when the local elementary schools were merged in the 1990s, children of the *ama* community began to socialize more with other local children. Many believe that this was a first step for a better relationship between the two groups; however, the legacy of the *ama*'s rather negative reputation has not yet completely vanished.

### **The *Ama* in the Context of Biocultural Diversity**

Since the 2000s, *ama* communities have become integrated into the environmental discourse, which also served them to develop a new identity, when ecologists (e.g., McDonald 2011) started to research the *ama*'s "traditional ecological knowledge." In consequence, their lifestyle and work also gained the attention of local policy makers who aimed to support them. Finally, their consideration as an important part of the Noto *satoyama satoumi* GIAHS designation in 2011 brought global acclaim and recognition to *ama* communities. Documentary movies (e.g., UNU Channel 2012) and other presentations of the *ama* that also target the Japanese public in general established a new positive image of them as people living in "harmony with nature," whose special professions and customs deserve protection. During several field stays in Wajima City and on Hegura Island in 2015, I interviewed ten *ama* divers and two community leaders. When asked about the impact of policies such as GIAHS on their daily life and work, most stated that their local reputation had become very positive, especially in comparison to earlier times. They were now feeling more accepted and even admired by the other citizens of Wajima City. Although they could not yet name any visible economic benefits aroused by the GIAHS designation, the sociocultural impact of their new identity should not be underestimated. In addition to feeling more integrated in the local society, this new pride might also encourage them to continue their traditional work, as the community suffers from over-aging and a lack of successors. Furthermore, they are receiving a "rewrite" of their history, in which they are portrayed as an important group of Wajima City's population. In 2014, their profession and culture were also designated as Intangible Folk Cultural Property of Ishikawa Prefecture (*Ishikawa-ken mukei minzoku bunkazai*).

### **Conclusion**

Wajima City's *ama* community can be regarded as an important example of how the recognition of biocultural diversity and its international designation can enable marginalized groups to gain a new identity and become more integrated into local societies. Besides biological data, traditional ecological knowledge, and economic benefits, the sociocultural recognition and well-being of locals who are actively engaged in the management of the environment is a valuable contribution to the successful implementation of biocultural agencies. This study might serve as an example for other movements aimed at the empowerment of marginalized groups in Asia, for which biocultural diversity can represent an important framework to express their value for both their society and environment.

### **References**

- Barth, F. 1969. *Ethnic Groups and Boundaries: The Social Organization of Culture Difference*, Oslo: Universitetsforlaget.
- Bartz, F. 1959. "Bevölkerungsgruppen mit besonderer gesellschaftlicher Stellung unter den Küstenbewohnern und Fischern des Fernen Ostens," *Erdkunde* 13 (4), pp. 381-395.
- Berkes, F. 2012 [1999]. *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*, Third Edition ed, New York; London: Routledge.
- Ishikawa Prefecture. 2014. *Ama bunka kisō chōsa hōkokusho. Wajima ni okeru sumoguri-gyo oyobi kankei suru shūkan no gaikan*, Kanazawa: Ishikawa Prefecture.
- Maraini, F. 1962. *The Island of the Fisherwomen*, New York: Harcourt, Brace and World.
- McDonald, A. 2013. "The Ama-san of Hegura Island: Carrying On The Traditions of Her Ancestors— Over 1,400 Years of Community-Based Resource Management," *Biological and Cultural Diversity in Coastal Communities. Exploring the Potential of Satoumi for Implementing the Ecosystem Approach in the Japanese Archipelago. Technical Series no. 61*, Montreal: Secretariat of the CBD, pp. 47-53.
- Segawa, K. 1970. *Ama*, Tokyo: Miraisha.
- UNU Channel. 2012. *Satoumi (Full Documentary)*, Online Video, Tokyo: United Nations University, <https://youtu.de/KkgHbrXoXes> (Access: 30.08.2016).

## The introduction of “Satoumi learning” at schools in Noto

Makoto Urata<sup>1\*</sup>, Kyoko Matsumoto<sup>1</sup>, Koji Yachiguchi<sup>2</sup>, Nobuo Suzuki<sup>2</sup>, Kazuichi Hayakawa<sup>2,3</sup>

1 Institute of Noto Satoumi Education and Studies.

2 Noto Marine Laboratory, Division of Marine Environmental Studies, Institute of Nature and Environmental Technology, Kanazawa University.

3 Faculty of Pharmaceutical Sciences, Institute of Medical, Pharmaceutical and Health Sciences, Kanazawa University.

**Contact:** satoumijimu@yahoo.co.jp

**Keywords:** Satoumi, Active learning, Experimental observation, Marine education, Elementary school

### Prospectus for the Institute

The Institute of Noto Satoumi Education and Studies was established in 2014 and began operation in 2015, supported by the Nippon Foundation. We support marine ecological, environmental, fishery, and cultural learning activities for children and teachers, mainly in Noto, in cooperation with the Noto-cho Board of Education and Kanazawa University (Noto Marine Laboratory, Noto Campus, School of Teacher Education, etc.). The beautiful coast of Noto is rich in fish, animals, and seaweeds of all kinds; therefore, it is quite natural that Noto be considered a suitable place for Marine Education, a new field proposed by the Research Center for Marine Education of the Ocean Alliance at the University of Tokyo. We also cooperate with many public educational and cultural facilities (Noto Marine Center, Noto Nature Homes, Astronomical Museum Yanagida Mantenboshi, Ishikawa Prefecture Fisheries Research Center, etc.) to achieve effective education regarding local environment and human culture, including Satoyama and Satoumi.

### Learning activities on Satoumi

The Ogi Elementary School was designated as a pilot school for Marine Education, with a special “Satoumi course” being taught as part of the compulsory curriculum since April 2015. All other elementary and junior high schools in Noto-cho also started “Satoumi learning” one year later. The marine (or Satoumi) education program integrates the following four themes:

1. Commune with the ocean  
Experimental observation in a coastal environment and local communities familiarizes children with the ocean, cultivates their sensitivity toward and interest in the ocean, promotes their positive attitude in noticing morphological, ethological, and/or seasonal differences in ocean animals and seaweeds.
2. Know the ocean  
Active learning about marine resources, and organic relationships with animals, plants, and human culture encourages children to study these further. A safety training program for marine activity is also included, supported by the Japan Coast Guard, aiming to prevent marine accidents involving children.
3. Protect the ocean  
Learning about environmental issues, such as marine pollution and the purification activities of bivalves, and voluntary beach cleanup for local communities, make children recognize the necessity of maintaining marine environments.
4. Use the ocean  
Learning about the fishing industry, effective use of marine resources, and shipping transportation, for example, through an examination of Japanese amberjack caught by a stationary fishing net, allows children to recognize how the ocean might be used to ensure sustainable coexistence of humans and nature. A cruise on the fisheries research

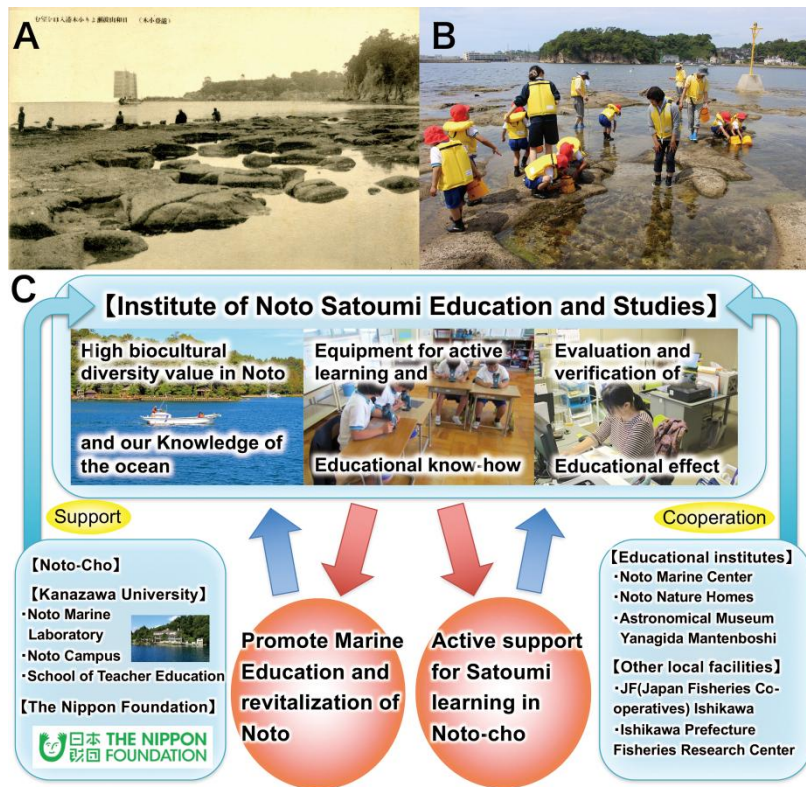
vessel, the Hakusan-maru, is also included, supported by the Ishikawa Prefecture Fisheries Research Center.

We offer technical assistance, equipment, and materials for such Satoumi learning in the Ogi Elementary School and other schools. We also organize a range of events for the promotion of Satoumi learning, such as a demonstration of a squid dissection at the Ogi Fishing Port Festival IKASU-KAI, an exhibition of Touch Pools containing a variety of Noto’s marine animals at the Kanazawa Umimirai Library, located in Kanazawa City, lectures on hermit crabs and fish scales for children and parents at Kanazawa Umimirai Library, and night nature observation events for children and their parents at the Kanazawa University Noto Marine Laboratory.

### Evaluation and verification of educational effects

It is important to ensure and demonstrate the appropriateness and validity of the Satoumi learning content on the basis of evidence. Questionnaire survey responses from participating children have shown that they gained an appreciation for their local environment and culture. For example, the elementary school children in the Satoumi course of marine education were shown to have the highest motivation for marine learning and greater awareness of stable settlement, in comparison to children at other schools. Indeed, the educational outcome of a course on sea urchin development was not only knowledge about the mystery of birth and life development, but also about the relevance of marine ecology and the environment.

On this basis, we show the contribution made by the coastal environment, Satoumi, to compulsory education at schools, which can promote education-oriented local revitalization in Noto.



A: A picture approximately 100 years old showing a well-developed shore platform (locally named “Hase”) in the area of Tsukumo-wan, Ogi. Children of that time learnt about the ocean and nature in the area as they played at the “Umi-Gakko” (Marine School). The photographed area has now been lost in the construction of a large breakwater. (M. U. collection)

B: A recent scene during a Satoumi course with the Ogi Elementary School first year class (children aged six to seven years) with staff of the Noto Marine Center in the area of Tsukumo-wan.

C: Organization and activities at the Institute of Noto Satoumi Education and Studies.

## Experience Learning Programs of Noto's GIAHS: Development and Practice 能登 GIAHS をテーマにした体験学習プログラムの開発と実践

Koji ITO\*, Shinsaku KOJI  
伊藤 浩二\*, 小路 晋作

Noto's Satoyama Satoumi Research Project, Kanazawa University  
金沢大学能登里山里海研究部門 (珠洲市)

Contact: k-itou@staff.kanazawa-u.ac.jp

**Keywords** : Globally Important Agricultural Heritage Systems (GIAHS), Satoyama Satoumi, Experience Learning, University Student, Continuing education

### 背景と目的

地域の生物文化資源やそれにまつわる知識を伝承し、活用するための人材育成を行う上で、多様なステークホルダーと連携した体験学習の実践事例の積み重ねと、課題改善のためのフィードバックが求められている。

金沢大学は 2006 年 10 月に珠洲市三崎町にある旧小泊小学校を借り受け、金沢大学能登学舎を開設し、「能登半島 里山里海自然学校」のプログラムをスタートした。これをきっかけに、「里山里海アクティビティ」、「能登いきものマイスター」養成講座、「能登里山マイスター」養成プログラム、そして「能登里山里海マイスター」育成プログラムといった能登をフィールドにした教育・研究および人材育成事業を次々と展開してきた。

2011 年 6 月に能登の里山里海が世界農業遺産 (GIAHS) に認定された際には、金沢大学が行うこれらの人材育成事業が能登 GIAHS の重要な取り組みの一つとして位置づけられ、世界的にも高い評価を得た。また、2016 年 6 月に能登 GIAHS 推進協議会が策定した「能登の里山里海 GIAHS アクションプラン」の中でも、金沢大学が実施する教育研究および人材育成事業が位置づけられている。しかしながら、能登の地域社会と里山里海の持続可能性を高めるためのより効果的な人材育成を目指して、さらなる改善の余地がある。そこで、金沢大学能登里山里海研究部門では、大学生あるいは社会人を対象に、能登の里山里海の現状を正しく理解し、持続可能な里山里海の保管理のあり方を検討するための体験学習プログラムの実践と改善について報告する。

### 世界農業遺産をテーマとした体験学習の効果

能登半島をフィールドに金沢大学の里山里海事業を通して実践してきた体験学習について、体験教育プログラムの実践事例とその効果・課題について整理した。

#### 1. 大学生向けの体験プログラム

大学 1・2 年生が中心の全学共通教育科目として「里山体験実習 in 能登半島」「里海体験実習 in 能登半島」の 2 科目を実施している。これらは主に能登半島や里山里海、あるいは農山漁村そのものについて初めて学ぶ者に向けたプログラムとしている。これまで、①里山里海を生業の現場とする事業主として、製炭業者、輪島塗工房経営者、定置網漁業者、ダイビング事業者、カキ養殖業者、棚田の営農組合、漁協といった個人・団体のほか、②里山保全を目的とした NPO 組織、③公的機関あるいは教育普及機

関として石川県奥能登農林総合事務所、能登海洋ふれあいセンター、金沢大学臨海実験施設等が実習受け入れ主体となった。

プログラムは参加人数が1回あたり30人規模となるため、主に受け入れ側の実践者からの説明の聴講と現場見学、一対多数の意見交換が中心となる。受講者には各見学先の「生業の持続可能性」「持続可能性を高めるための方策」をテーマに質問を用意させ、振り返りのグループワークではテーマに沿って受講生同士で議論を行う。

課題として参加人数が多いため、受け入れ可能な体験・見学内容と受け入れ主体は限定されてしまう。そのため概ね、毎年同じ受け入れ主体に依頼することになり、少なくない負担を強いることになる。一方で、同じ受け入れ主体を継続的に訪問することで、社会・自然環境の情勢に対する対応の変化と事業の発展について把握しやすくなり、持続可能性に関する学びの内容にフィードバックしやすい側面がある。

## 2. 社会人向けの体験プログラム

「能登里山里海マイスター」育成プログラム（以下、マイスターとする）のカリキュラムでは、能登の里山里海について学ぶ実習科目があり、複数のプログラムが用意されている。1年間のカリキュラムのうち、最初の3か月では大学生プログラムと同様に、能登の里山里海の現状を知るために、能登各地で活躍する実践者の現場を1クラス30人規模での見学するツアーを実施する。見学の受け入れ先は一部大学生向けのものと同様に重複するが、マイスター修了生あるいは支援サポート組織の地元農家等を訪問することで、受講者と受け入れ主体との相互交流を促す機会となることを期待している。

カリキュラムの中盤以降には、里山管理実習、里海調査実習を行っている。これは里山里海の恵みを持続可能な形で利用する知識と技術について、入門的に体験するプログラムで、里山二次林における植生および土壌の管理のほか、海岸の微環境と生物の関係性、海藻の多様性を見分け利用する知識などを学んでいる。

また「能登 GIAHS 調査実習」というプログラムでは、クラス単位の大人数では実施が難しい里山里海での体験と、実践者へのヒアリング、双方向の意見交換を通して、能登 GIAHS の現場についてより深い学びとなるようにしている。体験実習の内容は、受講者が選択できるようにし、各自の興味に応じてカスタマイズすることもできる。これらの受け入れ主体の一部として、マイスター修了生自らが体験プログラムをプランし、受講者から体験料を得る仕組みをつくっている。こうすることで、修了生が自らの生業に関する体験事業を行うきっかけにすることも期待している。これまでに、揚浜式塩田の塩づくり体験、里山の有用野生植物の見分け実習、里山の保全活用に関する各種団体へのヒアリング、獣害対策の漁師への聞き取りなどが実施された。最後に各実習先のレポートを受講者全員がいる場で報告し、個人の経験知の一部の共有化を図っている。

## まとめと今後の展望

能登 GIAHS をフィールドとした体験実習の機会を設けることで、里山の生物文化多様性に関する知識と技術の伝承を担う人材養成につなげることができている。とくにマイスターのように多様な人材が集まる場での、互いの経験知を共有することができる場は、学びの相乗効果をもたらすと期待できる。

このような体験学習を持続可能な形で実施するためには、まずは体験受け入れ側に対するサポートを行い、信頼関係を構築することが重要である。さらには体験受け入れ側の事業への波及効果が期待できるようなしくみを作ることが重要であり、受け入れ側と大学で協働した体験プログラムづくりが新たなチャレンジとして挙げられる。

同時に、能登 GIAHS の現場の持続可能性についての学術的な裏付けを示すような、大学ならではの取り組み（副読本などの教材づくり等）を充実させていく必要がある。

さらに、このような体験実習の実施に当たっては、多様な主体との関係づくりを行う「体験学習コーディネーター」および里山里海の持続可能性についての研究・普及機関の必要性が広く認識され、継続的な政策的支援がなされるべきである。

## **Current Status and Issues of Environmental Education Related to Biodiversity at Schools within Noto GIAHS**

Sayako Koyama<sup>1\*</sup>, Yoshihiko Iida<sup>2</sup>, Shinsaku Koji<sup>1</sup>, Koji Ito<sup>1</sup>, Mikiko Nagai<sup>2</sup>, Koji Nakamura<sup>1</sup>

<sup>1</sup>Kanazawa University, Kanazawa, Japan\*

<sup>2</sup>The United Nations University Institute for the Advanced Study of Sustainability, Operating Unit Ishikawa/Kanazawa (UNU-IAS OUIK), Kanazawa, Japan

**Contact:** sa.koyama@staff.kanazawa-u.ac.jp

**Keywords:** environmental education, biodiversity, Noto GIAHS

### **Objectives**

The need and importance of mainstreaming biodiversity into education has been emphasized by major organizations such as United Nations Educational, Scientific and Cultural Organization (UNESCO, 2016) and Convention on Biological Diversity (CBD, 2016). In addition, the action plan of Noto Globally Important Agricultural Heritage Systems (GIAHS) includes the need for nature observation classes to deepen the understanding of linkages between rice paddies, various organisms, and ecosystem conservation (Noto GIAHS Promotion Council, 2016). Although various nature observation classes have been provided to school children within the Noto region, the extent and contents of such activities are not clear. This study was thus conducted to better comprehend the current situation of environmental education related to biodiversity within Noto GIAHS and to examine factors that may be causing teacher hesitant in regard to starting such environmental education in their classrooms.

### **Methods**

A questionnaire survey was sent to every elementary school, junior-high school, high school, and special needs school within Noto GIAHS (i.e., nine municipalities in total). In addition to the questionnaire survey, a field visit to a nature observation class for elementary school children in Suzu City was conducted as a case study and further information was collected through an interview with a municipal officer who organizes the nature observation classes for all 9 elementary schools and is in charge of nature conservation in Suzu City.

### **Results**

Out of 96 schools in Noto GIAHS, responses were obtained from 97% of them (i.e., 93 schools). Responses show that 40% of all schools were carrying out environmental education related to biodiversity within the curriculum, and that the number of such schools increased rapidly since the designation of Noto GIAHS in 2011. However, the level of implementation varied greatly depending on municipality (80% in Suzu City but less than 20% and even 0% in some other municipalities). The level of implementation was highest in elementary schools, lower at junior-high schools, and lowest at high schools. There was no special needs school implementing such environmental education.

The survey results showed that outdoor nature observation classes were conducted in various environments including rice paddies, along the seashore, by rivers, and in biotopes and forests. Some of the classes were conducted during school hours while others were led by the municipal government outside of school hours. In some municipalities, such activities were supported by specialists from universities, research centers, or nonprofit organizations (NPOs). It was found out that 3 out of 9 municipalities provided opportunities for elementary school children to present the outcomes of their environmental education to other schools.

Questions regarding issues of implementation of such environmental education showed that the ratio of schools facing difficulty in implementation was highest in special needs schools

(67%), followed by junior-high schools (58%), and high schools (50%). Elementary schools showed the lowest level of implementation difficulty (28%), meaning that there are fewer obstacles to implementation. It was shown that 40% of junior-high schools and 50% of high schools do not have enough “preparation time” for the activities; in addition, approximately 40% of junior-high schools revealed that they do not have “adequate teaching materials.” Several schools also pointed out the difficulty in securing school hours for such activities and the incompatibility of such activities with studies required for high school or university entry exams. The importance of securing safety was also pointed out by both an elementary school and a special needs school. One unexpected finding was that of those schools that were not implementing such environmental education, 60% did not point out any specific issues or difficulties in doing so.

During the nature observation class in Suzu City, 3rd and 4th grade children were observed collecting aquatic insects from a rice paddy and a river; however, more than half of the children did not want to touch the insects and were asking other students to put them in small containers for sorting. The municipal officer who organized the nature observation class pointed out the importance of starting such education at an early age. He mentioned that if they start late, they would refuse to step into rice paddies or get dirty and also refuse to touch animals or insects. He also mentioned the importance of consecutive implementation of such classes to prolong the positive effects.

## **Discussion**

Results from this study reveal that environmental education related to biodiversity is carried out by making use of various the natural environments in Noto GIAHS. However, the level of implementation varies depending on the type of school and municipality, as well as the types of issues that are preventing some schools from engaging in such educational activities.

Inviting a guest teacher was shown to be one way of solving the issue of school teachers having not enough “preparation time.” This is the way the nature observation classes were held in all 9 elementary schools in Suzu City; however, inviting a guest teacher is often associated with additional cost and several schools pointed out the need for a list of available and appropriate guest teachers. In Suzu City, such cost is supported by the municipality and the guest teacher is also provided by the municipality, in close association with an NPO.

In order to expand biodiversity education into schools that do not yet carry out such environmental education, it may be worth approaching those 60% of schools that did not point out any issues or difficulties in implementation. Other actions, such as creating a list of available guest teachers and providing it to schools in Noto GIAHS or increasing opportunities for information sharing among schools, may help promote such activities.

Nature observation classes with scientific experts is important to deepen the understanding of biodiversity; however, implementing such classes throughout Noto GIAHS and at various levels and ages of schooling is difficult due to a small number of available experts and limited budgets. Thus, promoting outdoor nature observation classes with less formal expertise that can easily be done by teachers or local volunteers may also be important to foster a sense of wonder, especially during early childhood.

## **References**

- CBD 2016. Biodiversity Education, <https://www.cbd.int/education/biodiv-edu/default.shtml>
- Noto GIAHS Promotion Council 2016. GIAHS Action Plan for Noto’s Satoyama and Satoumi
- UNESCO 2016. Biodiversity and Education, <http://www.unesco.org/new/en/natural-sciences/special-themes/biodiversity/biodiversity-education/>

## **Acknowledgement**

This research was fully supported by the United Nations University Institute for the Advanced Study of Sustainability, Operating Unit Ishikawa Kanazawa (UNU-IAS OUIK).



## Cooperation with Farmers, Sake Brewers, and Students: Creating a New Brand of Sake

Shuichiro Kajima<sup>1\*</sup>, Rodrigo Jose Mundo<sup>2</sup>

Kanazawa University Human society institution<sup>1\*</sup>, Kanazawa University<sup>2</sup>,

Contact: j.kajima@gmail.com\*

**Keywords:** biodiversity, traditional knowledge, cooperation, satoyama, sixth-order industrialization

### Overview

This project originated in the Noto Peninsula, Ishikawa Prefecture, Japan, in March 2014 in cooperation with local brewer Kazuma Brewer (数馬酒造 and rice farming company Yumeurara (ゆめうらら) to promote passion among the younger generation for Japanese sake, Noto, and local agriculture. Showcasing the charm of Noto, particularly its landscapes, traditional agriculture system, and traditional sake culture, a group of university students were tasked with engaging in the agriculture and production of sake and to plan a new brand of the beverage. This project is aimed at revitalizing and drawing appreciation for Noto agriculture and Japanese sake, and eventually revitalizing the Noto sake industry by enlarging its younger fan base.

### Background

The production of sake in Noto is facing adverse circumstances in the form of three the major problems. First, an aging population and increase in the number of abandoned fields due to a lack of workers are causing a collapse of the landscape, ecosystems, and biodiversity created by satoyama and human life. Second, and also applicable to Japan as a whole, there are concerns over food safety and security. Since the Great East Japan Earthquake and nuclear accident at Fukushima, many people are apprehensive, and feel that food safety measures could be stricter. For that reason, this projects suggests producing rice in a safer way via pesticide-free farming and using organic fertilizer. Finally, the traditional sake-brewing industry is facing a serious lack of successors willing to run the business and pass it down to generations. There has also been stagnation in the domestic consumption of sake due to a decrease in the number of young sake drinkers.

In order to solve these problems, sake brewers and farmers in Noto are cooperating with university students in Kanazawa to revitalize the region and traditional drink. Under this flag, our project was launched in March 2014.

### Practice

N-project's initiative has three primary frameworks: (1) revitalization of the nature and landscape of Noto, (2) conservation of traditional intellectual inheritance, and (3) advances in sixth-order industrialization.

First, as Noto is becoming an aged society, traditional knowledge is becoming lost. This project seeks to conserve and disseminate traditional knowledge as a return to traditional and safety agriculture practices, giving up the "efficient" and industrialized agriculture. Learned farming methods and wisdom handed down as traditional knowledge of the region lead to the development of a pesticide-free organic agriculture. In particular, the agriculture that had been carried out in this area were learned from farmers for more than 80 generations.

Second, there was a recent revitalization of abandoned farmland in Noto, where the fields are now mainly used for the cultivation of rice that is partially used for brewing sake at Kazuma Brewer, such as Gohyakumangoku (五百万石), a type of rice traditionally produced for sake brewing. In addition, the revitalized fields have received certification from the consumption-quality appraisers association as a "Paddy environment Special A district." Aside from growing a variety of vegetables, biological diversity has been proven through the observation and records of small animals such as insects, fish, and birds.

Finally, we attempted to carry out six primary orders of industrialization in our project. Kazuma Brewer in Noto town used 80% or more of the rice produced under the rice farming company Yumeurara. Within the local area, our rice won a designation as Mezzanine in the brewer’s rice grade, and our brand, “Noto Jyosen (能登上撰),” produced by Kazuma using the same rice earned the “Delicious Sake Gold Medal Award 2016” for sake in a wine glass. This production style was defined as “six-step production.” The project has since become a cooperative work of two companies and university students, under the flag of creating sake (Chikuha N) by young people and for young people.

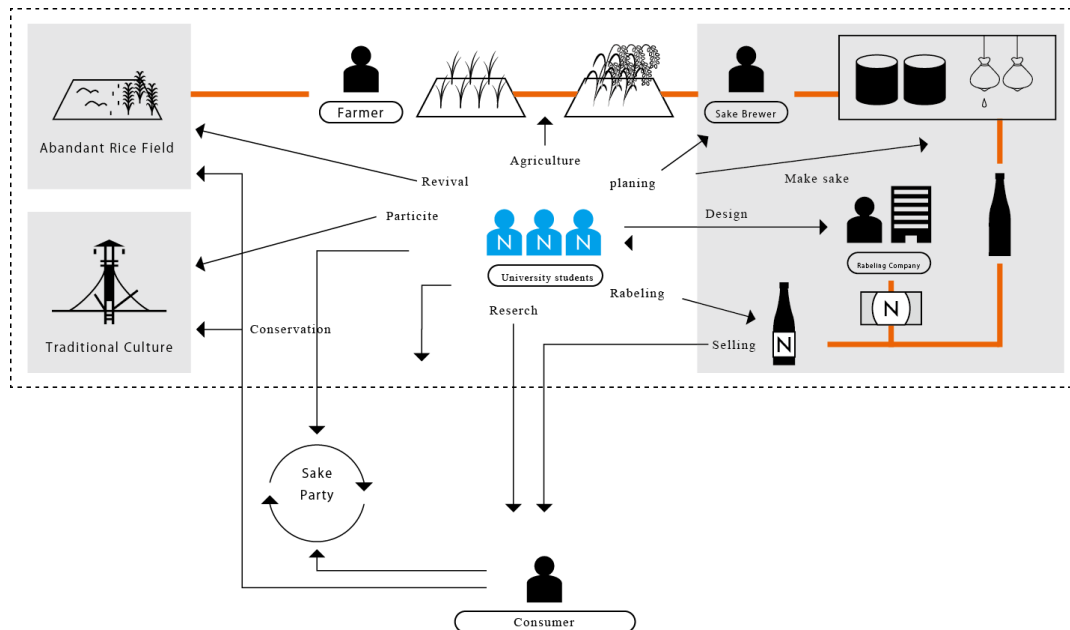


Figure.1 Scheme of N-project

### Effect of cooperation among the three stakeholders

The achievements of N-project can be summarized in three key aspects: (1) revitalization of farmland, (2) production of a new brand of sake, and (3) influence over university students, giving them the opportunity to put their abilities into practice and, in some cases, even helping them construct their own goals for the future.

In 2014, an abandoned plot of about 300 square meters was worked and restored to a functional paddy field. Furthermore, in 2015 about 15,000 square meters were designated as paddy fields in order to save the natural landscape of the region. In particular, to try to produce Gohyakumangoku (五百万石) rice, which was once produced widely throughout the region.

Thanks to the possibility of cultivating brewer’s rice in Noto, and with the help of Kazuma Brewer, our project was able to produce a new brand of sake aimed at a younger generation.

In 2015, N-project, working with university students through every step of production (from planting the rice to labeling and selling the sake), produced 1,000 bottles of “Chikuha N” and sold them for approximately US\$16 each. In 2016, the project is expected to triple production. Through these activities, university students have been periodically coming to visit Noto, and helping Noto to be known among people even from outside Japan (during 2016, N-project began working with students from China, Argentina, and El Salvador).

### Conclusion

This project revitalized a local area’s agriculture, natural environment, and the local economy while also providing students with opportunities to learn about public relations, marketing, and international perspectives. In addition, the university students involved in the project could interact and familiarize themselves with the satoyama values as well as biodiversity and traditional industry knowledge.

## Possibility of Revitalization Activities Using SATOUMI Bioresources

Ryohei Yamashita\*, Mariko Kono

Ishikawa prefectural university\*

Contact: r-yama@ishikawa-pu.ac.jp

**Keywords:** Ikari Mon tiger beetle, Hakui coast, Revitalization, Regional activity

### Background

With the exception of local administration and expert researchers, most inhabitants have overlooked the presence of certain bioresources in satoumi areas. This study examines residents of a town who are trying to revitalize this region in the wake of preservation efforts for the Ikari Mon tiger beetle (IMTB; scientific name, *Cicindela anchoralis*), shown in Photo 1. Generally speaking, a satoumi area is a valuable secondary natural environment that is cultivated and protected by its residents for many years. As such, it is necessary to preserve the vitality of the rural villages there—which are recovering from depopulation—while continuously preserving satoumi resources and using them effectively. Thus, it is crucial to find new value in the natural environments of the satoumi areas.



**Photo 1.** Ikari Mon tiger beetle

### Action in Study Area

The study areas in Ishikawa Prefecture are the village of Shibagaki, the city of Hakui-city, and the adjoining coastal village in Hakui County, which ranges from the Amada to the Oshima villages. Although this area's population has decreased by about 10% in the past 10 years, these regions are dedicated to local revitalization projects through joint environmental conservation activities. The IMTB is specified as a Type I endangered species on the Ministry of the Environment and Ishikawa Prefecture's "Red List." In order to protect it, observation and study meetings on the IMTB have been held, in addition to regular cleaning and environmental monitoring around beaches. As a result of these efforts, many people from across the area have begun to recognize the IMTB as a precious resource, and the awareness to continue and preserve the region has grown in the recent years. Moreover, experts examining the coastal environment from the perspective of ecological diversity conservation have joined this movement alongside local residents who want to restore the coastal landscape to its original condition. Thus, local governance of the area has emerged abiogenetically.

### Subject and Future Plan

Although people of this area and others interested in the conservation of IMTB are participating in ongoing activities, increased consciousness is occurring very slowly. A resolution of bipolar motivation between stakeholders is a critical issue to the activities' ongoing success.

In addition, since people's free time, even during vacations, is increasingly scarcer, it is difficult for many residents to participate in local and everyday activities toward conservation. Furthermore, fear of forced participation and additional work and activities creates an atmosphere of hesitancy to join leadership activities. Thus, a valid strategy is needed to encourage participation among a greater number of local residents in the conservation activities for the IMTB. Currently, we are intensively evaluating such strategies as well as seeking to obtain economical support for ongoing activities—an important strategy is to promote their significance to companies.

## **Synergy between designated sites: The initiative of Mount Hakusan Biosphere Reserve and Hakusan Tedorigawa Japanese Geopark**

Shinsuke Nakamura<sup>1\*</sup>, Tsuyoshi Hibino<sup>2</sup>

Hakusan Tedorigawa Geopark Promotion Council<sup>1,2\*</sup>,  
Mount Hakusan Biosphere Reserve Council<sup>1</sup>

**Contact:** geopark@city.hakusan.lg.jp

**Keywords:** designated sites, biosphere reserve, geopark, Hakusan, UNESCO

### **Hakusan, as overlapping sites**

Mount Hakusan Biosphere Reserve and Hakusan Tedorigawa Japanese Geopark partly overlap with each other. As overlapping sites, we are seeking some ways to create synergy between these two UNESCO related site designations.

### **Synergy at site level**

For instance, when describing an area's ecosystem as a biosphere reserve, the topography, geology and climate that constitute its background are indispensable. Incorporating the essence of the geopark gives further depth to the story of the biosphere reserve's ecosystem and culture.

On the other hand, having two projects moving forward at the same time in the same area, raises concerns regarding competition on financial and human resources. To address this, we have adopted an organizational system that the same staffs are in charge of managing both designations. Staffs of the Mount Hakusan Biosphere Reserve also work as staffs of the Hakusan Tedorigawa Japanese Geopark.

### **Synergy at network level**

During the reorganization of the Japanese Biosphere Reserves Network (JBRN), we have advocated for the importance of local initiative and face-to-face networking, which was later adopted, learning from its experience working within the Japanese Geoparks Network (JGN). This accomplishment has been presented in international conferences of both designations, such as the 4th Asia-Pacific Geoparks Network Symposium, the 4th World Congress of Biosphere Reserves, and the 7th International Conference on UNESCO Global Geoparks.

In the UNESCO Global Geoparks Celebration Forum held in Hakusan Tedorigawa Geopark in January 2016, which was organized together with JGN, the Operating Unit Ishikawa/Kanazawa (OUIK) in the United Nations University and other organizations, the experiences of biosphere reserves through the 40-year history as a UNESCO program served as input for the geoparks, which became an official UNESCO program in 2015.

With Hakusan as the bridge between the two networks, we would like to deepen their ties so that they can learn more from each other.

### **Reference**

- Nakamura, S., Hibino, T. and Aoki, T. 2015. Cooperation between geoparks network and biosphere reserves network in Japan -Through Hakusan as a focal point-. The 4<sup>th</sup> Asia-Pacific Geoparks Network Symposium, AO-17, Tottori (Japan), September 2015.
- Nakamura, S. 2016. Synergy between geoparks and biosphere reserves through Hakusan as a focal point. 4<sup>th</sup> World Congress on Biosphere Reserves, Lima (Peru), March 2016.
- Hibino, T. and Nakamura, S. 2016. Collaboration between Biosphere Reserves and Geoparks. In: Mount Hakusan Biosphere Reserve: Creating a new path for communities and nature. Iida, Y. and Nakamura, S. (eds) UNU-IAS OUIK, 75-77.
- Nakamura, S. and Hibino, T. 2016. Synergy between geoparks and biosphere reserves through Hakusan as a focal point. 7<sup>th</sup> International Conference on UNESCO Global Geoparks, Torquay (United Kingdom), September 2016.

## **Linking Geodiversity, Biodiversity & Cultural Diversity: The Geostory of Hakusan Tedorigawa Japanese Geopark**

Tsuyoshi Hibino<sup>1\*</sup>, Shinsuke Nakamura<sup>1</sup>

Hakusan Tedorigawa Geopark Promotion Council<sup>1\*</sup>

**Contact:** t-hibino@city.hakusan.lg.jp

**Keywords:** geopark, geodiversity, biodiversity, cultural diversity

### **Geopark**

Geopark is a nature park where geology, topography and other land features of the site is protected and conserved, while being utilized for education and tourism in order to contribute to the sustainable development of the area. UNESCO Global Geoparks (UGG) are designated by UNESCO, while Japanese Geoparks are designated by Japan Geopark Committee. UGGs count 120 among the whole globe, while Japanese Geoparks count 39 all over Japan including 8 UGGs (as of August 2016). Geoparks focus not only on the geological heritages, but also on its link with related ecological, archaeological, and cultural heritages, endeavoring to comprehensively communicate the “story of the earth (geostory)” for the area.

### **Linking geodiversity, biodiversity & cultural diversity**

Since Japan is a humid and tectonically active area, we can find geodiversity, as well as biodiversity. Additionally, we can find cultural diversity which makes the best use of biodiversity. The importance of the link among these three diversities is commonly said in geoparks. However, although there are many geoparks featuring geological heritages such as volcanoes or faults, there are not so many examples representing a clear link among these three elements.

In such a circumstance, Hakusan Tedorigawa Japanese Geopark has weaved a geostory emphasizing the connection of heritages, especially of these three elements. The geostory “Journey of water” & “Journey of rocks” which connects the three elements, has many benefits. For example, people in the mountainous area make rice cakes from Japanese horse chestnuts, and these forests develop on unstable lands. From this point, geodiversity, biodiversity and cultural diversity could be integrated in a single unified geostory which indicates the earth as a fundamental being for human and other organisms.

### **References**

- Nakamura, S. and Hibino, T. 2015. A Geostory Linking Geodiversity, Biodiversity & Cultural Diversity - An Attempt of Hakusan Tedorigawa National Geopark-. Izu Peninsula Geopark International Symposium -Prospect of Izu Peninsula as a geopark-, No.1, Numazu (Japan), March 2015.
- Hibino, T., Nakamura, S. and Aoki, T. 2016. The proposals from Hakusan Tedorigawa National Geopark -Weaving a geomorphological geostory with ecological and cultural features-. The 4<sup>th</sup> Asia-Pacific Geoparks Network Symposium, BO-17, Tottori (Japan), September 2015.
- Hibino, T. and Nakamura, S. 2016. Collaboration between Biosphere Reserves and Geoparks. In: Mount Hakusan Biosphere Reserve: Creating a new path for communities and nature. Iida, Y. and Nakamura, S. (eds) UNU-IAS OUIK, 75-77.

## "Welcome back, fireflies": Rice farming in harmony with biodiversity

「おかえり、ホタル」：生物多様性と共存するコメづくり

Yutaka Ohta

大田 豊

Ohta Farm, Representative

おおた農場・代表

Contact: yutaka.ota.nojio@docomo.ne.jp

**Keywords:** Rice farming, Satoyama, Foot of Mt. Hakusan, Biodiversity conservation, Revitalization of local community

コメづくり、里山、白山麓、生物多様性保全、地域活性化、

### 背景と経緯

筆者が代表をつとめる「おおた農場」は、石川県白山麓の中山間地（白山市渡津町旧鳥越村）にある。ここは人口減少（かつて140人が暮らしていたが現在は30人）と高齢化が急速に進行している「限界集落」であり、イノシシ、サルなどの獣害にも悩まされている。東京で会社員をしていたが、1990年に脱サラし、郷里の渡津へもどり、稲作中心の農業をはじめた。人口減少で担い手がなくなった近隣の水田を預かり集積しながら（6haからスタート、いまは20ha）、慣行栽培からはじめ、エコ認定、減農薬、有機栽培、無農薬栽培など、様々な試行錯誤を続けており、そのなかで中山間地での専業農家が直面する厳しい現実を思い知った。転機が訪れたのは、2002年にヘイケボタル (*Luciola lateralis*, 準絶滅危惧種) の大群が自分の水田に発生していることを知った時である。この美しいホタルの乱舞をたくさんの人々に見せたい、ホタルと共存する無農薬の安心・安全のコメづくりを推進し、それを地域の活性化につなげようという思いで様々な活動をしてきた。2011年には水田の横を流れる大日川からゲンジボタル (*Luciola cruciata*) が大発生していることも知った。いまでは「白山麓 渡津蛍米」が、人にもホタルにも優しいブランド米として確立しつつある。

### 取組内容

- (1) ホタルにやさしい環境保全型農法の実施
  - ・有機肥料を使用し、減農薬から無農薬栽培へ。
  - ・紙マルチ農法（黒紙を田の表面に敷き、雑草の生育を抑制。除草剤を使わずにすむ）の導入。
  - ・ホタルの生活史に配慮した農法
    - ・幼虫が成長する時期には、田に水を張り続け（秋～春）、畔塗をひかえる（3～4月、幼虫を窒息させない）。
    - ・田の周辺の草刈りのタイミング調整：幼虫がサナギになる頃（4～5月）、ホタル成虫の交尾時期（夏期）と孵化幼虫が草むらから水田に入るまで（8月）には草を刈らない。
    - ・田植えを1カ月遅くする（斑点米カメムシの発生ピークを過ぎてから稲穂が出るよう時期をずらし、農薬散布を不要とする）。
    - ・夜間は周囲の街灯にカバーをかぶせ、車のヘッドランプが水田を照らさないようにする（交尾を妨げない）。
- (2) 「白山麓 渡津蛍の里」づくり運動の展開
  - ・渡津集落の住民といっしょに、ゲンジボタル、ヘイケボタルのほか、オバボタル (*Lucidina biplagiata*)、オオオバボタル (*Lucidina accens*) の4種が生息する里山

の自然環境の豊かさと、そこで生産されるコメなどの農産物の安心・安全をアピール（2011年～）。

- ・水田の生物多様性専門家による渡津地区とその周辺の生物多様性の現状調査に着手（2016年）。

## 成果

### （1）環境配慮型農業の実施

- ・完全無農薬米「鳥越渡津蛭米」の商標登録を達成（2011年）。
- ・「米、食味分析鑑定コンクール国際大会」に応募し、特別賞（2011年）、金賞（最高賞、2012年石川県初と2014年の2回）を受賞。
- ・現在、20haのうち3haで完全無農薬の「渡津蛭米」、4haで農薬7割減の「渡津米」、13haでエコ栽培を行っている。

### （2）情報発信、社会的認知、ネットワークづくり

- ・ホタル鑑賞会の実施（6月下旬～7月上旬）。地元だけでなく、遠方からの参加者が増加（2015年、1000人以上。外国人、留学生等を含む）。
- ・渡津ホタル保存会による子供会のいきもの調査を実施。
- ・白山市のホームページに掲載。
- ・マスコミ報道（新聞、テレビ）での紹介。
- ・ネットワークへの参加。
  - ・生物多様性条約第10回締約国会議（2010年、名古屋市）
  - ・世界農業遺産大4回国際会議（2013年、七尾市）
  - ・（国連大学サステイナビリティ高等研究所）いしかわ・かなざわオペレーティング・ユニット（OUIK）との連携
  - ・JICA 国別研修事業の受入（マレーシア、自然共生型コミュニティづくりに向けた環境コミュニケーション研修、2015年11月）
  - ・（富士フィルム・グリーンファンドによる）金沢大学角間里山ゼミに参加（2014年～15年）
  - ・イフガオ里山マイスター養成プログラム（フィリピン）との交流会に参加（2016年）

## まとめ

白山市渡津において、過疎、高齢化にさらされている里山の集落の活性化と持続発展への道を農業実践をとおして志向してきた。これはたいへんきびしいみちであり、いまでも試行錯誤の連続である。群れ飛ぶホタルは、優雅な光の芸術であるだけでなく、きれいな水、無農薬がつくる、おいしいお米の「環境のバロメーター」となっている。どれほどたいへんでも安心・安全のコメづくりが、消費者のみなさまに支持され、里山を元気にするよう、無農薬の田んぼでがんばっていくことを考えている。

## **Restoration of Ecological Networks in Agricultural Landscape: Linkage between Scientific Research and Policy Making**

Ryuji Yonekura

Gifu Prefectural Research Institute for Fisheries and Aquatic Environments

**Contact:** yonekura-ryuji@pref.gifu.lg.jp

**Keywords:** biodiversity, connectivity, ecological network, fish community, paddy field

For the conservation of fish species diversity, it is important to maintain landscape connectivity between river and paddy field in freshwater environments. The loss of such connectivity cause a fragmentation of habitat area, which in turn leads to decline in opportunities for reproduction, growth and habitat colonization and finally causes a local extinction in fish population. Presently, freshwater environments in Japanese agricultural landscape are severely impacted by connectivity reduction due to the construction of dams, weirs and/or hydraulic drop, which are extensively constructed between rivers and paddy fields and/or within paddy fields.

Although the importance in such connectivity has been well recognized among ecologists and conservationists, for policy makers, there are little practical recommendations and few effective tools that help decision-makers correctly allocate limited resources (e.g., financial cost, labor) to prioritize restoration actions. For example, policy makers may practically have little knowledge about several questions. For examples, Where do they choose a restoration area as priority?; How do they rank the dams and weirs by priority for removal, taking into account the gains in the greater overall connectivity? In that situation, what is a balance between costs and gains? How does policy making affect a recovery of fish communities?

In this presentation, I show a practical program for the restoration of ecological networks in agricultural landscape in Gifu, Japan. In the program, we concentrate on freshwater fish communities as a conservation target, because they are a symbolic organism around paddy field. As unique but important points, the program is run with (1) a cooperation of different stakeholders (e.g., ecologists, policy makers, local people), (2) ecological research is conducted to choose a prioritized restoration area where a greater recovery of fish species diversity will be expected, (3) ecological networks are restored by engineering approach by river managers and farmland consolidators, (4) the effects of policy making are scientifically verified and adaptive management (i.e., PDCA cycle) that policy-making process are decided with maintaining scientific accuracy. Such a cross-sectional cooperation may have an insight on how landscape management such as an ecological network should be conducted with a cooperation of stakeholders and functional linkage between scientific research and policy making.



## The Traditional System of Combining Fishing and Agriculture in the Mikata Five Lakes: -Sustainable Use of Satoumi, Satochi, and Satoyama- (Efforts in Order to be Designated as GIAHS)

三方五湖の伝統的な漁業農業複合システムについて  
～里海湖（さとうみ）と里地里山の連環の持続的利用～  
（世界農業遺産認定を目指す取り組み）

Kouichi Sasaki  
佐々木康一

Traditional Agriculture and Mountainous Areas Group, Regional Agriculture Division, Department  
of Agriculture, Forestry and Fisheries, Fukui Prefecture Government  
福井県農林水産部地域農業課伝統農業・中山間 G

Contact: k-sasaki-ma@pref.fukui.lg.jp

**Keywords:** the Mikata Five Lakes, Globally Important Agricultural Heritage Systems, traditional fishing, biodiversity, traditional culture

三方五湖, 世界農業遺産, 伝統的漁業, 生物多様性, 伝統文化

### 農業遺産システムの概要情報

福井県美浜町、若狭町に位置する三方五湖の伝統的な漁業農業複合システムは、多様な水環境を有する三方五湖を構成する五つの湖それぞれに発達する伝統漁業を中心に、湖を取り囲む平地での水田稲作、湖にまでせまる山麓を利用した梅栽培が複合しながら持続的に営まれてきた、里海湖（さとうみ）と里地里山が連環する複合的な社会生態システムである。

これらは「小さな産業（小規模な漁業・農業）」の生業複合となり、歴史的に適度に資源利用されてきた。例えば、最上流で淡水環境の三方湖では、フナやコイを獲る「たたき網」漁と呼ばれる独自の漁法が発達した。また、最下流で汽水環境の久々子湖ではヤマトシジミ漁が発達してきた。それぞれの漁法には、漁業者らが自ら資源管理として漁期、漁具、漁場のルールを設けた持続的な漁法である。

湖辺にせまる急傾斜地の梅栽培と平地の水田耕作は、湖に栄養に富んだ水を与え、漁獲資源であるフナやコイをはじめとする多様な魚類を育む。また、湖辺のわずかな平地を利用した水田の水路は、フナやコイの再生産の場としても機能する。フナやコイは、湖の増水時には田面にまで溯上して水田のなかで繁殖することもある。三方湖のフナは、遺伝的に特異な組成を持つことがわかっており、水田稲作は漁業資源と遺伝資源の確保にもつながる。このように、三方五湖の漁業・梅栽培・水田耕作は、漁業をシンボルとした水循環でつながるシステムである。

フナ、コイ、シジミ、ウナギに代表される水産物は、おもに地域内で消費されることで、地産地消の食文化を形成する。湖からもたらされる恵みへの感謝は、宇波西神社の「王の舞」に特徴づけられるように、湖周辺の氏子集団による伝統的な祭礼によって象徴的に表現される。このように、三方五湖の伝統漁法は地域のシンボルであり、湖からの恵みは、食文化と祭礼文化を通じて地域の誇りとなっている。

賢明な資源利用のもとに形成された三方五湖の漁業農業システムではあるが、従事者の高齢化や担い手の減少などが問題である。これらの課題に対応すべく、現在、地域住民、関係団体、研究者、行政の多様な主体が連携して、自然再生や環境教育、地域振興などに取り組んでいる。今後、世界農業遺産、日本農業遺産に登録されることが、地域の絆のさらなる強化、「小さな産業」への誇りの再確認、持続可能な地域社会形成への契機になるものと期待できる。

Satoumi, Satochi, Satoyama:

Japanese people have developed ways to adapt to their surrounding natural environment by carefully utilizing and reshaping it for production, based on time-tested knowledge and practices; these places in nature are called Satoumi, Satochi, and Satoyama

## Satoyama Culture for Future Generations: A Case Study in Sakihama

Noriaki Otsuki\*, Dai Oguri

The Commemorative Foundation for the International Garden and Greenery Exposition,  
Osaka, Japan, 1990 (Expo '90 Foundation)\*

**Contact:** otsuki@expo-cosmos.or.jp, oguri@expo-cosmos.or.jp

**Keywords:** linkage between mountains, villages and the ocean, industries in satoyama, lifestyles, domestic wisdom

This study examines how the satoyama<sup>1</sup> culture is passed on to future generations, both now and in the past, in the Sakihama District of Ofunato City, Iwate Prefecture, through literature searches, on-site investigations, and interviews. The results of the study are summarized as an overview of the Sakihama District (e.g., location and land use, population trends, industry, and domestic culture); and characteristics of the satoyama culture, such as spatial linkages between satochi<sup>2</sup>, satoyama, and satoumi<sup>3</sup>, inheritance of domestic wisdom adapted to weather and climate from the past, and inheritance and development of the culture through relationships among people.

This study focuses on the serious damage caused by the Great East Japan Earthquake and associated tsunamis, through which many valuable natural assets were lost. In the years since those events, people have begun passing on cultural values, lifestyles in villages, blessings from the ocean, and restoring the mountain landscapes. The following quote emphasizes the importance of public benefits and regional characteristics of satochi, satoyama, and satoumi: “The climate is the integration of regional nature, history, and culture, and our lives depend on these elements. The hometown produced through such relationships should be bequeathed to the future generations. Actions and awareness of local people in addition to regional characteristics should be perceived as regional resources, and especially as one of public resources called regional resources.”<sup>4</sup> History and culture that have been passed down through the strong connection of mountains, villages, and waters of the Kesen region, including Sakihama, are valuable regional resources. It is important to carry out and improve activities to connect spaces with spaces, people with people, and the past with the present to pass on the valuable satoyama culture.



1 An environment where people use natural resources as fuel, food, etc., thereby conserving nature in between sato (lit. village) and yama (lit. mountain)

2 Areas such as agricultural land and human settlements

3 A section of ocean that coexists with a nearby populated area

4 “Conservation of freshwater fish that cultivate the regional abilities - Itoyo of the town of Otsuchi (in Japanese)”: Seichi Mori, Professor of Faculty of Economy, Gifu Keizai University (Nature, Water, and People of Otsuchi (in Japanese): edited by Tomoya Akimichi).

### Reference

Sakihama Chronicle Editorial Board 1991 “Regional History of Sakihama”, page 178-180

## Geographical Pattern of Wild Edible Plants: Supply and Utilization in Tohoku District, Japan

Haruka Sasaki<sup>1\*</sup>, Masahiro Aiba<sup>1</sup>, Michio Oguro<sup>2</sup>, Tohru Nakasizuka<sup>1</sup>

Graduate School of Life Sciences, Tohoku University<sup>1\*</sup>,  
Forestry and Forest Products Research Institute<sup>2</sup>

**Contact:** haruka.sasaki.t6@dc.tohoku.ac.jp

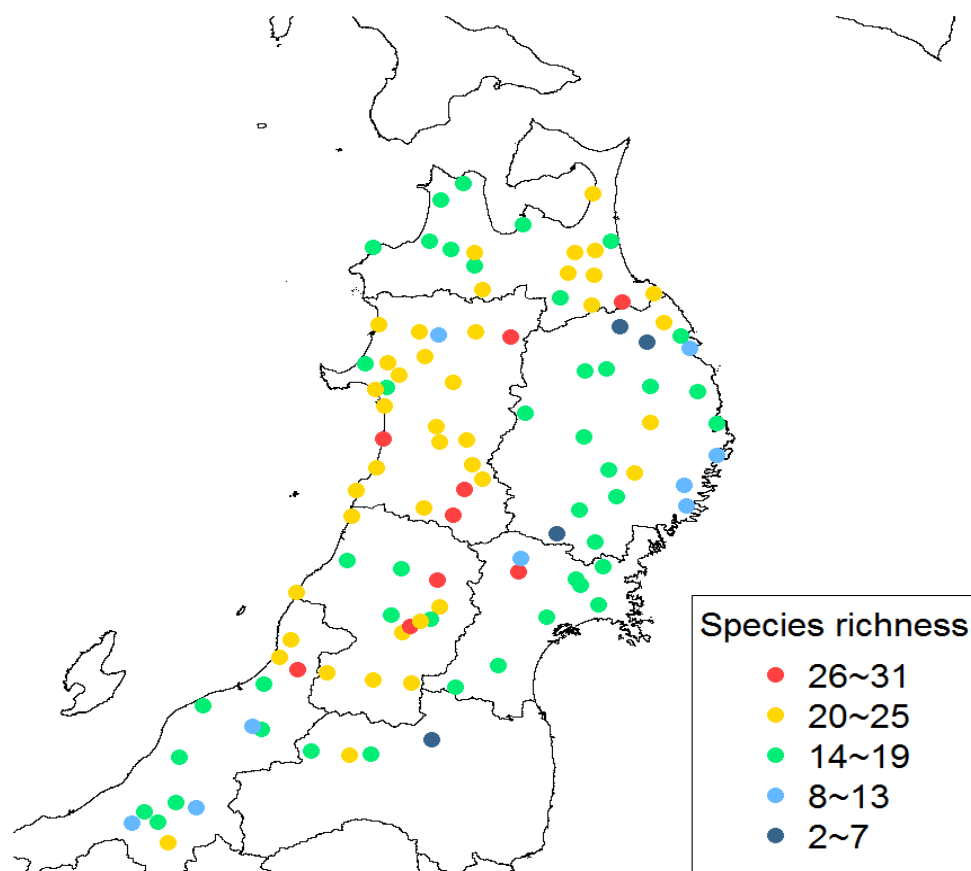
**Keywords:** ecosystem services, cultural service, wild food, wild edible plants, socio-ecological factors

To understand the mechanism underlying actual utilization of cultural ecosystem services, assessment of both supply and utilization of the service, as well as their underpinning factors, are important. Most previous studies, however, have only assessed the potential supply of cultural ecosystem services; therefore, roles of sociocultural factors in utilization of cultural services have been overlooked. This study evaluated actual utilization and potential supply of wild edible plants, which are important as cultural and provisioning services (Schulp et al. 2014, Reyes-García et al. 2015). The Michi-no-eki are roadside stations across Japan with a parking lot and rest area for drivers. Some of the Michi-no-eki have a store that sells wild edible plants collected by local people. By surveying what kind of wild edible plants are sold at the Michi-no-eki, we can then quantify actual utilization of wild edible plant species.

This study was conducted in 106 Michi-no-eki in Tohoku District and Niigata prefecture in Japan where utilization of wild edible plants has flourished. To survey actual utilization of wild edible plant species, the species of such sold in each station were recorded in spring of 2015 and 2016. At the same time, interviews with salesclerks in the Michi-no-eki regarding the species of wild edible plants sold in their stations were conducted. Based on occurrence data of each wild edible plant from vegetation survey data by the Biodiversity Center of Japan, Ministry of the Environment, vegetation type by vegetation map, climate data and topographical information, this study develop species distribution models for and estimated potential supply of each species around the individual Michi-no-eki. The study then compared distributions of potential supply and actual utilization of each wild edible plant as well as spatial patterns in potential and utilized diversity (i.e., species richness) of wild edible plants.

Results found that 46 species of wild edible plants were sold, and the maximum number of species sold at a single station was 31. Spatial patterns of actual utilization did not match those of potential supply for some species; for example, *Fallopia japonica* and *Akebia trifoliata* had broad distributions in potential supply, but they were only sold at a limited number of stations. Similarly, the correlation between potential and utilized diversity of wild edible plants was weak (i.e., species richness of actually utilized wild edible plants was not congruent with that of potentially supplied species). Deviance of utilized diversity from potential diversity showed local differences. In Aomori Prefecture, species richness of actual utilization tended to be higher than that of potential supply, whereas the opposite tendency was found in Iwate Prefecture.

This study also discusses sociocultural human population structure, as well as the industrial and cultural backgrounds responsible for the mismatch between potential supply and actual utilization based on additional analyses.



Species richness of wild edible plants sold at roadside stations.

### References

- Reyes-García, V., G. Menendez-Baceta, L. Aceituno-Mata, R. Acosta-Naranjo, L. Calvet-Mir, P. Domínguez, T. Garnatje, E. Gómez-Baggethun, M. Molina-Bustamante, M. Molina, R. Rodríguez-Franco, G. Serrasolses, J. Vallès, and M. Pardo-de-Santayana. 2015. From famine foods to delicatessen: Interpreting trends in the use of wild edible plants through cultural ecosystem services. *Ecological Economics* 120:303–311.
- Schulp, C., W Thuiller, and PH Verburg. 2014. Wild food in Europe: A synthesis of knowledge and data of terrestrial wild food as an ecosystem service. *Ecological Economics*.

## **Interrelationships among Cultural and Provisioning Ecosystem Services tightly Linked to Tree Species**

Chihiro Oka\*<sup>1</sup>, Masahiro Aiba<sup>1</sup>, Toru Nakashizuka<sup>2</sup>

<sup>1</sup>Graduate School of Life Sciences, Tohoku University\*,

<sup>2</sup>Research Institute for Humanity and Nature

**Contact:** djga1hikari@gmail.com

**Keywords :** ecosystem services, trade-off, biodiversity, cultural services, provisioning services

### **Study aims**

Most ecosystems provide multiple services important for human well-being, and an ecosystem with higher diversity is expected to provide richer services. There exist some trade-offs among services, where enhancing some ecosystem services might cause declines in others. If different species contribute to different ecosystem services, maintaining multiple ecosystem services will require greater biodiversity. Such mechanisms, however, have only been tested in supporting services (i.e., ecosystem functions), mostly in grassland and aquaculture experiments, although trade-off relationships between provisioning and cultural services have been reported in many studies.

To address this problem, this study investigates how 171 tree species dominant in Japan are linked with 15 provisioning and cultural services. This study identifies whether different suites of species contribute to different services and examines trade-offs among services, which can potentially lead to a positive relationship between species richness and diversity of ecosystem services.

### **Methods**

Existing literature was mined to discover whether or not each of the 171 tree species contribute to the 15 ecosystem services selected, including food, timber, religious uses, and traditional arts. To summarize linkages between tree species and ecosystem services, we calculated the overlap between which species contribute to each pair of services. The study also calculates the concordance rate of whether or not each species contributes to each pair. Then, a principal components analysis was conducted to show the relationships among services.

### **Results and discussion**

No species contributed to all 15 services, and, in general, the overlaps were rather low. None of the pairs of services had strong discordance or high concordance. These results indicate that there are certain trade-offs among services and suggest that higher species diversity ensures provisioning of multiple ecosystem services because different services were contributed by different species. Similar suits of species were sometimes involved in contrasting services, such as construction timber and religious uses. Species contributing to cultural services (e.g., uses in Haiku [short Japanese poem], chabana [traditional flower arrangement for tea ceremony]) and child's play, were not always similar to each other. Linkages between tree species and ecosystem services were not simple, and similar services were not always linked with similar suits of species.

## **Sustainably Exploiting the Natural Environment and Cultural Diversity through Community Initiatives: Two Case Studies in the City of Tanabe and the Town of Shirahama in Wakayama Prefecture, Japan**

Miki Yoshizumi<sup>1\*</sup>, Hirohide Kobayashi<sup>2</sup>

Educational Unit for Studies on the Connectivity of Hills, Humans and Oceans (CoHHO) at Kyoto University<sup>1\*</sup>, Graduate School of Global Environmental Studies, Kyoto University<sup>2</sup>

**Contact:** yoshizumi.miki.3x@kyoto-u.ac.jp

**Keywords:** community businesses, sustainable tourism, agricultural experiences, natural resources conservation, community development

### **Introduction**

The city of Tanabe and the town of Shirahama are located along the coast of southwestern Wakayama Prefecture, Japan. Coastal zones in these municipalities were selected for preservation as part of Wakayama Prefectural Natural Park, and designated as protected areas of the park in September 2015. There is a rich natural environment and cultural diversity with a long history such as Kumano Suigun Navy and the Kumano Kodo pilgrimage routes. However, these locales are prone to earthquakes. Massive earthquakes and tsunamis usually strike Wakayama's coastline every 100-200 years. In 1946, an 8.0 magnitude earthquake occurred, and a tsunami killed 269 people. Tanabe suffered the worst damage that year; 69 people were killed there, which was the highest number of casualties ever in a municipality in Wakayama Prefecture. Currently, a great earthquake is expected to strike within about 30 years, as well as a 12-meter tsunami along Tanabe's coast.

This paper explores sustainable use of the natural environment and cultural diversity through community initiatives, illustrating two case studies of community associations: "Shinjyo Aigoukai" in Tanabe and "Minamikisyu kouryu kousya" in Shirahama.

Field surveys and interviews were conducted from December 2014 to July 2016. The interviewees included the director and staff of "Shinjyo Aigoukai," residents of the village of Shinjyo, and the staff of "Minamikisyu kouryu kousya."

### **Shinjyo Aigoukai**

The village of Shinjyo merged with Tanabe in 1954. Shinjyo owned land and forests on village property, which was common land that had belonged to the villagers since the Edo period. When Shinjyo became part of Tanabe, it contributed 40% of the common land to Tanabe. However, it kept the remaining 60% for residents' use. The village's agriculture association managed the shared land. In order for locals to use it effectively, an incorporated association for the community called "Shinjyo Aigoukai" was established in 1964. The association has overseen the land and worked on education, welfare, and disaster management to benefit Shinjyo residents. The association inherited the common forests and land, and invested capital for purposes of sustainability. Figure 1 shows the association's various types of revenue and how it has changed over time. In the early stages, until 1967, the association mainly earned money from selling matsutake mushrooms. Since 1968, Shinjyo Aigoukai has leased part of the land for a golf course, which is its main source of income. Since 1975, Shinjyo Aigoukai has leased another part of the land for parking. Both of these sources provide Shinjyo Aigoukai with stable revenue. Matsutake mushrooms have become hard to find due to pine trees dying. Moreover, timber from the common forest has been sold, but the sales price of local wood has been low. Now, the cost of maintaining the forest is much higher than the sales price. Hence, the

association presently earns most of its money by leasing land. Shinjyo Aigoukai has tried not to reduce their assets by balancing revenue and expenditures.

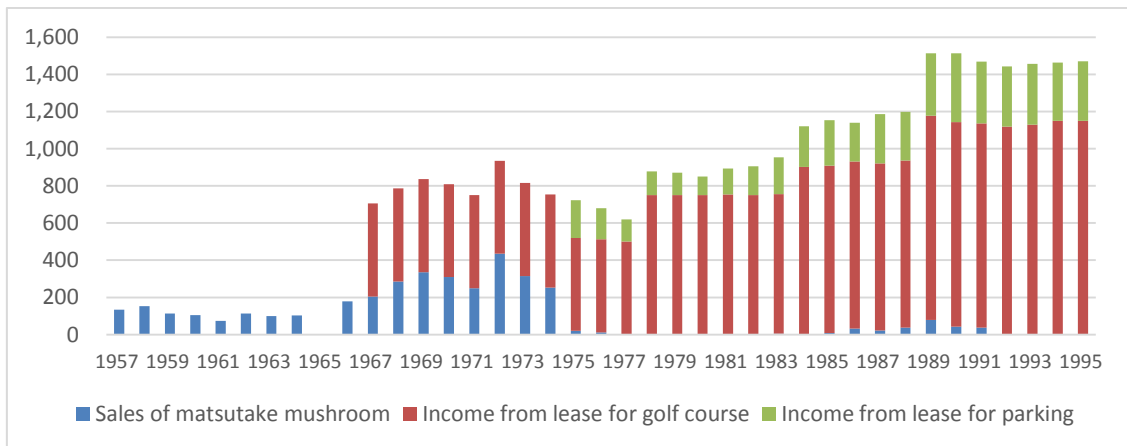


Fig. 1 How Shinjyo Aigoukai's income has changed over time

### Minamikisyu kouryu kousya

Before Shirahama merged with Tanabe on March 1<sup>st</sup>, 2006, the town of Hikigawa (which no longer exists by itself) was located along the Hiki river in the southern part of Wakayama Prefecture. In 2003, the town's population was 4,594. The town's major industries were forestry and timber. Along with the fall of the Japanese timber industry, that of Hikigawa was also declining. When the Kansai Electric Power Company purchased land in Hikigawa to develop a nuclear power plant in 1976, disagreements erupted among local residents, who either supported or opposed the plant. A resident who opposed it was elected mayor in 1988, after which the conflict ended. In order to develop new businesses and re-enhance local communities, a women's association in the former Hikigawa established a community association called "Daisuki Hikigawa no kai" in 2004, which was changed in 2011 to a general incorporated association called "Minami kisyu kouryu kousya." The association started a tourism business that includes farm stays as well as agricultural, forestry, and fishing experiences. The tourism industry has become popular. More than 3,000 tourists arrived in 2014, and more than 5,000 came in 2015. Since 2010, foreign tourists have visited from countries such as Taiwan, China, Korea, Malaysia, and Myanmar.

### Conclusion

The two case studies provide us with good models for sustainably using the natural environment and cultural diversity through community initiatives. "Shinjyo Aigoukai" has been able to protect natural resources and local culture, and promote disaster prevention by sustainably managing their assets, which are their common resources (i.e., forests and land). "Minamikisyu kouryu kousya" has also been able to preserve the natural environment and local culture through community tourist businesses. In both cases, the associations have not relied on government support. The communities' self-reliant management systems are key to sustainably exploiting the natural environment and cultural diversity, as well as conserving historical *satoyama* and *satoumi* landscapes, which provide locals with a livelihood.

### References

- Shinjyo Aigoukai, <http://www.aikis.or.jp/~shinjyo-aigokai/index.html>. Accessed 21 June 2016.  
 Shinjyo Aigoukai, Shinjyo Aigoukai no ayumi, 1996.  
 Minamikisyu kouryu kousya, <http://www.minamikishu.com/>. Accessed 21 July 2016.

## **Abundant Knowledge of Wild Fruit Use among Elders: “Wisdom of the Elders” or “Loss of Experience” as a Mechanism Explaining the Pattern**

Kaori Okui<sup>\*1,2</sup>, Yoshihiro Sawada<sup>1</sup>, Takehito Yoshida<sup>2</sup>

<sup>1</sup>Graduate School of Landscape Design and Management, University of Hyogo,  
954-2 Nojimatokiwa, Awaji City, 656-1726 JAPAN

<sup>2</sup>Department of General Systems Studies, University of Tokyo,  
Komaba, Meguro, Tokyo 153-8902 JAPAN

**Contact:** c-oqi@mail.ecc.u-tokyo.ac.jp

**Keywords:** ethnobotany, local knowledge, extinction of experience, wild fruits, Awaji island

### **Introduction**

Knowledge of natural resource use has been progressively lost all over the world, as reported by a number of studies on traditional knowledge. While some recording and conserving actions regarding traditional knowledge have been undertaken, it is far from exhaustive. This study focuses on the traditional knowledge regarding the use of wild fruits, how this knowledge differs across generations, and how it has been transferred. First, an inventory was created for the types of wild fruits used and for which purposes by the local people in Awaji Island, Hyogo Prefecture, Japan. Then, inter-generational differences in the use experience of wild fruits were analyzed. Previous studies have reported that elder generations tend to have a greater depth of knowledge compared to younger generations (1, 2), also shown in this study by the correlation between age and the amount of knowledge. Two alternative hypotheses (3) can explain this finding, though they have not been tested in previous studies: “wisdom of the elders” (i.e., elders accumulate more knowledge during their longer lifetimes) or “loss of experience” (e.g., youth have less knowledge because they have fewer opportunities for knowledge transfer in the modern life). In this study, we tested these hypotheses to explain the correlation between age and traditional knowledge by examining how different generations have used the knowledge of wild fruits applications during their lifetimes. In addition, we analyzed how this knowledge has been transferred within and across generations.

### **Study area**

Awaji Island is located in Hyogo Prefecture, Japan, surrounded by the Seto Inland Sea, and has a population of 134,500. Mountains and hills occupy 65% of the island’s land area. The largest town, Sumoto, has been urbanized, though there remain many fishing and farming villages all over the island. The highest mountain (608m a.s.l.) is located in the southern part of the island, and the flora is different between the north and south sides of the mountain.

### **Method**

Unstructured interviews and a quantitative questionnaire survey were conducted from March 2013 to February 2015. At first, 40 local people (mostly elders) were interviewed; as a result, eight types of wild fruits were selected for the later questionnaire survey. In the questionnaire, subjects were asked about their use experience with the eight types of wild fruits, age when using the wild fruits, and any memories of the wild fruits. Ultimately, there were 228 respondents covering a wide range of ages.

### **Results and discussion**

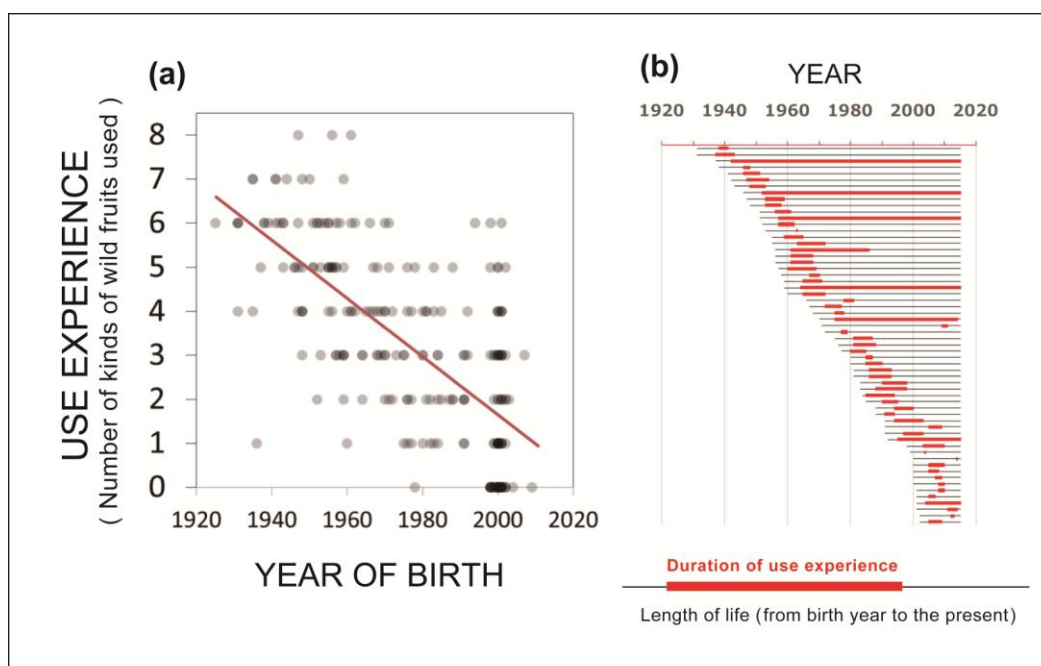
In total, 48 species have been used by the local people on the island for purposes such as



food, playthings, oil, transactional material, preservatives, pillow filling, fishing bait, and as offerings. Many of the species used have local names that differ among the local villages. Also, the male and female versions of some plants were named differently.

Quantitative survey results revealed that the experience of using wild fruits has continuously declined throughout the younger generations (Figure 1a). Most of the respondents had only experienced wild fruits use when they were children, although some respondents had a much longer period of experience (Figure 1b). This suggests that the greater instances of use experience among elders was not due to the accumulation of experience during the longer lifetime (i.e., “wisdom of the elders”), but due to the inter-generational change in experience during childhood (“loss of experience”). Also, this result indicates that future generations could potentially not have any use for wild fruits; thus, the knowledge of wild fruits use would be lost completely.

As a channel of knowledge transfer, “friends” and “senior students (students in the upper grades)” were important and used by more than 40% of the respondents who were born before 1970, whereas dependence on this channel declined to below 10% among the younger generations. Channels of knowledge transfer have changed continuously and are diversified across recent generations.



**Figure 1.** Number of kinds of wild fruits used among the total of 8 kinds (a) and the duration of use experience during the lifetime of example respondents (b). For the panel (a),  $n = 228$  and  $r^2 = 0.464$ .

### References

1. Ladio, A. H., and Lozada, M. (2004) Patterns of use and knowledge of wild edible plants in distinct ecological environments: a case study of a Mapuche community from northwestern Patagonia. *Biodiversity & Conservation*, 13:1153-1173.
2. Cruz García, G. S. (2006) The mother – child nexus. Knowledge and valuation of wild food plants in Wayanad, Western Ghats, India. *Journal of Ethnobiology and Ethnomedicine*, 2:39.
3. Koster, J., Bruno, O., and Burns, J. L. (2016) Wisdom of the Elders? Ethnobiological Knowledge across the Lifespan. *Current Anthropology*, 57:113-121.

### Acknowledgment

This research was supported by the University of Hyogo and the Environment Research and Technology Development Fund (S15–2[3]) of the Ministry of the Environment, Japan.

## **Impacts of Traditional Culture Inheritance on the Maintenance of Village Functions: A Case Study of *Nouson Kabuki* in Shodoshima, Japan**

Moe Nonoshita\*, Izuru Saizen

Graduate School of Global Environmental Studies, Kyoto University

**Contact:** nonoshita.moe.33v@st.kyoto-u.ac.jp

**Keywords:** traditional culture, inheritance, village function, sustainability

### **Introduction**

Recently, the decreasing population in Japanese farming villages has resulted in difficulty maintaining village functions, which in turn causes environmental or landscape degradation. Moreover, a general lack of successors and reduced connectivity among villagers make it difficult to inherit not only agricultural production activities but also traditional culture and habits. The importance of traditional culture is recognized widely for maintaining vitalities of farm villages, but there are few previous studies about the social impacts on their own regions or the reasons why villagers are preserving their traditional culture. In such a situation, the traditional culture called *Nouson Kabuki* has been passed down for more than 340 years from the Edo period in the Hitoyama District in Shodoshima, Japan, which is an island located in Seto Inland Sea. This research focuses on Hitoyama District as a study area and aims to clarify the concrete impacts on the region of traditional culture inheritance through focusing on the maintenance of the village functions. Results will also indicate regional vitality formed by the inheritance of traditional culture through interviews with villagers.

### **A traditional culture: *Nouson Kabuki***

In 1686, Oota Izaemon, who was a village headman (Shouya) at Hitoyama, constructed the Kaerugoike reservoir on his private property to help farmers irrigate their crops. After the construction of Kaerugoike, the farmers built a temporary building to host a play expressing their gratitude. This is thought to be the origin of *Nouson Kabuki*. The play is still performed at Hitoyama Rikyu-Hachiman shrine in dedication every May 3rd. In 1967, *Hitoyama Nouson Kabuki* Conservation Committee was established, which currently boasts 82 members. The support of the *Kabuki* practice and the operation of the performance is done by one group among six in rotation.

### **Methodology**

The study area is Hitoyama District, Tonoshou-cho, Syoudo-gun, Kagawa Prefecture, Japan. There are 250 households in the area with a population of about 670. Interviews were conducted primarily among members of the conservation committee, though there were also some non-member interviewees as well. The period survey was distributed between July 1st to 3rd and August 25th to 29th.

### **Results**

According to Japan's Ministry of Land, Infrastructure and Transport, "Village function" is comprised of the following three elements: (1) Livelihood assistance function, which is the function to improve and sustain their livelihood by helping each other, resulting in smooth lives in a community; (2) Production complement function, which is the function to improve and sustain production activities that are complementary among villagers; (3) Resource management

function, which is the function to maintain farmland, landscape, and culture. These definitions are used throughout this research.

Table 1 shows partial answers to the question: “What impacts are there in your daily life or your region?”

Results show that the inheritance of *Nouson Kabuki* brings positive social impacts to the region and works to bolster some village functions. Bonding within the region through *Nouson Kabuki* results in the unity of other autonomous organizations and it can strengthen the sustainability of some village functions.

Table 1 Social impacts on the region and achieved village functions

	Social impacts on the region	Achieved village function based on the definition
Mr. K (Age: 51)	It is easy to grasp the current state of the neighbors and to ask them for help.	1: Livelihood assistance function
Mr. Y (Age: 75)	<ul style="list-style-type: none"> <li>•Relation to the <i>Kabuki</i> connects to the unity of senior citizens’ because we share the difficulties and achievements of our youth.</li> <li>•It is easy to accept the national- or prefecture-level subsidies, such as support of agriculture and environment enhancement by the Hitoyama conservation committee, because enough villagers are always getting together to launch a new project.</li> </ul>	1: Livelihood assistance function  2: Production complement function 3: Resource management function
Mr. S (Age: 40)	I can feel the recognition of myself as a person in Hitoyama through relating to the <i>Kabuki</i> .	1: Livelihood assistance function 2: Production complement function 3: Resource management function

### References

- Sugita, M., Aizawa, H., 2010. Conditions of Sustainable Management and Its Inheritance in Agricultural Community which Has Stabilized Population Structure in Rural Area. *Journal Of Rural Planning Association*, Vol. 29, No. Special\_Issue, p. 323-328 (In Japanese with English abstract).
- You, H., Senga, Y., 2004. Study on Evaluation of Residents’ Vitality in Mountainous Villages. *Journal of Rural Planning Association*, Vol. 23, No. 6-suppl p. 193-198 (In Japanese with English abstract).

## Efforts for Regional Revitalization through Utilizing Abandoned Farmland in Shitaru, Tsushima City, Nagasaki Prefecture, Japan

Natsuko Shigehara<sup>1\*</sup>, Shozo Shibata<sup>1</sup>

<sup>1</sup> Graduate School of Global Environmental Studies, Kyoto University

**Contact:** n.shigehara@gmail.com

**Keywords:** remote areas, abandoned farmland, regional revitalization, underpopulation

### Background

The concept of “satoyama” is now drawing widespread attention. Satoyama is the traditional Japanese rural landscape; sato means “village” and yama means “mountain”. It is important not only for producing food, but also for multiple ecosystem functions, such as groundwater recharge and habitat provision for various species. To maintain a well-functioning system that effectively utilizes its environment, we need to tackle various problems resulting from depopulation, aging in the primary industries, changes in lifestyle, and so on. Above all, the expansion of abandoned farmland in rural areas is a serious problem (Shinohara, 1969), especially in remote areas such as Tsushima City, Nagasaki Prefecture, Japan (Fig.1). Tsushima has a unique ecosystem where the top-level predator is the Tsushima Leopard Cat (*Prionailurus bengalensis euptilurus*). For a long time, local people utilized the semi-natural environment and lived in a harmonious way. Many villages still continue traditional practices, and a rich natural environment remains. At present, Tsushima City faces serious underpopulation problems. The population of Tsushima City peaked at 69,556 in 1960 and has declined to less than half that number over the last 50 years (Tsushima City, 2016). Accordingly, vast farm lands, forests, and mountains were abandoned, and the number of opportunities to use natural resources has decreased due to changing life-styles. There are concerns about the impacts on the local ecosystem of environmental changes and the disappearance of traditional systems for using natural resources.



Fig.1 TSUSHIMA CITY location

In 2009, the Japanese government started the “community-reactivating cooperator squad system” to promote regional revitalization by accepting human resource from urban areas, and around 2,600 people worked on regional development throughout Japan in 2015. Tsushima City introduced this system in 2011, and many activities have begun in recent years.

In Shitaru, several efforts for the revitalization of local communities started in 2012. The population of Shitaru, as of September 2015, was 64, and the percentage of the population of Shitaru aged 65 years or older was 62.5%. For four months in 2013, I participated in an internship promoting the utilization of local resources with the members of the general incorporated association, which was started by urban-to-rural migrants. These activities continue today.

### Efforts for Revitalization of Abandoned Areas

#### (1) Assessment of Current Conditions and Problem Analysis

In order to clarify the current conditions and problems the community is facing, I conducted interviews with local people and surveyed current land use. A comparison between 1995 and 2015 showed that there was a reduction of 79.3% in functioning farmland. While 60% of

households still have a kitchen garden, 90% of the rice fields have disappeared, compared to 1995 (Shigehara, 2016).

(2) Revitalization of abandoned farmland by outsiders

In Shitaru, where there are not a lot of young people and further depopulation and aging is predicted, it is difficult to find workers to revitalize abandoned farmland. Therefore, it has been revitalized by an urban-to-rural move by outsiders and nonlocal visitors. Between 2011 and 2015, 0.8ha of abandoned land returned to farmland or usable land.

(3) Ownership system for the abandoned paddy fields

An agricultural field improvement project started throughout Japan in the 1930s, but this project was not introduced to paddy fields in Shitaru, so expansion and mechanization is still difficult today. In order to address this, an ownership system started in 2014. It made it possible to attach added value to agricultural products by appealing to exclusivity and safety. I advertised the story of the revitalization of abandoned paddy fields, growing rice using traditional methods completely without chemicals, and the importance of paddy fields for biodiversity. As a result of the advertisement, around 20 people became members of ownership system, and a profit was generated (about 600,000 yen/year).

(4) Contract farming for red pepper

In order to promote the utilization farmland, contract farming for red pepper was introduced. Eight households participated in contract farming. This program proved to be easy for rural residents to participate in, because many of them already grow a variety of crops for personal consumption.

(5) Efforts for regional initiatives

When promoting efforts for the revitalization of abandoned land, involving locals is very important. To do that, the following measures were taken. First, meetings were held to consider land use. Second, activities' leaders acted together with locals. Third, people were taken to advanced areas of regional revitalization so they could see that it is not difficult to achieve.

### Prospects for the Future

In rural areas with depopulation and aging problems, local populations taking their own initiative to solve their problems is unlikely to happen. In the context of promoting land utilization, outsiders have an opportunity to play an important role in motivating the locals. Shitaru is a remote area and has limited farmland, so it is impossible to make living with agriculture. In order to promote the utilization of abandoned land, it is essential to find new value and benefits for local people. Outsiders provided new values and opportunities to reconsider land use. In addition, their motivation is not only monetary, but includes social contributions, enjoyment, and nostalgia for the past. On one hand, it is suggested that the participation of residents is promoted by providing multifarious incentives. On the other hand, the issue of abandoned farmlands is rooted in the mindset of individual landowners.

It is difficult to find new value for abandoned areas. But in rural areas, there is a rich natural environment that holds attractions for urban people. Future issues will be how to commercialize local resources, and how to involve locals in these activities.

### References

- Shigehara, N. 2016. The Actual Condition and Problems for Promoting the Utilization of Abandoned Farmland in the Less-Favored Areas: A Case Study in Shitaru, Tsushima City. (to be submitted)
- Shinohara, S. 1969. A Process of Village Transfiguration in the Depopulation Area: A Case Study of the Middle and South-Western Districts in Shikoku Mountains, Japanese Journal of Human Geography, 21 (5), pp453-480.
- Tsushima City. 2016. Population: Tsushima City. Available from: <<http://www.city.tsushima.nagasaki.jp/deta/post-6.html>> (accessed 31.08.2016).





ISBN: 978-92-808-4572-3 [Electronic Version]

United Nations University Institute for the Advanced Study of Sustainability  
Operating Unit Ishikawa/Kanazawa (UNU-IAS OUIK)

**1st Asian Conference on Biocultural Diversity**  
**October 27–29, 2016**  
**Wakura-onsen, Nanao, Ishikawa prefecture, Japan**

