

The Taxonomy Bottleneck: Linking Biodiversity Data Mobilization to Local Communities in the Pacific Islands: - Challenges and Opportunities

**Biodiversity Information for Development (BID) Pacific Regional Meeting
The University of the South Pacific, Suva Fiji, 6-9 August 2019**



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I pay respect to, and ask for the blessings of the indigenous and long-resident local communities of the Pacific Islands as the original custodians of their islands and oceans and indigenous and local knowledge (ILK) of change and adaptation



BASIC ASSUMPTION No. 1

Eurocentric, “Urban”, Monetary Capitalistic Development and Consumerism that we have been promoting via modern education for the past half century or more is not sustainable in the long run in the Pacific Islands!

Nuku'alofa, Tonga, April, 2002

EUROCENTRIC DEVELOPMENT THEORY

TRADITIONAL →→→→→→→→→→→→→MODERN

Rural/Outer Island

Self-sufficient

Subsistence/Non-monetized

Resources renewable/biodegradable

Renewable Energy

Non-polluting/non-poisoning

POLYCULTURAL/BIODIVERSE

Low incidence of NCDs/premature death

Few Invasive Alien Species/Diseases

Equitable sharing of resources

RICH ILK AND TAXONOMIC KNOWLEDGE

rr

Urban and Industrial/Main Island

Dependent on Imports

Highly monetized (money-focus)

Nonrenewable/non-biodegradable

Fossil Fuel (Petroleum)

Polluting/Self-Poisoning

MONOCULTURAL/BIO-IMPOVERISHED

High incidence of NCDs/premature death

Abundance of Alien Invasive Species

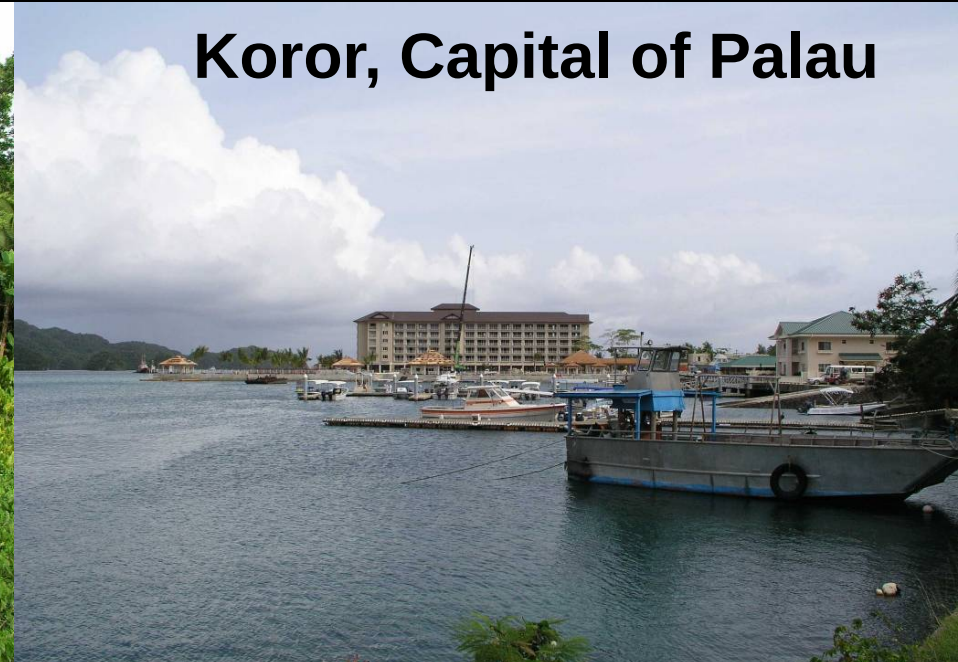
Unequal sharing

POOR ILK/FEW MODERN TAXONOMISTS

Women's Garden, Palau



Koror, Capital of Palau



BASIC ASSUMPTION No. 2

The Conservation and enrichment of Our Island and Ocean Biodiversity and associated ILK, Taxonomy and appropriate BES Knowledge is the most important Foundation for Sustainable Development and an important focus for “taxonomy”!!!

Nuku'alofa, Tonga, April, 2002

BIODIVERSITY IS LIFE, BIODIVERSITY IS OUR LIFE

UN INTERNATIONAL YEAR OF BIODIVERSITY (



2010 International Year of Biodiversity

Biodiversity is life
Biodiversity is our life

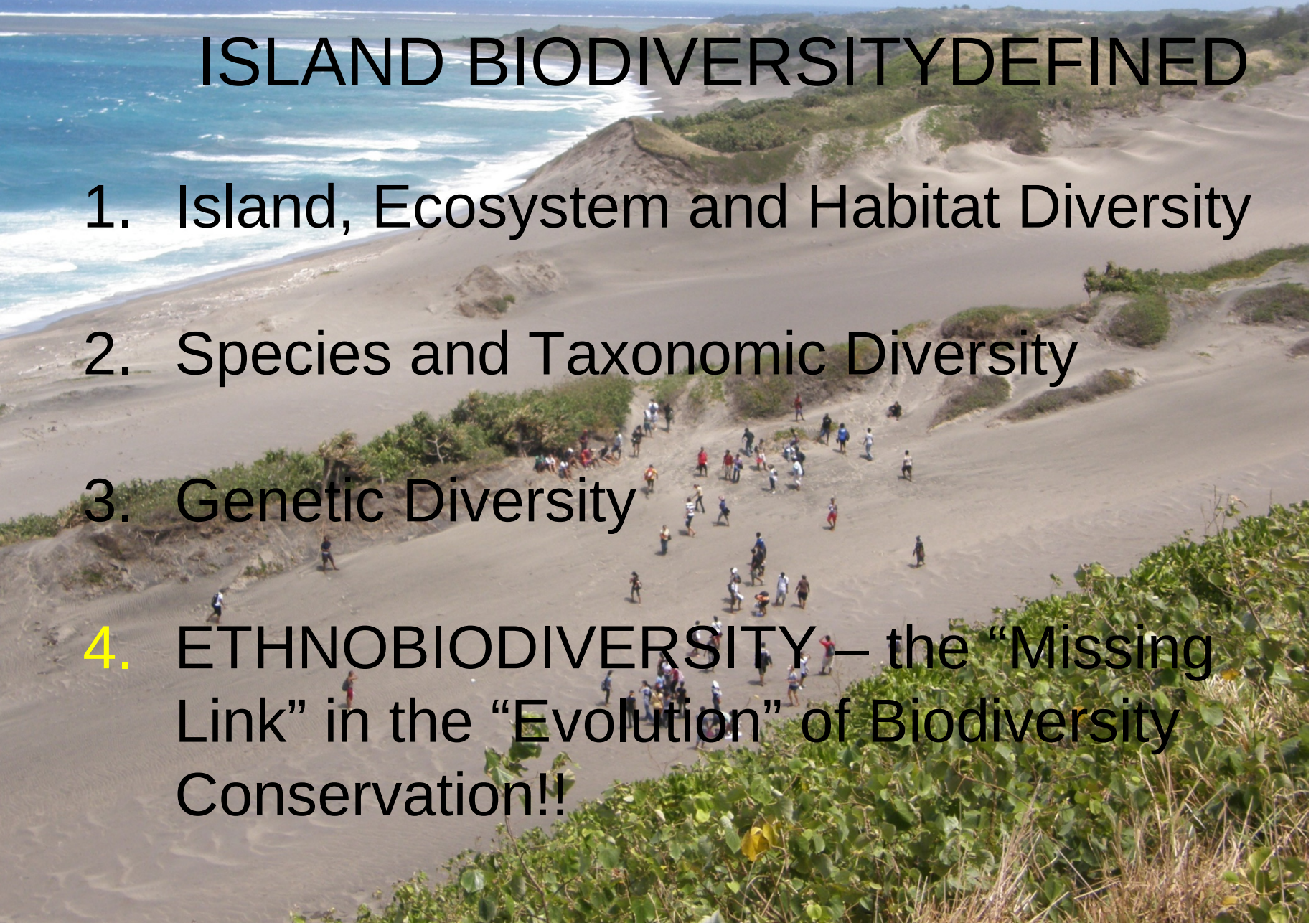
OBLIGATE DEPENDENCE

**that Small Island
Developing States
(SIDS) have on
their island AND
marine biodiversity
. . . to achieve the
objectives of
sustainable
development .**



ISLAND BIODIVERSITY DEFINED

1. Island, Ecosystem and Habitat Diversity
2. Species and Taxonomic Diversity
3. Genetic Diversity
4. ETHNOBIODIVERSITY— the “Missing Link” in the “Evolution” of Biodiversity Conservation!!



ISLANDS AS ARKS

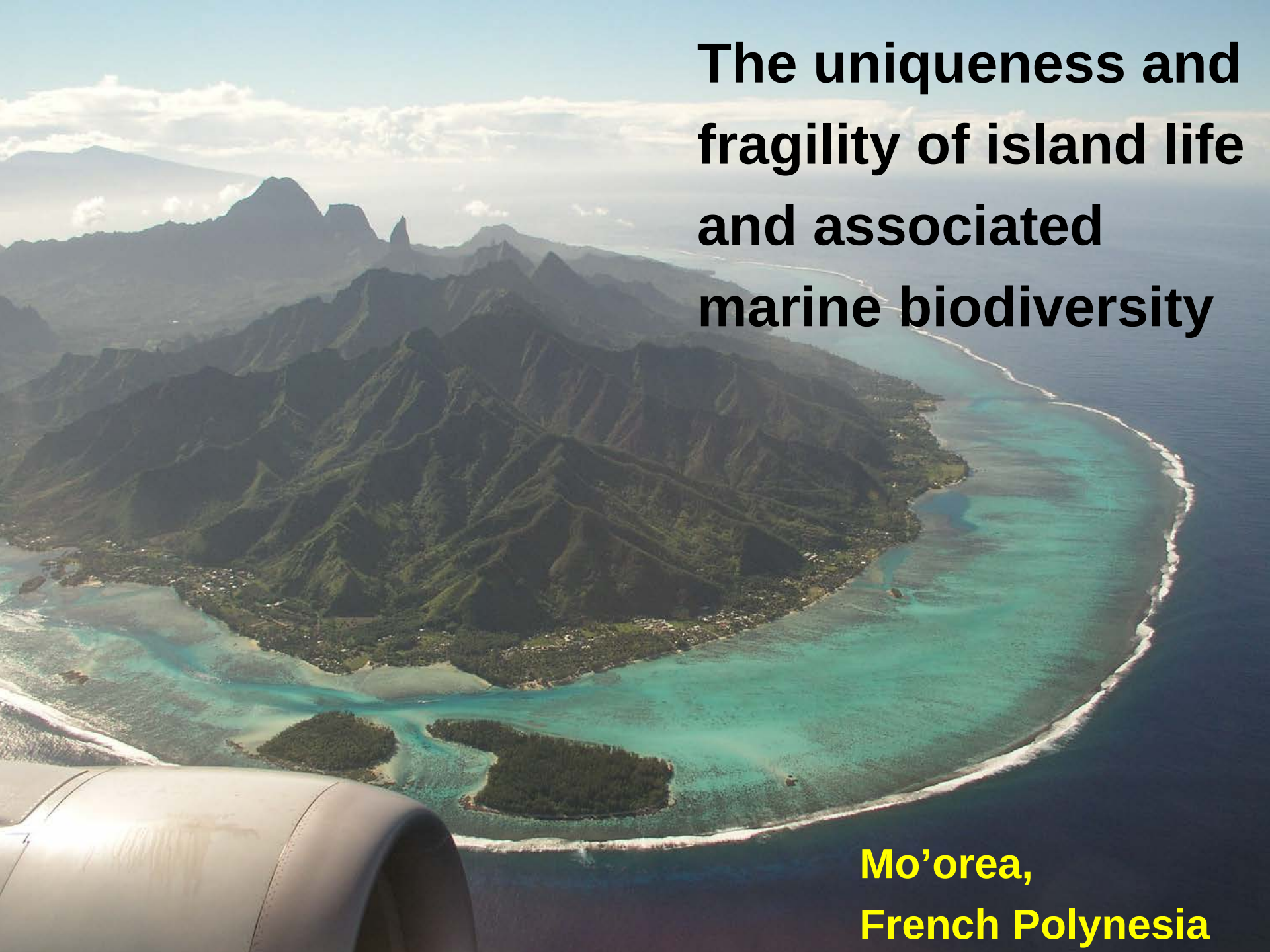
Islands and their surrounding marine biodiversity as constituting self-contained, bounded “ARKS”, each with their own

**unique, limited PASSENGER LIST of
TERRESTRIAL, FRESHWATER AND
MARINE BIODIVERSITY, including people
and their cultures – their
ETHNOBIODIVERSITY!**

Bellona (Mungiki)

**The uniqueness and
fragility of island life
and associated
marine biodiversity**

**Mo'orea,
French Polynesia**



Also – The Earth's Biodiversity “Coolspots”!!

TAKUU ISLET



Village
NUKUTOA
ISLET



Takuu Atoll, Papua New Guinea
Carteret Islands

ETHNOBIODIVERSITY



The knowledge, uses, beliefs, resource-use systems and conservation practices and language that island societies, including modern scientists (“hard” and social), have for their island and marine ecosystems, species, taxa and genetic diversity.

ETHNOBIODIVERSITY/ILK, just like
Biodiversity itself, highly threatened, creating
A parallel “ethnobiodiversity” extinction crisis

Marovo Lagoon
Solomon Islands



PYRAMID OF SUSTAINABLE ISLAND DEVELOPMENT

(Based on the Conservation and Sustainable Use of Island Biodiversity and Resources)

**ALL URBAN
ACTIVITIES**
(Politics,
Business,
Government,
Banking, Law,
Teaching, etc.)

EXPORT PRODUCTION
Timber, Crops, Fish, Minerals &
Tourism

PRODUCTION FOR LOCAL SALE
(Food, Fish, Handicrafts, etc.)

SUBSISTENCE PRODUCTION
(Food, Fuel, Medicines, Construction Materials, etc)

SPECIES, TAXONOMIC & GENETIC DIVERSITY
(Plants, Animals & Micro-Organisms)

ECOSYSTEMS (NATURAL & CULTURAL)
(Terrestrial, Freshwater & Marine)

TRADITIONAL & MODERN ETHNOBIODIVERSITY
(Uses, knowledge beliefs, Management Systems **TAXONOMY** & Language that a
Culture or Society has for its Biodiversity)

(Note: Although the lines between each level or the area within each segment may change for different islands, countries or communities, all activities will ultimately depend for their sustainability on the conservation and sustainable use of those entities beneath them)

ASSUMPTIONS: TAXONOMY AND BIOINFORMATICS AS UNDERPINNING THIS PYRAMID

- Among our most ancient areas of expertise
- For millennia, they have formed the basis for human understanding of biodiversity as a foundation for sustainable habitation of Planet Earth

Bellona (Mungiki) Is.
Solomon Islands



SERIOUS AND INTENSIFYING THREATS TO CBBC- 1

- TAXONOMIC IMPEDIMENT (loss of or lack of Alpha and Para Taxonomists, both modern and local, which is a two edges swrrd)
- LOSS OF TIME-DEPTH INDIGENOUS AND LOCAL KNOWLEDGE ABOUT BES DRIVEN BY URBANIZATION (geographical, educational, linguistic, taxonomic, values, spiritual, etc.)
- BREAKDOWN IN COMMUNITY- AND LANDOWNER-BASED BES CONSERVATION AND SUSTAINBLE USE
- INADEQUATE LEVELS OF SCIENTIFIC AND LOCAL KNOWLEDGE (PARTICULARLY TAXONOMIC KNOWLEDGE) AMONG THE FORMAL CONSERVATION COMMUNITY (limits our ability to assess and understand the status of the biodiversity we are assessing and trying to conserve)
- BREAKDOWN IN SOCIO-ECOLOGICAL PRODUCTION SYSTEMS
- BREAKDOWN IN THE SPIRITUALAND CULTURAL IMPORTANCE, SACREDNESS AND INTERCONNECTEDNESS OF HUMANS AND BES

SERIOUS AND INTENSIFYING THREATS TO CBBC -2

- BREAKDOWN IN BES-BASED FOOD, HEALTH AND ENERGY SECURITY
- AIR POLLUTION AND HUMAN-DRIVEN CLIMATE CHANGE (the main reason for reducing carbon pollution and other air pollution is that it is responsible for the death of millions of people and animals worldwide)
- WATER POLLUTION (nutrient pollution, chemical pollution, sedimentation, etc.)
- SOLID WASTE AND PLASTIC MANAGEMENT
- OVERFISHING AND UNSUSTAINABLE USE OF MARINE AND FRESHWATER FISHERIES BES
- OVEREXPLOITATION/UNSUSTAINABLE USE OF TERRESTRIAL BES
- DEGRADATION OF SURFACE AND GROUND FRESHWATER RESOURCES (Overuse, pollution, saltwater incursion, loss of snowpack, retreat of cloudforest)
- DEGRADATION OF SOIL, SEDIMENT, AGGREGATE RESOURCES AND BUDGETS (e.g., sand, sediment and rock aggregate from beaches, lagoons, streams, etc.)

SERIOUS AND INTENSIFYING THREATS TO CBBC - 3

- DEGRADATION AND LOSS OF BES ON SMALL UNINHABITED ISLANDS
- DEFORESTATION AND AGRODEFORESTATION AND THE LOSS OF ARBOREAL DIVERSITY (loss of cloud forests, lowland forest, coastal and mangrove forests, and agroforests and trees as ecological and cultural keystone species (need for a Blue-Green List! – see above)
- INDISCRIMINATE/UNCONTROLLED USE OF FIRE AND POOR FIRE MANAGEMENT (major threat to trees, forest, soil microorganism, and animal habitat,)
- MINING AND EXTRACTIVE INDUSTRIES AND SOLID AND TOXIC WASTE MANAGEMENT
- INVASIVE ALIEN SPECIES AND DISEASES AND WEAK BIOSECURITY
- INDISCRIMINATE PESTICIDE/BIOCIDE USE AND TOXIC WASTE DISPOSAL

Threats to BES Conservation in the face of global change in the Pacific Islands: Voices from the Field

ASSUMPTIONS - 1

- Threats are multiple and create negative synergistic effects that need to be addressed using trans-ecosystem, whole-island, ridge-to-reef community-based BES conservation.
- All threats are all intensifying, and must be addressed by building strong synergies between the best Indigenous and Local Knowledge (ILK) and Modern Scientific Knowledge (MSK), including taxonomy, both of which need to be strengthened.

Threats to BES Conservation in the face of global change in the Pacific Islands: Voices from the Field

ASSUMPTIONS - 2

- Conservation is the first line of defence, followed by enrichment and restoration of BES, including ILK and MSK) (e.g, is far easier to conserve mangrove forest than to replant or restore it; or recreate lost ILK or MSK).
- Overemphasis of conservation and taxonomy focused on “Biodiversity Hotspot” Islands and not enough on the atolls and other “Biodiversity Coolspots, that have little or no endemism, very limited terrestrial and freshwater diversity, but are more threatened than the Hotspots in terms of the importance of biodiversity as a Foundation for Sustainable Island Life

Threats to BES Conservation in the face of global change in the Pacific Islands: Voices from the Field

ASSUMPTIONS - 3

- There is a current over-emphasis on E-Learning, rather than F-learning (e.g. in/on/from the Field, Forest, Farm, Family, Forefathers, Fauna (frogs, moths, pollinators) and on the Front-line against the loss of BES!!

**This is not to say that E-Learning is not valuable, but only that there needs to be more emphasis on fieldtrips, fieldwork and practical in-the-field, in-the community learning), something that USP was traditionally renowned for, but which has been de-emphasised over the past years; and which is one way of involving community-based experts in making education more practicable and effective).

Threats to BES Conservation in the face of global change in the Pacific Islands: Voices from the Field

ASSUMPTIONS - 4

- There is a need to engage and to honour and recognise, formally, Biodiversity Conservation Champions, especially community-leaders (practitioners, leaders, sports stars, entertainers, etc.)
- There is need for the involvement of all relevant community-based partners in BES conservation initiative (e.g. local rural and urban communities, local taxonomists, local government, faith-based organisation, tourism operators, sports, entertainment and cultural art/craft community)

Threats to BES Conservation in the face of global change in the Pacific Islands: Voices from the Field

ASSUMPTIONS - 5

- In addition to the well-known IUCN Red List of Globally Threatened Species, there is the need for the development of an IUCN Blue-Green List of Threatened Ecologically and Culturally Keystone Species. based on community-based perceptions, an endeavour which USP can play a major role, possibly working through our regional centres.

*** Important focus for IPBES and GBIF!

Threats to BES Conservation in the face of global change in the Pacific Islands: Voices from the Field

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Ethnobiobiodiversity information is often not recorded in detail as a INTEGRAL component of many scientific biodiversity survey expeditions . . . Sometimes only as an after thought!



USP's role in building synergies between ILK and MSK

Given the unique and rapidly changing environmental, cultural and political realities and aspirations of Pacific peoples, neither ILK or MSK, alone, can promote truly long-term sustainable development in a rapidly urbanising and globalising Pacific . . . a Pacific in which the loss of ILK and associated cultural resilience is probably a much more serious long-term obstacle to sustainability than climate change, extreme events, environmental degradation, pollution, increasing crime and corruption, globalisation, etc., ***all of which need to be addressed through the building of positive synergies between ILK and MSK, a role in which USP, because of its unique mandate, has been exemplary!***

Solving this crisis, part of which has been referred to as the “taxonomic impediment”, is not just about training taxonomists to catalogue unidentified biodiversity and provide information to conservationists.



It is about supporting indigenous taxonomists and traditional biodiversity users to record, preserve, disseminate, and use their own taxonomies and “stories”



It is also about training armies of
parataxonomists



Making sure our children know the names of plants and animals, what BIODIVERSITY is and the ways ecosystems function.



Ethnobiobiodiversity is the vital between “our” and “their” taxonomies and bioinformatics as bases for the conservation and sustainable use of biodiversity.



UN Convention on Biological Diversity (CBD)

Program of Work on ISLAND BIODIVERSITY

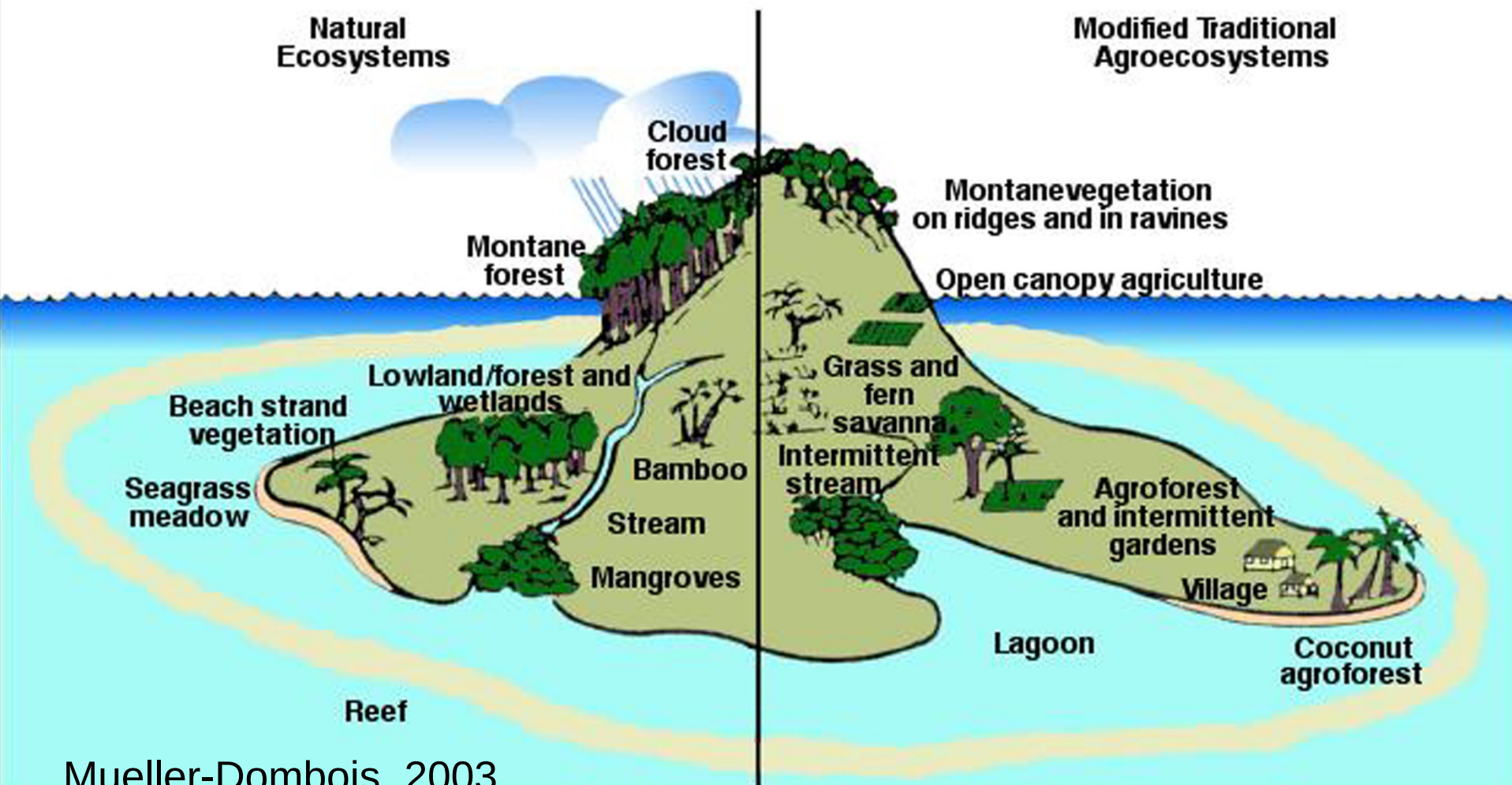
Approved April 2004 by COP 8 in Curitiba, Brazil

Recognised the Critical Importance of ILK



HOW????

Ridge to Reef *Ahu Pua'a* Concept, Hawai'i



Mueller-Dombois, 2003

**For island people and their cultures
were not be separated from . . .**

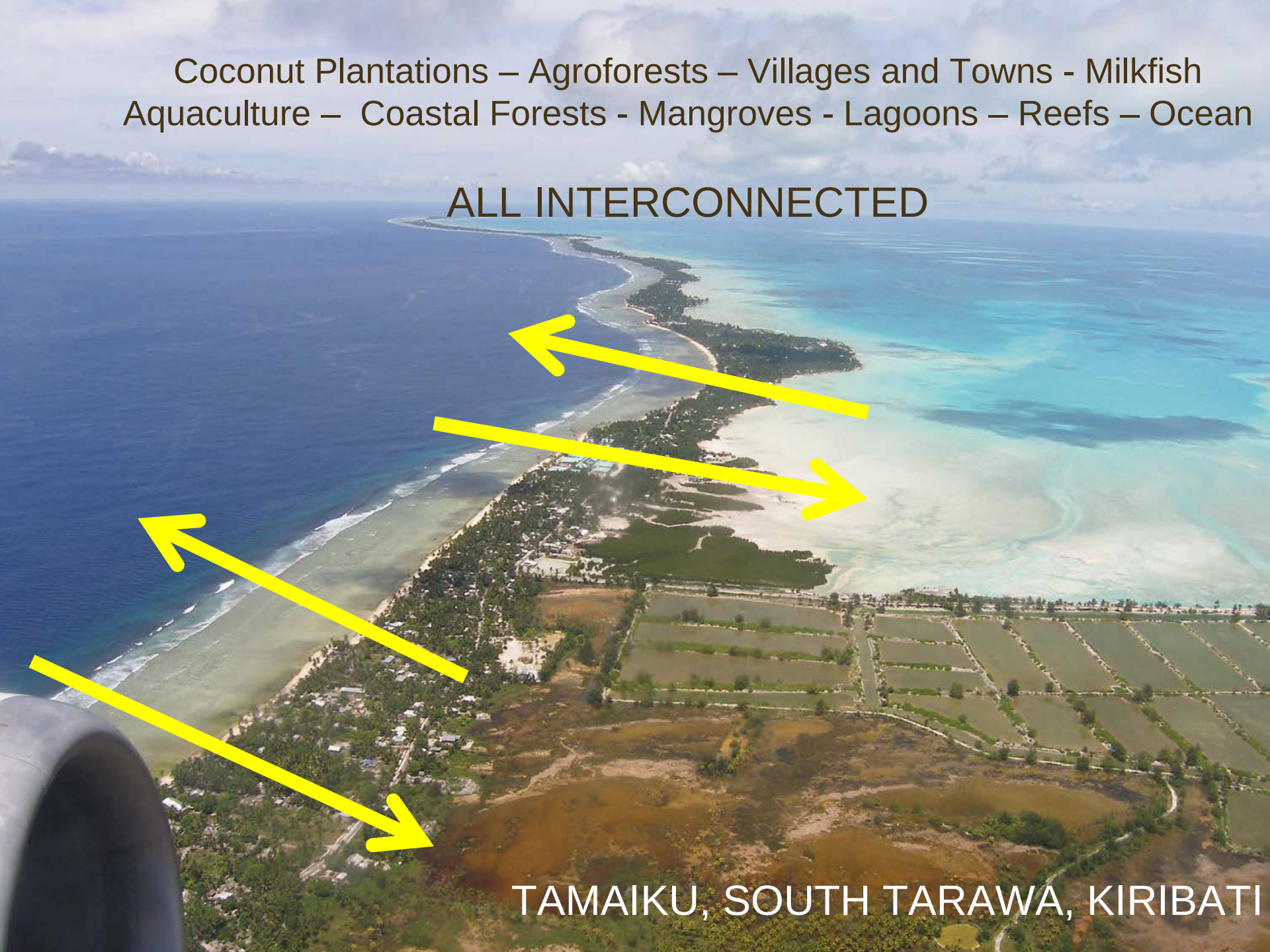
**their island and ocean biodiversity . . . All
“natural” and cultural ecosystems were
Interconnected!!**

**Natadola Bay and
Navo Island,
SW Viti Levu, Fiji**



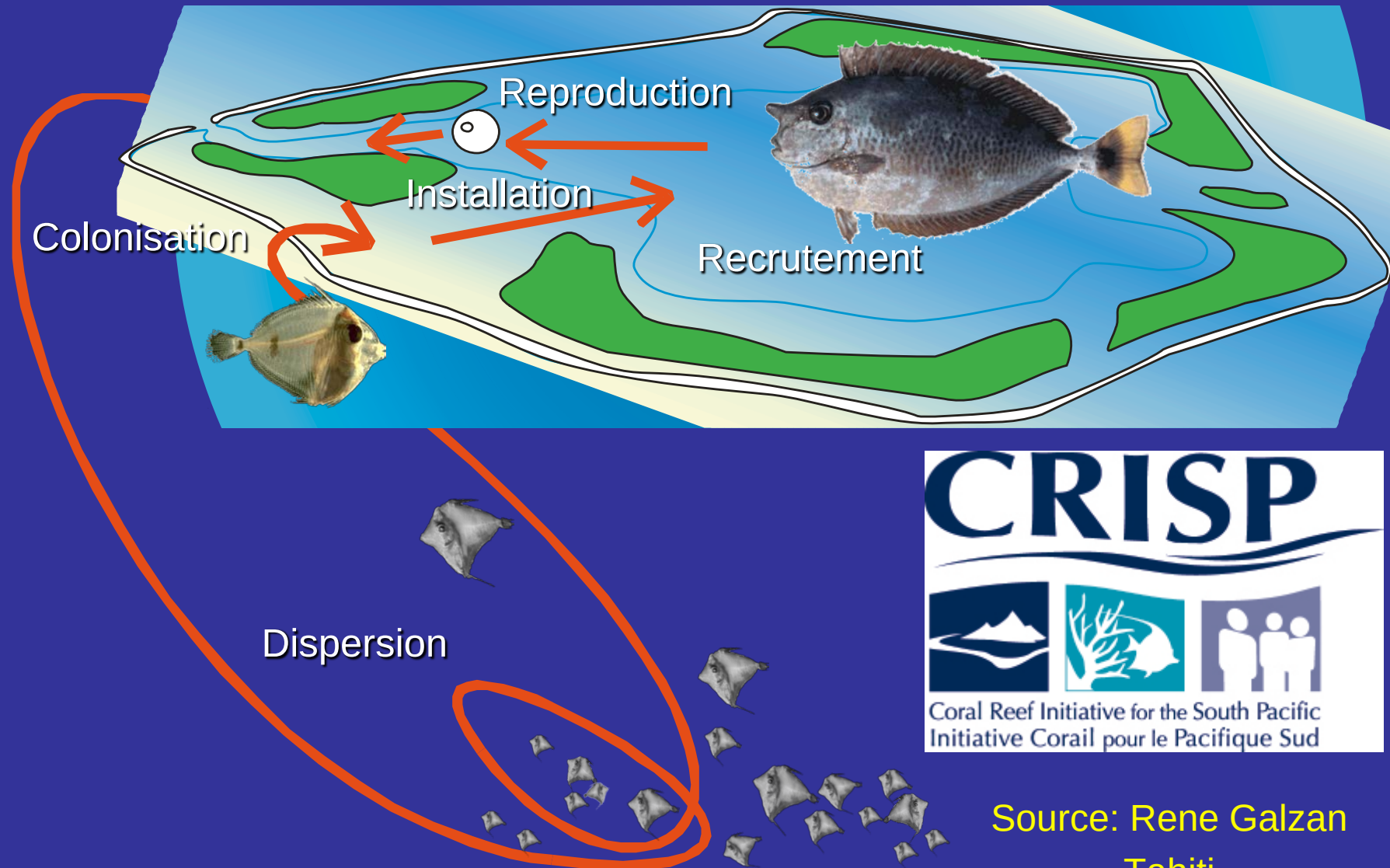
Coconut Plantations – Agroforests – Villages and Towns - Milkfish
Aquaculture – Coastal Forests - Mangroves - Lagoons – Reefs – Ocean

ALL INTERCONNECTED



TAMAIKU, SOUTH TARAWA, KIRIBATI

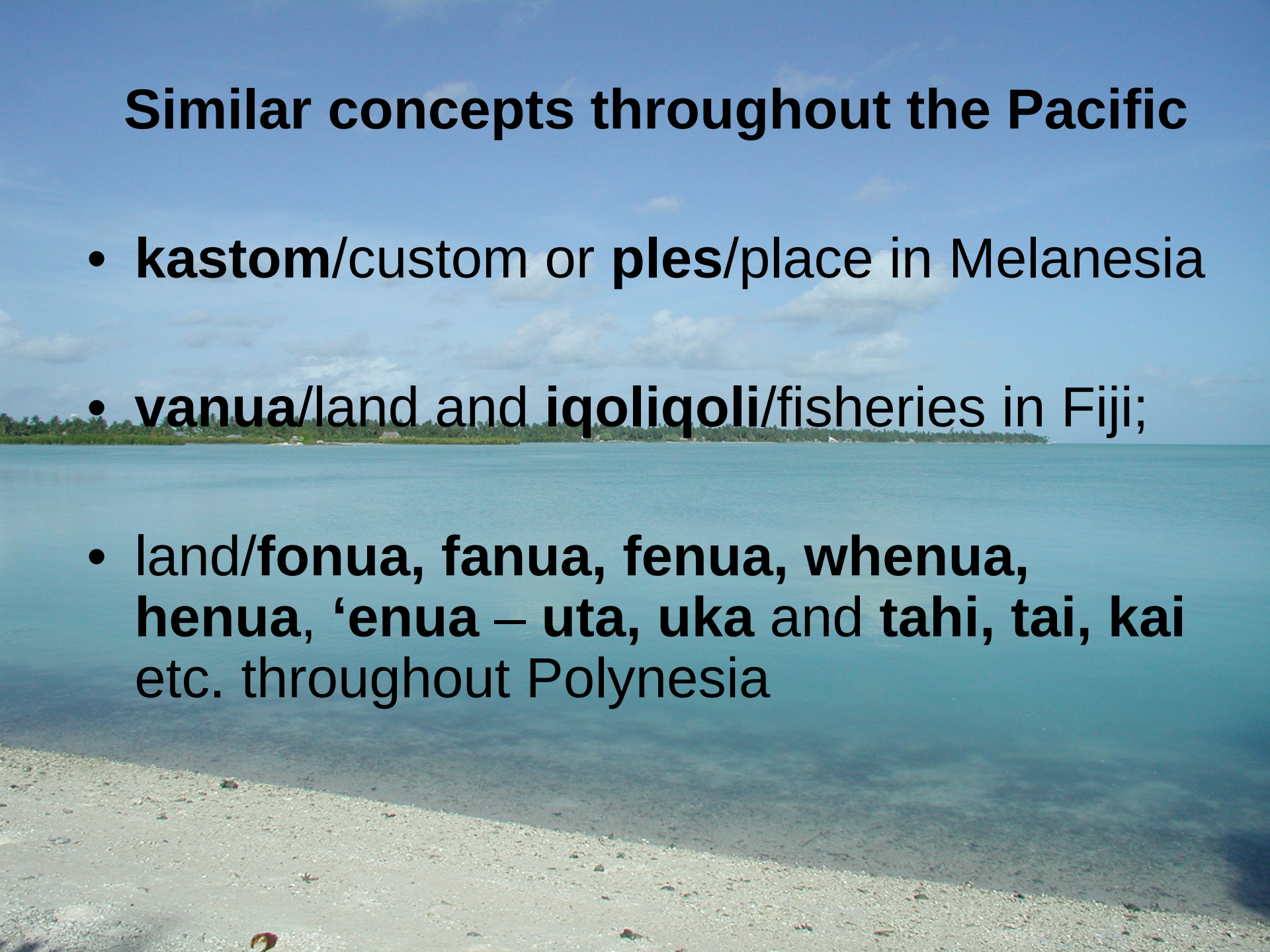
Reproduction Cycle of Coral Reef Fishes (Lagoonal Spawning, Oceanic/Pelagic Growth and Lagoonal Recruitment Phases)



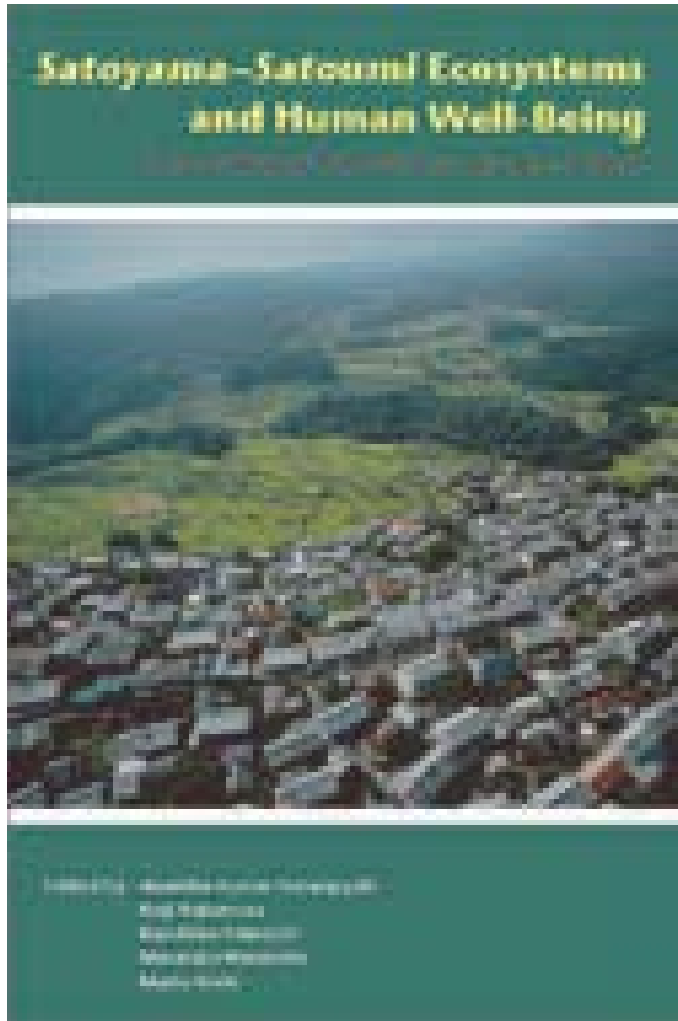
Source: Rene Galzan
Tahiti

Similar concepts throughout the Pacific

- **kastom**/custom or **ples**/place in Melanesia
- **vanua**/land and **iqoliqoli**/fisheries in Fiji;
- land/**fonua**, **fanua**, **fenua**, **whenua**, **henua**, 'enua – uta, uka and **tahi**, **tai**, **kai** etc. throughout Polynesia



Japan Satoyama-Satoumi Assessment (JSSA) Socio-ecological Production Landscapes – Japan's most important ecosystem assessment – Example of the marriage of ILK and MS for BES Assessment



STUDIES AT USP



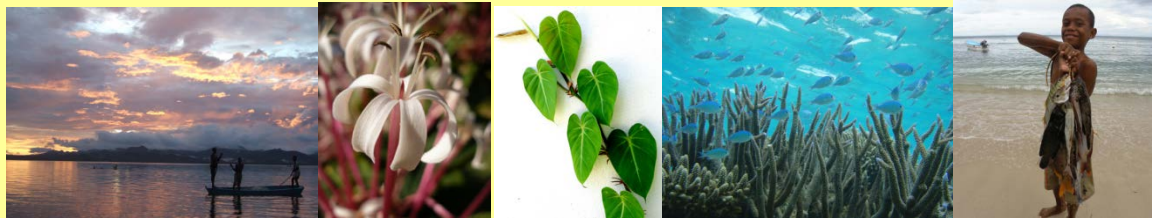
Islands offer some of the best answers to, and opportunities for, solving the sustainable development crisis.



**USP signing MOU with the UNU
As a Centre of Excellence in Sustainable
Development, Mauritius, Jan 2005**

USP Econesian Society 2007-2010





**A VISION FOR THE CELEBRATION AND APPLICATION OF
INDIGENOUS KNOWLEDGE- ECONESIAN HONOUR FIJI
JOURNEY - 2012**

**USP Econesian Society guiding principles and areas of priority
action marriages between indigenous and traditional knowledge
and wisdom with the best cutting edge scientific knowledge as a
foundation for sustainability in the face of global change.**

AREAS OF OPPORTUNITY FOR THE MARRIAGE OF ILK AND MODERN SCIENCE FOR ADAPTATION, MITIGATION AND DEVELOPMENT

- 1. Forest and Arboreal Resource Management**
- 2. Fishing and Marine Resource Management**
- 3. Adaptation to and Management of Extreme Events and Natural Hazards**
- 4. Water and Watershed Management**
- 5. Soil Conservation and Management:**
- 6. Polycultural Agriculture and Food System Conservation and Enrichment:**
- 7. Medicinal and Health Management**
- 8. Handicrafts, Construction, Architecture and Boatbuilding**
- 9. Energy, Waste and Pollution Management.**
- 10. Invasive alien species (IAS) and Disease Management**
- 11. Cultural and Spiritual, Social Cohesion, Education and Governance.**
- 12. Tourism, Travel and Migration – Ecocultural Tourism,**

***Cross-cutting themes, education, awareness, and cultural and environmental conservation, restoration and enrichment!**

Sigatoka Dunes – Fiji's First National Park



Yadua Taba Island Crested Iguana Reserve Off Vanua Levu, Fiji (National Trust of Fiji)



Importance of Preserving Traditional Knowledge

Tuvalu Traditional Fisheries Knowledge Workshop



- Major Problems / obstacles to SUS
- WSSD - World Summit on Sustainable
1. Climate Change
 - Global Warming & sea Level Rise
 - Breakdown in Earth's Protective Ozone
 2. Increasing Population
 3. Overconsumption & Poverty
 4. Population & Wastes
 5. Loss of Biodiversity
 6. Environmental Blindness

Asia-Pacific Locally Managed Marine Areas Learning Workshop

USP, August 2005



Involve More P.I. Students in Research And Publishing



**Danish-USP Galathea Expeditions on Small Island
Sustainability, Bellona Island, Group 2, 6 December 2006
– 35 students and many community members involved**

Tetepare Island, W. Solomon Islands

(The World's Largest Uninhabited Is. - Tetepare Descendents Association TDA-WWF Conservation Initiative)



Gerald McCormack and the Cook Islands Biodiversity and Ethnobiology Database

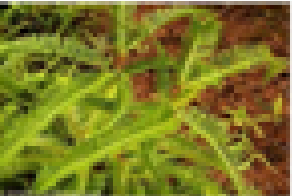
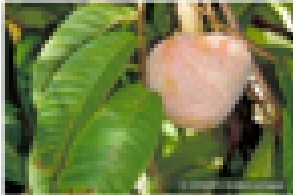
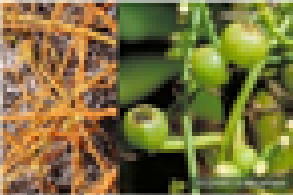
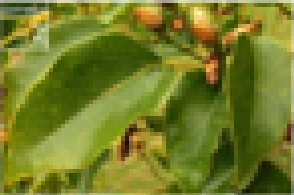


Cook Islands
Biodiversity & Ethnobiology Database

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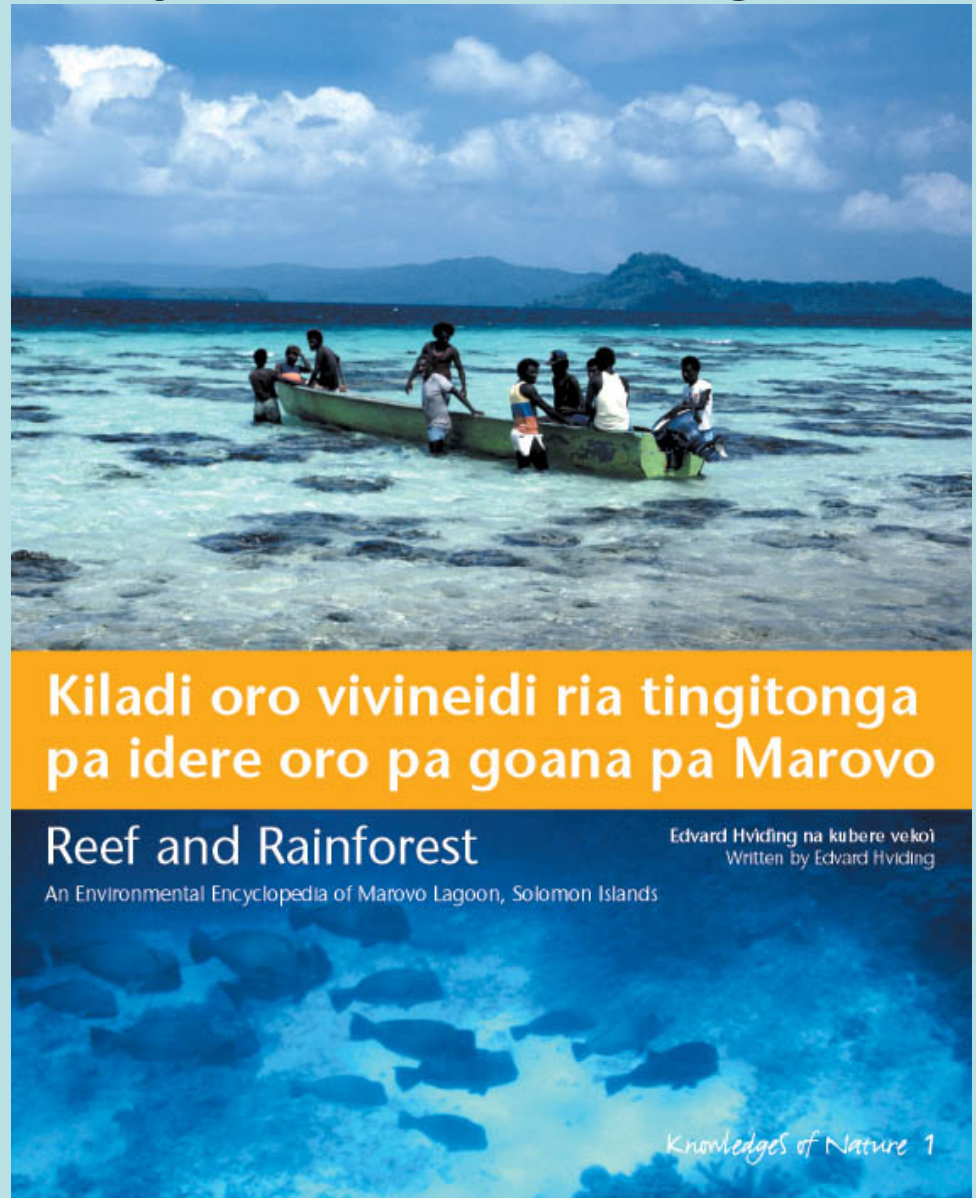


 Caulella racemosa Sea-grapes Seaweed Renu Kiri	 Lycopodium obscurum Old Man's Beard Renu Kiri	 Polystichum caeruleum Whirok Fern Tootea	 Cochlospermum reticulatum Stalked Adder's-tongue Fern Wapito	 Dacrydium imbricatum Tangle Fern Tuamotu
 Microsorium gracillimum Unscented Calf-leaf Fern Mahe Tōtōa-puaka	 Cavendishia acida Polynesian Cavendish Pōmō	 Neochloa acuminata Lobelious Sword-fern Tōmōtōu Kāne-Sāringa *	 Neochloa latiuscula Lobed Sword-fern Tōmōtōu Tāringa *	 Dioscorea thurstonii Taro-crop Kāhā-tapa
 Dioscorea reticulata Bullock's-Heart Pōpōtōe-Papō'i	 Cinnamomum camphora Perfume Tree Hāhāi	 Cassia alata Cassia Tānōka	 Cinnamomum camphora Camphor Tree Hā	 Hemelia moerhousiana Mountain Lantern-tree Tāme

Edvard Hviding (2006) – Bilingual Reef and Rainforest Dictionary of Marovo Lagoon



“marine lore is so exceptionally rich that full study of it would require an appropriately trained marine biologist to spend at least 18 months living in the Marovo area and in daily contact with Marovo fishers” (Johannes and Hviding 2000)



Patrick Pikacha
Western Solomon Is.
USP Graduate
Book on “The
Wild West” –
Western Solomon Islands
and lead author
Frogs of the Solomon Is.



Gerald McCormack and the Cook Islands Biodiversity and Ethnobiology Database

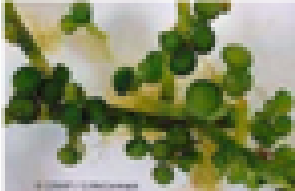
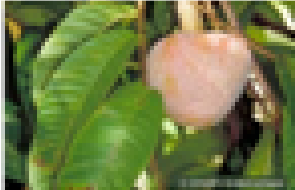
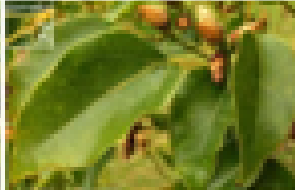
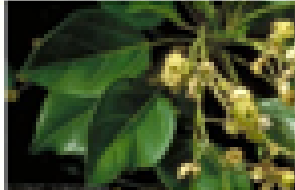


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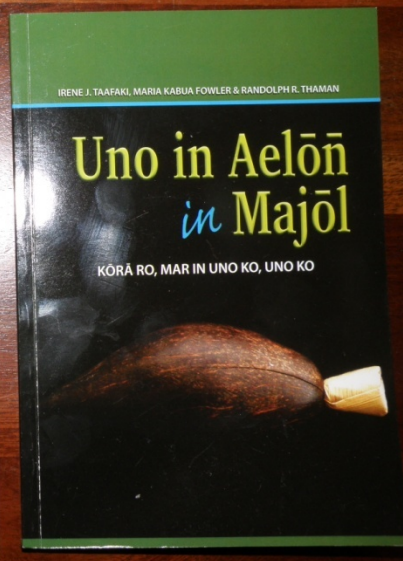
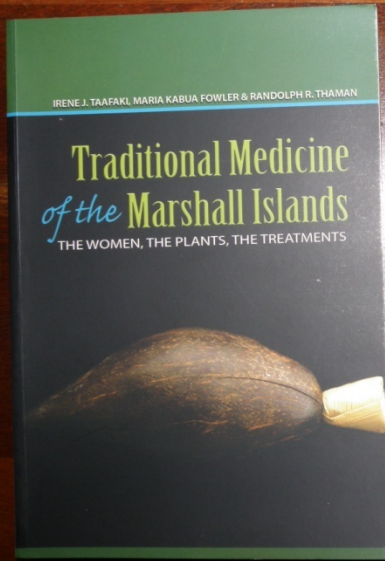
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RESULTS – Women's Medicinal Plants Workshop Majuro, Marshall Islands



Hanako Term
Indigenous Taxonomist
and Herbalist

RESULTS

IRENE J. TAM

KINOJ, KINWŌJ

RUBIACEAE

Hedyotis biflora (L.) Lam.



Kinoj ej juön mar eo ej töbal im bölökin rej jeljel im wüttin emoujij im edik, im leen einwöt lippiruk ko elöñ ine jiddik ko ilowaan.

Kinoj ej eddök ilo Melanesia kan ñan Micronesia kein im aelöñ ko irear in Polynesia. Ejejalok bötob maroñ lo iturin eppe ko iturin jikin kallib ko, n... jikin jokpej ko. Ejejalok bwe u... rekääl retok im binej j... ok ko aer. Elöñ rej eddök ilo a... ilikin ijoko redekäke.

KINOJ, KINWŌJ
RUBIACEAE
Hedyotis biflora (L.) Lam.



Körā

Uno in boub an körā

Böktok 3 likiio in kinoj ekoba okar. Kwali kön dän innem noi im kömmane juön o. Kobaiki ippän juön pint in dän elaññe ejjab ekwe juön ni maro. Idaak juön ilo juön raan mae iien eo kwöj kajoor. (GEN)

Ajri

Uno in an ajri wötlok

Uno in ejja einwöt uno in boub eo an körā ijin ilöñ. (lale uno ne ilöñ)

Emmaan

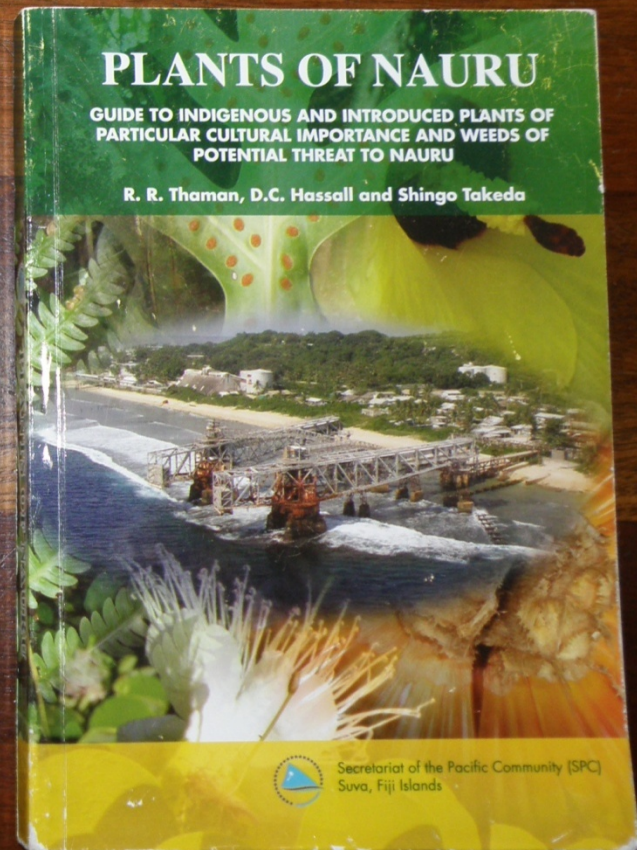
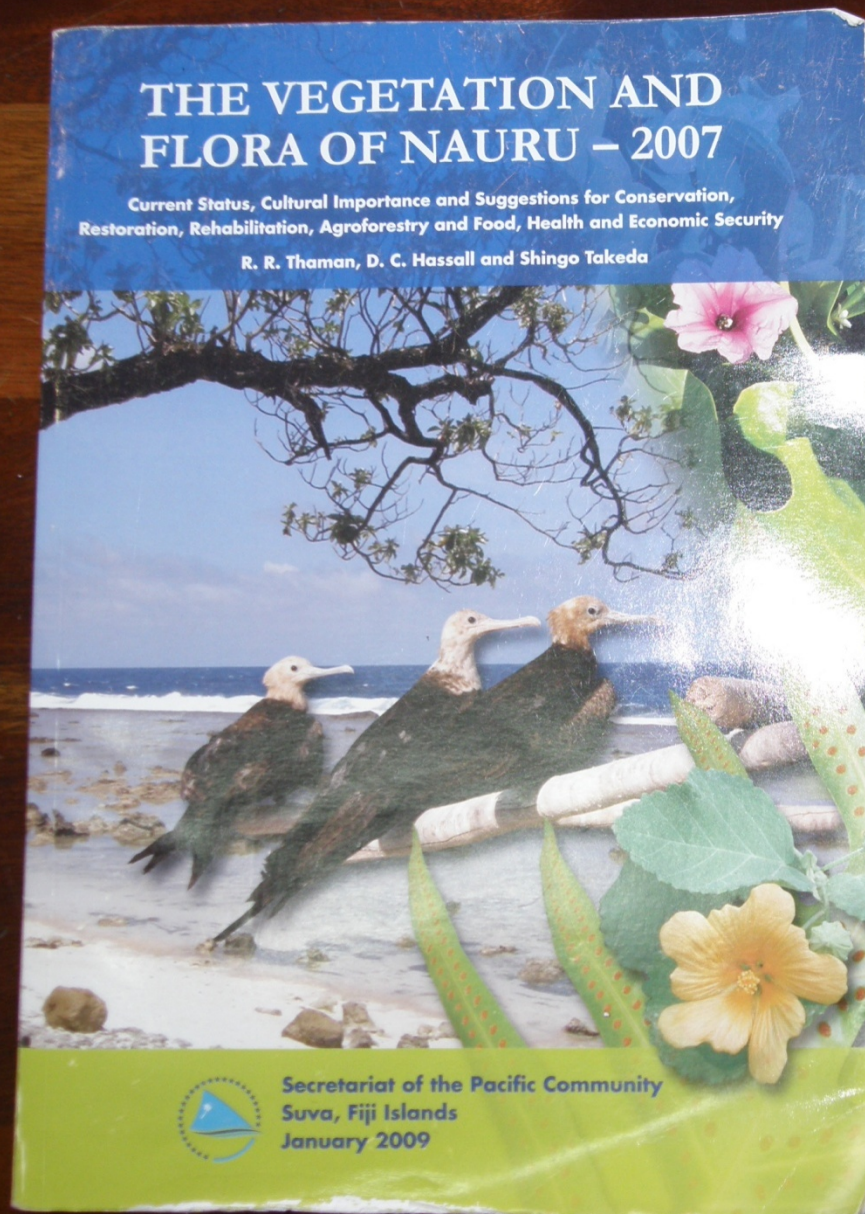
Uno in boub an emmaan

Böktok juön likiio in kinoj ekoba okar eo im lukkuun kwale. Innem böktok juön ni maro im jeblok tulöñ in im kwetok lowaan tulöñ in ni eo innem noe ippän kinoj eo im kömmane juön o. Keen o in ilowaan ni eo im idaak. Kömmane wäween in toon wöt am aikuji. (MKL)

Boub an emmaan

Böktok juön likiio in kinoj koba okar eo im lukkuun kwale innem ippän juön jul in pinana mökadkad. Kömmane juön o innem ene na ilo tarrin juön quart in dän ilowaan juön bijja. Lelok owe ri-nañinmej eo en kömaate. Köjberbal juön o juön raan iumin jilu raan. (Group1)

RESULTS – SPC Forests and Trees Study of the Vegetation and Flora of Nauru!!



RESULTS

Vigna sesquipedalis (long bean, yard-long bean, snake bean, asparagus bean, asparagus pea) FABACEAE

Nauruan Name: **bin** ("bean")

Pre-World War II introduction. Tropical Africa. Common. Food plant in Chinese gardens at Location and Topside workshops in the 1980s. Found in the FAO Experimental gardens and Chinese gardens in 2007. Eaten as a vegetable and served as a cooked vegetable in Chinese restaurants in Nauru.



Scaevola taccada (half-flower, beach saltbush) GOODENIACEAE

Nauruan Name: **emet, emed, emit**

Indigenous. Tropical Asia to Hawaii. Very abundant. Dominant species in strand vegetation and one of first colonizers on strip-mined areas. Also planted and protected in houseyard gardens. Wood considered good for smoking (cooking) fish and the black noddie bird (an important delicacy at feasts); hollow branches used as guns to shoot gum balls (**egato**) and small balls carved from pandanus; inner bark used in the past to make headbands which resembled noddie-bird feathers and which were worn for traditional dances; leaves used to wrap food and to cover the earth oven (**eom, eyom**); *Scaevola* and *Guettarda speciosa* (**iut**) flowers, the first flowers smelled by returning sailors; flowers used in garlands and either added directly, or boiled with coconut oil, to scent it; leaves crushed to yield a juice to retard loss of hair and cure rashes; inner bark scraped to yield medicine for abscesses or boils, and white ripened fruit squeezed into eyes as a pre-eye-drops cure for conjunctivitis.



Ouvea, Loyalty Islands, New Caledonia

World Heritage Site Study (IRD, UNC, USP)



Launching and Planting Nature Fiji-Mareqeti Viti 30.6.07



Launching of the Great Sea Reef (Cakau Levu) Marine Reserve Network, Macuata



Kabara Limestone/Karst Island WWF Climate Witness and Sustainable Livelihood Program



Kabara WWF Climate Witness video and Vesi (*Intsia bijuga*) replanting and sustainable use



Upper Navua Conservation Area Ramsar Site, Fiji (Rivers Fiji)



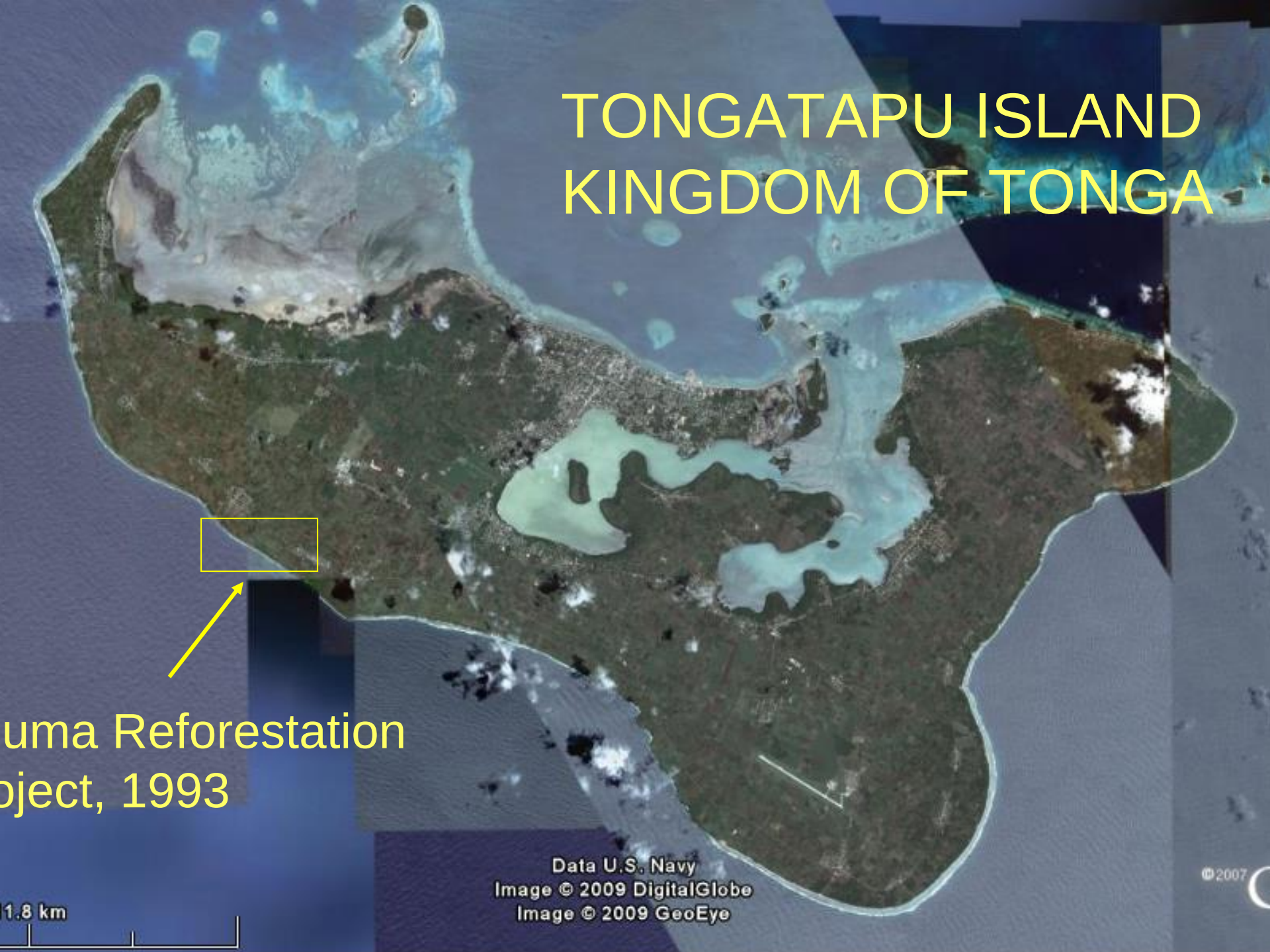
TONGATAPU ISLAND KINGDOM OF TONGA

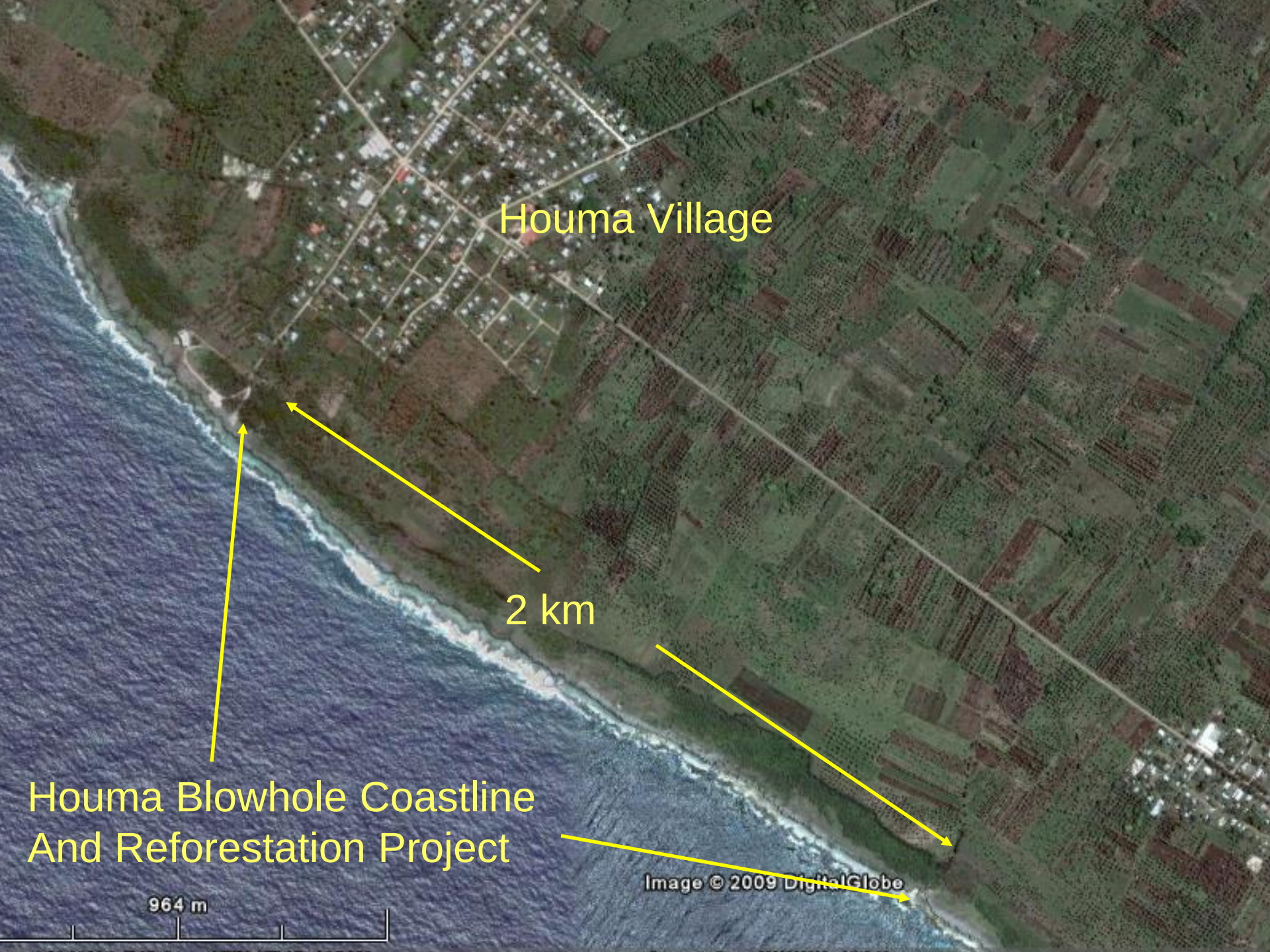
uma Reforestation
Project, 1993

1.8 km

Data U.S. Navy
Image © 2009 DigitalGlobe
Image © 2009 GeoEye

© 2007





Houma Village

2 km

Houma Blowhole Coastline
And Reforestation Project

964 m

Image © 2009 DigitalGlobe

Other Indigenous
Tree Species

Double Row of Casuarina



Image © 2009 DigitalGlobe

© 2007

Google

175°17'39.66" W

Streaming 100%

Eye alt

Houma Blowhole Coast, Coastal Reforestation Project, 1993 – 20,000 trees planted along 2 km of coast (Revisit, August 2004)



Houma Blowhole Coast, Coastal Reforestation Project, 1993 – 20,000 trees planted along 2 km of coast, Cost \$US10,000 (Revisit, August 2004)

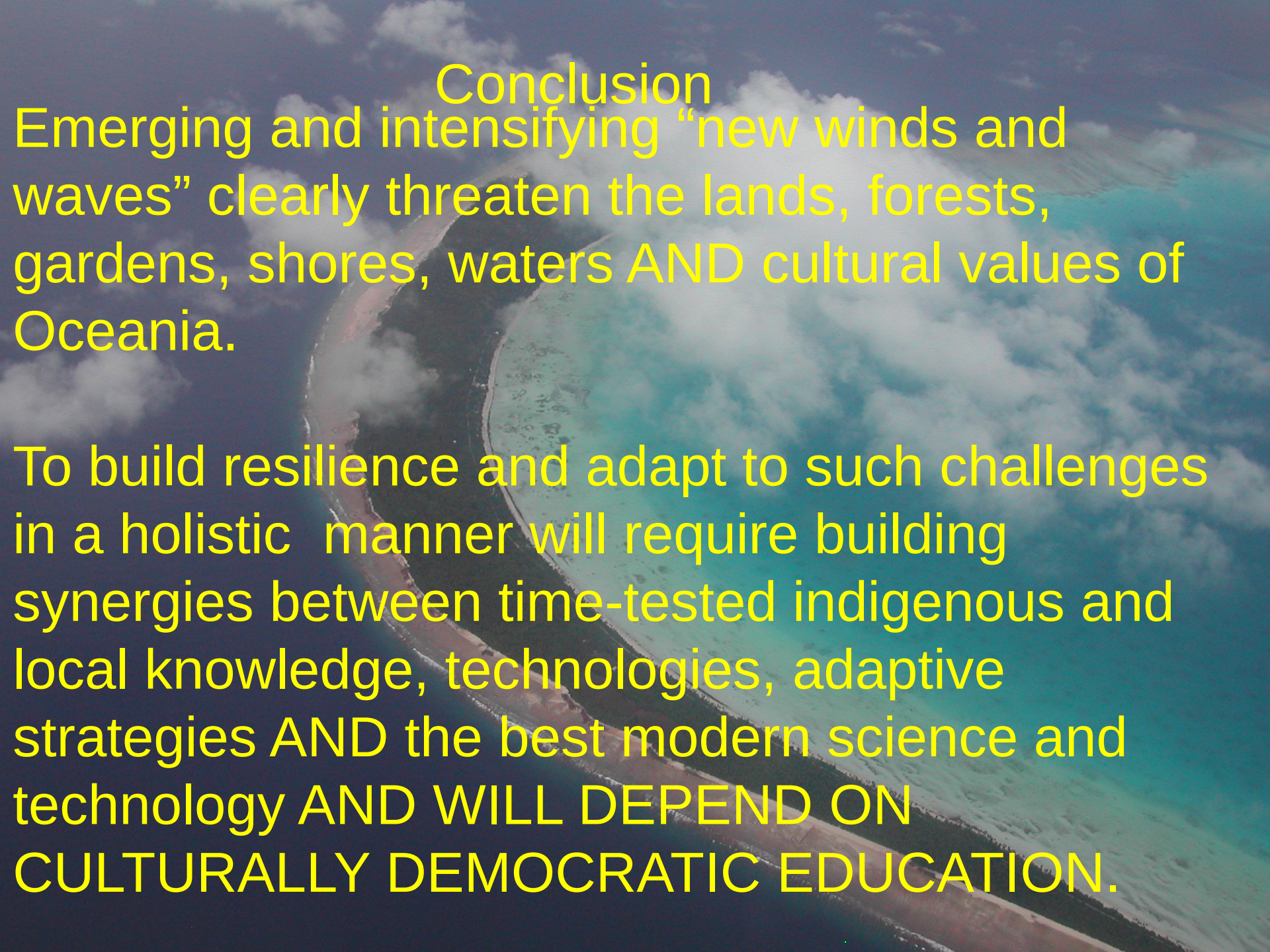


Conclusion

We must “put ancient fair winds into new sails” as we chart our course through increasingly degraded islands and turbulent waters and against the rising tide of rapid monocultural globalization and the accelerating loss of the fragile island and ocean biodiversity and ecosystem services that underpin sustainable island life!!!

Fiji 7's – Marriage of ILK and talent and modern sports, rugby, conditioning and food science)!!!



An aerial photograph of a tropical coastline. A narrow, dark sandy beach curves along the edge of a vibrant turquoise ocean. A thin line of coral reef is visible just offshore, separating the shallow water from the deeper blue sea. The sky above is a deep blue with scattered white clouds. The text is overlaid on the upper half of the image.

Conclusion

Emerging and intensifying “new winds and waves” clearly threaten the lands, forests, gardens, shores, waters AND cultural values of Oceania.

To build resilience and adapt to such challenges in a holistic manner will require building synergies between time-tested indigenous and local knowledge, technologies, adaptive strategies AND the best modern science and technology AND WILL DEPEND ON CULTURALLY DEMOCRATIC EDUCATION.

CONCLUSION

We must “put ancient fair winds into new sails” as we chart our course through increasingly degraded islands and turbulent waters and against the rising tide of rapid monocultural globalization and the accelerating loss of the fragile island and ocean biodiversity and the linguistic and cultural diversity ecosystem services that have underpinned sustainable island life for millennia!!!

USP Graduation – Capacity Building for Sustainable Island Development



OUR PI GRADUATES – FOUNDATION FOR CONSERVATION AND BUILDING RESILIENCE TO SUSTAINABLE USE OF OUR ISLAND BIODIVERSITY



VINAKA VAKALEVU

