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Training leaders from small remote island states in advancing sustainable development

- Introducing ISA's Australia Awards Fellowships initiative funded by AusAID -

Executive Summary

The aim of this program is to train leaders from small remote islands in the area of sustainable environmental and economic development in order to increase their capacity to deal with key regional issues such as energy supply and climate change, waste management, poverty, marine parks and biodiversity, and population health. The program focuses on facilitating regional cooperation through providing networking opportunities, peer-to-peer knowledge exchange and management training. It includes specifically tailored training units aimed at enhancing the Fellows' education and skills, and in turn economic opportunities.

This program will assist island communities to address the priority problems of: high energy cost and losses, waste disposal, imported fuel dependence, biodiversity decline, marine resource and land degradation, high ciguatera disease incidence, and declining export industries. Fellows will gain knowledge and practical know-how about Environmental Impact Assessment (EIA), energy conservation and planning, recycling systems, national park and land management, harmful algal bloom monitoring, emissions reduction, as well as developing fisheries resources into a sustainable export industry.

The program addresses these priority areas through: tailored courses in Environmental Impact Assessment, environmental accounting and energy systems planning designed for business and government professionals; guided team work and discussions; practical training in microscopy, toxic algae identification, fisheries and aquaculture management; site visits; and through a practical training program in recycling facilities, methane emissions capture, waste energy recovery, and training in administration, procedures, and governance for the environment, conducted on Norfolk Island.

Through island-based examples of applied local knowledge and self-sufficiency combined with peer-to-peer learning and networking, the training will benefit Fellows in acquiring new skills, enabling them to implement strategies aimed at sustainable development, and to provide policy advice to government.

Development issue

Regarding sustainability, most island communities face a number of major challenges: energy supply, waste disposal, health, developing education and skills, and maintaining economic opportunities.

First, most islands do not have indigenous energy resources, but instead have to ship in fuels over considerable distances, at a considerable financial burden. Especially high oil prices faced many island governments with high cost of vehicle fuel and electricity. Renewable energy opportunities are often limited by the availability of resources such as hydropotential or reliable wind. These issues have a significant bearing on poverty in many small island states.

Second, most islands do not have enough space for operating landfills, so that waste is often burnt under hazardous conditions, with resulting toxic emissions to air, and adverse effects for freshwater reservoirs and population health.

Third, most small island nations experience frequent ciguatera outbreaks and high disease incidence, which is due to lacking harmful algal bloom monitoring programs.

Fourth, small island nations have limited possibilities for developing new industries, and often rely heavily on fisheries resources and tourists attracted by their unique and beautiful marine environments. Marine environments, including fisheries stocks, are often being depleted or compromised because of lack of specific management knowledge. In addition, marine and coastal resources will undergo changes due to climate change, which are likely to have impacts on local populations, such as changed species distribution and abundance. Loss of marine resources is another significant contribution to poverty.

Fifth, small islands urgently need education and skills to undertake informed Environmental Impact Assessments, prepare environmental management plans and administrative procedures supporting sustainable development, and write funding applications.

Amongst the many obstacles preventing sustainable development of energy resources, waste streams and fisheries, are regulatory, legal and institutional barriers, high upfront capital cost and lack of aid, lack of skills to maintain technically sophisticated facilities, lack of knowledge, and inappropriate technology design.

Addressing the development issue

The proposed program will address these development issues in a number of ways: 1) through a series of tailored courses aimed at business and government professionals, 2) through guided team work and group discussions, 3) through practical training in marine environmental management, 4) through a hands-on practical sustainability training program conducted by key personnel on Norfolk Island, and 5) through a training unit on process, procedures and requirements to implement potential projects tailored to island circumstances.

1) The *goal* of the **first training unit** is to enhance the Fellows' skills in Environmental Impact Assessment (EIA) and environmental accounting. Fellows will study economic input-output analysis, and how it can be used to improve an Environmental Impact Assessment by adding impacts that are felt beyond their own island. The EIA training will enhance Fellows' awareness and understanding of the relationship between lifestyles, consumption, and environmental issues on their islands and elsewhere. In addition to purely technological approaches to solving problems of vulnerable energy supply or high energy prices on remote islands, the training unit will raise the Fellows' awareness for approaches that tackle the environmental impacts from a lifestyle, or consumption point of view.

The Fellows will be engaged in a three-day learning unit on EIA and environmental accounting, with a focus on integrating multiple dimensions of sustainability – environmental, social and economic. The unit covers island energy supply, business, and land management, complemented by carbon footprints. Islanders are already well aware of the potential impacts that climate change can have on their homes. Using their own applications and data (households, power plants, organisations, or whole islands), Fellows will learn how to determine in which ways their activities impact on their own environment, but in addition have global ripple effects. The *purpose* of this training unit is to enable Fellows to identify priority issues in their community, to support decisions involving trade-offs cross multiple dimensions, and ultimately mobilise strong community ties to improve community resilience in the face of limited resources and budgets. The three-day course will be interspersed with hands-on experiences at a number of sustainability education sites around Sydney.

2) The *goal* of the **second training unit** is to train the Fellows in energy system analysis and planning, by engaging them in team discussions over jointly collected data, and providing them with the opportunity to raise and discuss the challenges they face on their home island with each other. The focus in this second unit is on information and skill exchange, and mutual learning. Using databases compiled by the University of Sydney team, and their own data on annual imports and per-capita use of liquid energy carriers such as petrol and diesel, motor vehicle usage, electricity generation and consumption, energy demand structure, fuel and electricity prices, and penetration and potential of renewable energy sources, the Fellows will identify and compile key determinants and drivers of energy demand on their islands, such as population growth, affluence growth, age, tourist arrivals, and foreign aid/support.

After examining the statistical evidence, the program participants and trainers will continue discussions, exchanging information on questions such as

- How large are our energy bills, and how much energy is lost at various stages of our islands' energy systems?
- How much could our fuel bill be reduced by implementing energy efficiency and conservation measures? What are the implications for poverty on our island? What are the implications for pollutant emissions?
- Does my island have an official energy strategy / policy? If yes, who initiated it, and how? If not, why not?
- What is the decision structure on my island? Are there any barriers for implementation of energy policies?

- Which barriers exist for sustainable development of energy resources because of particular cultural values and social structures on my island, because of support payments, or because of skills shortages?

Ultimately, the participants will attempt to answer overarching crucial questions such as

- What are the differences between our islands in terms of their energy costs?
- How can we explain these differences?
- Resulting from these insights: What could be potential drivers of change towards reduced fuel bills and poverty, and towards reduced emissions?

The *purpose* of this training unit is to provide the Fellows with networking opportunities that facilitate ongoing mutual support, and an understanding of the determinants and drivers of energy dependence, fuel cost, pollution and poverty.

3) The *goal* of the **third training unit** is to provide an understanding of the issues in marine environmental management in the Pacific region and how to address them. It will be conducted at the Sydney Institute of Marine Science, where the participants will also be accommodated for one week. During this training block, fellows will

a) Determine options for wastewater treatment and monitoring to protect lagoon and coastal ecosystem health,

b) Learn about climate change impacts on coastal and lagoon fisheries, including the design of programs to monitor for, detect and mitigate the increased incidence of ciguatera fish poisoning in the Pacific, and understand the importance of these programs in providing health benefits to small island states.

c) Take part in a demonstration of options for the development of new sustainable aquaculture enterprises in Pacific communities,

d) Review the latest developments in approaches to commercial and recreational fisheries management, including optimal design and implementation of Marine Protected Areas, an overview of issues in relation to Distant Water Fishing, Marine ecotourism and Fish Attraction Devices,

e) Determine country specific priorities for changes, and have access to relevant scientific expertise and information to develop and implement the most appropriate solutions,

The *purpose* of this training is to provide Fellows with the knowledge necessary to influence policy around conservation and sustainable development of fishery assets.

4) The *goal* of the **fourth training unit** is to facilitate regional cooperation by materialising opportunities for inter-island transfer of ideas, skills and solutions to sustainability challenges. During this training unit, Fellows work together in acquiring skills about implementing solutions that are proven to work on Norfolk Island, and that can also work on their home island. The training program will include three full-day training blocks:

a) A day of detailed instructions for hand-building methane digesters - constructed using local knowledge and materials - capturing methane from farm animals. Such digesters do not only reduce greenhouse gas emissions causing climate change, the trapped biogas also provides a valuable energy resource, and it reduces pollution through run-off into water resources, with corresponding health benefits.

b) Training in the application of devices that are able to capture the waste heat from the stacks of the islands' power plants, in order to run centralised cool stores. Such cool stores could lead to substantial reduction of electricity usage, and associated bills and emissions.

- c) Training in the implementation and operation of island recycling systems, for the example of a soft drink factory using recycled bottles, and avoiding the shipment and disposal of thousands of plastic soft drink bottles from overseas.
- d) Training in the use of recycled glass as an aggregate for road base. Step-by-step guided tour of waste centre, sorting processes, crushing, and application on island roads, showcasing a five-star resort featuring over 450 m of driveway made of reconstituted silica gravel, avoiding importing resources for bitumen-sealed roads.
- e) Training in national park and land management with particular view mitigating erosion and general land degradation.

The *purpose* of this training is to enable Fellows to apply, or provide practical advice on how to apply, the knowledge gained in the first and second training units. This includes knowing how to construct and maintain some of the technological solutions to sustainability.

5) The *goal* of the **fifth training unit** is to provide missing skills regarding governance, planning and administration, grant writing, and strategies for understanding legal and regulatory issues for small islands. During this training unit, Fellows learn how to identify and understand the general requirements, systems, processes and procedures, including legislative frameworks that guide investigation and implementation of potential sustainable business projects, and how such requirements are unique on islands. The training unit will touch on the following stages:

- A. **Feasibility Stage:** Learn how to determine whether the project is realistic; financial viability of the project; whether the project can deliver the desired results, goals and objectives; whether the project is environmentally sustainable. This stage covers:

Project Description

Aims, objectives, goals, what it would achieve, justification, vision, anticipated outcomes and benefits, size, scale, etc.

Research, Investigation and Consultation:

Governance and Administration Systems, Legislation and Regulations, Decision Making processes, Government Policies and Programs, Areas of support – government, community, potential financiers.

Benefit / Cost Analysis of the Facility

Economic, Environmental, Social

Identifying Funding / Capital Investment Sources:

Researching potential funding sources e.g. investors, sponsors, government assistance grants applications, aid agencies and programs, philanthropy. Consideration of eligibility criteria, timing, resources, financial plans; Preparing and writing funding applications.

Identifying likely skills required to progress the project and roles:

Project Management, engineering, financial management, architecture, building and construction, planning and environmental specialists, Triple Bottom Line assessment, various trades for construction.

Project Management Plan: Planning, Programming and Timing:

Developing a Project Management Plan, e.g. Gant Chart or similar – ascertain time, logistics required to accomplish all tasks and stages required; research and investigation, feasibility assessment, development approvals, construction / development.

Finances and Costs:

Ascertain all costs involved from Feasibility, Approval and Construction and Development: e.g. identifying fees, charges, salaries, wages, commissions, acquisition, transport/ delivery, professional services charges, construction, production of documents, plans and reports.

- B. **Approvals Stage;** this stage covers

Environmental, Planning and Development Approvals

Value of planning; Planning and Development Assessment Systems; Requirements and procedures; Documentation required (e.g. environmental impact statement, plans and drawings, specialist reports) Skills and resources needed to prepare a development application / environmental study to seek development approval. Prepare documentation and seek approvals for any other licenses, permits etc that may be required as identified in research and investigations.



C. **Construction Phase;** this stage covers

Is there a need for tenders or Government staff? Determine operational and management requirements, Logistics, Need for on site manager fulltime /part time, other staff required, temporary facilities required, Procedural issues – manuals, safety procedures, management plans etc.

The *purpose* of this training is to enable Fellows to effectively implement measures that advance the sustainable development of their island in alignment with AusAID’s priority areas of environment, education, poverty and health. It particularly supports the International Climate Change Adaptation Initiative (ICCAI) to help Australia’s neighbouring island countries to adapt to the impacts of climate change. The program supports ICCAI’s objectives by providing scientific and relevant information, improving understanding of local environmental impact and providing multilateral support for climate change adaptation to the Fellows. Partner countries will gain further understanding of the impacts of climate change on their natural and socioeconomic systems and enhance their capacity to assess key climate vulnerabilities and risks, formulate appropriate adaptation strategies and plans and mainstream adaptation into decision making.

Example activity timetable, ALAF Round 11, 2012

Activity details	Implementation dates/duration	Activity location
1. Tailored, hands-on Environmental Impact Assessment (EIA) and carbon footprinting course, based on application chosen by the participants	1-3 October – three full days	Sydney (USyd)
2. Two education site visits: the self-sufficient residence “Mobbs House”, and the sustainability education site “Pigface Point”	4 October 2012 – full day	Sydney (USyd)
2. Team work: Jointly examine the statistical evidence about island energy supply and consumption, population, and finances; develop a model and understanding for an island’s energy metabolism, and identify main losses and opportunities for energy conservation	5 October 2012 – full day	Sydney (USyd)
3. Introduction to wastewater management for small island communities, lagoon health and harmful algal blooms, ciguatera fish poisoning: monitoring and mitigation, with hands on microscopy demonstration	8 October – full day	Sydney (SIMS)
4. Guest lectures: Change management, development of new aquaculture enterprises in Pacific nations, Marine Protected Areas – including excursion to local MPA	9-10 October – two full days	Sydney (SIMS)
5. Fisheries management in relation to distant water fishing, marine ecotourism in Pacific nations	11-12 October 2012 – two full days	Sydney (SIMS)
6. Visit to Norfolk Island National Park and training in national park management, including issue concerning erosion and general land degradation; On-site training on methane digester designs	15 October 2012 – full day	Norfolk Island
7. Training in governance, planning and administration, grant writing, and strategies for understanding legal and regulatory issues for small islands; Visit of Norfolk island administration and meeting with Environment Minister;	16 October 2012 – full day	Norfolk Island
8. On-site training on operating recycling facilities: showcase soft drink factory	17 October 2012 – full day	Norfolk Island
9. Visit of National Park, and waste disposal and recycled road base facilities;	18 October 2012 – full day	Norfolk Island
10. On-site training on implementing centralised coolstores powered by power house waste heat	19 October 2012 – full day	Norfolk Island

Outcomes of the training

1. At the completion of the three-day Environmental Impact Assessment (EIA) and carbon footprinting course participants will
 - a. Gained improved skills in Environmental Impact Assessment;
 - b. understand what an environmental footprint is, how footprints can enhance EIAs, and appreciate current footprint issues and trends;
 - c. be familiar with environmental indicators and document locally important indicators
 - d. understand the concept of responsibility in global supply chains, and what this means in practice; develop group skills, trust and support through use of teaching games.
 - e. gain insight into data needs and possible issues and solutions to data collection
 - f. understand the background and foundation to footprint accounting; develop group skills, trust and support through participation in input-output game.
 - g. gain skills in use of EIA and footprinting tools with own data relevant to own community; understand meaning of outputs; appreciate range of participants' related issues and solutions; plan for ongoing mutual support.
2. Site visits
 - a. Site visit 1, urban setting: gain first hand information on self-sufficiency in water, waste disposal, energy, heating and cooling and fresh food.
 - b. Site visit 2, semi-rural setting: gain 1st-hand info on how to build and maintain sustainable systems for generating power, waste disposal and water conservation.
3. Team work
 - a. understand common issues and those particular to specific islands
 - b. share successful strategies and 'road blocks'
 - c. understand underlying social structures and develop strategies for support and change
 - d. develop strategies for supporting policy development and actions to address climate change
 - e. further develop writing skills, team building skills and trust through co-documentation of the above processes, practices and action plans

The above mix of practical activities, site visits, discussion and workshops will provide Fellows with tools and the vision to assist in integrating the principles of sustainable development into country policies and programs which will go some way towards reversing the loss of environmental resources (7th Millennium Goal). Participants will gain skills, knowledge and know-how that will give them the confidence and expertise to take on or increase their leadership roles in the community as well as in their professional lives. The training materials and tools will be freely available to all participants enabling them to pass on information to others, taking on education roles where appropriate. The program of study will directly address climate change and the environment while indirectly through knowledge exchange and team building will support understanding between Australia and the Pacific promoting regional stability.

4. Marine environmental management in response to climate change
 - a. Gain information about future risks and projections for changes to fisheries and aquaculture in response to climate change
 - b. Gain knowledge of resources to help inform decision making about marine management
 - c. Understand the importance of base line data, and have tools to initiate monitoring programs of indicator species
 - d. Evaluate issues in the identification of sites for Marine Protected Areas, and develop strategies for community engagement in decisions regarding MPAs,
 - e. Learn how to evaluate the efficacy of marine ecotourism ventures such as marine mammal viewing,
5. Coastal water quality, ciguatera identification, monitoring and abatement
 - a. Understand the risks of ciguatera fish poisoning and its impact on health and fisheries exports and the link with lagoon health
 - b. Learn how to identify the causative agent and initiate a monitoring and research program
6. Fisheries and aquaculture methods and management
 - a. Identify knowledge gaps and needs for effective fisheries management
 - b. Learn hands on methods for developing a new sustainable aquaculture enterprise

This training block will prepare Fellows for future challenges to their fisheries industries, in particular those challenges that will arise due to inevitable effects of climate change on island environments. Ciguatera fish poisoning is one of the most immediate dangers to humans resulting from increased temperatures and algal bloom frequencies. Hence, the ability to identify and monitor blooms will be of great value for island communities.

7. Methane digester
 - a. gain know-how on building a methane digester using local materials and available skills
 - b. gain knowledge of the multiple benefits that accrue from such low-tech solutions
8. Recycling facilities
 - a. gain know-how on operation of recycling facilities
 - b. understand supply chain implications of recycling to island communities (i.e. apply EIA and footprinting knowledge to real-life situation)
 - c. develop appreciation of recycling possibilities for their own situations
9. National Park and waste disposal
 - a. share insights into value of national parks
 - b. understand supply chain implications of waste disposal on Norfolk (i.e. apply EIA and footprinting knowledge to real-life situation)
 - c. extrapolate to own situations
10. Waste heat and cooling
 - a. gain know-how about devices for capturing waste heat to run cool stores
 - b. understand importance of such symbiotic systems for small island sustainability



11. Island governance, planning, administration and regulatory issues
 - a) gain a practical understanding of how to develop an implementation plan to progress a project through three key phases of Feasibility Assessment, Approvals and Construction
 - b) explore procedures for implementation of a project that apply in similar Island jurisdictions as examples of how the methodology could be applied in different situations; a range of contemporary tools and methodologies available to the planner,
 - c) Identify the benefits of good project planning and an awareness of risks of a lack of project planning;
 - d) Understand the need to consult, develop support, address issues raised, and have plan contingencies.

We expect that all participants at the end of the three weeks will have gained not only knowledge about how to address the issues surrounding waste and energy but also have gained major insights into the practical application of their knowledge in a small island environment.