Darwin Initiative – Final Report

'Conserving Coral Reefs through Community Ownership and Enterprise in Indonesia'

1 April 2005 – 30 April 2008

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Darwin project information

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1 Project background

The purpose of the project, 'Conserving Coral Reefs through Community Ownership and Enterprise in Indonesia', was to conserve the threatened marine biodiversity of Bali Barat National Park and its neighbouring buffer zones. This was done by engaging the local community in the development of an integrated coastal zone management plan and the establishment of a sustainable fishery enterprise based on the Marine Aquarium Council's (MAC) international standards for the collection and care of marine life.

The project addressed two problems[1]:

1. destructive fishing methods (in particular the use of cyanide and explosives)
2. poor coastal zone management

The project partnerships conducted activities in Bali's Buleleng district (*Figures 1,2)* in four impoverished fishing villages (*Figure 3)*. At the end of the project, 47% of the local fishermen had adopted environmentally friendly fishing methods, which lead to an increase in marine biodiversity and the return of sensitive fish species.

Figure 1 *Map of Bali (project area circled)*

Figure 2 *Map of Buleleng district (coloured area), Gerokgak sub-district (pink), (project area circled)*

Buleleng district

Coastline:	144 km
Area:	1,366 km^2 (75% sea)
Population	588,662
South latitude	8^{O}03'40"–8^{O}23'00"
East longitude	144^{O}25'55"–115^{O}27'28"

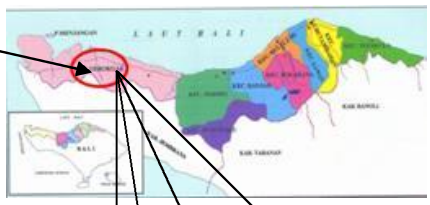

Figure 3 *The four villages where project activities took place*

	Villages	Population
1.	Pejarakan	9,507[2]
2.	Sumber Kima[3]	6,417[4]
3.	Pemuteran	8,168[5]
4.	Penyabangan	4,237[6]

1. 2. 3. 4.

[1] The project was inspired by a previous project in Les village in northern Bali, funded by the GEF/UNDP Small Grant Programme. With technical support from the Marine Aquarium Council (MAC), this project (2002-2004) helped fishermen swap their destructive fishing practices for environmentally-friendly techniques, with the goal of implementing community-based coral reef restoration: http://sgp.undp.org/web/projects/6603/coral_reef_restoration_and_establishment_of_sustainable_community_based_ornamental_fish_business.html

[2] Source: Profil Desa Pejarakan 2006

[3] Sumber Kima, a village with a mixed Hindu and Muslim community, was the site of an earlier WWF Indonesia project to introduce environmentally-friendly fishing practices, as part of a larger conservation effort to protect the marine area of the Bali Barat National Park. The LEAD project aimed to build on WWF's results and support the local fishing community by encouraging a wider adoption of MAC standards.

[4] Source: Profil Desa Sumberkima 2004

[5] Source: Profil Desa Pemuteran 2008

[6] Source: Profil Desa Penyabangan 2004

2 Project support to the Convention on Biological Diversity (CBD)

60% of Indonesia's coral reefs are in a degraded state[7]. As a result, the Indonesian Government has identified the conservation and sustainable management of coral reefs as a national priority, outlined in the National Strategy and Action Plan for Coral Reef Ecosystem Conservation and Management (Ministry of Environment, 1992), Indonesia Biodiversity Action Plan (1993) and Indonesia Agenda 21 (1996).

Project activities were guided by the principles set out in the Convention on Biological Diversity's 'marine and coastal biodiversity' thematic programme of work and the 'sustainable use of biodiversity' cross-cutting issue. Project outcomes were designed help the Indonesian government meet its obligations under the Convention of Biological Diversity (CBD), specifically in four CBD articles: 8, 10, 11, and 12 (*Annex 3*), with the majority (70%) of activities supporting two articles:

Article 8 (30%) In-situ conservation with a special focus on:
- initiating the restoration of the degraded coral reef ecosystem of Buleleng;
- ensuring compatibility between the sustainable use of marine resources (especially ornamental fish and fish for consumption) and their habitat conservation;
- protecting traditional fishing lifestyles and encouraging the use of local knowledge regarding biological resources;
- managing areas adjacent to protected areas, specifically the Bali Barat National Park.

Article 10 (40%) Sustainable use of components of biological diversity with a special focus on:
- supporting local fishing communities to implement remedial actions, i.e. stopping the destructive fishing practices of using cyanide and explosives;
- encouraging cooperation between local governments (traditional and conventional), the private sector, local communities and scientific, research-based conservation organisations;
- introducing the notion of evidence-based adaptive management of natural marine resources.

The project fulfilled all three CBD objectives:

1. Objective 1: Conservation of biological diversity. The project:
   - Increased the biodiversity and abundance of ornamental and food fish species
   - Raised awareness of the importance of conservation in poor fishing communities
   - Developed local capacity to conserve marine biodiversity

2. Objective 2: Sustainable use of the components of biological diversity. The project:
   - Catalysed the development of a new local resource management system
   - Introduced adaptive resource management through the cooperation of research organisations, resource users and policy makers
   - Introduced new policies and financial incentives

3. Objective 3: Equitable sharing of benefits. The project:
   - Strengthened local resource management councils
   - Designed and piloted a fair trade ornamental fish supply chain

By significantly decreasing destructive fishing, initiating the restoration of coral reefs in Buleleng and facilitating project replication in Bali and throughout Indonesia, the project contributed to the CBD 2010 target of reducing the current rate of biodiversity loss.

The project did not directly follow guidelines set out in the Convention on Migratory Species (CMS) or the Convention on International Trade in Endangered Species (CITES). However, the project recommended that some ornamental fish species used in the live aquarium fish trade be considered for inclusion in CITES *(5: Lessons learned)*.

There was no direct consultation with Indonesia's Biodiversity Strategy Office. However, the Indonesian project team is planning to brief the office on the success of the project and seek their support in replicating the project elsewhere in Bali and Indonesia.

[7] Third National Report, CBD, Indonesia http://www.cbd.int/doc/world/id/id-nr-03-en.pdf

3 Project partnerships

The project was implemented through a complex, multi-stakeholder partnership. Partners played complementing roles:

1. LEAD International, London, UK provided capacity development, technical support and an international platform to share lessons learned and replicate the successful model.
2. LEAD Indonesia, Jakarta coordinated the complex project with its special contribution to improving natural resource governance.
3. Fishing communities in Buleleng district, Bali advised on and facilitated the adoption of new, sustainable marine resource governance in their villages.
4. Lembaga Pilang, a local nongovernmental organisation in Bali, worked as a community organiser and supported all activities with a special contribution to environmental advocacy and environmental education.
5. Marine Aquarium Council (MAC) Indonesia, Bali trained and certified fishermen and exporters according to the international MAC standards[8].
6. Reef Check Foundation Indonesia, Bali conducted regular biodiversity monitoring and trained local fishermen in monitoring methods.
7. WWF Indonesia, Jakarta supported LEAD Indonesia's efforts in local policy advocacy.
8. Indonesian Government supported the dissemination and replication of results.

Most of the decisions were made by the principle partners: LEAD Indonesia and LEAD International.

4 Project achievements

See *Annex 1* Report of progress and achievements against final project logframe for the life of the project

4.1 Impact: achievement of positive impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

The project had significant impact in all three focal areas identified by the Darwin Initiative, which correspond with the Convention on Biological Diversity's three objectives:

Biodiversity improvement – restoration of coral reefs in Bali (*Annex 9: MAC Report*)

- The following ornamental fish species have returned to the coral reefs: blue/gold striped snapper (*Symphorichthys spilurus*), barracuda (*Sphyraena barracuda*) and blue-girdled angelfish (*Pomacanthus navarchus*).
- Point sampling surveys show an increase in live hard corals.
- There is an increase in ornamental fish diversity and abundance over time in the surveyed project area.
- Within two years (2005–2007), the diversity of ornamental fish species in Penyabangan increased by almost 60%. As most of the fishermen stopped using cyanide, this increase could be attributed to the change in fishing methods.

Behaviour change (individual, organisation) – transition from unsustainable to sustainable resource management

- Members of three MAC-certified ornamental fish collecting enterprises *(4.2: Outcomes)* stopped using cyanide and explosives, and started only using sustainable fishing practices. These MAC certified fishermen exercise peer-pressure on other fishermen in their village to adopt environmentally-friendly fishing techniques.

[8] MAC International Standards: http://www.aquariumcouncil.org/macintlstandard.html

- There are three well-organised and influential community-based marine resource management councils *(4.2: Outcomes)* in the project area which will provide a long term foundation for sustainable marine resource management. Two councils[9] have legal authorisation from their village governments to enforce the use of sustainable fishing practices, represent the community in policy dialogues and negotiate with the private sector.
- As a result of comprehensive capacity development activities, local communities are now able to better represent their long-term interests related to sustainable resource management when they negotiate with local government and other stakeholders.

Livelihood improvement of communities living off biodiversity resources

- Selected members of MAC-certified fishermen enterprises gained access to low-interest loans from the community-based 'Wana Agung Cooperative' (a micro-finance organisation) to buy tools that enabled them to continue fishing in an environmentally-friendly way. The low-interest loans significantly improved fishing communities' ability to earn a reasonable income and improve their livelihoods. Prior to accessing these loans, the fishermen were entrapped in high-interest loans and were forced to sell fish for low prices by local money-lending middle-men.
- Selected members of MAC-certified fishermen enterprises earned a higher price for sustainably-harvested ornamental fish through the new, experimental 'eco-fish' supply-chain.

The project had an unexpected positive social impact on Sinar Baru, one of the three fishing enterprises:

- 'Sinar Baru', a group of 19 MAC-certified fishermen in Penyabangan, collects ornamental fish using only environmentally-friendly methods. Inspired by the project, Sinar Baru's leaders – Ketut Baktiyasa and Mohamad Halil – have expanded their fishing enterprise into a professional membership organisation (including drawing monthly fees), a model of sustainable small business that draws on biodiversity to improve livelihoods.
- Sinar Baru is known for its innovative approach: members have created new, environmentally-friendly techniques to collect and handle ornamental fish *(4.6: Capacity Development)*. They have also started to diversify their business to secure an income at times when ornamental fish collection is not feasible (e.g. during extended periods of storms).
- Sinar Baru received funding from the local government to construct an office and a meeting room to support their future development. They will also receive new fishing nets to continue environmentally-friendly harvesting. Sinar Baru was nominated as the representative of all the community-based fishing enterprises of Gerogkak sub-district at a competition to find 'The Best Environmentally Friendly Community-based Fishermen Enterprise'. This is the first competition of its kind, organised by the district government to support and encourage sustainable fishing practices.

[9] LPLP, LP3LP

4.2 Outcomes: achievement of the project purpose and outcomes

The project fulfilled its purpose of contributing to the conservation and restoration of the threatened marine biodiversity of Bali Barat National Park and its neighbouring buffer zones.

Outcomes include (see also *4.1: Impact*):

- Three MAC-certified, profitable live ornamental fish enterprises in place *(see next paragraph)*
- Three community-based marine resource management councils are functional *(see next page)*
- Recovery of ornamental fish stocks and coral reefs in the project area
- Increased levels of public participation and more effective dialogue with local government in the management of marine resources.

MAC-certified community-based ornamental fish collecting enterprises:

- 'Laut Lestari' in Pejarakan[10]
- 'Segara Indah' in Sumber Kima[11]
- 'Sinar Baru' in Penyabangan

Community-based marine resource management councils:

- 'Lembaga Pendiri, Pengawas, Pengelola Laut dan Pesisir' (LP3LP) in Pejarakan
- 'Badan Pengelola Wilayah Laut dan Pesisir' (BPWLP) in Sumber Kima
- 'Lembaga Pengelola Laut dan Pesisir' (LPLP) in Penyabangan

Outcomes were facilitated by activities *(4.3: Outputs)* strengthening

1. local capacities
2. governance
3. policies
4. financial incentives

4.3 Outputs and activities

Project outputs followed the plan set out in the project logical framework. All planned outputs were delivered as follows:

Trained fishermen (*Annex 8*):

- 243 community members (235 ornamental fish collectors, 8 exporters) were trained in techniques for sustainable ornamental fishery management and received MAC certification.
- The final figure is 62% more than the initial projected figure (150). This achievement marks a critical mass (47%) of fishermen[12] who can facilitate the universal application of MAC standards in Bali.

Research *(4.5: Technical and scientific achievement):*

- Ecological status: baseline data and two consecutive surveys were conducted in three villages for long-term monitoring of the area's marine resource base.
- Socio-economic status: two socio-economic studies were conducted to help inform an effective poverty alleviation approach including economic incentives for coral reef conservation.

[10] Pejarakan fishermen formed their organisation in October 2004, before the Darwin project started, with the commitment to stop using cyanide and restore their reefs.
[11] Fishermen in Sumber Kima also formed their environmental fishing group before the start of the Darwin project.
[12] An estimated 500 fishermen collect ornamental fish in the project area: Tejakula, Buleleng and Gerokgak sub-district, Bali according to Yahya, Y., P Widyastuti AS., A Mustain., W.Suradnya., N. Sutrisna and J.B. Ariatman. 2008. Status Sumberdaya Perikanan Hias Laut Kabupaten Buleleng: Laporan hasil survey kondisi terumbu karang dan Perikanan Hias 2003-2007 dan Monitoring Hasil Tangkapan Ikan Hias 2005-2007. MAC Indonesia-Yayasan LINI, Bali.

Livelihood of communities enhanced:

- A new ornamental fish supply chain was successfully tested with 'Blue Star', an ornamental fish exporter. Selected fishermen (from Sinar Baru, *4.1*) who participated in the experimental supply chain earned a further 10% on their previous income. Bringing the new 'eco and fair trade' supply chain to the mainstream has the potential of improving the livelihoods of all MAC-certified ornamental fish collectors in Bali.
- Cooperation was established among MAC-certified fishermen.
- Thoughtful integration of the new ornamental fish supply chain and the micro-credit system has proved to have the potential of improving local communities' livelihoods while contributing to biodiversity conservation.

Multi-stakeholder dialogues for improved governance:

- Comprehensive capacity development activities were conducted to engage the community-based fishing organisations in participatory dialogue with local government and other stakeholders.

Policies:

- Initiated and negotiated by the community-based marine resource management councils, the project achieved the following three policy improvements in Buleleng, Bali:

(1) Fishing permit regulation – the local government has issued a clear procedure for issuing fishing permits[13].

Significance:

- There was no clear procedure before. Fishermen did not understand the regulations, which made them vulnerable when the police confronted them. Fishermen did not consider the police enforcement fair.
- The new standardised and clear procedure protects fishermen from unfair police investigation and/or from having their licence confiscated by the police. All parties – local government, fishermen, police – share the same understanding of rights and responsibilities related to a fishing permit.
- The permit issuing process helps the local government keep track of the number of fishing licences. As fishermen holding a fishing licence are liable to pay tax, the local government benefits from issuing licences through collecting tax revenue.

(2) Tax relief on traditional fishing boats – the local government has waived the tax on traditional fishing boats.

Significance:

- Previously, all boat owners were liable to pay tax. As traditional fishing boats can catch fewer fish than modern vessels, families who owned traditional fishing boats (who tended to be poor) were at a disadvantage. The new tax waiver greatly improves the livelihoods of low income fishing families.

[13] The name of this local government regulation in Bahasa Indonesia is 'Peraturan Daerah or Perda'. The title of the new policy in Bahasa Indonesia is 'Perda Retribursi Pelayanan Perizinan Usaha Perikanan and Kelautan' Number 10/2007, Date of issue: December 2007.

(3) Community rights for resource management – the local government has given two community-based marine resource management councils (LPLP in Penyabangan, LP3LP in Pejarakan)[14] legal status, including the right to management the local marine resources.

Significance:

- Previously, resource management was exclusively a government privilege and as such was not sufficiently effective and efficient. Also, in many cases the government did not take into account the needs, aspirations and the concerns of the fishermen community.

- The new regulation authorises the local community-based marine resource management councils to exercise law enforcement (e.g. enforce the ban on cyanide use), represent the community in policy dialogues and negotiations with the private sector. This is a mechanism where the community's aspirations and concerns are taken into account through official mechanisms, part of the decentralising democracy.

Dissemination of project results and lessons learned (*5: Lessons learned*):

- A wide range of communication products have been developed for various audiences, from local fishermen to policy makers, to share lessons learned and disseminate project results in Bali, throughout Indonesia and internationally. Products include three case studies, four documentary films, an informative project website, a sticker, a poster, project promotional leaflets and newspaper articles for the general public.

- Over 40 Indonesian and 2,500 international organisations received information about project results. Indonesian organisations were mailed hard copies of a package of dissemination materials to share lessons learned and facilitate replication.

Challenge

Local coordinator:

- Staffing changes for the position of local project coordinator was the main challenge for the project. Three committed and accomplished professionals were hired by LEAD Indonesia during the lifetime of the project for the local coordinator position. They were all from Java. The first coordinator stayed for over a year, the second and third for less than a year. The first coordinator relocated to Bali temporarily from Java, the second and third visited Bali on a regular basis. They all had relevant professional backgrounds: social science and community development, marine science and conservation, and agriculture and small business development, respectively. The challenge they faced was to balance the diverse expectations of various stakeholders.

- According to LEAD Indonesia, the main issue was the lack of availability of a local (Balinese) person who had the right leadership skills and attitude. To fill the gap, the Director of LEAD Indonesia (based in Jakarta, Java) invested extra time to supervise the responsibilities of the local coordinator, and make sure the project delivered good results in the short timeframe.

[14] The name of this village regulation in Bahasa Indonesia is 'Peraturan Desa'.

4.4 Project standard measures and publications

See *Annex 4* and *Annex 5*

4.5 Technical and scientific achievements and co-operation

(a) Ecological Assessment

The research on the project area's coral reefs and their ecological status was conducted by MAC Indonesia and Reef Check Foundation Indonesia. The purpose of the assessment was to support sustainable marine resource management, especially ornamental fisheries, in the project area.

Reef Check conducted three marine resource assessment surveys during the project (2005, 2006 and 2007). The 2006 survey was part of Reef Check's coral reef monitoring training for local fishermen. The results of these surveys were measured against a baseline established before the project in July 2003. The survey sites were located in the MAC-certified collection areas, located by GPS.

Reef Check Indonesia used the same team for all three surveys for consistency, including Domingo Ochavillo, Yunaldi, Putu Widyasututi and Andre.

Monitoring method

MAQTRAC (Marine Aquarium Trade Coral Reef Monitoring Protocol) method was used in all surveys. MAQTRAC was originally designed and tested by Reef Check scientists and has been used internationally since 2004. MAQTRAC is an assessment and monitoring protocol specifically designed for the marine aquarium trade, a requirement for all MAC-certified collection areas.

MAQTRAC components include a wide area survey and site selection ("Manta tow" survey for habitat overview), belt transects (for fish and invertebrates census and organism density and size classes), line transects (for substrate sampling and identification), and timed swims.[15]

MAQTRAC's objectives include the following:

1. To determine the status of marine resources
2. To set total allowable catch (TAC)
3. To make recommendations for no-take zones

Findings

- A steady improvement of the state of coral reefs was observed in the project area, i.e. Bali's Gerokgak sub-district. This improvement is significant in the light of the increasing trend of exploitation of marine ornamental reef fish species in the project area.

- An indication of reef recovery is the return of fish species such as the blue/gold striped snapper (*Symphorichthys spilurus*), barracuda (*Sphyraena barracuda*) and blue-girdled angelfish (*Pomacanthus navarchus*). Fishermen in Penyabangan first spotted them in October 2007. Some of these fish species had not been seen in the area for 13 years. Reef Check and MAC confirmed the fishermen's observations.

- An increase of live hard coral cover was documented by point sampling surveys over the assessment period.

- MAC recorded an increase in the number of species in the surveyed area: 99 species in 2004, 132 species in 2005, and 185 species in 2007.

[15] MAQTRAC http://www.aquariumcouncil.org/pdffiles/Press_Kit_MAQTRAC.pdf

- There seems to be an increasing trend in diversity and abundance of ornamental fish over time in the surveyed area.

- The reefs near Pejarakan and Penyabangan showed the best results. MAC found the highest diversity of ornamental fish in:
  2004 in Pejarakan (67 species)
  2005 in Pejarakan (75 species)
  2007 in Penyabangan (101 species)

- Within two years (2005–2007), the diversity of ornamental fish species in Penyabangan increased by almost 60%, which could be attributed to the fact that most fishermen stopped using cyanide.

- The results are promising, but further and more frequent (quarterly) monitoring is necessary to gain a better understanding of the pattern of reef recovery in Buleleng, especially the seasonality of abundance and diversity.

- MAC recommends establishing no-take zones in Pejarakan, Sumber Kima and Penyabangan to catalyse the restoration of coral reefs, increase biodiversity and have a possible 'spill-over' effect. Establishing no-take zones may counteract the increasing pressure on marine life caused by resource extraction. MAC's recommendation on the no-take zones is based on a documented biodiversity improvement in a no-take zone in Sambirenteng, Tejakula.

Survey reports (not peer-reviewed)

2005 Report on Ecological Assessment from Pejarakan, Sumber Kima and Penyabangan, Gerokgak sub-district, Buleleng, Bali. Prepared by MAC based on MAQTRAC and Reef Check, June 2005 (submitted to Darwin Secretariat in Year 1 Annual Report, Attachment 3)

2006 Ecological Carrying Capacity and Empowering Community, Developing Community Based Marine Resources Management for Sustainable Use, 2006 (submitted to Darwin Secretariat in Year 2 Annual Report, Attachment 6)

2007 Yahya, Y., P Widyastuti AS., A Mustain., W.Suradnya., N. Sutrisna and J.B. Ariatman. 2008. Status Sumberdaya Perikanan Hias Laut Kabupaten Buleleng: Laporan hasil survey kondisi terumbu karang dan Perikanan Hias 2003-2007 dan Monitoring Hasil Tangkapan Ikan Hias 2005-2007. MAC Indonesia-Yayasan LINI, Bali. English Summary. (submitted to Darwin Secretariat in Year 4 Final Project Report, Annex 9)

(b) Socio-economic assessment

Two socio-economic studies were conducted to develop strategies that could harmonise conservation and livelihood improvement goals: MAC's base-line study from a local (Balinese) perspective, 2005; and A+CSR Indonesia's study from a national (Indonesian) perspective, 2006. The studies helped project partners design key interventions in capacity building, policy and financial improvement.

Methods

Data collection included:
- Document review of previous project documents
- Literature review on economics, social and environmental conditions of Buleleng
- Field observation, first-hand field experience
- In-depth interviews with fishermen and other parties in the ornamental fish supply chain
- In-depth interviews with Pilang NGO, the local project partner
- Focus group discussion with formal and informal leaders

Findings

- Unilateral efforts, such as biodiversity conservation without considering livelihood improvements, are not sustainable in the long term. Previous projects in Buleleng were biased towards conservation. MAC certification alone, biased towards conservation, did not bring the expected, much needed, immediate improvements in livelihoods.

- 'Quick fix' solutions or solutions in isolation do not work. Integration of the new supply chain, MAC certification, and improved credit schemes is necessary to achieve the desired results.

- Only an integrated approach can provide fishermen with social, environmental and economic incentives. This approach ought to give local communities ownership over managing their marine resources, with its legal rights and responsibilities. It also requires a collaborative approach from stakeholders and external donors.

- Effective local governance should be based on the subsidiarity principle (where matters are dealt with by the lowest competent authority) and include the following components:
  - establishment of community-based marine resource management councils
  - reviewing existing policies and revising them when necessary
  - developing new policies
  - improvement in decentralisation of local government

Reports (not peer-reviewed)

2005 Socio-Economic Profile of Buleleng, Bali. MAC. (submitted to Darwin Secretariat in Year 1 Annual Report, Attachment 2)
2006 Socio-Economic Profile of Fishermen Communities (submitted to Darwin Secretariat in Year 2 Annual Report, Annex 3)

4.6 Capacity building

Capacities of local stakeholders were developed in two areas:

- Skills and knowledge of sustainable ornamental fishery
- Improving financial know-how, including how to recognise and negotiate better terms for loans, and a higher price for 'eco-fish'

Training workshop participants were selected on their ability and commitment to share their learning experience with their community members.

Content

The training sessions were designed to improve local stakeholders' competencies in four areas:

a. Sustainable development with a special focus on fisheries
b. MAC-certified fishing and handling of ornamental fish
c. Monitoring marine resources
d. Financial planning and management

(a) Sustainable development with a special focus on fisheries

LEAD facilitated a series of training sessions on sustainable development, with a special focus on sustainable fisheries, for community leaders and key representatives of various sectors. The participants included members of community-based resource management councils *(4.2.: Outcomes)*, village level government officials, sub-district and district officials, staff members of Pilang NGO and interested fishermen. 27–50 people participated in each workshop.

The training workshops covered the following areas:

Module 1: Sustainability of coastal and marine biodiversity (June 2006)
Module 2: Sustainable natural resource management (July 2006)
Module 3: Negotiation and decision making (August 2006)
Module 4: Facilitation of effective meeting (August 2006)
Module 5: Organisational management (October 2006)

Community facilitators

Nine participants were selected to form a core team of facilitators[16] charged with disseminating and encouraging the uptake of sustainable development practices in their communities. These people were selected on the basis of their standing in the community and their knowledge and skills.

(b) MAC certification

MAC Indonesia trained fishermen in environmentally-friendly harvesting practices and post-harvest handling according to MAC's international standards[17].

The purpose of the MAC training workshops in Buleleng was to help fishermen:

- implement best practices in collecting and post-harvest handling of marine ornamental fish according to MAC standards
- maintain the optimal health of organisms during transport and in temporary holding
- understand the buyers' expectations of the condition of ornamental fish and coral
- understand how to dive safely, adopt MAC's health and safety standards for diving

[16] Core Team of Facilitators in Bahasa Indonesia: 'Facilitators Inti'

[17] MAC International standards: http://www.aquariumcouncil.org/macintlstandard.html

MAC training modules provided fishermen with:

Module 1: An introduction to the global ornamental fish trade, its present state and trends; Indonesia's coral reefs and fishery; the concept of sustainable fishery.
Module 2: Best practice in environmentally-friendly techniques and tools for catching ornamental fish; post-harvest handling requirements; identifying fish; packing, acclimatisation and segregation;
Module 3: The benefits and requirements of documentation;
Module 4: Safe diving techniques and equipment; emergency procedures.

As a result of the MAC training workshops, most of the certified fishermen now use environmentally-friendly fishing methods. The fishermen reported that the training workshops helped them realise that environmentally-friendly harvesting, not fishing with cyanide, would ensure their and their children's livelihoods.

MAC-certified fishermen in three of the villages where project activities took place have created their own fishing enterprises *(4.2: Outcomes),* which also function as a support group.

(C) *Monitoring marine resources*

Reef Check conducted training sessions for 15 community members from 4 villages to provide them with the skills to manage marine resources in a sustainable way. Participants learned how to perform a Participatory Coastal Resources Assessment (PCRA), and worked together with Reef Check and LEAD to formulate the Total Allowable Catch (TAC) for the ornamental fisheries.

The training enabled the project partners to work with the community to identify a potential Marine Protected Area (MPA) in Sumber Kima. The geographical scope of the MPA was agreed in consultation with the community. The final legal procedures to enforce MPA regulation are ongoing.

(d) Financial planning and management

The objectives of the financial training workshops were to enable the fishermen to make the best use of financial assistance, help them increase their income and free themselves from the entrapment of high-interest money lenders.

The business training covered the following areas:

Module 1: Enterprise Development – the roles of community groups, cooperatives and NGOs in the ornamental fish trade (August 2006)
Module 2: Managing a Micro Finance Institution (October 2006)
Module 3: Writing Credit Proposals for Micro Finance Agencies (November 2006)
Module 4: Market Match for the Ornamental Fish Trade: Facilitated meeting involving the fishermen community, suppliers, government agencies (December 2006)

At the end of the training, the fishermen were introduced to MAC-certified exporters and Jakarta-based retailers as well as micro finance institutions and local government in order to develop their business network. This meeting was fruitful and provided fishermen with information and financial access to build up their businesses.

Assessment

The MAC training had formal assessments. Successful participants were granted MAC certification according to the MAC international standards. While there was no formal assessment at the end of other training programmes, each workshop had an evaluation.

Accreditation

Participants received a certificate of participation from LEAD for successful completion of the training workshops. MAC has issued special certificates for the certified fishermen and exporters. The training activities were not accredited.

Impact

The project's wide portfolio of capacity development enhanced the competencies and financial capabilities of local stakeholders. In particular, they are now able to make their local fisheries sustainable and restore their local coral reefs by stopping the use of destructive fishing techniques and thus improving biodiversity.

The training has significantly strengthened two types of local organisations that play a key role in biodiversity improvement and conservation *(4.2: Outcomes):*

- Community-based marine resource management organisations
- Sustainable ornamental fishing enterprises

The training inspired some fishermen to innovate and create new fishing techniques. Abu Kasim, a young fisherman, has been experimenting with new, eco-friendly methods for catching ornamental fish. Abu Kasim belongs to the Sinar Baru fishing enterprise from Penyabangan and has been sharing his successes with his fellow fishermen. This is a great example of how local ecological knowledge can contribute to sustainable natural resource management.

4.7 Sustainability and legacy

The legacy of the project is the establishment of a network of community-based organisations – three resource management councils and three fishing enterprises *(4.2: Outcomes)* – that have the capacity for and commitment to further sustainable marine resource management in Buleleng.

With the motivation and long-term view of Pilang, the local NGO, these organisations are able to leverage resources for their own organisational development and replicate the institutional model. Their success will likely depend on ongoing financial support (e.g. PT Indonesia Power recently pledged their financial support to Wana Agung, a local micro finance cooperative), technical and management mentoring, their ability to network and collaborate effectively with a wide range of stakeholders, including local government, research and conservation organisations, businesses, micro-credit institutions, media, and their ability to practice adaptive management.

These community-based resource management organisations have a strong sense of place and belonging and are able to apply their rich and dynamic local / traditional ecological knowledge and integrate it with other knowledge bases. These organisations are the key to creating resilient socio-ecological systems in Bali and Indonesia.

As Indonesian national law gives artisanal fishermen open access to all national waters (as long as they observe local regulations), strong local governance is critical if not the only way of protecting local resources from external poachers. Coastal waters without strong surveillance and local protection often fall prey to 'roving bandits'[18], fishing parties that roam the sea with well-equipped boats. They collect marine organisms for live trade without any environmental consideration, and leave destroyed reefs behind.

Project partners will keep in touch (most of them know each other from before the project) and plan to replicate the project model in other parts of Indonesia with the support of in-country (e.g. Foundation for Indonesian Biodiversity, Ministry of Environment, Department of Fisheries, etc.) and international donors.

[18] Berkes, F, et al. (2006) *Ecology: Globalization, Roving Bandits, and Marine Resources*. Science. Vol:311(5767). 1557-1558

5 Lessons learned, dissemination and communication

Lesson Learned & Recommendations

(1) Conservation cannot be separated from social and economic development issues

- Setting up local governance systems that draw on biodiversity conservation for poverty alleviation is of paramount importance for the sustainable improvement of both biodiversity and livelihoods.

- MAC standards represent good practice and contribute to conservation of reef resources but do not ensure better income for the fishermen.

- Compelling economic incentives are needed to strengthen fishermen's commitment to conservation and sustainable use of coastal marine resources. Higher prices for eco-fish could serve as an economic incentive.

(2) Eco-fish supply chain

- There exists an opportunity to create a new supply chain for eco-fish where fishermen work directly with exporters and thus get a higher price for than they normally would do through middle-men. But the obligations of both parties – exporters and collectors – must be clarified for the relationship to run smoothly and to ensure fair payment for the fishermen.

(3) Higher price for eco-fish

- Ornamental fish collectors ought to receive at least double the normal price for eco-fish, paid in cash. This will act as a strong incentive to encourage fishermen to apply MAC standards to protect coral reef resources.

- All market players, including exporters, retailers and hobbyists, ought to commit to paying more for eco-fish as is the case with other certified organic and fair-trade commodities such as coffee, cocoa, etc.

(4) Multi-stakeholder cooperation

- Multi-stakeholder cooperation is necessary to initiate and maintain sustainable ornamental fisheries at any level. Collaboration between stakeholders at the local level is the most critical for harmonizing conservation goals with poverty alleviation.

- The ornamental fish trade can be a sustainable enterprise so long as it is regulated at national and international levels. These regulations need to be harmonized and enforced to make an impact.

- International regulation should include ornamental fish species in the Convention on International Trade in Endangered Species (CITES). Currently only giant clams and live corals are included in CITES. CITES, however, does not always help to regulate and control domestic fishery issues. Better domestic management practices are prerequisites to make CITES work.

(5) Community-based resource management

- Community-based coastal and marine resource management councils and certified fishermen enterprises ensure the conservation of coastal and marine resources and sustainable management of marine resources. The formation of similar institutions in other coastal villages is highly recommended.

(6) Loan: clear and sustainable terms and conditions

- Financial support from cooperatives or other micro-finance institutions helps fishermen avoid dependency on high-interest loans from local middle-men.

- Financial institutions, however, should adopt and enforce policies that make sure the loan is used only to purchase goods and services that support sustainable livelihood development and sustainable coral reef resource management. Credit policies need to be reviewed on a regular basis to make sure credit is not used to purchase goods that contribute to further deterioration of coral reefs or the well-being of the fishing community.

(7) Diversifying fishermen's income

- Fishermen need assistance in diversifying their income outside of coastal and marine resource-based activities. This will help them adjust to any losses in income that result from limitations on the number of fish they can catch, or bad weather, such as during the January/February 2008 western monsoon period, when strong waves prevent them from fishing.

(8) Leadership

- The community organiser, Indra, director of Pilang NGO and a respected community leader, was key to the success of the project as she could work with both the fishermen and the government officials.

- Leadership has an important role in social change. Replacing destructive fishing methods with environmentally-friendly ones requires commitment, encouragement, incentives and a role model or a leader of high integrity. The influence and impact of such leadership is demonstrated in Penyabangan village where most fishermen stopped using cyanide, developed a new attitude to their reef, and became guardians of eco-fish. They have realised that destructive fishing practices jeopardise their livelihoods, while eco-friendly fishing practices will most likely help them keep their marine resources for long time.

(9) Pollution control

- Fishermen are often blamed for the destruction of coral reefs, regardless of the impact of other factors like pollution or climate change. For example, waste water from hatcheries in Penyabangan and Sumber Kima make the coastal seas eutrophic. As a result, a thick carpet of filamentous algae has developed at the coastal water in Penyabangan. Although phalanxes of sea urchins control the spread of the algae, the high nutrient level poses an imminent threat ('phase shift') to the neighbouring reefs. Boat fuel at the traditional harbour of Sumber Kima is known to pollute and destroy the reef. The fishermen believe that the fuel made the mangroves die back in that area.

- Sewage treatment and a preventive pollution control by the local government would greatly contribute to the effective conservation of coral reefs along the shores of Buleleng.

(10) Adaptation to climate change

- The 1997 El Nino caused significant coral reef destruction. Global warming could increase the frequency of similar events, which will also have a serious negative impact on ornamental fishing. Awareness raising, capacity development and planning are of high priorities: different scenarios of adaptation to climate change must be explored in Bali with special reference to the ornamental fish trade.

(11) Replication

- The project's integrated approach can be replicated throughout the Buleleng district and the entire Bali province, even on a national scale throughout the entire country of Indonesia. Local project members – e.g. the MAC-certified fishermen of Sinar Baru in Penyabangan who are willing to share their knowledge and skills with other fishermen, and Pilang, the local NGO – should play a significant role in efforts to replicate the project elsewhere.

Dissemination and Communication

Project results have been disseminated through a wide range of media to different audiences (*Figure 4*).

- Dissemination in Indonesia occurred through mass media (local and national newspapers, TV) and targeted mailing of printed project promotional materials (posters, stickers, leaflets, DVDs, etc.) to over 40 addresses. LEAD Indonesia in Jakarta and Pilang NGO in Bali have been in communication with journalists.
- Dissemination to international agencies and professional organisations is on-going by emailing URLs of relevant parts of the project website that allows them to download information. LEAD International took the lead on international communication, and sent out information about the project in e-newsletters and list-serves to over 2,500 individuals, members of the global LEAD network, and conservation professionals.

The dissemination effort will continue after project completion. The cost will be borne by partners who manage to secure funding or individuals who are committed to volunteer their time.

Figure 4 *Dissemination of project results*

Product	**Audience**	**Media**
Case study (personal) Kisah dari Buleleng Kami Yakin karena ikan Piama (Bahasa Indonesia)	Fishermen, Bali, Indonesia	Printed matter & http://www.lead.org/page/421
Case study (personal) 'Our Story from Buleleng: We believe in 'Piama'' (English)	Fishermen, International	Printed matter & http://www.lead.org/page/421
Case study (short) Menuju Perdagangan 'Eco Fish' yang lebih adil (Bahasa Indonesia)	General public, Indonesia	Printed matter & http://www.lead.org/page/421
Case study (short) Towards Green & Fair Trade for Eco Fish (English)	General public, International	Printed matter & http://www.lead.org/page/421
Case study (long) Towards sustainable ornamental fisheries in Bali	Conservation professionals, International	http://www.lead.org/page/421
Sticker, leaflet, poster (Bahasa Indonesia)	Retailers, consumers Jakarta	Printed matter
Documentary film 40' Eco Fish: Kisah dari Buleleng, Bali Utara (Bahasa Indonesia)	Fishermen, Bali, Indonesia	DVD
Documentary film 24' Conserving reefs for community ownership and enterprise (developed for an Indonesian TV channel) (Bahasa Indonesia with English subtitles)	General public Bali, Indonesia, and International	DVD *http://www.lead.or.id/darwinproject/ecofishfilm.php*
Promotional film 5' Our Story: Message From Buleleng (English and Bahasa Indonesia)	General public, funding agencies, fishermen, retailers	Project website http://www.lead.org/page/423 *http://www.lead.or.id/darwinproject/ecofishfilm.php*
Promotional film 30'' Buy Me: Eco Fish (Bahasa Indonesia)	Reef fish hobbyists	Project website *http://www.lead.or.id/darwinproject/ecofishfilm.php*
Newspaper articles	General public Bali, Indonesia	Printed matter
LEAD Network e-bulletin	2,500 sustainable development professionals in Indonesia and worldwide	*http://www.lead.org/page/237*

5.1 Darwin Initiative identity

The project was recognised as a distinct project, on its own merits, with a clear identity. However, because local partners were more familiar with LEAD, the project was often referred to as 'LEAD' project.

The Darwin Initiative (DI) has been acknowledged in several ways in the project:

- The DI logo (in the form of a large sticker) is displayed on the front door of the project office in Buleleng, Bali
- The DI logo is displayed on all printed materials (except the shop sign and the poster produced in Year 3 as a response to DI's request)
- DI is acknowledged in the documentary films
- DI is acknowledged in all letters sent to partners accompanying project promotional and dissemination materials.

All local partner organisations (LEAD Indonesia, Pilang NGO, MAC, Reef Check) are familiar with the Darwin Initiative, and aware that the project was funded by the Darwin Initiative.

LEAD International made several presentations on the Darwin Initiative at the 'training of trainers' workshops in Year 2, as well as discussing the history, aims, objectives and types of projects of the Darwin Initiative in formal and informal community meetings. DI pens were distributed at the training workshops, and each graduating participant received a DI pin. As the participants of these events were community leaders, facilitators and high impact community members, it is a fair assumption that key community members are aware of the link between the project and the Darwin Initiative.

6 Monitoring and evaluation

There was no change to the project design. Changes were made only in the timeline with the approval of the Darwin Initiative secretariat. Schedule revisions included the training of trainers programme in Year 1 and Year 2, the case study development and dissemination in Year 3 with a 30 day extension of the project implementation period through April 2008.

The monitoring and evaluation system was found to be practical and provided useful feedback to partners and stakeholders. There was also an external mid-term evaluation in December 2006 when a DI consultant visited Bali. The evaluator was impressed by the creative and dynamic project, and some of the findings were eventually published in the Darwin Initiative's thematic review on islands in 2007.

Strategy

The original project proposal – specifically the 'logframe' and milestones – was used to monitor progress and make sure the project was on track. The half-year and annual project reports provided opportunities for evaluation and making sure the project was on the right track.

Project partners used regular email and phone communication to monitor progress, and used face-to-face meetings – i.e. the UK partner's four visits to Indonesia – to reflect on project results and adjust plans accordingly. Each project activity was evaluated individually after the completion of the event. All training workshops included a formal evaluation.

The ecological and socio-economic assessments were evaluated against baselines that had been established before or during the project (*Figure 5*) *(4.5: Technical and scientific achievements).*

Figure 5 *Ecological and socio-economic baselines and monitoring schedules*

Baseline	***Monitoring***
– Ecological assessment (July 2003) – Socio-economic assessment (2005, 2006)	– Ecological assessment (December 2007) – Interviews for case studies (July 2007–January 2008) – Interviews for documentary films (February 2008)

Results

The project has fulfilled its purpose – the conservation of coral reefs through community ownership – and the outputs are comparable with those set out in the proposal. In some case the actual outputs went beyond what was projected *(4.3: Outputs).*

Key indicators

Project outcome	***Indicator***
Coral reef recovery	– return of sensitive species – increase in biodiversity – increase in abundance
Coral reef conservation	Local capacities are increased, e.g. – MAC-trained and certified fishermen and exporters – Cooperation of stakeholders – Commitment of stakeholders to continue their cooperation, e.g. Memorandum of Understanding – Conservation management plans – Relevant new or revised policies
Community ownership	– Community-based fishing enterprises – Community-based resource management councils – Fishermen are committed to using MAC standards, despite the short-term economic disadvantage

Value

The evaluation results demonstrate that the project contributed to:
- Conservation / natural capital (reef recovery, return of sensitive species)
- Conservation science (better understanding of reef recovery)
- Social capital (community empowerment)
- Economic capital (livelihood improvement)

What made the project really exceptional is the way it leveraged local resources – i.e. the community became an integral part of the project – to deliver results quickly and effectively. This approach was much faster and more effective than any isolated, single-discipline-based approach would have been.

One of the key values of the project was to demonstrate that strengthening community ownership can be more important than short-term economic benefits, even in an economically impoverished community. If a community is granted political, legislative and economic authority to participate in decisions regarding the natural resources its members depend on, it will have better control over its short-term economic benefits.

6.1 Actions taken in response to annual report reviews

LEAD International has thoroughly discussed the issues that were raised in the reviews of the Year 1 and Year 2 annual reports with the host country partner. In addition, a LEAD International senior manager travelled to Bali to have a face-to-face consultation with key project partners.

The issues that were raised required clarification of LEAD International's contribution, explanation of biodiversity science and practices used in this project, the international validation of Reef Check's methods used for marine resource monitoring, and the removal or approval of the Darwin logo from the eco-fish shop sign. LEAD Indonesia removed the Darwin logo from direct market promotion materials, such as the shop signs on pet shops that sold eco-fish, and the poster that was designed to be displayed in pet shops to promote the purchase of eco-fish.

LEAD International responded to all other issues satisfactorily in the requested format (see revised report). There are no outstanding issues to be resolved to the best knowledge of the partners.

7 Finance and administration

7.1 Project expenditure

The project has used the DI grant effectively and efficiently, with a final balance of 2% *(Figure 6)*. The underspend occurred in Year 1.

For breakdown of staff budget and actual expenditure, see (*Figure 7).*

The following budget allocations were made with DI's approval. Approved carry forward
- from Year 1 to Year 2: £6,970 (3 April 2006, Margaret Okot)
- from Year 3 to Year 4 to be spent by 30 April 2008: £6,839 (31 March 2008 Lisa Spencer)

Capital item: Project office, shared with 'Pilang' NGO in Bali

Figure 6 *Summary: Original and final budget, actual expenditure, variance*

	Budget Original (Stage2)	**Budget** Final	**Actual** Expenses	**Variance**	**Variance %**
Staff					
Rent					
Office					
Travel & subsistence					
Printing					
Conferences					
Capital items					
Socio-economic survey					
Ecological carrying capacity research					
Contingency					
Training cost					
TOTAL	**£149,953**	**£149,953**	**£147,236**	**£2,717**	**2%**

Explanation of variation in expenditure +/- 10% of the budget:

- Printing 19%: Less material was printed for the TOT than planned for (Year 1).
- Capital items (43%): The expenses of constructing a project office in Bali (capital item) were higher than expected. (Year 1)
- Ecological carrying capacity research 48%: MAC has provided in-kind services to conduct the research (Year 1).
- Contingency 31%: There was an underspend in Year 1 due to the re-scheduled training of trainers (TOT) to Year 2.

Figure 7 *Staff budget and actual expenditure breakdown*

	Yr1	Yr2	Yr3	Yr4	Total
Project Director (Dr Simon Lyster) (UK)					
Project Manager (UK)					
IT and Communication Officer (UK0					
Finance Officer (UK)					
Executive Director (Indonesia)					
Finance and Administrative Staff (Indonesia)					
Communication Officer Indonesia (Indonesia)					
Local Project Director (Indonesia)					
Community Development Staff (Indonesia)					
Case study Writer Indonesia (Indonesia)					
TOTAL Staff Budget					
TOTAL Expenditure					
Balance					

7.2 Additional funds or in-kind contributions secured

The project attracted 49% matching funds (cash and in-kind contribution) and 5,854 person-days to augment the DI grant. Many of the in-kind contribution, however, can not be really expressed in financial terms, e.g. community contribution.

Summary

Total Darwin grant: £149,953
Total matched funds: £64,991 *(Figure 8 + 9)*
Matched funds / DI grant 49%

Details

Total matched funds committed in Stage 2 proposal: £29,700
Total matched funds from committed sources: £43,091 *(Figure 8)*
Total matched funds from not-committed sources: £21,900 and 5,854 person-days *(Figure 9,10)*

Figure 8 *Matched funds from committed sources (other than Darwin Initiative funding committed in Stage 2 proposal)*

	Yr1	Yr2	Yr3	Committed	Actual Matched
Staff					
Rent					
Office					
Travel & subsistence					
Printing					
Conferences					
Capital item					
Socio-economic survey					
Ecological carrying capacity research					
Contingency					
Training on MAC standards					
TOTAL	**£11,370**	**£13,680**	**£4,650**	**£29,700**	**£43,091**

Figure 9 *Matched funds from non-committed sources*

Source	Amount (IDR)	Amount (£)	Notes
PT. Indonesia Power	30,000,000	1,875	Cash for promotional materials for 'eco fish'm workshop activities and materials and for underwater shooting of documentary films
PT. Indonesia Power	45,000,000	2,813	Cash to 'Wana Agung' local cooperative to give low-interest loans to fishermen community enterprise
LEAD Indonesia Executive Director		10,587	In-kind, time over three years
'Timelime' film production company	106,000,000	6,625	In-kind, discounted price for producing the documentary films from IDR 200 millions into IDR 94 million. Additional 11 stock shots film.
Total		**£21,900**	

Figure 10 *Matched funds from non-committed sources - person-days*

Source	Person-day	Notes
Department of Fisheries and Marine Resources of District Government, Buleleng, Bali		In-kind, venue for meetings and workshops
PT. Indonesia Power		In-kind, commitment to mentor 'Wana Agung' to strengthen their management skills
Local fishing community members	5,760	In-kind, time; 3 years, 12 month/year, 2days/person/month, 4 villages, 20 people/village
UK consultant	72	In-kind, time; 3 years, 12month/year, 2days/month
LEAD Fellows	10	In-kind, time; 2 LEAD Fellows; 5 days/person
Peer-reviewers of Case Studies	12	In-kind, time; 2 reviewers; 3 case studies; 2 days/case studies;
Total	**5,854**	

7.3 Value of Darwin Initiative funding

The Darwin Initiative (DI) has enabled the UK and the host country partner to explore and implement a new type of activity in their long-standing partnership in capacity development. DI has enabled the partners to 'walk the talk', to apply innovative approaches to conservation. Without DI funding this complex project would only have been dreamt about.

Annex 1 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements April 2005 - April 2008	Actions required/planned for next period
Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve • The conservation of biological diversity, • The sustainable use of its components, and • The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources		- Biodiversity increased in project area: baseline survey and subsequent annual surveys by MAC & Reef Check provide evidence of improved abundance and diversity in project area where destructive fishing is stopped. - Sensitive ornamental fish species returned to the coral reefs of project area. - Members of three MAC certified ornamental fish collecting enterprises *(see 4.2.)* stopped using cyanide and bombs, and they started using only sustainable fishing practices. - A new eco and fair-trade supply chain has been successfully tested. All members are MAC certified. Fishermen's livelihood improved as they earned 10% more in the new, shorter supply chain. Full documentation is available.	
Purpose Conservation of threatened marine biodiversity of Bali Barat National Park and neighbouring buffer zone, through a participatory approach of developing an integrated coastal management plan and establishing a sustainable fishery enterprise – based on MAC standards.	1. MAC certified profitable live fish export enterprise in place. 2. Evidence of recovery of fish stocks and reefs within zone (measurable 5 yrs after project implementation) 3. Increased levels of public participation and more effective dialogue with local government in management of marine resources.	1. Three community-based MAC certified fishing enterprises are in place, profitable. 2. Abundance and biodiversity increase has already been detected at the end of the project. 3. Increased public participation: three community-based marine resource management councils have established good rapport and effective communication with local government and private companies.	

Output 1. 150 community members trained in techniques for sustainable fishery management	1. 243 community members have gained MAC certification in sustainable fishery techniques.	1. Completed, more than projected A total of 243 fishermen - 235 ornamental fish collectors and 8 ornamental fish exporters – have gained MAC certification in sustainable ornamental fish collection and handling. *See Annex 9.*
Output 2. Research: Ecological & resource stock data gathered & analysed	2. Baseline data by Year 2, Annual monitoring data in subsequent years	2. Completed Three assessments of marine resources (including baseline) and two socio-economic surveys were completed. Copies of reports are available.
Output 3. Livelihoods of communities enhanced	3. Increase in disposable income by Year 3	3. Partially completed – A new ornamental fish supply chain has been successfully tested. Selected fishermen earned 10% more from the new ornamental fish supply chain. – Selected MAC certified fishermen enterprises gained access to low-interest loan from the community-based Wana Agung Cooperative which significantly improved the livelihood of participating fishing communities compared to their previous entrapment in high-interest loans from middle-men.
Output 4. Communities better able to engage in participatory dialogue with local government & other stakeholders	4. Increased levels of participation and dialogue in decision-making. Increased trust between communities and decision makers.	4. Completed – Three community-based resource management organisations are working successfully and effectively; two of them (LPLP in Panyabangan, LP3LP in Pejarakan,) are authorised by their local government – Three sustainable MAC certified community-based fishing enterprises operate by environmentally friendly standards – Communities negotiated fishing permits with the local government – Minutes of community consultations and multi-stakeholder meetings are available.
Output 5. Dissemination of project results and lessons learned	5. Report produced, report presented at regional and international conferences	5. Reports completed; dissemination in progress – 3 bilingual case studies, 4 films and project promotional materials are available and disseminated project results and lessons learned for local, national and international audiences – Final report is submitted to Darwin Secretariat.

Annex 2 Project final logframe, including criteria and indicators

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve: – The conservation of biological diversity, – The sustainable use of its components, and – The fair and equitable sharing of benefits arising out of the utilisation of genetic resources			
Purpose Conservation of threatened marine biodiversity of Bali Barat National Park and neighbouring buffer zone, through a participatory approach of developing an integrated coastal management plan and establishing a sustainable fishery enterprise – based on MAC standards.	1. Fully MAC certified profitable live ornamental fish export enterprise in place. 2. Evidence of recovery of fish stocks and reefs within zone (measurable 5 yrs after project implementation) 3. Increased levels of public participation and more effective dialogue with local government in management of marine resources.	1. MAC documents and verifications + published accounts. 2.a) Baseline survey report (Year 1 & 2) and subsequent annual survey reports (Year 3) by MAC and Reef Check 2. b) Fish catch data 3. Records, minutes of village meetings illustrating public participation and dialogue.	1. The fishing communities are willing to give up use of cyanide and explosives for harvesting fish, and adopt MAC practices / standards which require constant verification and documentation. 2. The shift from current fishing practices (often involving the use of cyanide and explosives) to MAC methods will result in a measurable increase in fish stocks in the district, as demonstrated in previous projects by WWF Indonesia. 3. Willingness on the part of all stakeholders including communities and representatives of government to engage in participation and dialogue.
Outputs 1. 150 Community members trained in techniques for sustainable fishery management. 2. Research: Ecological & resource stock data gathered and analysed	1. Community members have gained MAC Certification in sustainable fishery techniques. 2. Baseline data by yr 2, Annual monitoring data in subsequent years	1. Training records and evaluation materials including MAC Certification documentation. 2. Copies of baseline surveys & subsequent annual survey reports	1. There will be sufficient interest in communities in becoming trained in sustainable fishery practices and gaining MAC certification. 2. Authorisation of research by appropriate authorities

3. Livelihoods of Communities enhanced.	3. Increase in disposable income by yr 3	3.a) Gauged against socio-economic baseline established	3. Communities willing to forego practices resulting in quick short-term gains for longer term well-being.
4. Communities better able to engage in participatory dialogue with local government and other stakeholders	4. Increased levels of participation and dialogue in decision-making. Increased trust between communities and decision makers.	4. Evidence of community consultation, minutes of meetings, official reports.	4. Community representatives and other stakeholders prepared to adopt participatory approach.
5. Dissemination of Project results and lessons learned	5. Report produced, report presented at regional and international conferences	5. Copies all publications and other materials sent to Darwin Initiative	

Annex 3 Project contribution to articles under the CBD

Project Contribution to Articles under the Convention on Biological Diversity (CBD)

Article No./Title	Project %	Article Description
8. In-situ Conservation	**30%**	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
10. Sustainable Use of Components of Biological Diversity	**40%**	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
Other Contribution *(see details below in italics)*	**30%**	
11. Incentive Measures	*10%*	*Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.*
12. Research and Training	*20%*	*Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).*
Total	**100%**	

Annex 4 Standard measures

Code	Description	Totals (plus additional detail as required)
Training Measures		
1a	Number of people to submit PhD thesis	
1b	Number of PhD qualifications obtained	
2	Number of Masters qualifications obtained	
3	Number of other qualifications obtained	
4a	Number of undergraduate students receiving training	
4b	Number of training weeks provided to undergraduate students	
4c	Number of postgraduate students receiving training (not 1-3 above)	
4d	Number of training weeks for postgraduate students	
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(ie not categories 1-4 above)	
6a	Number of people receiving other forms of short-term education/training (ie not categories 1-5 above)	449
6b	Number of training weeks not leading to formal qualification	127
7	Number of types of training materials produced for use by host country(s)	14
Research Measures		
8	Number of weeks spent by UK project staff on project work in host country(s)	6
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	5
10	Number of formal documents produced to assist work related to species identification, classification and recording.	
11a	Number of papers published or accepted for publication in peer reviewed journals	
11b	Number of papers published or accepted for publication elsewhere	

Code	Description	Totals (plus additional detail as required)
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	
13a	Number of species reference collections established and handed over to host country(s)	
13b	Number of species reference collections enhanced and handed over to host country(s)	
Dissemination Measures		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	1
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	2
15a	Number of national press releases or publicity articles in host country(s)	
15b	Number of local press releases or publicity articles in host country(s)	7
15c	Number of national press releases or publicity articles in UK	
15d	Number of local press releases or publicity articles in UK	
16a	Number of issues of newsletters produced in the host country(s)	
16b	Estimated circulation of each newsletter in the host country(s)	
16c	Estimated circulation of each newsletter in the UK	2,600 (LEAD International's + LEAD Indonesia's newsletter)
17a	Number of dissemination networks established	
17b	Number of dissemination networks enhanced or extended	
18a	Number of national TV programmes/features in host country(s)	3
18b	Number of national TV programme/features in the UK	
18c	Number of local TV programme/features in host country	
18d	Number of local TV programme features in the UK	

Code	Description	Totals (plus additional detail as required)
19a	Number of national radio interviews/features in host country(s)	
19b	Number of national radio interviews/features in the UK	
19c	Number of local radio interviews/features in host country (s)	
19d	Number of local radio interviews/features in the UK	
Physical Measures		
20	Estimated value (£s) of physical assets handed over to host country(s)	£3,854 (project office in Bali)
21	Number of permanent educational/training/research facilities or organisation established	4 organisations
22	Number of permanent field plots established	1 (project office in Bali)
23	Value of additional resources raised for project	£64,991 + 5,854 person-days
Other Measures used by the project and not currently including in DI standard measures		

Annex 5 Publications

Type ** attached to the final report*	**Detail**	**Publishers**	**Available from**	**Cost £**
newspaper	Untung Widyanto, Made Mustika: Under Sains Special Report: "The return of Piama", 5-11 May 2008 Edition (page 45-47)	Tempo Magazine *(Bahasa Indonesia)*		
newspaper	Eco-Friendly Fishermen Face Marketing Challenges, February 18, 2008 (page 5)	Jakarta Post, Bali *(English)*	*http://www.lead.org/page/413*	
newspaper	Dicky Christanto: Under :Environmental Issues "Hindari Pemakaian Potas untuk Tangkap Ikan Hias" ("Stop Potassium use to collect reefs fish") February 15, 2008 (page 4)	Denpasar Post *(Bahasa Indonesia)*		
	Mudiarta: Under Agriculture and Hobby: *"Nelayan di Penyabangan Terapkan Penangkapan Ikan Hias Ramah Lingkungan" ("Fishermen of Penyabangan Village collect reef fish using eco friendly practices"), February 15, 2008 (page 5)*	Bisnis Bali *(Bahasa Indonesia)*	*http://www.bisnisbali.com /2008/02/15/news/ agrohobi/kj.html*	

newspaper	Agustinus Wibowo Series of article on "The struggle of Reefs Fish Fishermen of Gerokgak coastal area": "Tak Lagi Gunakan Sianida, Ikan Langka Bermunculan" *(Without cyanide, rare species are coming back)* "Tak Berdaya Hadapi Ikan Hias Potasan dari Luar Bali" *(Helpless to prevent cyanide collected reefs fish out off Bali")* "Dijebak Oknum Petugas, Diperdaya Para Eksportir" *("Trapped by 'police', and …by the exporter")* Published: – 14 February 2008, front page & page 15 – 15 February 2008 front page & page 15 – 16 February 2008 front page & page 15	Harian Umum Nusa Bali *(Bahasa Indonesia)*	http://www.lead.org/page/413	
* Documentary film	*'Eco Fish: Kisah dari Buleleng, Bali Utara'* Duration: 40 minutes Audience: general public Language: Bahasa Indonesia	LEAD Indonesia		
* Documentary film	*'Conserving reefs for community ownership and enterprise'* Duration: 24 minutes Audience: Indonesian fishermen Language: Bahasa Indonesia with English sub-titles	LEAD Indonesia Aired: Bali TV Metro TV Trans TV	http://www.lead.or.id/darwinproject/ecofishfilm.php	
Documentary film	*'Buy me'* Duration: 30 seconds Audience: aquarium fish hobbyists Language: Bahasa Indonesia	LEAD Indonesia	http://www.lead.or.id/darwinproject/ecofishfilm.php	
Documentary film	*'A Message From Buleleng'* Duration: 5 minutes Audience: general public Language: English	LEAD Indonesia	http://www.lead.org/page/423 http://www.lead.or.id/darwinproject/ecofishfilm.php	
* Case study	*'Our Story from Buleleng: We believe in Piama'*	LEAD Indonesia & International	http://www.lead.org/page/421	

	Personal Case Study Audience: fishermen Language: English Format: booklet; pdf			
* Case study	*'Kisah dari Buleleng Kami Yakin karena ikan Piama'* Personal Case Study Audience: fishermen Language: Bahasa Indonesia Format: booklet (1,000 copies); pdf	LEAD Indonesia	http://www.lead.org/page/421	
* Case study	*'Towards Green & Fair Trade for Eco Fish'* Short Case Study (5 pages) Audience: general public Language: English Format: booklet (600 copies); pdf	LEAD Indonesia & International	http://www.lead.org/page/421	
* Case study	*'Menuju Perdagangan "Eco Fish" yang lebih adil'* Short Case Study (5 pages) Audience: general public Language: Bahasa Indonesia Format: booklet (300 copies); pdf	LEAD Indonesia	http://www.lead.org/page/421	
Case study	*'Community-based coral reef management – An integrated approach'* Long case study (20 pages) Audience: Conservation community Language: English Format: pdf	LEAD Indonesia & International	http://www.lead.org/page/421	
Shop sign	Promoting pet shops that sell eco fish	LEAD Indonesia	http://www.lead.org/page/282	
* Posters	Raising awareness of marine aquarium fish hobbyists	LEAD Indonesia	http://www.lead.org/page/422	

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