

Darwin Initiative: Half Year Report

(due 31 October 2010)

Project Ref. No.	162/16/002
Project Title	Building capacity for sustainable fisheries management in the Wallacea region
Country(ies)	Indonesia
UK Organisation	Operation Wallacea Trust
Collaborator(s)	Forkani
Project Leader	Dr Tim Coles
Report date	1 April - 30 September 2010
Report No. (HYR 1/2/3/4)	HYR/3
Project website	http://www.wallaceatrust.org/Pages/indonesia_kaledupa.shtml

1. Outline progress over the last 6 months (April – September) against the agreed baseline timetable for the project (if your project has started less than 6 months ago, please report on the period since start up).

Fisheries monitoring and database development

The weekly monitoring of all landings over a 24 hour period in each of the 9 main fishing villages has continued throughout the report period and all data have been entered into the database on Kaledupa. In September 2010 a report summarizing the data collected from July 2007 to July 2010 by the Fisheries Monitors employed as part of the Darwin Initiative were analysed by Professor James Haynes, Head of Department of Environmental Science and Biology at SUNY Brockport (Appendix 1). The fishery monitoring aspect of the project was designed to produce these outputs to help the Kaledupa Fisheries Forum monitor their effectiveness of their agreed changes.

Reef monitoring

Dr Dave Smith from the University of Essex and a team of marine biologists completed an annual survey of the reef fish and coral communities from 108 fixed transects each 50m in length around Kaledupa Island.

Fisheries Byelaws and Regulations

Two approaches were investigated for introducing the 22 agreed byelaws that came out of the Darwin funded Kaledupa Fishers Forum. The first approach was to utilize the existing system of local village byelaws (perdas). The problem with this approach was that in order to introduce byelaws in this way there has to be extensive consultation and there is then always the chance that this village based consultation results in different byelaws being introduced in different villages which would make enforcement around the island almost impossible. On the other hand the benefit is that if the village agrees to implement and then enforce their own byelaws that enforcement is generally more effective. Forkani were very keen on utilising the village byelaw approach if possible and after they had completed the consultation on 5 villages an audit was completed on 2 of the villages (Appendix 2). This audit showed that enforcement of the regulations even in villages where they had voluntarily agreed to implement the byelaws was poor. Given the results of this audit all further socialization of the byelaws and implementation at village level was stopped and efforts re-directed to persuading the Wakatobi government to introduce these byelaws at island level. The Bupati (Governor of the Wakatobi Islands) has agreed that this is the best strategy and enforcement will be done by the Park rangers along with enforcement of the zonation scheme.

Development of businesses to provide income for licence buy outs

The main thrust of the Darwin Initiative project though is not the use of byelaws or zonation systems but rather the reduction of fishing effort through buy outs of fishing licences. With the completion of registration and the continued monitoring everything is in position to start reducing fishing effort and the aspect that is slowing the process is the need to develop the carrageenan extraction factory that has been identified as the most likely way of producing income, with those surrendering licences being offered shares in the new business. Considerable progress has been made on this aspect since the last

report with the Wakatobi Government having built an enormous aircraft hanger sized building (see Appendix 3) with 2 ha of land immediately adjacent to the sea so that the carrageenan can be landed. The costs of this construction were in excess of £200,000. The Darwin team on Kaledupa were then asked by the Wakatobi Government to produce plans for building a pilot plant for the carrageenan plant

The original Darwin report was based on laboratory work in the UK, where a typical 'run' would involve using a 2 litre beaker and about 200gm of raw seaweed material. The question of possible scaling-up errors was mentioned in the report. The full factory-sized plant was calculated to require 8,000 litre tanks – a four thousand-fold increase. The proposed pilot plant needs to be somewhere in between, but where? Initial thoughts were to design it at one tenth scale i.e. using 800 litre tanks but the costs and probable effort in building and running this size of plant were daunting. For example an 8,000 litre insulated tank costs £17,000 but the same company quoted for an 800 litre insulated tank at £8,000. One-tenth the volume yet nearly half the price and this was true of nearly all the equipment.

The laboratory work conclusively demonstrated the physico-chemical basis of the process. What is required now is assurance that the major inputs (chemicals, energy, etc) calculated earlier on a lab scale can be replicated on a significantly larger scale. If they can be shown to increase arithmetically then it would be reasonable for a potential investor to be reassured that the final, full-sized, stage would follow pro-rata. Taking the above into account we have opted for basing the pilot plant on 200 litre tanks, which is a hundred-fold increase on the laboratory scale previously used and one fortieth of the proposed full-scale plant. They and the other equipment needed on site are easily handled and can subsequently be dismantled and the various parts usefully absorbed into the final full-sized plant or perhaps sold to local businesses. One immediate advantage of selecting this lower size range of tank is that the inherent complications of heating and regulating the temperature of the 'reaction' tank are overcome. It can be electrically heated and simply requires a petrol or diesel generator. Such electrically-heated tanks are reasonably easy to source - one well-known UK use for them is as ham-boilers by butchers.

The final stage in the process is mechanically drying and milling the final product on site. To build a small milling and drying facility on site would cost a high percentage of the full plant costs but if 2 tonnes of wet processed carrageenan can be freighted to the UK for testing by possible suppliers of these very specialised pieces of equipment then the process can be proven without needing to invest in the actual equipment. Laboratory equipment however, will be needed and this is the same as would be used for the full sized plant and could be used afterwards.

One point that always comes up when talking to investors is why build the plant in Kaledupa? The key advantage in building the plant locally is that instead of drying the seaweed (which is done just so you can transport the product at reasonable cost) that you could process wet and therefore very fresh seaweed. Indeed when the dried seaweed arrives at the plant the first step in the process is to increase the moisture content! So during the pilot plant phase the process will be adapted to use wet seaweed so that the plant can claim to be processing really fresh product for the carrageenan market which should give it a significant marketing advantage. Note the process uses freshwater so that the only effluent from the plant will be NPK fertiliser which can be used on agricultural land on Kaledupa.

The Wakatobi Government has included £200,000 in their budgets for completion of the scale plant over the next few months. The objective is that the government will then hand over the results of the scale model and the building and land to an investor so the full size plant can be built. In exchange the investor has to ensure that shares with sufficient annual dividend to provide more income than gained from reef fishing, are offered to Kaledupa registered fishers so total fishing effort on the reef can be reduced. Two potential investors have already been sourced by the Darwin team and both are awaiting the results of the pilot plant investment.

Publicity

A very supportive 30 minute film about the Darwin Initiative Kaledupa fishery project was broadcast on national Indonesian TV in September 2010.

2. Give details of any notable problems or unexpected developments that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

The main issue remains ensuring the carrageenan plant is developed and the buy outs can begin. Fortunately this process does not require Darwin funding and has now been fully adopted by the Wakatobi Government. The secondary issue is making sure the byelaw and boat registration

enforcement is included with the zonation enforcement undertaken by the Park rangers.	
Have any of these issues been discussed with the Darwin Secretariat and if so, have changes been made to the original agreement?. No changes to the original agreement were required.	
Discussed with the DI Secretariat:	Yes no/yes, in..... (month/yr)
Changes to the project schedule/workplan:	no/yes, in.....(month/yr)

<p>3. Are there any other issues you wish to raise relating to the project or to Darwin’s management, monitoring, or financial procedures?</p> <p>No</p>

If you were asked to provide a response to this year’s annual report review with your next half year report, please attach your response to this document.

Please note: Any planned modifications to your project schedule/workplan or budget should not be discussed in this report but raised with the Darwin Secretariat directly.

Please send your **completed form email** to Eilidh Young, Darwin Initiative M&E Programme at Darwin-Projects@ectf-ed.org.uk . The report should be between 1-2 pages maximum. **Please state your project reference number in the header of your email message eg Subject: 14-075 Darwin Half Year Report**