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A contribution of conservation and management of tropical marine biodiversity in the Pacific islands – the CRISP programme

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The initiative for the protection and sustainable management of the coral reefs of the Pacific (CRISP), aims to develop a vision for the future for these unique ecosystems and the peoples who depend on them for their livelihood. It seeks to put in place strategies and projects to preserve the biodiversity of the reefs and for the future development of the economic and environmental services that they offer both locally and globally. Further, the initiative is also intended to serve as a vector for regional integration between the developed and the developing countries of the Pacific.

The specific objectives are i) to develop a better understanding of the biodiversity as well as the state and functioning of the coral ecosystems ii) to carry out actions for large-scale protection and management of the coral ecosystems, iii) to develop the economic potential of the coral ecosystems based on their use value and biodiversity and iv) to disseminate information and knowledge: capacity strengthening and organisation of local, national and international networks in the entire South Pacific. The initiative aims to combine cross-cutting networking activities (with localised field projects with conservation and economic development objectives), research, planning and development but also the contributions of different scientific disciplines, including biology, ecology, economics, sociology, law and anthropology. It is active on all issues (terrestrial and marine that have a bearing on the reefs, including watershed management and water sanitation) and avoid creating a new structure but, instead, make financial resources available to already active partners who indicate an interest in developing and consolidating their activities in the spirit of regional cooperation.

Regarding its structure, the CRISP comprises three principal components, each with a number of different aspects.

Component 1 deals mainly with Marine Protected Areas and Watershed Management. It will encompass the implementation by the WWF of two ecoregional analysis in New Caledonia and Polynesia (including Cook Islands) and of a global one at the Pacific level by Conservation International (CI), in order to set up a strategy for marine biodiversity conservation. Marine protected areas (MPAs) will be developed as a tool in the protection and development of the biodiversity of the coral reefs and for the sustainability of the economic activities associated with these ecosystems. This component will depend on the intervention of several partners, mostly international NGOs working in the area of environmental protection, including Conservation International (CI), the WWF and IUCN – The World Conservation Union. Watershed management will also be addressed to check soil erosion, which can be very detrimental to the survival and proper functioning of coral reefs. This aspect of the component will be jointly executed by CI and the International Centre International de Recherche Agronome pour le Développement (CIRAD). The setting up of comprehensive tools of management of the socio-economics and cultural constraints for the adoption by local populations of the process of implementation of MPAs will also be part of this sub-component which will mainly be implemented by the *Institut de Recherche pour le Développement* (IRD).

Component 2 consists of support for knowledge on coral ecosystems in order to better protect, develop and restore the biodiversity. It will take the form of interventions by several participants, principally research organisations, such as the IRD, the *Ecole Pratique des Hautes Etudes* (EPHE) in collaboration with the *Centre National de la Recherche Scientifique* (CNRS), University of French Polynesia, University of the South Pacific as well as some already existing networks, including the *International Coral Reef Action Network* (ICRAN), an off-shoot of ICRI, which will delegate the technical work to the *WorldFish Center* (WFC). The component will focus on (i) the acquisition of terrestrial and marine data and the transfer of research findings allowing the evaluation of ecosystem degradation risks (over-fishing indicators, cartography of erosion risks, etc.), (ii) the development of aquaculture activities (for aquarium trade), (iii) the development of pharmacological active substances (from the bio-pharmacological and legal standpoint), studying ways to develop the ecotourism potentials of the region, (iv) an assessment of the current state of knowledge about the interactions between the increase in atmospheric CO₂ content and the growth of reefs, (v) the dissemination of ecosystem restoration techniques and (vi) the creation of a meta-database on the coral reefs of the Pacific.

Component 3 includes the creation of a coordination unit with a technical assistant from the French Ministry of Foreign Affairs, based in Noumea, who is in charge of the coordination and monitoring of the entire initiative. A second aspect of this component will rely on the *South Pacific Regional Environment Programme* (SPREP), a legitimate and representative institution, for the integration, leveraging and dissemination of information gathered through the initiative (data, approaches, methodologies and know-how). From a financial perspective, the government of France launched a call in 2002 for a proposal and co-financing based on a financial input of 5 Million euros. Other donor agencies such as CI, WWF or the United Nations Foundation (UNF) answered positively to reach a global budget of around 9 Millions Euros in 2005.

The scope of the programme is regional. For on-ground activities, the programme will rely on projects developed in Fiji, Vanuatu, Samoa, Cook Islands, Kiribati, French Polynesia, Wallis and Futuna and New Caledonia with the possible involvement in 2006 and 2007 of other Pacific countries such as Papua New Guinea, Palau, Niue and Tuvalu. The expected results are a better knowledge on coral ecosystems, including the effects of global changes, would have made significant strides toward integrating cross-disciplinary fertilisation and that such knowledge would be available to decision makers and planners; a significant and carefully selected portions of these ecosystems will become protected or placed under participatory and sustainable management, following a region-level decision on what the priorities should be and according to harmonized procedures; the economic potential of these ecosystems will be demonstrated by examples drawn from their principal functions (fishing and aquaculture, tourism, biodiversity development, etc.); collaborative networks bringing together citizens of the French overseas territories, developed countries of the Pacific and the small island states of the region will be strengthened or created.

The CRISP programme should contribute to a better knowledge and conservation of biodiversity in several ways. The results of the three ecoregional analysis conducted in the framework of component 1 should be very interesting tools for implementing a strategy of conservation of the marine biodiversity and particularly define priorities. After analytical phases mainly conducted by researchers, the final step of these analysis consist of organizing a meeting with policy makers who are supposed to take on the process and implement the adequate tools for management and conservation of the priority areas. The Marine Protected Areas, also developed by Component 1, will definitely contribute to a better management of

reef resources, hopefully avoiding any loss of species diversity. Also under the component 1 of the CRISP programme, an inventory of coral reef species will be conducted in New Caledonia which remain the one only French overseas territories where such a study was not yet conducted. By its EEZ size (both in subtropical and almost temperate latitudes) and location regarding the Indo-Pacific center of biodiversity, New Caledonia offers a tremendous potential in terms of scleractinian corals species diversity.

Under the Component 2, several activities implemented in subcomponent 2A focus on identifying and reinforcing alternative income generation based on the development of capture of post larvae (fish or crustacean) that could be used in different manners, mainly for the aquarium trade in terms of substantial financial benefits for fishermen, should contribute to lighten the pressure put by overfishing on some specific and endangered species such as groupers or humpback wrasses. Such alternative processes and income generation should allow a better enforcement of good practices in the field of reef fisheries, and the ban of specific activities endangering the fish diversity such as fishing on spawning aggregations for the live reef fish trade or unsustainable capture of adult fishes for aquarium trade. The innovative technologies (crest nets or light traps) used for capturing postlarvae fish during the colonization phase bring other hopes once preliminary tests in Fiji showed that some postlarvae of reef fishes (at least 1 Siganid and 1 Lethrinid) that have disappeared from this archipelago at the adult stage, were trapped. The capture and rearing of postlarvae of these specific species open the possibility of an assisted local reintroduction which does not present any danger in terms of alien genetical input, once it follows a natural process of recolonization. In addition to limiting the erosion of the reef fish species diversity, the postlarvae techniques may therefore also contribute to the reinforcement of this diversity.

The sub-component C of component 2 will specifically develop bioprospection in 3 Pacific island states based on the collection of benthic invertebrates (mainly sponges). Before the screening orientated toward the findings of active molecules, an important stage of identification of the invertebrates is conducted and contributes to the enrichment of the taxonomy. A complementary output of this subcomponent will propose an improvement of the legal framework in Pacific SIDS in order to ensure suitable economic benefits for countries where active molecules can be found.

The CRISP programme is facing the challenge of providing support to the implementation of existing solutions and to the setting up of innovative ones in order to improve the general capacity of ensuring a better conservation of biodiversity of coral reefs in Pacific islands. A 3 years programme appears too short for such a purpose and efforts should be anticipated for raising a new set of funds for a second 3-year phase.