

COOK ISLANDS

NATIONAL SUMMARY REPORT

I D N D R

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Cook Islands

SECTION A: PROFILE

1. Composition of National Committee (Focal Point)

Ministries		Non Governmental Organisations	
- Health	[1]	- Red Cross	[1]
- Public Works	[2]	- Religious Advisory Council	[1]
- Internal Affairs	[1]		
- Education	[1]		
- Finance & Planning	[3]		
- PM's Department	[2]		
Media		Private Sector	
- Govt Information Office	[1]	- Chamber of Commerce	[1]
Public Services		Others	
- Meteorological Services	[1]		[]
- Police	[3]		
- Telecommunication (TCI)	[1]		
- Electricity Supply	[1]		

2. Internal Organisation of the National Committee

CABINET

PRIME MINISTER

NATIONAL DISASTER MANAGEMENT COMMITTEE

The National Disaster Management Committee (NDMC) was formed by Cabinet directive in February 1993, Cabinet Minute No (93) 151. It supersedes the Hurricane Safety Committee and is chaired by the Secretary of the Prime Minister's Department who has a co-ordination role and reports directly to the Prime Minister. The Prime Minister who is also Minister of Police and Civil Defence reports to Cabinet. The Committee includes all Departmental Heads involved in disaster mitigation, response and rehabilitation activities as well as relevant NGOs and Ad-Hoc bodies.

The NDMC is a policy planning and monitoring body. Policy proposals are analysed before these are presented to the Prime Minister for approval and submittal to Cabinet. The NDMC is tasked with **inter-alia**, the complete review of the existing Hurricane Safety Act and the drafting of a new National Civil Defence Act which will include both natural and man-made disasters and cover in detail all the islands in the Cook Islands. The first draft should be completed by March 1994.

The Secretary of the Prime Minister's Department plays a co-ordination role in the administration of Government policies including civil defence policies. The Senior Government Representatives on each of the outer islands also act as Civil Defence Co-ordinators and they also report to the Secretary. The NDMC meets every two weeks and will continue to do so until the new legislation and National Civil Defence Plans are finalised and enacted by Parliament. Four sub-committees dealing with Legislation, Preparedness and Awareness, Response and Rehabilitation meet every other week and report back to the NDMC.

The NDMC is responsible for the co-ordination of overseas and local disaster related training seminars and workshops. Attendees at overseas workshops require prior approval by the Committee. With a small internal budget, the Committee is able to assist with small training workshops throughout the country as well as awareness and preparedness programmes. Although the NDMC has been in operation for eleven months now, it is estimated that its current work programme is 50% complete. Progress is somewhat constrained by the fact that all Committee members have full-time jobs.

3. Prevailing Hazards

Type	Location	Affected Population
Tropical Cyclones	All islands	Total 20,000
Drought	All islands	
Tsunami (rare)	All islands	

Tropical Cyclones are the most common hazards with the majority of damage occurring in the Southern Group islands where cyclones usually reach their peak intensity. Serious drought may occur every ten years while tsunamis are known to occur every fifty years or more.

4. Recent Natural Disasters

Type	Location	Affected Population	Losses
TC Peni 1989/90	All islands	20,000	1 death, \$1.0 million damage
TC Val 1991/92	All islands	20,000	Seawalls mainly
TC LIN 1992/93	S/Group	13,000	minimal damage
TC Nisha 1992/93	S/Group	13,000	minimal damage

The Cyclone Season normally last five months, from November to April. Tropical Cyclones (TC) can cause extensive damage in the agricultural sector as well as infrastructure and buildings close to the shoreline.

5. National Socio-Economic Conditions

- . Population 20,000
- . Gross-National Product (GNP): (1990) NZ \$105.8 million
- . Per-Capita Income: (1990) NZ \$5,783

6. Availability of Assistance to other countries in the field of Natural Disaster Reduction.

New technology in terms of foreshore protection (COPED units) against storm surge was recently developed and successfully trialled by the private sector. An advanced model will be ready for trials in 1994.

The new Cook Islands National Building Code was completed in 1990. The cyclone resistant building standards may be of interest to other Pacific countries.

7. International Assistance required for Natural Disaster Reduction

1. Expertise

Experts are required to advise in several areas including health, agriculture, civil engineering, foreshore protection and land-use planning. Professional trainers are urgently required to educate disaster officials and volunteers as well as assist in providing disaster reduction information to the general public. Environmental Impact Assessment advisors and trainers are also a priority.

2. Technology

New radar imagery equipment is required for tracking cyclones and therefore provide improved warning systems. Small, portable satellite receivers could be used for communication between the islands during a major cyclone when the main satellite receivers are dismantled and stored while portable radio telephones for inter-village communications are essential.

3. Resources

Emergency supplies such as tarpaulins, stoves, first-aid kits etc are a priority. Chainsaws, safety wear (raincoats, boots and helmets), waterproof torches are in short supply.

SECTION B: STRATEGIES AND ACTIVITIES

1. Steps towards achieving the 3 main Decade Targets

(a) Comprehensive national assessments of risks from natural hazards, with these assessments taken into account in development plans:

As far as natural hazards are concerned, the only concern for the Cook Islands are tropical cyclones. As cyclones are generated between 5 S and 10 S, they tend to move in a southeast direction and speed up as they move into higher latitudes over cooler waters.

Over the past 50 years, a large number of cyclones have passed through the Cook Islands and an analysis is shown indicating the vulnerability of each of the islands to this hazard - see Appendix I. Cyclone formation in the maxima areas will generate a high risk to near-by islands.

The most vulnerable area is just to the west of the Southern Cook Islands. Past experience has also shown that the western coasts of the most eastern islands and the north-western coasts of the most southern islands of this group will be threatened by any cyclone formation or cyclone passing to the west of the group.

Since cyclones are known to reach their highest intensity at these latitudes, the threat to this island group is intensified accordingly with extensive damage from hurricane force winds and very high seas causing storm surge in low-lying areas.

The Northern Cook Islands have experienced fewer cyclones compared to the southern group and those experienced are usually of lower intensity and consequently inflict less damage. However, although the threat of a cyclone occurring is lower in the northern group, nevertheless the isolation from the main Meteorological Station in Rarotonga often results in a delay in the identification of depressions or low pressure systems within the area. Due to the low lying nature of these islands (atolls), there is a constant threat from storm surge or high seas.

The main threats from cyclones are strong winds and high seas causing extensive damage to buildings, foreshore areas, and major infrastructure such as roads, harbours and airports. Agricultural products are also vulnerable often with drastic effects on the local food supply.

- (b) Mitigation plans at national and/or local levels, involving long-term prevention and preparedness and community awareness; and**

Legislation

The current Hurricane Safety Act was passed in 1973 and applies mainly to the island of Rarotonga. A new "National Civil Defence Act" is being drafted and should be ready in February 1994. Environmental Impact Assessment procedures and improved Land-use Management Practices are to be incorporated in the revised Conservation and Sustainable Development Act in 1994.

Long-Term Preparedness and Mitigation Strategies include:

- (i) Improvements in cyclone surveillance, tracking and warning systems - on going.
- (ii) Effective public education systems including training workshops, newspaper and television releases and advertisements. Schools, NGOs and churches in particular are targetted.
- (iii) Encourage residents to build homes and other infrastructure in inland areas and away from the foreshore particularly in the vulnerable northern and north-west sections of each island.
- (iv) Ensure that the new Building Codes are adhered to and that all new buildings are cyclone resistant.

- (v) Remove or trim trees in the vicinity of buildings and/or power lines.
 - (vi) Where possible, convert to underground power and telephone lines.
 - (vii) Ensure that adequate drainage systems are in place and maintained in low-lying areas.
 - (viii) Develop and install foreshore protection systems.
- (c) Ready access to global, regional, national and local warning systems and broad dissemination of warnings**

Regional cyclone warnings are transmitted from the Global Telecommunication System (GTS) in Fiji (Nadi) to New Zealand and then to the Cook Islands via the Aeronautical Fixed Telecommunication Network (AFTN). Special weather bulletins for the Cook Islands are issued by Nadi when cyclones reach a certain level of intensity. On the national level, these warnings are immediately disseminated to two radio stations for broadcasting to the general public. Television is also used for warning transmission when appropriate.

An alternative transmission system is via International Shortwave Radio Broadcasts by Radio New Zealand and Radio Australia.

Advices are also issued by other regional centres including Honolulu and Guam.

2. Present national plan for natural disaster reduction

a) Time span covered:

The National Hurricane Safety Plan was produced in 1973 and is ammended every year. This plan and related piece of legislation deals exclusively with cyclones and is concerned primarily with the main island of Rarotonga. The National Civil Defence Plan which is being drafted will encompass the full range of natural and man-made disasters such as oil spills, bushfires etc. This plan and in particular the section dealing with cyclones will be a five year plan, to be updated every year.

b) Agencies, institutions and organisations involved:

The Police Department is responsible for updating the current Hurricane Safety Plan on an annual basis. It is anticipated that the NDMC will annually review and update the new Civil Defence Plan and its related Act which should be completed in 1994.

c) **Implementing agencies:**

The implementing agencies are the Police Department, Ministry of Works, Ministry of Transport, Ministry of Internal Affairs, Health Services, Ministry of Finance and Planning, Ministry of Education, Cook Islands Broadcasting Corporation, Ministry of Energy, Telecom Cook Islands, Meteorological Services and Red Cross. Co-ordination of the above is by the Prime Minister's Department through the NDMC.

d) **Funds available for implementation:**

There is a small internal budget (CKI \$20,000) for NDMC work projects particularly preparedness and awareness programmes. Contingency funding can be made available by Treasury during a cyclone or other disaster. International Governments and funding organisations also provide emergency funding on request. Funding is also obtained from UNDP, AIDAB and other funding agencies primarily for training workshops and seminars.

3. Legislation introduced and enacted in relation to natural disaster reduction

The Cook Islands Hurricane Safety Act was introduced in 1973. This is to be replaced by the Cook Islands Civil Defence Act in 1994.

4. Disaster mitigation activities completed or underway:

a) Identification of hazard zones: hazard assessment

The nature and effects of tropical cyclones is well known and tabulated. The emphasis is now on protective and mitigation activities.

b) Monitoring, prediction and warning

Title of project: Surveillance Radar Project

Status: The Cook Islands Meteorological Service has a wind-finding 100 radar which, with extra equipment can be upgraded to a surveillance radar. The range required at this stage would be 250km to cover all the islands in the Southern Group.

Funding is being sought for this project.

Participating institutions: Cook Islands Meteorological Service
Bureau of Meteorology of Australia

Costs of project: AU\$100,000

Source of funding: AIDAB

Implementing agencies: Bureau of Meteorology of Australia
Cook Islands Meteorological Service

Address of the agency in charge:

P O Box 127
Rarotonga
Cook Islands
Ph (682) 20603
Fax (682) 21603

c) Short-term Protective measure and preparedness

Title of project: Tree Trimming Project

Status: Hurricane force winds from cyclones usually result in trees being uprooted or simply pushed over. Large branches may also be removed and can cause a hazard to housing etc. Power lines are damaged, roads blocked and houses crushed by falling trees.

During the last two years, a tree trimming programme was instituted to either trim or totally remove trees within close vicinity of and posing a threat to houses, power lines and other infrastructure and facilities. The programme is now more than sixty per cent completed on the island of Rarotonga. Progress on the outer islands is less advanced.

Participating institutions in the country and/or on the international level:

This is an in-country project with the Ministry of Works, Transport, Energy and the Prime Minister's Department playing a key role. The community is also heavily involved in this project providing a valuable labour force. The Conservation Service provides advisory services to the project.

Cost of project:

The estimated cost so far is in the vicinity of \$60,000. The full cost of the project should be in excess of \$100,000.

Sources of funding: Government funding.

Implementing agencies:

Government agencies as mentioned above.

Address (telephone and fax-number) or the agency in charge:

Co-ordinating agency: Prime Minister's Department
Telephone: 29-304
Fax: 22-856

d) Long-term preventive measures

Title of project: Foreshore Protection Project

Status: CPU (Coastal Protection Units) developed by a local engineer is designed to reduce the effects of wave damage on the shoreline. The initial units designed principally to build up and protect sandy beaches was successfully trialled in 1992. A more sophisticated model (COPED) is due to be trialled early in 1994. These have the potential of minimising or defusing the destructive forces of storm waves and could provide the protection required for the valuable infrastructure on the Avarua foreshore area and at the same time provide promenade facilities.

Participating institutions in the country and/or on the international level:

Coastal Environmental International Ltd
Cook Islands and New Zealand Governments
University of Canterbury, New Zealand

Costs of project:

\$150,000 provided by the New Zealand Government for the initial trials at the Rarotongan Hotel. Installation of protective units along the entire foreshore of the capital town of Avarua could cost over a million dollars.

Sources of funding:

New Zealand ODA
Cook Islands Government

Implementing agencies: Cook Islands Government

Address (telephone and fax-number) of the agency in charge:

Prime Minister's Office Projects Division
Telephone: 21-793 Fax: 20-856

e) Land-use and risk management

Title of project: Soil Conservation and Land Management

Status: In September 1990, the Government requested FAO technical assistance in reviewing the extent and causes of land degradation in the Cook Islands, and in preparing and implementing a legislative framework for conservation and restoration in land use. Project TCP/CKI/0152 was approved on 16 January 1991 and the Technical Cooperation Programme. The draft project documents were presented to Government in 1991. Other pressing commitments resulted in the project being delayed indefinitely.

Participating institutions in the country and/or on the international level:

Department of Agriculture
Conservation Service

Costs and sources of funding are still be finalised.

Implementing agencies: as above.

Address (telephone and fax-number) of the agency in charge:

	Telephone	Fax
Department of Agriculture	28 711	21 881
Conservation Service	21 256	22 256

f) Public Education and Information

Title of project: Disaster Awareness Project (Cyclones)

Status: A Disaster Awareness Sub-committee was formed by the NDMC in 1993 to review the situation and effectively implement public awareness and preparedness programmes under the guidance of the NDMC. Extensive use was made of Television during the National Cyclone Awareness Week in November along with radio and newspaper releases. National and International Video clips and advertisements were shown on national television. Radio talkback and interviews was another medium used by the Committee. Basic First Aid Workshops organised by Red Cross and funded mainly by the NDMC were organised on most islands.

Participants:

The project was supervised by the National Disaster Management Committee (NDMC). Subcommittee members were

drawn from the Education Department, Meteorological Office, Police, Cook Islands Broadcasting Corporation and the Prime Minister's Department.

Cost of project: \$10,000

Sources of funding: Local/Overseas Agencies

Implementing agencies: As above

Address (telephone and fax-number) of the agency in charge:

Meteorological Office	Telephone:	25-920
	Fax:	21-603

5. Plans to fully achieve Decade targets by end of 1999

As mentioned above the NDMC was only formed in February 1993 and became aware of IDNDR activities in September through information received by one of the Committee members. Hence all activities up till then were initiated by various agencies on a needs basis and independent of IDNDR requirements. The NDMC is now the coordinating body for all disaster related projects and will be working towards achieving the targets of IDNDR by the end of the decade.

For the reasons mentioned above the NDMC has no new projects identified for the next five years apart from those already mentioned in 4 above. New projects will be identified when the National Civil Defence Plan is completed in early 1994. It is agreed however that the Foreshore Protection Project, Land Use Project, Water Supply and Disaster Awareness Programmes should remain as top priority IDNDR projects for the next five years.

SECTION C: INTERACTIONS

1. Publication on IDNDR-related subjects:

There are very few publications to date of relevance to IDNDR. However along with the "National Civil Defence Plan", the NDMC is currently producing a "Cyclone Preparedness Brochure" to be completed before May 1994. A "Hazard Zone Map of Rarotonga" should be completed in February 1994. Further publications should come on-stream over the next few years as the NDMC's disaster awareness and mitigation programme is implemented. Relevant publications recently produced are:

- (i) "Cook Islands National Hurricane Safety Plan" - Produced in 1973 and updated in 1993.
- (ii) "Report on the National Disaster Preparedness Workshop held in Rarotonga, Cook Islands 9-13 March 1992." Produced by Australian Overseas Disaster Response Organisation (AODRA) and funded by AIDAB. **NB:** The formation of the NDMC and it's original terms of reference was initiated by recommendations arising out of this workshop.

2. IDNDR meetings and conferences held or planned:

In November and December 1993 the Chairman and Secretary of the NDMC visited most of the outer islands to hold meetings with the Hurricane Safety Committee and Island Councils - the local government body. Discussions were centred on NDMC disaster awareness, mitigation and response programmes. Information was collected from each island for inclusion in the National Civil Defence Plan.

The Red Cross Organisation is currently visiting the outer islands to conduct First Aid Workshops. Due to the highly positive response, this programme is to be repeated and extended in 1994.

Pending the availability of funding, the NDMC is planning to hold another National Disaster Awareness and Preparedness Workshop in October or November 1994. A programme of smaller workshops and seminars focussing on specific disaster topics were prepared in 1993 with assistance from UNDP Fiji. These will be instituted as soon as funding is identified.

Representatives from the Cook Islands Government and/or relevant NGOs are selected by the NDMC to attend relevant regional disaster related workshops and seminars, in particular those arranged by the Asian Disaster Preparedness Center, AIT, Bangkok. Held in different venues around the Pacific, there may be up to eight such workshops per year.

3. Current or planned partnerships and cooperation related to IDNDR with other countries

The Cook Islands Government has a close relationship with UNDP through it's Apia and Suva offices. UNDP Department of Humanitarian Affairs Division based in Fiji is responsible for developing a programme of training workshops for the Cook Islands in 1992. This programme was approved by the NDMC and Cabinet and is awaiting funding from overseas agencies.

The Cook Islands Meteorological Service is a member of the Tropical Cyclone Committee, a World Meteorological Organisation (WMO) body based in Geneva. Regional members of the committee include USA/Hawaii, New Zealand, Australia, French Polynesia, Canada and Japan.

The NDMC works closely with the Asian Disaster Preparedness Centre in Bangkok. Firm relationships are also established with AIDAB, ADB, and NZODA.

SECTION D: EVALUATION

(This section analyses national progress and outlines possible improvement.)

1. Overall evaluation of national disaster mitigation programmes including but not limited to those initiated after IDNDR and achievements up to now

a) Disaster Awareness and Preparedness Programme

Initiated by the NDMC in October 1993, this programme conducted a highly successful "Disaster Awareness Week" programme in November. Activities included television interviews, advertisements and documentaries as well as radio programmes and newspaper articles and advertisements. First Aid Workshops were also held principally for disaster response staff. The programme concentrated mainly on the main island of Rarotonga, home to fifty percent of the population and over seventy percent of the economic activities. Visits to the outer islands by NDMC officials took place after the above programme to spread the message. It is anticipated that the next "Disaster Awareness Week" programme will include all the outer islands.

NDMC plans to hold local disaster preparedness workshops and seminars in 1993 did not eventuate due to lack of funding. It is hoped that funding can be identified in 1994 for this very important programme.

b) Foreshore Protection Programme

The economy of the Cook Islands is dominated by a rapidly expanding Tourism Industry. Over 50,000 visitors every year are attracted by the warm climate, friendly people and **white sandy beaches with clear warm lagoons**. During the peak seasons, up to 2,000 visitors may be present on Rarotonga at any time i.e. 20% of the total population. In order to improve the above visitor interest, and

thereby maintaining the steady growth in the local economy, it is vital that the Foreshore Protection and Preservation Programme maintains its top priority rating.

The COPED units mentioned in 4 (d) above are designed to rebuild and maintain sandy beaches and protect these from scouring by storms. The protection of the beaches also assists in the protection of Tourist Hotels, the majority of which are located adjacent to a white sandy beach. The commercial and public sectors on Rarotonga are also located on the foreshore and is highly vulnerable to cyclone force seas. Protective rock walls are already in place in the main town of Avarua and should provide protection against minor cyclones. A combination of these walls and the new COPED units should assist in protecting that the commercial and public sectors from major cyclone force waves. History has shown that the majority of damage to infrastructure and buildings is due to wave damage from very high seas.

c) Tree Trimming Programme

Another major cause of damage to buildings is falling trees and branches caused by cyclonic force winds. Roads and access ways are often blocked by falling trees. The recent tree trimming and removal programme initiated in 1992 has reduced this threat to manageable levels. This programme is only sixty percent complete on Rarotonga.

d) National Civil Defence Plan and Associated Act

The NDMC target was to complete the new Civil Defence Plan and Act before the 1st of November, the beginning of the official cyclone season. This target was not met due to pressing responsibilities on the committee members from their full-time jobs. However significant progress was made and the first draft of the Act is expected in February 1994. The more comprehensive Civil Defence Plan should be completed before June 1994.

Because of the delays in the implementation of its work programmes, the NDMC is now proposing that Government employ a Disaster Official to act as a Secretariat to the NDMC and work full-time on disaster related programmes.

2. Review of the IDNDR

The majority of the programmes referred to in this report were initiated on a needs basis and independent of IDNDR. Prior to the formation of the NDMC early this year, there was no focal point for disaster related matters within Government. External information was received by the Meteorological Service, Police, Foreign

Affairs, Ministry of Works and the Prime Minister's Department. Disaster related activities were fragmented and information often did not reach the appropriate officials. As a result, Government was not aware of the existence of the IDNDR programme until September 1993, three months before this mid-term review report was due. The NDMC was therefore unable to initiate and implement programmes which are related to IDNDR and relevant to the Cook Islands situation.

This report is therefore limited in scope due to the reasons mentioned above. However within the last three months the NDMC has raised its level of disaster reduction activities primarily because of the beginning of the cyclone season in November but also because of IDNDR requirements. At the same time even without IDNDR, the disaster reduction programmes initiated by Government were all important in enhancing the disaster preparedness and mitigation situation in the Cook Islands. The NDMC and Government is keen to participate in IDNDR activities for the remainder of the decade.

Future Plans

The NDMC is committed to assisting Government in protecting the people and assets of the Cook Islands from the wayward forces of nature. Protection of the foreshore is a top priority - it is now simply a case of a 'race against time' - will the protective barriers be installed before the next major cyclone?

Disaster training for officials, volunteers and the general public is another priority area. The training programmes are documented and will be implemented as soon as funds are available.

There is no doubt that disaster reduction programmes are important. Of equal importance however is the administration of recovery or rehabilitation programmes. History has shown that rehabilitation efforts in the Cook Islands are often bigger disasters compared to the original cyclone. The NDMC is aware of this and is presently drafting a formal Disaster Rehabilitation Plan for the Cook Islands - there is none at present.

The cost of disaster reduction programmes such as those mentioned above are beyond the resources of the Cook Islands Government and external assistance will be required for these to be implemented. It is hoped that the World Conference in Yokohama will assist developing countries in identifying funding for their IDNDR programmes.

Finally it is noted that funding agencies are always ready to provide relief funds after a disaster but funding for preparedness and mitigation activities (which may reduce the amount of post-disaster requirements in the first place, ie be a saving to the agency in the long term) are extremely difficult to acquire.

PRIME MINISTER'S DEPARTMENT

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Please address all correspondence to the Secretary

14 January 1994

Ms Maris Kohn
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International Decade for Natural Disaster Reduction
IDNDR Secretariat
Palais des Nations
CH-1211
Geneva 10
SWITZERLAND

re: Cook Islands National Summary Report - IDNDR

Please find attached a copy of Appendix I and II to be attached to the Cook Islands National Summary Report. My apologies for the delay.

Yours sincerely

Tere Bishop
SECRETARY/CHAIRMAN - NATIONAL DISASTER MANAGEMENT COMMITTEE

07 FEB 1994
Action: PK
Information:
File: 1994 Nat Rep

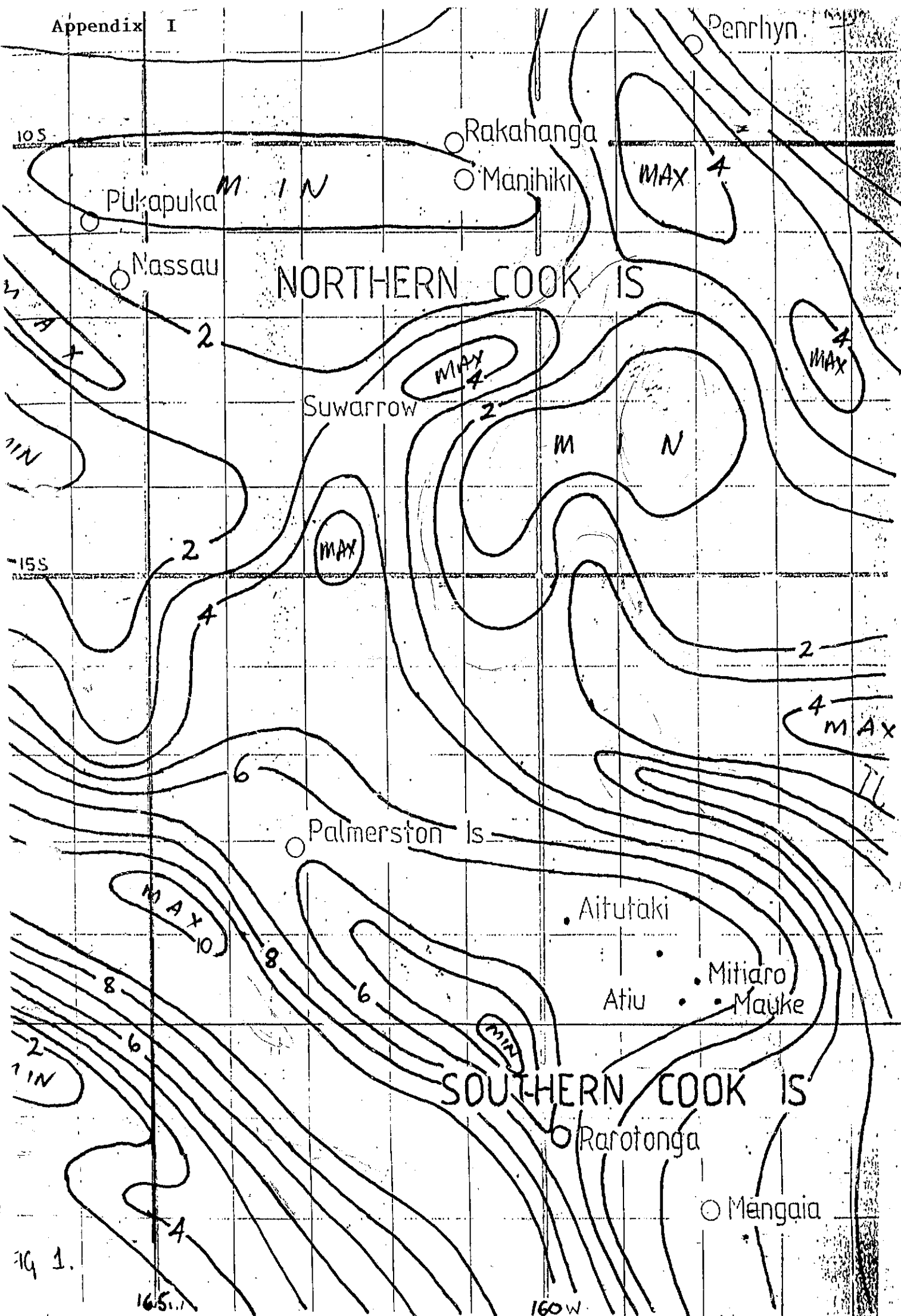


Fig 1.

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Appendix II

Brief Description of the Cook Islands

Location

The Cook Islands consist of fifteen islands divided into two broad groups spread over 2 million square kilometres of the South Pacific Ocean. The islands are situated between Longitude 157 and 166 West, and Latitude 9 and 20 south of the Equator - lying directly between French Polynesia and Samoa. The Northern Group islands consist of seven low lying atolls while the six inhabited islands of the Southern Group are high volcanic islands. There are also two small uninhabited atolls in the Southern Group. The total land area of these islands is 244 square kilometres. The largest island, and centre of Government, is Rarotonga with a land area of 67 square kilometres. The total population is approximately 20,000 of which 10,000 live on Rarotonga and 80% in the Southern Group.

Climate

The Cook Islands enjoy a warm sunny climate all year round. The mean maximum temperature is 27.0 C and mean minimum temperature of 19.9 C. November through to March is the hot season often with heavy rain, this is also the official cyclone season.

Economy

Tourism and Agriculture, the backbone of the Cook Islands economy are both highly vulnerable to the effects of tropical cyclones. Past experience has shown that cyclones can rapidly damage or destroy the tourism (and commercial) infrastructure as well as seriously affect food production in the agriculture sector. A serious cyclone at this time could set the economy of the Cook Islands back many years. Rapid recovery from such a disaster would be unlikely without external assistance.