IMPLICATIONS OF A CHATHAM ISLAND SYNTHETIC CRUDE INDUSTRY

by

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A report to the Liquid Fuels Trust Board and the Town and Country Planning Division (Ministry of Works and Development)

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July 1984

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SUMMARY OF FINDINGS

[1] Chatham Island peat appears suitable as feedstock for the production of synthetic crude oil. A synthetic crude industry on the Chatham Islands could make a substantial contribution to New Zealand's energy requirements.

[2] A great deal of investigation into the viabilty of a synthetic crude industry has yet to be carried out. The peat resource has to be accurately assessed and much research into the peat conversion process needs to be undertaken. The outcome of these investigations could drastically affect the viability of a project.

[3] In the absence of a national policy on peat and peatlands, there is a morass of legislation dealing with peat, some of which has conflicting objectives. The Coal Mines Act 1979, is the most pertinent piece of legislation for the peat mining proposals. The Act gives the Minister of Energy extensive powers and discretion. Provisions for incorporating environmental, social and regional issues are extremely limited, and the current legislation is unlikely to provide sound guidelines for the development of a major industry on the Chatham Islands.

[4] Chatham Island flora and fauna contain many unique species. The original flora has been extensively modified and depleted. Few rare and endangered species are represented in the current reserves system. The Southern Tablelands are the most crucial area for conservation purposes as they contain most of the rare and endangered flora and fauna on Chatham Island. Conservation of the remaining flora and fauna is therefore dependent upon obtaining comparatively large reserves in this area. No detailed on-site investigations have occurred in the north west part of the Island proposed for mining.

[5] Water is the environmental factor most likely to be severely affected by peat mining. There is no catchment authority directly involved on the Chatham Islands although

there are currently many soil and water problems. A lack of basic information on the Chatham Islands' soil and water resources will likely frustrate planning for a synthetic crude industry.

[6] The Chatham Islands' community is distinct from the rest of New Zealand society. The community is small and isolated and it is disadvantaged with regard to services and amenities available. The local residents have a way of life which is different from that of the mainland.

[7] The Chatham Islands' labour force is not likely to provide a significant input to a major industry. The size and nature of the workforce needed for such a project will have a pronounced effect on the host community and the operation itself.

[8] Previous boom and bust development has left a legacy of suspicion and concern, which has a significant influence on how local residents view new development proposals.

[9] Although the fishing industry appears to be a sustainable operation, the agricultural sector has yet to establish a sound economic base, and is currently experiencing a number of problems.

[10] The present Central and Local Government involvement is struggling with the existing Chatham Islands' administrative need. The Chatham Islands County Council is not equipped to undertake a substantial local role in a major resource development. The Central Government administration has no strategy for the Chatham Islands that would cater for a major industry.

[11] The Chatham Islands' community is not homogeneous. There are a number of levels of division within the community, and other levels at which the community unites. The first level of division is between local residents and civil servants. The second level of division is amongst the local residents on the basis of factors which include:

length of residence on the Islands, occupation, and ethnic origin. But local residents unite in suspicion of outsiders and for some common economic and social needs.

[12] There is no consensus among the community about whether the peat mining proposals should proceed. Longer term residents generally support continuation of the existing way of life. The Council, local business interests and new arrivals, generally support development, provided they have a measure of control over it and provided also that benefits are realised within the Chatham's community. The proponents of investigations into a synthetic crude industry on the Chatham Islands have been the most vociferous. The concerns and fears regarding peat mining proposals have usually not been articulated in formal forums.

[13] Currently, local residents have little understanding of what peat mining proposals entail. They are presently making their minds up with regard to a new industry on the basis of speculation in the absence of sound information.

[14] In the context of an isolated and unique natural environment and community, any sizeable resource development is likely to generate a range of significant impacts. The potential for adverse social and environmental impacts must be addressed from the onset of planning.

[15] Two main stategies for development of a synthetic crude industry exist: one is to isolate the community from the development and the other is to incorporate the community directly as part of the project. Each strategy will produce a different set of outcomes.

[16] A number of pressing social and economic problems on the Chatham Islands warrant urgent attention, regardless of whether major resource development proceeds. These include expensive transportation between the mainland, poor central and local government administration, small community size, costly services and amenities and development of the farming sector.

PREFACE

Much of New Zealand's major energy development in recent years has occurred in rural areas. These developments, by virtue of their size, have had significant social, economic and environmental implications. The scale of social change, for instance, is often larger than the host community can adjust to without significant social dislocation. Although there is no clear consensus in the literature as to what actually constitutes the field of social impact assessment (see Krawetz 1983 and Taylor & Sharp 1983), ideally any study that addresses a resource development proposal should undertake to describe and assess the host community in the pre-impact phase. This type of study may then be used for subsequent planning, assessment of alternatives, mitigation strategies, monitoring and management.

This report provides an initial analysis of the Chatham Islands with regard to peat mining proposals. It contains an integrative review of the literature and provides a community analysis which was the result of fieldwork on the Chatham Islands. The emphasis of the report is the identification of the main types of issues that could arise from a major resource development such as peat mining for the production of synthetic fuels. This study can therefore be viewed as providing the initial research for an on-going social impact assessment process. Further research using an issues oriented approach for investigations into a Chatham Island synthetic crude industry could be integrated into an anticipatory planning framework. This type of approach would be responsive to changing circumstances as investigations proceed.

The work being undertaken by the author is in partial fulfilment of the degree of Masters of Science in Resource Management. The Liquid Fuels Trust Board and the Town and Country Planning Directorate of the Ministry of Works and Development have jointly provided financial assistance for the project. Their support and enthusiasm is gratefully acknowledged. Similarly, the staff of the Centre for Resource Management and the people of the Chatham Islands are acknowledged for their generous assistance to this work.

1 INTRODUCTION

This section outlines the topics addressed in the main body of this report. Investigations have proceeded over the last few years into the suitability of Chatham Island peat for producing synthetic crude oil. Whilst the investigations into a synthetic crude project have yet to enter the feasibility phase, it is important to address the implications of possible development now, in order that these considerations are recognised and addressed from the onset of planning.

Current knowledge of synthetic crude oil production from peat is presented in the form of one production scenario. The implementation of a future project is also discussed in addition to the legislative context for peat mining, with a focus on the Coal Mines Act (1979) and its provisions. The report then addresses some of the environmental issues that could arise from this scale of development. Deficiencies in the basic resource data are noted and areas for further research are suggested.

The administative context of the Chatham Islands is outlined in terms of central and local government responsibilities. The implementation of a major resource development on the Chatham Islands is discussed in order to highlight the inability of the current administrative bodies to cope with major change.

The social and economic setting is then outlined. A precis of the Chatham Island economy is given and an account of its boom and bust legacy is provided. The community analysis is presented next. This section is not intended to be a social impact assessment per se, rather, the intent is to identify community concerns and aspirations before any major development proceeds, in order to initiate an on-going social impact assessment process.

Finally, a concluding section is presented and a set of

recommendations for future research and administrative purposes is provided.

This report does not consider whether the use of the Chatham Island peat resource for the production of liquid fuels, is a "wise use" of the resource. Given that the project would entail large capital expenditure which would necessarily limit other energy development options and affect the national economy, this question should be addressed directly before any such project proceeds.

1.1 METHODS

Existing literature on the Chatham Islands has been supplemented by a community study which was undertaken on the Chatham Islands during the summer of 1983/4. A network of field contacts was established before visiting the Chatham Islands, comprising key local residents and civil servants, who hold influential positions within the community. These initial contacts were then expanded during the course of the study. Semi-stuctured interviews were conducted informally with over 80 people on the Chatham Islands, which comprises approximately 17 per cent of the adult population. A well attended public meeting was held on the Chatham Islands in May, during which the peat mining proposals were outlined and some of the implications of a major industry were discussed. The majority of people interviewed were key community figures.

Throughout the study, an issues-oriented approach has been utilised to indicate how large scale resource development may affect the Chatham Island environment and community, and how in turn, such development could be effected. Issues identification essentially involves outlining the implications which will conceivably be the most important effects of the proposed development. In particular, the aspirations and concerns of the local residents have been detailed. This approach was utilised by the Joint Centre for Environmental Sciences (1982) during their investigations into lignite mining in Southland, and is further outlined by Taylor (1983).

The research methodology is intended to be participatory and findings will be disseminated within the Chatham Island community. Emphasis has been given to the exchange of information between the researcher and the host community. The dissemination of information concerning the peat mining proposals is a necessary prerequisite to enable positive response to be made by the community. It may also help avoid reactionary situations which could

only serve to frustrate genuine discourse.

1.2 THE PEAT RESOURCE

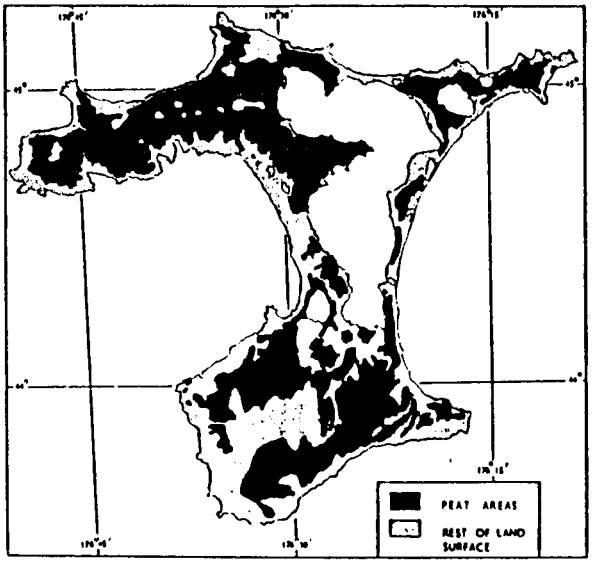
Peat is formed in cold humid areas when plant and vegetable matter decay in the absence of air (usually in swamps or under wet conditions). The widespread occurence of Dracophyllum spp. roots throughout the peat areas, suggest that peat was formed mainly from Dracophyllum forest, rather than the more usual peat residues such as sphagnum (Cathcart, 1982).

The peat resource on Chatham Island has been known to be rich in waxy material for over a century (Palmer, 1974). The high wax content, (over 40 percent in some samples) of Chatham peat is caused by chemical constituents of plant material that have resisted decay (ibid). Two major types of peat are found on Chatham Island. Lowmoor (or basin) peat is formed around existing lakes and marshes and in poorly drained depressions. This peat type is found primarily in the southern part of Chatham Island. The more extensive peat type is Highmoor (or upland) peat, which is older and has a higher calorific value. Pitt Island is geologically different from Chatham Island and has no significant peat deposits. An important feature of the Chatham peat is its comparatively low water content which averages 65 percent, compared to most peats, which average 80-90 percent water content (Stewart, 1984). As cellulose material in the peat is almost completely broken down, it closely resembles a lignite or young coal.

The peat blanket on Chatham Island is formed on gently undulating to rolling downs and it contains bands of ash and buried mineralised soils (Cathcart, 1982). These features of the Chatham peat mean that it is entirely different from mainland New Zealand peat deposits.

A 1959 DSIR soil survey states that peat, and soils derived from peat occupy 59 percent of the land surface of Chatham Island (as indicated in Figure 1).

Figure 1: Distribution of peat on Chatham Island



Source: Wright, 1959, p.10.

Work done by ICI during the 1970's indicates that peat reserves on Chatham Island are in the order of 1000-2000 million tonnes (Berryman, 1981). An agent for Consolidated Minerals later estimated that there were approximately 28,000 ha of peatlands on Chatham Island with an average depth of between eight to 10 metres (ibid). There have been few comprehensive core sampling tests of Chatham peat , which suggests that estimates of the peat resource can be treated as inferred reserves only, (in the geological sense). In 1973, the Chemistry Division of the Department of Scientific and Industrial Research (DSIR), drilled 21 holes and took four bulk samples from which they based their peat wax investigations (Palmer, 1974). This has been the most comprehensive testing of the peat resource to date.

1.3 BACKGROUND TO THE PEAT MINING PROPOSALS

Commercial interest in the wax content of Chatham Island peat has occurred a number of times over the years. During the Second World War, the curtailment of wax supplies from Germany prompted evaluation of the Chatham resource. It was not until the early 1970's that several companies showed interest in establishing a sizeable peat wax extraction industry on the Island. The industry would have used solvents to produce wax, resin and asphaltine fractions. Extensive resource evaluation and market research were undertaken, but the industry never eventuated. Reasons given at the time were:

1/problems with marketing the products,
2/that peat wax was not a specified mineral, which would have changed the mining companies tax status,
3/ that a similar wax was found in Otago lignite deposits and the Chatham Islands were considered too risky for establishing an industry.
(Barker, 1982).

A joint venture involving Fletcher Challenge Ltd (FCL) and Consolidated Minerals was established in 1981 to investigate the Chatham Island peat resource for liquid fuel production. This venture followed Dr. J Sprott's work in supplementing earlier DSIR Chatham wax analysis, which showed that Chatham peat could yield a range of liquid fuel fractions. FCL committed an initial expenditure of $500,000 to bring the project to the feasibility stage, and took a 51 percent interest in the venture. In 1981, Consolidated Minerals applied for a coal prospecting licence for a total area of over 20,000 ha on Chatham Island. This application was opposed by Federated Farmers, on the grounds that it was incorrectly advertised and because of uncertainties surrounding post-mining land reclamation. In 1983, Consolidated Minerals readvertised the original application with the significant omission of a 400 ha scenic reserve on the southern coast. Later in 1983, following major internal

restructuring, Consolidated Minerals agreed to sell its interest in the Chatham peat resource to FCL, reserving the right to a five percent interest in the project (Consolidated Enterprises Ltd, 1983).

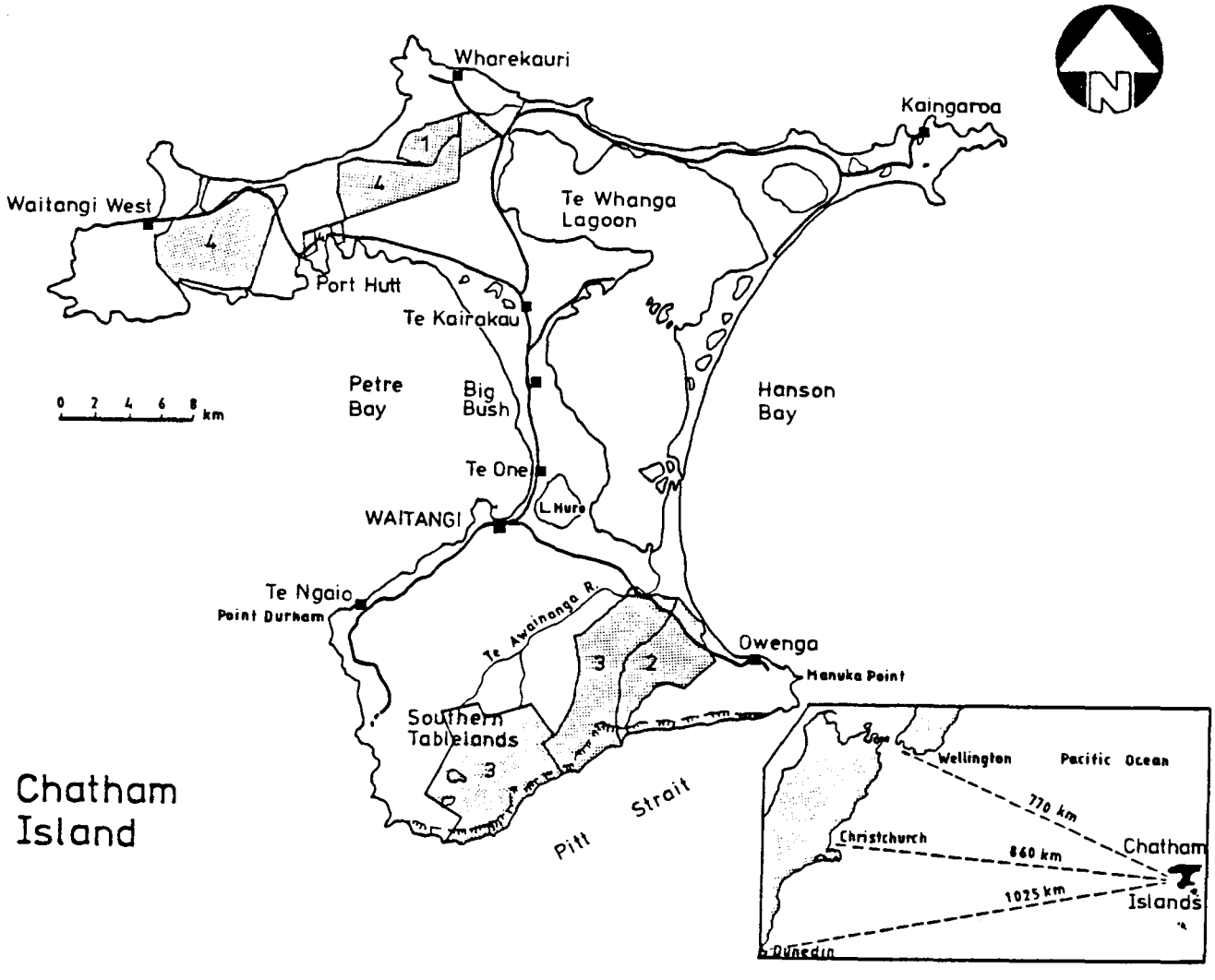
In October 1983, FCL then applied for a coal prospecting licence in the north- west part of Chatham Island. This application is now being considered by the Mines Division (Ministry of Energy) along with the earlier applications by Consolidated Minerals. If the licences are granted, they will then presumably be transferred to FCL who are acting for Consolidated Minerals with regard to the application. Applications for coal prospecting licences are indicated on Figure 2, and detailed in Table 1.

Table 1: Coal Prospecting Applications on Chatham Island

MAP NO	APPLICATION NO	AREA (ha)	APPLICANT	TENURE
1	35193	1798	Consolidated Minerals	Crown Land
2	35202	2228	Consolidated Minerals	Crown Leasehold Land
3	35205	7708	Consolidated Minerals	Freehold
4	35260	5285	Fletcher Challenge Ltd	Freehold

Information supplied by Mines Division (Ministry of Energy) and General Draughting Division, Department of Lands and Survey (May, 1984)

Figure 2: Coal Prospecting Applications on Chatham Islands



Information supplied by General Draughting Division, Lands & Survey Department (May 1984)

2 THE PROCESS AND NATURE OF A SYNTHETIC CRUDE INDUSTRY

2.1 The Production Process

The following section was compiled mainly from a seminar given by Mr K. Stewart of FCL, to the Engineering Faculty, University of Canterbury on "The prospects for development of the Chatham Island peat deposits". Material presented in this section is based on this seminar, unless otherwise indicated.

One production scenario is outlined. Major investigations into a synthetic crude industry have still to proceed. Changes in the scale of production or process type, (gasification instead of pyrolysis for instance) would yield different quantities and/or products. The objective of outlining a production scenario is to indicate the likely nature of a future industry on the Chatham Islands and present the state of investigations.

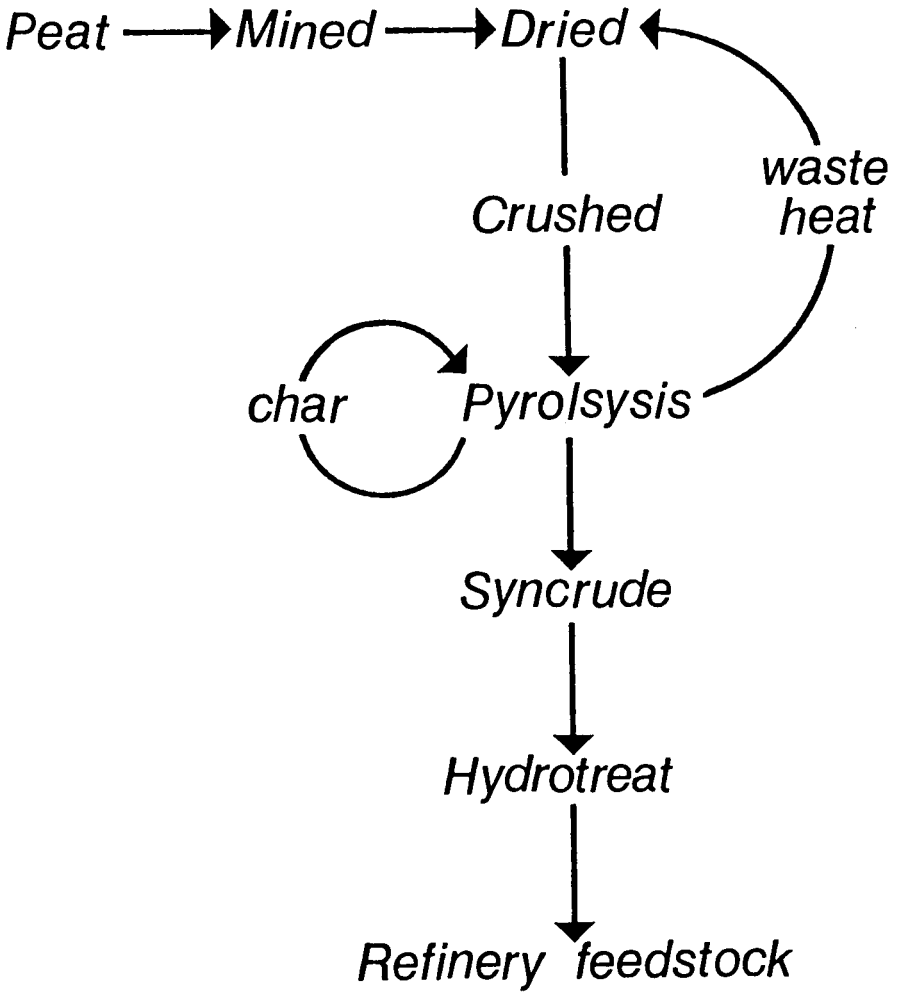
Stewart indicates that at least ten years research and development would need to be undertaken before a processing plant could be built and an expenditure of approximately $50 million dollars would be needed before the feasibility of such an operation could be finally decided upon. An all up cost in the order of $1 billion was indicated.

Although peat is used to fuel thermal power stations in Ireland, Finland and the USSR, it has seldom been used for the commercial production of synthetic liquid fuels. Recent research in several countries has shown that peat is an excellent feedstock for the production of synthetic fuels (Punwani, 1983). The Institute of Gas Technology in the US, for instance, has shown that in experiments on peat gasification (partial combustion of peat by air or

oxygen and varying amounts of steam), there is a significantly higher tendency to form hydrocarbon gases from peat than from coal (ibid). The high wax content in Chatham peat apparently gives it these desirable properties. Peat was once used as a fuel on the Chatham Islands, powering a fish freezing unit around the turn of the century.

Figure 3 presents one synthetic crude oil production process as a flow diagram.

Figure 3: Flow Diagram of Synthetic Crude Production from Chatham Island Peat



Source: Stewart, 1984

Peat would be mined, dried to a level of 20-30 percent average water content, crushed, and fed into a pyrolysis unit. This unit would quickly heat the feedstock to approximately 500 degrees celsius in an inert atmosphere, ie with no oxygen. The products obtained from the pyrolysis plant include gases, liquid fuel fractions, and a char which would be fed back into the process to fuel the reaction. Waste heat from the process may also be used for drying the mined peat. The liquid fuel components produced would be upgraded by hydrotreating (to remove some of the available oxygen) to produce a feedstock suited to the Marsden Point refinery. The viability of such an operation will hinge very much upon the efficiency of the various technologies that are used for mining, drying and pyrolysis.

Three methods of mining would appear possible for the type of operation proposed. The method considered most likely is mining using a bucket wheel excavator. The top half metre or so of overburden would be mined and stockpiled. Removal of peat would then proceed down to the basement material (mostly sand). Subsequent land development would utilise the stockpiled overburden, however, further nutrients will also be required. The mined peat would be fed to a processing plant via a conveyer belt system.

Alternatively, a cheaper method of mining would entail hydraulic mining which would sluice peat off an exposed face and transport it to a plant in a slurry pipeline. This latter method would pose difficulties of dewatering the peat and may entail a large energy expenditure. Water may also be a limiting factor for this type of operation.

A third method of mining peat, which involves a milled or sod peat, is discussed by McKenzie (1982). FCL appear to have discounted this option for mining Chatham peat.

Drying the peat may involve atmospheric drying mechanical, and/or thermal heating (using heat from the pyrolysis process). Little work appears to have been done on this

aspect of the operation, although this step is critical to the economic feasibility.

With the scale of plant and process envisaged, an accessible peat resource in the order of 100-150 million dry tonnes would be required for a viable industry. Distances over which peat is to be transported from the area where it is mined to the processing plant are important for the overall viability of the operation. Due to the costs of a conveyer belt/slurry pipeline system to transport the peat to the plant, most of the resource will need to come from the northern part of the island. It is there that the better quality highmoor peat is located. A process rate of 18 million wet tonnes per year (or six million dry tonnes per year), of peat would be needed. This rate of usage is estimated to yield 25,000 barrels of syn-crude per day, and could substitute approximately 45 percent of estimated New Zealand imported crude oil demand in 1990. A breakdown of the possible contributions to the national liquid fuels demand is given in Table 2.

Table 2: Possible Contribution of Chatham Syncrude to New Zealand Liquid Fuels Demand

PRODUCT	PRODUCT DEMAND		PEAT PRODUCTS	
	1981	1990		% of projected 1990 total demand
Gasoline	43,100	45,900	7,000	15
Kerosine, avgas	3,700	3,900	6,000	154
Diesel	20,300	21,200	8,000	38
Fuel oil etc	16,700	17,600	3,000	17
TOTAL	83,800	88,600	24,000	- (units in barrels/day)

Source: Stewart, 1984

These figures assume a peat resource lifetime of approximately 50 years, (even though the plant lifetime would be considerably shorter). The processing plant would run 24 hours per day, 365 days per year.

Little work has been done on post mining land development, although the DSIR have been involved in such studies for peatland development after mining in other parts of New Zealand. Ash, which would be a major by-product from the pyrolysis plant, could be used for land development.

2.2 Project Implementation

It is likely that much of the equipment for this type of industry would be barged to the Chatham Islands in a pre-assembled form. Two alternative sites appear feasible for the processing plant. One is in the sheltered inlets on the southern side of the north-western peninsula. A breakwater would be built across the inlet and a wharf built on it, with the plant situated behind. An area would need to be drained and reclaimed for the plant. The second alternative would involve dredging the entrance to the Te Whanga Lagoon and barging a plant to the north-western shore of the lagoon (refer to Figure 1).

Stewart (1984), indicates that a total resident population of 400-600 people would be required for the operation. If families, support personnel and service people are included, these figures are likely to be several times higher. A peak construction workforce of approximately 1500 people would be involved. As with the permanent workforce for the processing plant, support personnel and service people will likely mean that this figure is an underestimate. A shift work system could be considered for the construction workforce. This arrangement may have some merit due to the high costs of permanent accomodation for temporary workers and the likely social disruption to the host community. Social interaction with the host community would be minimised if the construction workforce operated on long shifts and were transported back to the mainland after their shift work period is finished. Accomodation for this workforce may well be on barges or accomodation vessels anchored off-shore. Such arrangements have been implemented for other similar projects in isolated areas.

3 THE LEGISLATIVE CONTEXT FOR PEAT MINING

A peatlands policy study report commissioned by the National Water and Soil Conservation Organisation (NWASCO, 1982), lists legislation pertinent to peatlands as : the Land Act 1948, Reserves Act 1977, Land Drainage Act 1908, Soil Conservation and Rivers Control Act 1941, Harbours Act 1950, Coal Mines Act 1979, Wildlife Act 1953, National Parks Act 1980, Water and Soil Conservation Act 1967, QE 11 National Trust Act 1977, Town and Country Planning Act 1977 and the Local Government Amendment Act 1979. This morass of legislation deals with the many facets of peatlands and some Acts have conflicting objectives. For instance, the Reserves Act may conflict with the Land Drainage Act if draining a peat bog with high natural values is contemplated. Of all the Acts listed, only the Coal Mines Act refers to peat directly by defining it as coal for the purposes of that Act.

Nowhere in the legislation is there an adequate definition of what actually constitutes the peat resource. The ownership of peat is unclear as some Acts have specified peat as a mineral (eg the Coal Mines Amendment Act 1972) while others have specified it as a coal (eg the Coal Mines Act). The Land Act 1948 reserved all minerals on Crown Land to the Crown. Section two of this Act defines 'minerals' as including coal and other valuable minerals, but makes no mention of peat. The Coal Mines Ammendment Act (1972), did include peat as a mineral, but the Coal Mines Act (1979), defined peat as coal. The report of NWASCO (1982), outlines some of the anomalies that can arise from the lack of a succinct and consistent definition of peat in the legislation. For instance, a farmer may own his "soil", but not the peat which underlies it. The Steering Committee on peatlands policy and management, recommended that the Town and Country Planning Act and Water and Soil Conservation Act were the appropriate pieces of legislation for the management of peatlands (ibid).

The Coal Mines Act

Mining legislation in New Zealand has come under close scrutiny in recent years. The 1981 Amendment to the Mining Act (1971) made significant provisions for those objecting to the issue of exploration, prospecting or mining licences. Mining legislation is still, however, a seperate code of authorisation and embodies an implicit dominant use assumption that has overridden less specific Acts, such as the Town and Country Planning Act. It is particularly important to analyse the provisions of the Coal Mines Act, as most of New Zealand's large scale mining will come under this Act.

The Coal Mines Act appears similar to the Mining Act 1971, but it is very different in substance. The nature of the Act reflects the extensive involvement of the State in coal mining operations. There are two sets of procedures under the Act, one for private coal mines and one for state coal mines.

Private Coal Mines: Licensing procedures under the Act deal with prospecting and mining licences for private coal mines. There is no automatic right of transfer from a prospecting right to a mining right conferred on the applicant. Under section 41, before granting a coal mining licence, the Minister of Energy may have regard to:

> [a] The nature and extent of the coal resource on or under the land and its relationship to coal and other resources and industries in the area.
>
> [b] The best and most efficient utilisation of that resource.
>
> [c] Any special environmental factors involved in the development of that resource. (Author's emphasis).
>
> [d] The general development and conservation of New Zealand's energy resources.

Matheson (1983) notes that the corresponding section of the Mining Act (section 69 1(a)) differs significantly from section 41 of the Coal Mines Act. The Minister, for

instance, shall have regard (to the above mentioned factors). Similarly, under section 41 2(c) of the Coal Mines Act, consideration is required only of "any special environmental factors". Under the Mining Act, the corresponding section requires that consideration be given to "any environmental and social factors". (Author's emphasis).

Under section 20 of the Coal Mines Act, the Minister can issue a coal mining right "notwithstanding anything in any other Act" and the right of the holder extends to all acts and things necessary to carry out the coal mining operation (section 55). The Minister has no right to issue a water right, which must be applied for to the regional water board.

Procedures for objections (for "questions of law" and "other objections") are similar to those which existed for mining before the 1981 Amendment Act. Unless landowners and local authorities have been notified informally, the formal objection procedures are the only means under the Coal Mines Act for expressing concerns. Mines Division have consulted the Chatham Island County Council and some Government Departments, although there is no legislative requirement for such liaison. The relationship of this Act with the Town and Country Planning Act is not at all clear, as no reference is made to it in section 122 which deals with conflict with other Acts. This is an undesirable situation as the Town and Country Planning Act with its broad mandate, is the most appropriate Act for considering social and regional issues. For instance, the Planning Tribunal held in Auckland Maori Council v Manukau Harbour Authority, [1983] 9 NZTPA at p.167, that the "public interest" in s102 A(4)(b) of the Town and Country Planning Act, was wide enough to include the question of the likelihood that a proposal might prejudice the cultural, social or general welfare of the people.

State Coal Mines: The Minister of Energy also has extensive powers under part four of the Coal Mines Act to establish State Coal Mines, and may take any land for that purpose. Although the FCL coal prospecting application number 35260, in the north west part of the Island involves privately owned

peat, a large scale syn-crude industry with state involvement may necessitate invoking this section of the Act. Section 105 states: "The Minister on behalf of the Crown, and on such conditions as he thinks fit, may acquire by way of purchase or lease, any lands, coal, coal mines, or coal mining rights that may be required for coal mining operations as State Coal Mines". The right of acquisition would be subject to the Public Works Act 1981, which lists works for the production of energy, as essential works (Palmer, 1982). Pursuant to section 102 (3), the Minister is obliged only to give public notice to the local authority concerned, and to consider any submissions received. There is no further objection or right of inquiry conferred on any person or party.

The Coal Mines Act therefore appears deficient in that it provides inadequately for consideration of environmental and social matters. The procedures for both private and state coal mines have limited provision for public input, the latter being the most limited. Given that major coal development, (and peatmining) could cause significant environmental and social impacts, the Coal Mines Act can only be viewed as inadequate with respect to incorporating these issues under its provisions.

The Minister of Energy is reported to be considering bringing state coal mining operations under the same provisions that exist for private coal mines (Mining Monitor, 1984). An analysis of the Coal Mines Act has been prepared under contract for the Commission for the Environment. It has also been reported that a review committee will be formed to consider possible changes in this Act (Press, 28th March, 1984).

4 ENVIRONMENTAL FACTORS

4.1 Biological Implications

The Chatham Islands' flora and fauna have evolved in isolation over several million years and consist of many unique life forms. The indigenous flora of the Chatham Islands includes over 300 species of higher plants. Twenty nine full species (or 9 percent), are endemic, ie found nowhere else (Kelly,1983). No other area of similar size in the New Zealand region has so many unique plant species (Given and Williams, 1984). Of the 20 endemic bird species on the Chatham Islands, four are now extinct and eight are endangered (cited in McKenzie, 1982). The Chatham Islands are also of international scientific interest as an oceanic archipelago in the temperate Southern Hemisphere (Botany Division, 1982).

The indigenous flora has been extensively modified during the 150 years of European contact. This change has primarily involved the removal of the original forest vegetation by burning, grazing and then wind damage. At the turn of the century, Cockayne warned that the rate of depletion of natural vegetation would soon leave very little of the virgin plant formations on Chatham Island (cited in Given & Williams, 1984). Kelly (1983) noted that scarcely enough remains of the native vegetation to visualise the original vegetation pattern of Chatham Island.

The plight of the Chatham's fragile natural environment has received attention in numerous reports and publications. Botany Division, DSIR (1982) noted that because of the expense of sending research staff to the Chatham Islands and short term priorities that dictate expenditure elsewhere, detailed ecological research on the

islands is still lacking. Subjective rankings of key botanical areas are listed in Kelly (1983) and this work will be covered in more detail in work due to be published this year by Given and Williams. A Chatham Island land inventory is being prepared by the Department of Lands and Survey on Series 290 maps, pending publication later this year. These publications will provide good resource material, but need to be supplemented by extensive on-site investigations into areas proposed for mining or land development.

Ongoing conservation programmes have proceeded for a number of years for rare and endangered bird species found on outlying rocks and islands. However, the fauna and particularly the flora on Chatham Island, have received less attention. Given and Williams (1984), draw attention to the lack of representative reserves on Chatham Island. They note : "approximately half the endemic [plant] species and species under threat on Chatham Island are inadequately reserved". In recent years there have been a number of reserves donated by local residents; however, the species which are the best reserved are those which are the least threatened (ibid). Kelly (1983, p.2) suggested that the Southern Tablelands (see Figure 1) are the key area for conservation as they "epitomise the unique Chatham landscape". This area has been investigated by the Department of Lands and Survey for National Park status. It is also included in the area currently being considered for coal prospecting licences. The conservation of indigenous flora and fauna on Chatham Island is dependent on obtaining comparatively big reserves in the Southern Tablelands area. Mining activities in this area would be incompatible with this objective.

Peatland ecosystems are little understood and are poorly represented in the present New Zealand reserves system (Thompson, 1978). Peatlands are described as "stress" environments, and all plants able to grow on them are adapted to stress conditions of low pH, waterlogging and

low nutrient levels (ibid). Some peat areas on the Chatham Islands are of international importance such as those areas containing the rush Sporandanthus which is found only on the Chatham Islands and two other places in New Zealand. The lowland peat areas where this rush is found on the Chatham Islands have been drained and altered drastically, so that it is comparatively rare.

Due to pressure from some members of the scientific community, the Department of Lands and Survey now has a full-time reserves ranger living on Chatham Island. Local residents, however, generally have little appreciation of the rare and endangered biota of Chatham Island and the need for its conservation.

4.2 Surface and Groundwater Implications

McKenzie (1982) noted that water is the environmental component most likely to be affected by development of a synthetic crude industry on the Chatham Islands. Disposal of drainage water, fire hazard, development of mined areas and the effects on water quality and quantity are likely facets of peat mining proposals that will need to be addressed. The availability of a reliable and good quality fresh water supply in the north-west part of Chatham Island could well be a limiting factor if a major industry was located there.

In a report from the North Canterbury Catchment and Regional Water Board (NCCRWB) to NWASCO, Cathcart (1982) outlines the nature of soil and water problems on the Chatham Islands. Sand erosion, fire hazards, the lack of good quality water supply and the absence of shelter were amongst the most pressing problems described. Other problems that were outlined included, overgrazing on sandy soils, leached soils and inadequate drainage in some areas.

There is at present no direct catchment authority involvement on the Chatham Islands, and very little exists in the way of basic resource information. The Water Resources Council, which was previously the catchment authority for the Chatham Islands, has been replaced by a larger National Water and Soil Conservation Authority (NWASCA), in the 1983 amendments to water and soil legislation. NWASCA is now, therefore, the Catchment Board for the Chatham Islands. Apart from climatic data collected for a limited number of sites by the Meteorological Service, and investigations into small hydro schemes, there has been no monitoring and evaluation of soil and water conditions that will be imperative for a major mining operation.

Soil and Water conditions attached to prospecting licences

for peat and phosphates on the Chatham Islands, are being made in the absence of a sound and comprehensive water resources inventory. Cathcart (1982) highlights the urgency of detailed inventories of land and water resources. In particular, the role of the peat blanket and its vegetation in regulating the flow of water in streams and to groundwater is little understood. The peat blanket will likely affect water quality as well as flow rates. Water quality will be an important determinant for any future development, industrial or otherwise.

Under the present mining legislation there is no mechanism for Catchment Authorities to collect a supervision fee for monitoring and advice on matters relating to mining activities. In Cathcart's report to NWASCO (1982), it is recommended that the NCCRWB provide full catchment and water board services on an agency fee basis for the Chatham Islands. A decision from NWASCA is still being awaited. Cathcart also suggests that the additional catchment authority involvement that would be needed for large scale peat mining, would entail a cost beyond the means of the present community.

5 ADMINISTRATION

5.1 Central Government

The Chatham Islands are administered by the Department of Internal Affairs whose responsibility is to: "...promote the wellbeing of the Chatham Islands and to co-ordinate the activities of Central Government related to the Islands" (Internal Affairs, 1983 p.19).

Administrative responsibility was transferred to Internal Affairs from the Department of Island Territories in 1962, after a report on the future administration of the Islands was adopted by Cabinet. A three man committee had concluded, inter alia, that Government activities relating to the Islands demanded more effective co-ordination and that assistance must be carefully planned (Inter-Departmental Committee, 1961). An interdepartmental advisory committee was also formed in 1962 to prevent duplication of departmental activities. Initially, all central government agencies had their financial inputs to the Chatham Islands met from vote through Internal Affairs. The interdepartmental advisory committee was thus a forum for coordinating expenditure on the Chatham Islands. This situation has changed so that now, government departments with an involvement in the Chatham Islands carry the relevant expenditures on their own vote. Although not officially disbanded, this interdepartmental committee has been superseded by a policies committee and a number of interdepartmental subcommittees which were established in 1980. These committees, convened by Internal Affairs, meet informally from time to time to consider Central Government involvement on the Chatham Islands. To date this has mostly been in response to specific proposals for development or the provision of services in the absence of

any long-term planning.

With regard to the Chatham Islands, the Department of Internal Affairs (1983) lists as its objectives:

> [1] To enable the positive benefits of life on the mainland to be available on the Chatham Islands.
>
> [2] To develop: (a) sea and air transport to and from the Islands, (b) the meatworks on the Islands, and (c) the energy supply undertaking, to the stage where each service can operate with the minimum of Central Government control or supervision and financial input.
>
> [3] To operate these services until such time as they can be taken over by an appropriate non-government or local government organisation.

The Department also administers subsidies on the air service ($360,000/annum), the shipping service ($1,400,000/annum) and the meatworks ($330,000/annum), (Internal Affairs, 1983). These services are provided for social support, but are being increasingly reviewed on purely economic grounds. A recently approved 35 percent freight increase on the shipping service highlights the process of economic rationalisation of subsidies to the Chatham Islands.

The Department of Internal Affairs works in association with a Commissioner for the Chatham Islands based in Wellington , who is appointed by Government. He is directly responsible to the Minister of Internal Affairs. The Commissioner has no legislative mandate, and deals with requests for development on an ad hoc basis by liasing with Government Departments and other groups. Internal Affairs also has a Resident Agent living on the Chatham Islands who acts as a representative for Government Departments with no direct representation on the Island. He is also the airport manager, receiver of wrecks and superintendent of mercantile marine.

In the absence of an integrated strategy to help the

Chatham Islands reach a degree of regional autonomy and to replace government services with non-government organisations, it is difficult to see how the Department's own objectives can be met. The absence of long term planning will hardly facilitate any major resource development proposed for the Chatham Islands, and may well prevent effective participation by the local community.

5.2 Local Government

The Chatham Islands were constituted as a county in 1901, but remained without a local government until 1925. The County Council now has 11 elected representatives from four ridings. The Council has had a long history of financial and administrative difficulties. In 1936, a Chatham Island Empowering Act suspended the powers of the Council to levy land rates due to the difficulties of collecting rate arrears, (from absentee landowners and composite land titles) and the low value of the land. Instead, authorisation was given to collect import and export dues set by Central Government. This system was unique in New Zealand and served to penalise producers. It also meant that revenue collected by the Council could not be predicted with any degree of certainty. Since the bulk of produce exports is from November to March, the Council had to carry a sizeable overdraft for much of the year.

During the crayfish bonanza, the Council sought to place a levy on crayfish to provide revenue for harbour and roading development. The Council was ill prepared to meet the change that accompanied the crayfish bonanza. Atkinson (1971) noted that the council at this time was comprised solely of farming interests and little dialogue occurred with the fishermen. After protracted negotiations with the Fishing Industry Board and Central Government, a levy was finally settled upon at a time when the crayfishery was about to collapse. A loan of $400,000 was also raised from the National Provident fund against the expected revenue from crayfishing, in the early 1970's. Due to the rapid collapse of the fishery, this loan is still being paid off by the County .

The Council now reflects a broader base of community interests. It has also had a great deal more experience with financial matters. In 1980, the Chatham Islands County Council Empowering Act restored the power of the

Council to collect land rates (which are in addition to the import/export dues component). Revenue collected from the two sources is not to exceed the aggregate sum which the Council could levy by way of a general rate under section 136 of the Local Government Act. The Council now has autonomy in setting its own rates, which is consistent with Internal Affair's stated aim of giving more administrative responsibilty to the Local Government. The land rate struck was originally a low one and has barely compensated for reduced import/export volumes in the last few years. Land rating is based on capital value and carries its own set of inequities as it continues to be a levy on development (Brown, 1982). The reasoning for this is that capital improvement will be rated and if the overall development of the islands is uneven, then the better developed properties will still bear a greater proportion of the rating load than those that remain undeveloped (ibid).

The Chatham Islands County Council is responsible for a wider range of administrative functions than counterpart mainland local authorities. It is, for example, charged with harbour administration, loading and unloading the 'Holmdale' vessel, air service control and bookings on the Islands, the community hall and picture theatre and a small museum. This diverse portfolio is in addition to general administration and road maintenance and development. The Council also assumes the important role of general spokesperson for the Islands.

The Chatham's isolation causes added costs to the provision of amenities and services. The County is sparsely populated at 0.6 persons per square kilometre, compared to the New Zealand Counties' average of three persons per square kilometre. The dispersed pattern of settlement means that a small rating base has to provide and maintain costly infrastructure (eg the 190 kilometres of roading). The Council is forced to provide expensive plant and machinery, which is underutilised as there can be no sharing of equipment with other Councils nor are

there contractors of any significance on the Islands.

Table 3 shows the high per capita costs of services and amenities on the Chatham Islands compared to the other Island counties and one mainland county. Although this is offset to some extent by the comparatively high average income figures, it does not account for the distribution of costs. For instance, nine percent of persons usually resident in the Chatham Islands, accounted for approximately 35 percent of the total income from earnings (Statistics Department, 1983). Most rates on the Chatham Islands are provided from the 30 or so full-time farmers and two outside owned fish packing plants.

Table 3: Comparison of Rates Levied and Average Incomes for the Chatham Islands and Some Other Counties

COUNTY	RATES LEVIED ($000)	1981 POPN.	RATES/HEAD POPN.	AV.INCOME/ HEAD POPN.	RATES/$ INCOME/ HEAD POPN
Chatham Islands	166	750	$220	$6,074	0.04
Stewart Island	70.2	600	$117	$5,803	0.02
Great Barrier Island	89.1	573	$154	$2,322	0.07
Hurunui	1,353	6,561	$206	$4,741	0.04

Source: Statistics Department 1982a, b, c,
1981/2 current receipts for local authorities were supplied by the Department of Statistics, Christchurch.

NOTE: Income figures are gross income before tax, for the year ended 31 March 1981 (persons 15 years and over). Average income figures were derived by taking a medium point between the income categories listed in Census of Population and Dwellings, 1981. Figures listed as 'not specified' were not included in the analysis and a figure of $35,000 was used for the '$25,000 and over' category.

In addition to revenue raised within the County, there are also contributions from the National Roads Board Authority and Development Loan and Special Assistance grants.

The Council is exempt from producing a regional and an operative district planning scheme. In lieu of an operative district planning scheme, the Council has a Planning Statement. However, the day-to-day realities of planning and administration show little adherence to the broad policies and objectives contained in the Planning Statement. The ad hoc nature of development in the Waitangi township, for instance, has already overloaded the sewerage and water supply systems.

The Council lacks administrative expertise and many councillors are not fully conversant with their responsibilities under the Local Government Act. Some councillors, frustrated with the lack of progress on the Chatham Islands, feel bitter about Central Government administration, which they perceive as treating the Chatham Islands as a poor relation. The Council has had difficulty in retaining County Clerks; most have tended to serve only their two year minimum term.

Weber and Howell (1982) describe how, in the context of rapid growth, local government officials often do not have adequate resources to research the issues when rapid growth is anticipated. They also state that many local leaders and residents are uninformed about the deleterious impacts of rapid growth, and on current methods for managing growth and gaining local control. Within the New Zealand context, Taylor and Sharp (1983), discuss some of the problems that have occurred from rapid growth, with respect to local authorities. In many cases, regions are unable to provide revenue to meet the increased demand for local government services and amenities that accompany the developments. The Chatham Island County, with its small rating base and population, almost certainly falls into this category.

The composition of the Chatham Island County Council, as a democratic body, can only reflect the divisions within the community it represents. Although councillors generally have visible positions within the community, council

matters have tended to be treated behind closed doors. Only in the last year have Council meetings been recorded in the community newsletter. Little in the way of information is disseminated back to the community and little interest exists amongst the community in council affairs. Allegations are frequently made that Councillors are "in it" for personal gain. Such feelings have been expressed over the Council's negotiations for a change in the mainland shipping port servicing the Chatham Islands.

Bowles (1981,p.101), with regard to social impact assessment in North America,wrote:
"Authentic community participation in decision making is possible and can be compatible with resource development. It can occur, however, only if more powerful bodies (government and corporations) recognise the claims of the community as legitimate, provide total information, and structure the decision making process so that community members can participate from the earliest stages and continue through the operation of the project."
The Chatham Island County Council, as the elected representatives and general spokesbody for the Chatham Islands, has a very important role to play in any future resource development. It is, however, ill-equipped to meet this challege at the present time.

6 ECONOMIC ACTIVITIES

6.1 The "Boom and Bust" Legacy

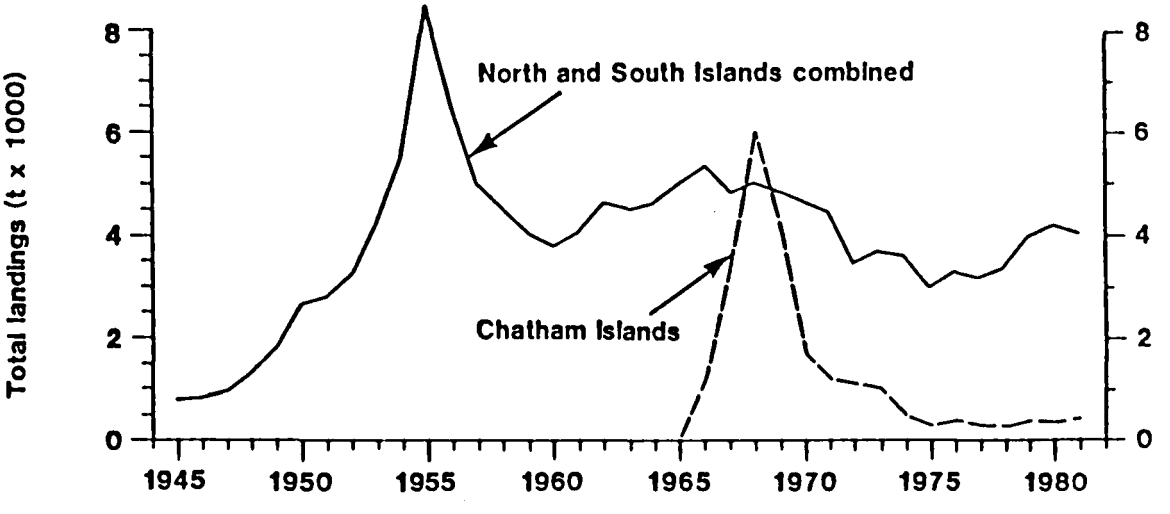
The history of the Chatham Islands has been punctuated by cycles of economic boom and bust. Exploitation of the Islands' primary resources, which have included whales, seals, wool and more recently crayfish, has been a common theme. Most of these resources have been destined for areas outside of the Chatham Islands with little benefit accruing to permanent residents.

The most recent boom and bust cycle on the Chatham Islands came to be known popualarly as the crayfish bonanza. The crayfish bonanza occurred between 1965 and 1969 and its effects are still apparent on the Chatham Islands today. Atkinson (1971) notes that the bonanza coincided with a number of concurrent happenings: restrictive licensing of the fishing industry was repealed in 1963, demand for frozen crayfish on the American market had intensified, and there was a political atmosphere conducive to the development of the fishing industry as evidenced by the newly created Fishing Industry Board. Falling catches in other crayfisheries meant that boats from all over New Zealand joined the rush. Clay (1970) estimated that 450 fishermen were present on boats in Chatham Island waters during the peak months of 1968-9. Due to the transitory nature of the bonanza, many of the fishermen lived on their boats and later returned to the mainland. Only a small percentage of those fishermen actually lived on shore for any length of time. One settlement at Kaingaroa was spawned by the bonanza and is now a permanent fishing village.

These figures suggest that the population of the Chatham Islands was almost doubled from the 1966 census figure of

520 permanent residents. Few local residents were employed fishing or in the nine shore processing plants that existed at the peak of the bonanza, but the incomes of these people were among the few tangible benefits to the local community during the bonanza itself. The higher incomes and subsequent investment in the fishing industry from the crayfish bonanza prompted a number of changes. For instance, it contributed to the transition from a self-sufficent type of lifestyle, to one more centered on the cash economy. Clay (1970, p.139) wrote: "A vast amount of the financial returns of the industry are directed out of the Islands, and the majority of the Islanders have not shared in the boom in any constructive way". The bonanza collapsed almost as spectacularly as it had started (see Figure 4) and left behind it an ailing farming sector. Most of the transient population had departed, and there was a very real sense of disappointment; expectations that the bonanza would contribute positively to the Islands' welfare had not been fulfilled.

Figure 4: Total Rock Lobster landings in New Zealand showing the effect of the Chatham Island's bonanza.



Source: Annala, 1983, p.5.

The crayfish bonanza contributed to the instability of the Chatham Islands, but it did bring the Islands to national attention. The bonanza preceded a period of

consolidation, characterised by large capital investment in transport and communications facilities, in addition to general development assistance. There has been increasing Central Government involvement on the Chatham Islands as a result of the crayfish bonanza. Appendix 1 shows the Government Departments represented on the Chatham Islands. Government representatives account for approximately 10 percent of the total adult population and comprise a significant proportion of the Chatham Island community with their families. This table does not include those Central Government Departments which regularly visit the Chatham Islands, such as the Rural Banking Corporation, the Valuation Department and the Wildlife Service.

The current economic situation, covered by sector, is outlined in the following sections.

6.2 The Agricultural Sector

Since the crayfish bonanza of the late sixties, there has been some steady progress in land development and utilisation. The bonanza displaced an ailing agricultural sector by shifting investment from agriculture to fishing. Labour previously available for seasonal farm work joined the bonanza, as did some farmers who left their land idle. The newly built Chatham Island cooperative freezing works began killing in 1968, but due to the crayfish bonanza, stock throughput dropped and labour was unavailable for the killing operation. By 1971, the freezing works had gone into receivership.

Confidence in the agricultural sector since the crayfish bonanza is attributable to the Government decision to take over the meatworks and the general improvement in wool prices (Douglas and Fraser, 1982). The Livestock Incentive Scheme and Land Development Encouragement Loan Scheme in addition to improved farming practices, have also provided stimulus to develop farmland. The Ministry of Agriculture and Fisheries operates an extension service and the Department of Lands and Survey is involved in the development of farm units for ballot.

Table 4: Land Use on the Chatham Islands as at 30 June 1980

	AREA (ha)	% of total area occupied
Grassland	28,757	39.7
Crops	50	0.1
Plantations	61	0.1
Tussock or danthonia (including swamps and sand dunes)	34,899	48
Other	8,754	12.1
Total area occupied	75,521	100
Lagoons and Lakes	19,950	
TOTAL	92,471	

Source: Department of Statistics, cited in Douglas & Fraser, 1982, p.5.

The comparatively large amount of accessible land in an undeveloped state is a key feature of the Chatham Islands' agricultural sector. Table 4 shows landuse on the Chatham Islands as at 1980.

Another important feature of the agricultural sector is the poor performance of Chatham Island farms; by comparison with the mainland, low stocking rates, high stock mortality and low lambing percentages are common features. Although the climate is well suited to livestock production, extensive areas of acidic peatlands are a major obstacle to land development. Large inputs of finance,labour and materials, such as lime quarried locally, are needed to develop the peatlands. Land development also entails a level of debt loading which many Chatham Island farmers are unwilling to accept.

There are currently 36 full-time and 27 part-time farms on the Chatham Islands (Tuanui, 1984,pers. comm.). A characteristic of the farming community is the farmers' high average age which is over 45 (ibid). Traditionally, farms have remained as family units and few land sales have occurred until relatively recently. Another characteristic is that much of the farmland is owned by a comparatively small number of landowners. This is in itself an important factor with regard to the peat mining proposals, as only a small number of landowners are likely to receive any direct benefits from the mining in the form of royalties.

Maori land comprises approximately 15 percent of the occupied land area of the Chatham Islands. Significant efforts have been made to establish formal titles since the Maori land court began hearings on the Chatham Islands in 1981.

The meatworks are Government owned and under a management contract with a Gisborne meat packing company. They are run at an annual loss of over $300,000 which is recovered by a Government subsidy. The farming sector does however

make a net national contribution of almost $400,000 per year (Fraser, 1982). The meatworks provides seasonal employment for approximately 30-35 people and plays a vital role in the agricultural sector.

It is often claimed in the literature, (see Brown 1982 & Fraser 1982) that both the meatworks output and farm output can be substantially increased. Farm forestry and horticulture have been proposed but little comprehensive evaluation of their viability has occurred. Potential exists for the production of some food lines on the Chatham Islands for the local market. At various times, dairying and market gardening have been tried, without any long term success. A nursery for the production of trees for reafforestation has also been advocated. Recent land sales appear to have inflated land prices beyond the productive value, particularly since farmers are increasingly faced with comparatively low returns for produce and high development costs. The recently approved 35 percent freight increase on the shipping service will severely affect the viability of the farming sector. Some young farmers coming to the Chatham Islands have found that their level of debt loading has placed financial hardship on them and their families.

6.3 The Fishing Industry

The fishing industry on the Chatham Islands has seen a period of consolidation since the bonanza of the sixties. Atkinson (1971) notes that in the two years of peak production from the Chatham Islands' crayfishery (1968-9), it contributed over 40 percent of New Zealand's total fish export value. In 1981, approximately 10 percent of the total New Zealand rock lobster catch came from the Chatham Islands (Annala, 1983). Because of their relative value to fishermen, crayfish and paua have comprised the bulk of the Chatham's catch and have hindered diversification into wet fishing. However, certain high value fish and fish products such as kina (sea egg), could prove a viable proposition and are currently being investigated by some fishermen who are keen to see diversification of the fishing industry on the Chatham Islands.

In 1981, the Chatham Islands became part of a controlled rock lobster fishery zone. There are 65 rock lobster licences and three full-time divers (Saxton, 1984, pers. comm.). The controlled fishery aims to effect conservation and the best use of specific fisheries having regard to:

-optimum continuing yield from the fishery

-optimum socio economic benefits of management

(Annala, 1983). Stringent conditions are attached to licences to prevent the overexploitation of the resource. Sustained yield for the crayfishery is determined primarily from catch figures as there is very little information on crayfish lifecycles and biology.

Fishermen currently operate out of Waitangi, Kaingaroa, Owenga, Port Hutt and Pitt Island (see Figure 1). Two fish packing plants exist; one at Kaingaroa and one at Waitangi. Together these plants employ between 20-50 people on a seasonal basis. The Chatham Islands' fishing industry earned approximately $6 million in foreign exchange and approximately $1 million on the domestic

market in the 1981/2 year (Chatham Island News and Views, March 1983). Catch figures from 1982/3 suggest that the foreign exchange earned last season, will be considerably higher than these figures.

It should be noted that the existence of a Chatham Island community was instrumental in New Zealand gaining the world's fourth largest 200 mile Exclusive Economic Zone. The Chatham Islands' region contributes approximately one seventh to the total area.

7 THE CHATHAM ISLAND COMMUNITY

The most thoroughly researched community study on the Chatham Islands, is contained in G.A. Arbuckle's work (Arbuckle 1968 & 1969). Arbuckle describes the Chatham Islands' community of permanent residents as having their own distinct cultural characteristics, which he states are a product of isolation, history and conflict with mainland society and culture. He compared the "folk culture" of the Chatham Islands with that of the "urban culture" of the New Zealand mainland. It is asserted that the folk culture of the Chatham Islands consists of strong personal links, a high degree of independence and self sufficiency, order maintained by informal community means and a suspicion of outsiders. As this work was written during the height of the crayfish bonanza, Arbuckle was able to underline some of the fundamental differences in outlook and philosophy between local residents and mainland New Zealanders.

The crayfish bonanza prompted a number of reviews and publications, but in the intervening years, most writing has focused on specific facets, such as flora and fauna, agriculture and transport. Little mention is made, except in passing, of community aspirations or the social change that has occurred since the crayfish bonanza. There have been many important social changes which have blurred some of the distinctions Arbuckle made between the "folk" and "urban" cultures. Better communications, more contact with the mainland and between parts of the Chatham Islands, higher standards of living and increased expectations, are all major changes that have altered the way of life of the Chatham Island community. The following section provides an outline of the present community on the Chatham Islands.

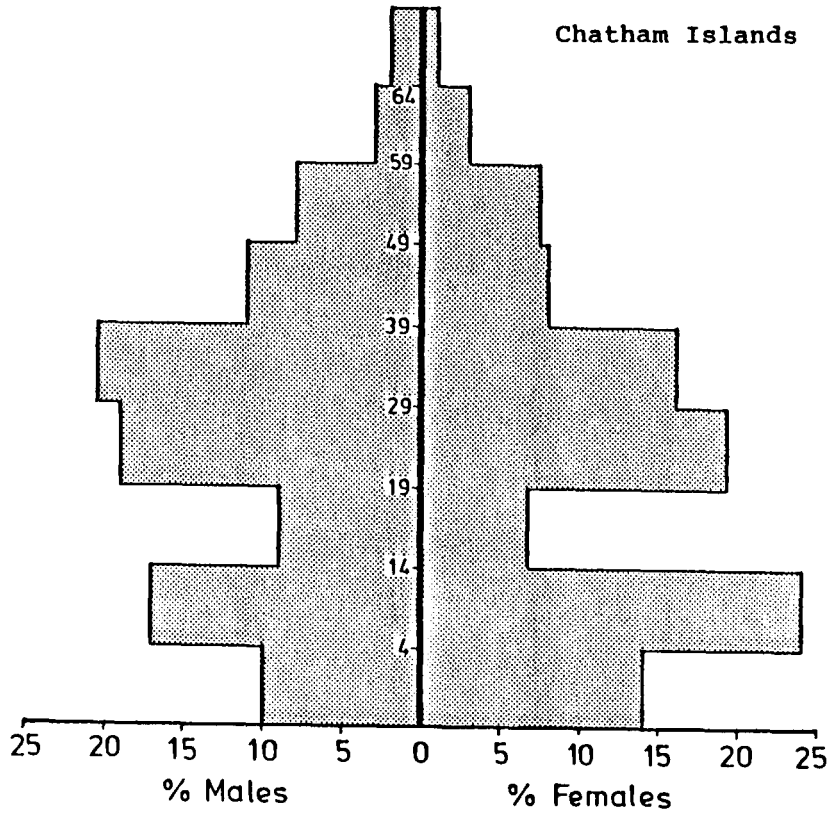
7.1 Population

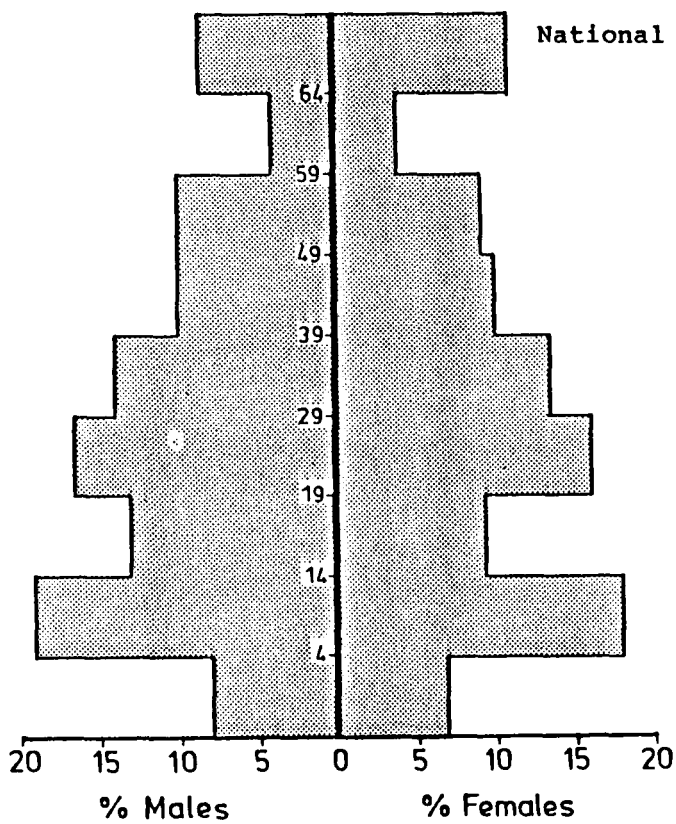
The Chatham Island community, whilst a part of New Zealand, is culturally different. The community has been influenced over the past 150 years by the in and out migration of different groups which have included whalers and sealers, mainland New Zealand Maoris, and European settlers. The indigenous residents of both Chatham and Pitt Island, are descended from the numerous nationalities who have settled the region. Also included are descendants of the extinct Moriori people, who were first to live on the Chatham Islands. The population on the Chatham Islands has been closely linked to the level of economic activity. Boom periods have had population inflows, and subsequent low levels of economic activity have generally produced outflow of population. During most of the past century, the population of the Chatham Islands has fluctuated between 400 and 750 people. The 1981 census recorded a total of 750 people living on the Chatham Islands. An age/sex pyramid given in Figure 5 shows the youthful makeup of the Chatham Island population. The 1981 figures exclude approximately 60 children attending secondary school on the mainland. If they were included as resident population, then approximately 40 percent of the total population would be under the age of 18.

The 1981 census revealed that 357 people resident on the Chatham Island, (or nearly 50 percent) claim to be of Maori descent.

A recurring problem on the Chatham Islands has been the emigration of many young people (particularly females) to the mainland for career opportunities unavailable on the Islands. Fulltime employment for women has really only been available on the Chatham Islands over the last 15 years since the crayfish bonanza (see section 7.3).

Figure 5: Comparison of Chatham Islands and National (NZ) Age/Sex Pyramids.





References: Statistics Department 1981(b) and (d)

The 1966-1971 census data showed a population increase of 40 percent attributable to the crayfish bonanza. The total population, despite an initial decline in the post bonanza period, has remained more or less constant since then.

Approximately 40 percent of the Islands' population is located in the Waitangi/Te One area with smaller communitites at Owenga, Kaingaroa and Pitt Island (see Figure 1). The remainder are scattered among the 60 or so farms. Most populated areas on Chatham Island are readily accessible by metalled road.

7.2 Amenities and Social Services

Waitangi is the administrative centre of the Chatham Islands and has a range of facilities for community activities and commercial services (see Appendix 1). Waitangi is also the the main port, and the new sealed airport at Karewa Point is situated 19 kilometres away. Waitangi contains most of the Civil Servants' housing and all the Council housing is situated there. Also in Waitangi are the Post Office, hospital, council buildings, community hall, court house, general store, garage for engineering work and repairs, another garage for fuel, the hotel and motel.

Accomodation is in short supply, particularly for transient labour. In 1982, five families were successful in a Housing Corporation ballot and took possession of the housing originally constructed for the airport construction and wharf reconstruction workforce.

The hospital is run by Missionary sisters of the Society of Mary, and administered by the North Canterbury Hospital Board who provide a resident doctor. The hospital has four beds and the sisters' services are held in high regard by local residents.

The hotel and motel together provide over 20 beds for accomodation. The hotel has been substantially upgraded over the past few years and is a focal point for the community with its dining room facilities and organised evening activities.

An electrical reticulation scheme is administered by the Central Canterbury Power Board. Diesel generators are run from the meatworks, six kilometres from Waitangi, and provide electricity at 38.6 cents per unit to some buildings in the Waitangi/Te One area. In spite of plans to extend the reticulation area, the majority of Chatham Island residents produce their own electricity supply from

diesel generators.

The main school is located at Te One and has approximately 80 pupils. Schooling is provided up to, (but not including) secondary level, after which time most children attend boarding school on the mainland for some time. A pre-school has recently been established in addition to a Kohanga reo, both of which are located at Te One. Smaller schools also exist at Kaingaroa, Owenga and Pitt Island. It should be noted that these smaller settlements have no shopping facilites and little in the way of community/recreation amenities.

The Chatham Islands have a number of clubs, sporting groups and committees. In recent years, a concerted fund raising effort has been undertaken to build a centralised sporting complex at the Norman Kirk Memorial Reserve site, just outside of Waitangi. Home entertainment has changed considerably in the last few years with the advent of video tape players, and one satellite dish has been installed for foreign television reception. This technological adoption, has served to promote rapid social change.

7.3 Employment

Most labour is seasonal for both the agricultural and fishing sectors, which are the two major employing industries on the Chatham Islands (see Table 5). In 1981, 501 people were recorded as being fulltime in the labour force, and over half of these people were wage or salary earners. Within the group of permanent residents, a comparatively large number of male and female workers are employed seasonally in the meatworks and fish packing plants. Some employment exists in a limited number of service industries in Waitangi.

Employment tends to be male dominated. Most of the fulltime positions for females exist principally in the clerical, retailing, communications and hotel trades. Career opportunities are limited for females however, and many are involved in voluntary community work.

The Chatham Islands have a number of shearing gangs and a few agricultural contractors in addition to one transport operator and a variety of "handymen".

Contractors who have worked on the Chatham Islands have tended to employ mainland labour, as the local residents' work ethic is in many instances different from that found on the mainland. Industries and Commerce (1972) noted that until the crayfish bonanza occurred, few local residents worked the regular hours that mainland employers were accustomed to. Although this situation has changed to a large extent, mainland labour is often preferred for major contracts. For instance, the new airport construction and wharf reconstruction, which occurred between 1979-81,employed fewer than six local men on a casual basis plus the Islands' one transport operator. A total workforce of approximately 30 men was involved with the two projects, with the majority of fulltime labour coming from the mainland. The local business community benefitted from increased demand for goods and services

during the projects. However, most of the materials and equipment were imported, and much of the money injected into the Chatham Islands was leaked out in the form of wages to workers normally residing on the mainland.

The labour requirements for a major resource development on the Chatham Islands are likely to produce a skills mismatch, with regard to the local labour pool. The local workforce is unable to provide more than a small amount of unskilled labour for such development. A large industry could however, attract some expatriate Chatham Islanders back, as many have sought employment in mainland New Zealand due to the lack of career opportunities available on the Chatham Islands.

A synthetic crude oil industry will most likely emphasise particular categories of employment during the course of the development (Taylor and Sharp, 1983). For instance, during the construction phase, most of the employment will be for males. The type of employment generated and its change through time, will largely determine the type of social life on the Chatham Islands during the operation of such a project.

Table 5: Chatham Island Labour Force by Sex and Industry Major Division (1981)

Industry Major Divisions	Females (total nos)	Males (total nos)	Total	% of Labour Force
Agriculture & Fishing	6	141	147	39.2
Manufacturing (includes food processing)	24	48	72	19.2
Community, social & personal (includes Central and Local Government)	15	33	48	12.8
Building and Construction	3	36	39	10.4
Transport, Storage and Communication	15	24	39	10.4
Wholesale, retail and restaurant	9	6	15	4
Others (including inadequately defined)	3	12	15	4
TOTALS	75	300	375	100

Source: Statistics Department, 1982(b)

7.4 Social structure and community way of life

In this section, some of the factors which explain the social structure and way of life of the Chatham Island community are outlined. Due to its isolation and unique ethnic composition, the Chatham Island community is different from other parts of New Zealand. The local residents feel quite separate from the rest of the nation and alienated from its decisionmaking. New Zealand is often referred to as though it were a different country. Thus, the local residents' way of life contrasts quite separately from the body of Civil Servants who also live on the Chatham Islands.

The two main influences on the social structure and way of life of the local community are its size and isolation. These two factors are closely inter-related. Isolation has forged a strong link with the past, and in particular, tradition is an important social factor. Although increased contact with the mainland has weakened many of the traditional ideals, tradition still dictates a number of social norms. These norms for instance, mean that certain forms of behaviour are acceptable or unacceptable. Deviation may result in ostracism of the offending groups or individuals. Isolation also explains a fatalistic trait that orients the community towards the present, as opposed to mainland society which is primarily future oriented.

Smallness is a major contributing factor to the community social structure and way of life. Parochial groupings have produced a fragmented community in which loyalties are closely related to geographic locality or family groups. Public and private roles are often blurred. The size of the community and the close interpersonal relationships, mean that informal community means are the principal methods of communication and social control.

Arbuckle (1968 & 1971) discussed the segmented nature of the Chatham Island community. He listed factors conducive

to segmentation as: geographical isolation of groups, inter-family feuds, religious differences, diversity of racial origin, and diversity of socio-economic status. He contended that these segments are not permanently divided, but unite at some levels where there was a common need, or basis for unity. For instance, local residents unite in their suspicion of outsiders.

Many of Arbuckle's suppositions about the Chatham Island community remain unchanged. The community is still segmented. Most of these divisions are subtle and underlying. Their effect is to prevent social interaction between groups rather than produce overt conflict.

Social groups that can be readily identified on the Chatham Islands are: long-term residents, new arrivals, the Maori community and Civil Servants. These are the fundamental groups and their inter-relationships are explained by the following factors which provide the basis for community interaction. These factors may be the basis for segmentation and/or community cohesiveness:

[1]Length of residence. The first and most fundamental level of division in the Chatham's community is between Civil Servants and the local residents, based primarily on the length of residence on the Islands. Within the second level of divisions, which is among local residents themselves, length of residence is also an important factor. New arrivals to the Chatham Islands often feel frustrated with the lack of progress on the Islands and with the long established residents.

[2]Socio-economic status. Within the local community, socio-economic status is not as important as length of residence. Income is not necessarily related to community status. However, there are some significant distinctions within the community based primarily on socio-economic grounds. Land ownership would appear to be an important factor. Arbuckle (1968 & 1971), listed a number of factors related to socio-economic status, which included personal qualities and family background. Civil Servants

are also contrasted against local residents on socio economic grounds. They live in the better houses and receive steady incomes which are supplemented with isolation allowances.

[3]Kinship. The family unit provides both community cohesion and division. Inter-family feuds in the past, particularly over land matters, have meant that some families do not interact socially, although this is very underlying and subtle. Within family units, there are strong kinship bonds and problems that arise are often dealt with in the extended family.

[4]Proximity. Because of the dispersed settlement pattern on the Chatham Islands, some residents have tended to develop their own sense of place and identity. Although roading and communications generally have broken down much of the isolation within the Chatham Islands, the Pitt Island and Kaingaroa communities have maintained a strong sense of identity.

[5]Occupation. Divisions between fishermen and farmers were particularly pronounced during the crayfish bonanza . Fishing interests are now represented on the Council and many part-time farmers derive an income from fishing. Distinctions between full-time farmers and fishermen nonetheless exist and are manifest in the limited interaction between these groups.

[6]Ethnic origin. As recently as 10-15 years ago, studies on the Chatham Islands noted that there were few divisions in the community based on racial origin. Racial differences have become an important divisive factor in recent years. There is considerable resentment by some older members of the community towards Maoritanga which is fostered by the Department of Maori Affairs. Religious differences have always existed on the Chatham Islands. To some extent this has been manifested in inter-family differences.

[7]Gender and Age. The sentiment that it is a "man's world" on the Chatham Islands is frequently expressed. Few women are involved in important community decision-making, as is exemplified by the fact that there are presently no women on the Council. However, isolation has meant that many women adopt what would traditionally be regarded as "men's roles". As indicated by the age/sex pyramid, there are comparatively few old people on the Chatham Islands. However, it is the older members of the community (particularly farmers), who are responsible for most of the decision making, and fill the positions of influence in the community. Their conservatism and the lack of involvement in decision making by younger people are important considerations.

7.5 Attitudes to Peat Mining Proposals

The Chatham Island community is divided at several levels on the basis of attitudes towards the peat mining proposals. Many of these differences are explained by the different perceptions and positions of various groups on the Chatham Islands, as has been outlined.

New arrivals to the Chatham Islands, in addition to local business interests and in particular the Council, see a new industry as necessary for the Islands' survival. These groups, who are frustrated with the lack of progress on the Chatham Islands, and/or the current administration, perceive a new industry as providing sorely needed investment and people for the Chatham Islands.

The Council is an advocate for investigations into a new industry on the Chatham Islands, with particular interest in improving its present weak financial situation. Under the 1981 Ammendment to the Local Government Act, United or Regional Councils may impose a development levy at a rate not exceeding 0.5 percent of the estimated capital cost of a project; for a project with a capital cost in excess of $50 million. This levy is made available for meeting the costs of roads, recreational and community development. In addition, revenue could also be generated from the import/export dues which the Council can levy, and the land rating base might widen.

Local supporters of the peat mining proposals are adamant that such an operation should be controlled to ensure the local community benefits from the development. For instance, the expectation amongst some farmers was that mined land would be developed to productive grassland and provide impetus to the agricultural sector.

New projects proposed for the Chatham Islands are considered with suspicion and caution by long-time residents. In the past, other proposals, such as peat wax

mining and trout farming, have failed to eventuate. This lack of development has built up a climate of indifference to new proposals.

Another mining operation was recently granted a limited impact prospecting licence in the Te Whanga lagoon and this has heightened concern amongst many residents about mining. Fears have been expressed about the possible destruction of traditional food resources by mining activities, or depletion of resources by the mining workforce. The Te Whanga Lagoon is highly regarded by many local people as a recreation area and source of food such as whitebait, flounder, eels, shellfish and swan's eggs.

Although these fears, both real and perceived, do exist, very few have been formally articulated. Most local residents find procedures for objecting to prospecting and mining licences incomprehensible.

The workforce that would accompany a new industry is treated with suspicion and concern by local residents. Some people were alarmed at the prospect of their interests being displaced on the Council. Others are fearful of a repetition of the lawlessness that was seen during the crayfish bonanza.

Segregation already exists between local residents and Civil Servants in Waitangi. This segregation has been accentuated by the new housing subdivision built for the civil servants. The small workforce for the airport construction and wharf reconstruction projects, was accepted into the Waitangi community with few difficulties. However a large workforce may not be so readily accepted if it appears that local residents would become a minority.

Freudenberg (1982), outlined the importance of the host community's perceptions of an incoming workforce for a new development, using North American examples. The social

changes that have occurred in response to rapid growth are reviewed by Taylor and Sharp (1983), using New Zealand "boom town" examples. The divisions that could result from the unacceptance of a workforce by established Chatham Island residents may well be a significant source of difficulties with a major industry on the Chatham Islands.

Other people on the Chatham Islands rejected peat mining proposals because they were concerned simply that their way of life would be lost. Few benefits to the community were perceived. Many people preferred to see a scale of development better suited to the needs of the present community.

Virtually all people on the Chatham Islands have very little understanding or knowledge of the peat mining proposals. Mining companies in the past have shown a great deal of insensitivity to the local people, for instance, by advertising mining licences in newspapers that are not circulated on the Islands. Despite an invitation, the mining company that applied for prospecting licences in the Te Whanga Lagoon, declined to address a public meeting when the Planning Tribunal was hearing objections on the Chatham Islands late last year. FCL have undertaken an informal agreement with the Council to keep them "informed" on the peat mining proposals. Apart from a series of poorly advertised meetings in 1982, this undertaking has involved little more than notifying the Council when FCL's delegations are about to arrive on the Islands. This situation is in spite of the fact that there has been a seminar on the peat mining proposals given by FCL this year. Also Mines Division (Ministry of Energy) convened a meeting late last year with various Government Departments and the Commissioner for the Chatham Islands to discuss the peat mining proposals. As this sort of information has been made available on the mainland, it should be disseminated to Chatham Island residents. To date, little attempt has been made to keep them notified on the peat mining proposals.

As a result of the absence of information on the Chatham Islands of peat mining proposals, there is already a great deal of speculation and misinformation amongst the local community. Some absentee Maori landowners have recently shown interest in the Maori Land Court proceedings. They perceive that there could be benefits from mining royalties accruing to landowners. Local residents are already making their minds up about what benefits the proposed industry might bring, and whether these developments are in their interests or not. These factors will have an important bearing on how the host community will respond to any large scale mining operation.

8 CONCLUSIONS

This report has provided a synthesis of some of the literature on the Chatham Islands, and an assessment of its community in order to outline issues that could arise from a large scale peat mining operation. Given that this type of development has not yet entered the feasibility phase, conclusions regarding the state of investigations can only be regarded as tenuous. However, it is important to realise that by virtue of the size of the peat mining proposals, a synthetic crude industry will have significant social and economic implications. Both the environment and community are unique and highly susceptible to change. Already, the uncertainty on the peat mining proposals have caused some social impacts within the community.

Planning for further investigations into the viability of a synthetic crude industry should recognise the potential for adverse impacts, and address them directly. Any economic development on the Chatham Islands, should not be in isolation from community development, in order to address some of the problems that have been outlined. Social change from resource development should be of a scale suited to the Chatham Island community, as this is the expressed desire of many local residents.

When considering a major resource development on the Chatham Islands, two fundamental strategies exist with regard to the local community. One is to isolate the development from the host community, and the other is to incorporate the host community in the development. Each strategy will produce a different outcome. The former option may preserve the present way of life to some extent, whilst the latter option will radically alter it.

The option of isolating the development from the community would be quite feasible given the isolated location of a mining town in the north west part of Chatham Island. The construction workforce could be organised to have minimal

contact with the host community, by being self contained with regard to services and amenities. The host community could share some of the transport facilities installed for a mining operation, but generally it would not be involved directly with the mining project. However, it would be virtually impossible to isolate the mining workforce from the host community and would conceivably require draconian measures to do so. Already there are significant expectations amongst local residents supporting development. A strategy of isolating the two groups could only serve to exacerbate differeces beetween the two groups and cause many social problems.

The option of involving the community directly with the mining operation would integrate existing community services and functions. For instance, some measure of guaranteed employment and representation in the administration of the project would be advocated. The whole Island would probably become dominated by the one single large industry. The important concern with regard to this strategy therefore, would be how fast the development proceeds and the provisions for participation by the host community.

Irrespective of whatever strategy, or combination of strategies, is proposed if mining occurs, a number of issues will still need to be addressed. Pressing social and economic problems on the Chatham Islands currently exist and deserve urgent attention, whether the peat mining proposals proceed, or not. These problems include aspects of transport to the mainland, poor central and local government administration, small community size, costly services and amenities, and the development of the farming sector.

An exchange of information on community views and the mining proposals, must be initiated and continued throughout planning, in order that the local community has some say in its own destiny. As the production of synthetic crude oil is principally for the benefit of interests outside the Chatham Islands, it is important that the local community's interests are also heeded. This sort of discourse must be encouraged. The local community should benefit from any development and in a way most appropriate to its needs.

9 RECOMMENDATIONS

[1] Social and cultural issues should continue to be evaluated in an on-going process. A commitment should be made to foster both resource and community development. This objective could be attained by setting up advisory groups comprising representatives of central and local government agencies, the developer and community interest groups. The functions of such a group would include consultation with, and involvement of the local community, information gathering, liaison with various groups and initiation of monitoring. Such an arrangement would allow evaluation of alternative ideas and options for development and mitigation of impacts. It is important that public participation should enable the different community sectors to articulate their concerns and that time and resources are made available to achieve this end.

[2] Research is urgently needed on the Chatham Islands, on the following areas:

- -biological inventories and evaluation of reserves proposals
- -hydrological and water resource inventories, particularly the role of the peat blanket in the hydrologic regime
- -an economic survey is needed to evaluate the role of the Chatham Islands in the New Zealand economy. This study should investigate the costs and benefits of infrastructure requirements for a future industry to provide a data base with which to view the peat mining proposals.

All research findings should be disseminated back to the local community so that a meaningful response can be be made on their part. The use of public meetings and the community newsletter are obvious forums for the exchange of information

[3] The Coal Mines Act should be amended to include greater public input and increased provision for environmental and social matters. This amendment could be achieved by changing

the act to incorporate provisions of the Town and Country Planning Act.

[4] Planning for a major development will necessitate a major reorientation of the Chatham Island administration. As outlined in this report, the central government, and particularly the local government agencies, have little ability to give direction to major change on the Chatham Islands. Two possibilties are outlined and each option is discussed with regard to the effectiveness of implementation and the existing administration.

[a] Regional Planning Exercise A planner could be seconded to the Chatham Island County Council (eg from the Ministry of Works and Development), to act in a coordinating role for gathering resource information (inventories etc), and for liaison with Central Government departments involved with the Chatham Islands. This option would initiate a regional planning exercise. It should be noted that all other areas of New Zealand have either a Regional Development Council or belong to a United Council. Ministry of Works and Development representatives often play an important part in facilitating regional planning. The advantage of such a scheme is that it may be implemented with the minimum of delay and help provide a valuable regional input for the planning of any resource development. For instance, if an operative district planning scheme is implemented, a planner working with the Council will be integral to its functioning. The role of the Commissioner for the Chatham Islands and the Department of Internal Affairs would need to be reviewed.

[b] Separate Act of Parliament A seperate Act of Parliament could be passed to provide guidelines for development of a major industry, and facilitate an input from the Chatham Island community. Some form of legislative control will be necessary as the present legislation provides conflicting objectives. Such an Act of Parliament was passed in 1974 for the Shetland Islands preceding North Sea oil and gas development in Britain. This Act gave the Shetland Islands' Council the right to acquire land and licence construction, so as to isolate the development from the local community

whilst attempting to maximise the benefits. A policy of employing much of the operational workforce from the host community was also agreed upon. However, the local authority there had large financial and administrative resources in comparison with most New Zealand local authorities. The Chatham Islands would require a strengthened regional authority in order to conduct such negotiations.

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11. APPENDIX 1 : Inter-relationships between Mainland and Chatham Island groups

FUNCTION	MAINLAND	CHATHAM ISLAND
ADMINISTRATION	Department of Internal Affairs Commissioner for the Chatham Island	Resident Agent Chatham Island County Council
CATCHMENT AUTHORITY	National Water and Soil Conservation Authority	*
COMMUNICATIONS	Post Office	Linesmen, Telephone operators, Radio Station, Postmaster, POSB
COMMUNITY	Community for the Chatham Islands Department of Internal Affairs Department of Maori Affairs Mainland Organisations	Social groups and Committees Chatham Island County Council Wharekauri Tribal Committee
EDUCATION	Canterbury Education Board Department of Maori Affairs	Four schools and one preschool Kohanga reo
ELECTRICITY SUPPLY	Central Canterbury Electric Power Board	Chatham Island Council Council
FARMING	Advanced Meats Ltd (Gisborne) Ministry of Agriculture and Fisheries North Canterbury provincial branch Federated Farmers Department of Maori Affairs Department of Lands and Survey	§ Meatworks Livestock Officers, Meat Inspector Chatham Island Branch, Federated Farmers * Wharekauri land development block
FISHING	Ministry of Agriculture and Fisheries Fisherman's Association Fletcher Fishing Ltd (Auckland) Salmond Industries Ltd (Wellington)	Fisheries Inspector Fishermans' Association (CI branch) Fish packing plant (Kaingaroa) Fish packing plant (Waitangi) Port Liaison Committee (comprised of local representatives)
HEALTH	North Canterbury Hospital Board	Resident Doctor, Hospital (staffed by Sisters)
METEOROLOGICAL SERVICE	Ministry of Transport	Meteorological Station
POLITICAL	Lyttelton and Western Maori MPs	National and Labour party branches
PUBLIC WORKS	Ministry of Works and Development Mainland contractors	Carpenter, Painter Chatham Island County Council Local contractors
RETAILING	Lyttelton and Canterbury businesses	General store, hotel, two garages
RESERVES	Department of Lands and Survey	Reserves Ranger and Assistant
TRANSPORT	Department of Internal Affairs Ministry of Transport Safe Air Union Steam Ship Co	Chatham Island County Council Meteorological Station § Chatham Island County Council (78 return flights/year) § (12 voyages/year)

KEY: * No direct representative for that particular function

§ Run on contract