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Neiafu Master Plan
Vava'u,
Kingdom of Tonga

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Strategic Environmental Assessment (SEA) Report

Neiafu Master Plan
Vava'u
Kingdom of Tonga

Prepared for the
Ministry of Foreign Affairs
Kingdom of Tonga

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INTRODUCTION

This report presents the results of a strategic environmental assessment of the development projects that have been proposed for the town of Neiafu, on the island of 'Uta Vava'u, Tonga, as part of the Vava'u Development Programme. The various project proposals have been described in the Neiafu Master Plan (Draft Final Report), accordingly, no details of the individual proposals are given in this assessment.

This Strategic Environmental Assessment (SEA) was initiated by SPREP out of necessity to determine through the various project environmental impact assessment reports that SPREP has undertaken in relation to the Neiafu Master Plan, together with other proposed projects in the Plan, that the basis for the proposals is environmentally sound and to help determine in totality the broad environmental impacts of all projects of the Plan on the Port of Refuge and the township of Neiafu. This report also marks the first attempt by SPREP to apply environmental assessment to policies, programmes and plans.

The Purpose of Strategic Environmental Assessment (SEA)

For the purpose of this report it is not appropriate to give a detailed explanation of the nature and purpose of Strategic Environmental Assessment, but rather a brief overview to clarify the aims of the report.

SEA is a form of Environmental Impact Assessment (EIA), but has a different emphasis compared with project EIA. Project EIA examine proposed activities in some detail in order to make specific predictions about the changes that will take place in the biophysical, and socio-economic and cultural environment. This information can be used to modify, or even cancel, the intended activity for the purposes of mitigating or avoiding significant adverse environmental changes. SEA is also concerned with identifying adverse environmental changes but is used to evaluate policies, programmes, and plans, rather than specific project proposals. Of necessity, it must take a more general view of environmental implications than project EIA. Rarely, for instance, does it deal with specific impacts of individual activities at a stage when it is still possible to modify the proposed policy, programme or plan. The particular benefit of SEA is that it allows a coherent overview of a set of proposed activities that may possibly have effects on the same geographical area and/or the same environmental sectors. It is particularly useful when a proposal has been evolving over a number of years as it allows an appraisal of the overall proposal, away from the detail of specific project proposals. Therefore, SEA is an opportunity to step back and review the evolving policy, programme, or plan and ensure that the basis of the proposal is environmentally sound.

Often SEAs are based on the broad concepts of sustainability, which provides the criteria for evaluating the proposal and the environmental changes that are likely to occur after the proposal has been implemented. Sustainability is widely seen as a concept that seeks to balance the needs of economic development and the well-being of local communities and the natural environment. The SEA process, in common with all EIA activities, is a fundamental tool for the promotion of sustainable development, as it emphasises thinking through the environmental consequences of proposed developments before committing to the proposal. In this way, environmental costs and trade-offs can be brought out explicitly in the

decision making process and steps can be taken to enhance long term sustainability of the final development.

It is important to recognise that the environment being considered includes not only the natural environmental components but also the human communities affected by the proposed policy, programme or plan. The community lifestyles, values, health and culture are seen as part of the overall environment that might be changed. In terms of the concept of sustainability, the support of local communities for the plan or programme is given a high weighting, which makes the avoidance of adverse impacts particularly important. Another major issue in planning for sustainable development is the importance, where possible, of not reducing options for future resource users. This means that careful thought must be given to the consequences of proposed actions to ensure their impacts do not unintentionally constrain such future options.

SEA is very appropriate to the planned activities in Neiafu. The combination of all the proposed activities constitutes a major change in the character of the town and its role, not only in Vava'u but in the country as a whole. Vava'u supports about 20 per cent of the Tongan population and Neiafu is of major regional and national importance. Equally, unintended consequences of the proposals, particularly if they affect the economic and social base of the local area or region, will be of great importance.

It is important to recognise that this SEA is an evaluation of a specific document - the Neiafu Master Plan - published in 1993. The Plan reflects the thinking at that time and inevitably the subsequent implementation of the Plan has seen a degree of revision of ideas and intentions. The comments in this report are made on the basis of the 1993 plan as it stands, however, brief comments at the end of this report include recent thinking on the development issues in the Vava'u Development Committee and the Vava'u Development Unit.

Methodology

The SEA was approached in three ways:

a. The background to the Neiafu Master Plan, its links to wider policy initiatives for Vava'u and for Tonga as a whole, and the general environmental context of the plan, were examined. General features of the plan, and of the policy and programme development process, could then be assessed for their degree of adherence to good environmental planning criteria.

b. The component activities making up the plan were examined in a broad but coherent fashion to help identify the major environmental implications. A simple impact (interaction) matrix was used to help organise this approach, and attention was paid in particular, to the totality of the broad environmental impacts (i.e. a cumulative assessment), the relative distribution of impacts between the biophysical and social environments, and any specific issues that had not been identified in relation to individual projects in the Master Plan. In some cases more detailed environmental impact assessments would be useful and these have been identified.

c. In light of broad environmental implications of the development plan, the study examined the issue of monitoring and the feedback of information into the development activity. The emphasis here was on monitoring for the wider environmental concerns, rather than project specific concerns, although in reality there is a necessary link.

POLICY CONTEXT OF THE NEIAFU MASTER PLAN

Vava'u Regional Development

The Neiafu Master plan is the product of a planning process begun in the early 1980s, but given greater focus in 1986 with the establishment of the Vava'u Development Committee (VDC). The purpose of the committee is to plan for the social and economic development of Vava'u and they have commissioned a number of reports to this end. An important document was the so-called "Atkins" report: the *Vava'u Regional Development Programme. Phase II: Final Report, Project and Programme Dossiers,* completed by the consulting firm WS Atkins International and published in August 1989. In Phase I, the consultants had examined the social and economic character of Vava'u and made a number of recommendations for development projects, aimed at the improvement of the economic base of the region and living conditions of local communities.

The Phase II report outlines specific projects, making up an overall development programme for Vava'u. The report describe the programme as:

"A strategy to promote the primary sector and maximise natural advantages. The development strategy is based on a balanced programme which reflects the rural lifestyle of the population and the predominance of the primary sector in employment and wealth creation. It also recognises that the scenic and environmental quality is such that Vava'u has significant tourist appeal, a potential which must be harnessed through a sensitive and phased development programme which conserves and enhances these assets." (Atkins report, executive summary, p1-2)

And later in the report, by way of background information:

"The programme is designed to enhance rural employment and income levels through active promotion of export crops and improved marketing of fish products. Enhanced tourist attractions are intended to increase visitor expenditure and hence incomes in the region whilst at the same time conserving the natural heritage and environmental balance of Vava'u. Road improvements will be influential in promoting agriculture and tourism facilities and hence are an important part of programme design. The central town of Vava'u, Neiafu, requires a number of improvements in order to raise the standards of living for its inhabitants and these considerations have been assessed fully. The overriding requirement is clearly for a Masterplan of the town to be undertaken in order to assist future planning. Social considerations have been made in assessing health and education requirements." (Atkins report, sect. 2.2.a)

The Neiafu Master Plan therefore is a direct product of this process. The Atkins report provided a reasonably detailed brief of the topics to be addressed in the plan:

a. building conservation and regulations
b. town amenity sites
c. transport management
d. potable water supply
e. urban sewage disposal
f. power station
g. new market site
h. harbour/wharf area
i. strategic planning of foreshore, old Neiafu harbour and the Pouono

harbour and the Pouono historical site (adjacent to the Governor's office)

Overall, the Master Plan was to guide future development, limit land use conflicts and improve architectural and design standards. The Plan was produced in 1993 (by Kinhill Kacimaiwai) and presented an integrated plan for the development of the town, incorporating the specific activities listed above. A technical feasibility study was released in 1994 and proposed more detailed investigations for a number of the projects described in the original plan.

The Vava'u Development Unit, established in 1992, is responsible for implementing the projects contained in the Neiafu development programme, as well as development projects for other areas of Vava'u, such as jetty development and solar-powered lighting in the outer islands. Projects linked to the Master Plan which are underway and those to start in the near future include drainage improvements in the town centre, wharf re-development, and re-location of the open market. Other projects will be undertaken as the programme develops and funding is finalised. The Tongan Water Board has a national programme underway for improving water supplies, and the Neiafu water supply problems are being examined within that programme.

National Development Plans

The whole Vava'u development initiative has to be seen in the wider context of national development policies. The Tongan National Plan, produced on behalf of the Government by the Central Planning Unit, represents a periodic appraisal of the social and economic state of the country and sets out national development objectives for the various sectors of the economy and for social services such as health and education. The planning for the development of Neiafu has taken place under the fifth and sixth National Plans and will consequently reflect the broad economic and social objectives of the central government.

The Sixth National Plan does not explicitly consider the environmental implications of the development objectives set out in the Plan. However, in 1990, Economic and Social Commission for Asia and the Pacific (ESCAP) produced an Environmental Management Plan for Tonga which does address many of those issues. The ESCAP document reviews the major sectors of the Tongan economy and identifies important environmental impacts and issues associated with those sectors. The document also contains a summary of the institutional arrangements for managing the environment and dealing with the problems raised by the various economic activities, from farming and forestry to fishing and tourism. This is used to identify possible improvements to the environmental management framework for the country.

The ESCAP document is a valuable resource and can be used as a source of ideas for sound environmental management of activities that can affect the environment. The main limitation of the report is the comparatively weak analysis of the social impacts.

Comment

Given this background, a number of observations can be made about the Neiafu Master Plan.

(a) The Atkins report set the context for the Master Plan in clear terms. The focus was to be on improving the living standards of local people by using the available natural resources, but clearly recognising the need for wise use of those resources, be they agricultural, fishery or aesthetic resources. The implication is

clear, the resulting development proposals were expected to balance the economic, social and environmental needs of the region so that local people could achieve a better standard of living, while protecting their resource base. This is one of the main principles under-pinning the concept of sustainable development and it is clear that the Neiafu Master Plan was expected to fit within this context.

Three observations can be made, however. First, it is not clear from the Atkins report as to what extent the local communities in Vava'u had participated in the development programme to that stage. There is also no indication that participation would be a consideration in the continuing programme. Certainly the VDC has two People's Representatives to the Legislative Assembly (i.e MPs), but there appears to have been no other formal mechanism for seeking the views and concerns of the community. It is widely recognised that major initiatives such as those comprising the Vava'u development programme require strong support from the local communities if they are to succeed in the long term. Intensification of agriculture and fisheries will only occur if the farmers and the fishing community wish those outcomes for themselves, and that, in turn, often requires their involvement in developing programmes that tackle their specific concerns and needs. Moreover, the local knowledge they bring to the process will often improve the design of options and the subsequent evaluation and selection of the best option. This is especially the case where knowledge of the local environment can be very valuable in relation to projects such as road and causeway building. Local awareness of environmental conditions can help avoid basic problems arising from ill-considered location or design.

Second, environmental planning requires a good understanding of the environment in the area. It is not clear from the Phase II study that the social and natural environments were examined to establish parameters such as natural carrying capacities, resource use limitations, sustainable yields, limits of acceptable change, or other similar measures that are used to identify the basic environmental limits on economic and social activities. For instance, with water supply, it is not evident that a water resource survey was carried out to determine the extent of groundwater supplies. Is there a limit beyond which further usage would harm the groundwater resource and threaten social and economic activities?

Third, linked to the last point, the Atkins report was the stage at which an environmental assessment of development options would most usefully have been introduced. What are the environmental consequences of promoting more intensive agriculture in Vava'u? Will the expansion of tourism threaten the natural or social environment in some fundamental way? An SEA would have been very useful for informing the policy process at that stage of the programme.

(b) The plan contains a mixture of elements, reflecting the original brief in the Atkins report. There are specific activities aimed at the improvement of living conditions for local people, while other activities are more clearly aimed at improving the economic base of the town - for example, by addressing infrastructure problems. The plan also contains broad indicative policies about the future management of development in the town; residential, industrial and tourist developments are seen as being managed spatially, through a zoning-type strategy, to minimise conflicts.

The practical activities, i.e the projects, are largely funded through the government (often with the assistance of donor countries) and can therefore be promoted with greater certainty.

The policies aimed at managing the future development of the town are not as easily implemented, as they are dependent on the establishment of control procedures such as legislation. Consequently, there is a clear danger that the broad, integrating policy framework will be overlooked and the Master Plan will be implemented in an incremental manner. This has implications for environmental aspects of the development. Once a plan becomes a set of discrete projects, the broad environmental principles underlying the plan can be lost sight of, diminishing the original value of taking a strategic approach to the development of Neiafu.

Overall, it would seem that the Master Plan is based on earlier steps that explicitly recognise the importance of environmental management and the need to avoid adverse impacts on the social and biophysical environment. The specific topics to be covered in the Master Plan were generated within that context and it can be assumed that they were considered to be consistent with the underlying sustainability perspective of the Atkins report. However, there is no evidence of any formal examination of the possible environmental consequences prior to the selection of the particular development options. This does not mean that those options are not the right ones for the Vava'u region and its people, but it does leave open the possibility that important environmental problems may still result from the initiatives being pursued.

The ESCAP *Environmental Management Plan for the Kingdom of Tonga* (1990) provides a very valuable overview of the major environmental concerns associated with the various sectors of the economy. It summarises the particular problems being experienced in different parts of the country for instance, the impacts of tourism on the Vava'u marine environment are graphically described. The document then prescribes a variety of possible management responses which can be used to develop environmentally based development policies for activities such as tourism and agriculture. One would hope that if the Atkins report were to be produced today, the ESCAP material would be used to evaluate the strategic choices available for developing the Vava'u region.

Implications of Tourism Development

The Neiafu Master Plan includes a number of projects that directly or indirectly address tourism related problems in the town. By undertaking these proposed projects, the tourism industry would be encouraged. In all likelihood, Neiafu would become a major centre attracting tourists in its own right, and providing a service centre for tourists drawn to the wider region, especially the marine area. That encouragement could then result in greater tourism impacts in other parts of the region, particularly on the reefs and in popular anchorages. A project-oriented EIA, assessing the immediate impacts of the proposed projects on the local environment, does not take this wider perspective into account hence the need to assess the *policy of encouraging tourism* before developing specific projects for particular locations. The regional and even national implications need to be explored first, then development projects can be identified and planned within a framework that takes the wider implications into account.

Apart from the water supply question alluded to earlier, one particular issue that will need to be addressed in light of the proposed developments, is the question of solid waste management, especially domestic refuse. Population increase, allied with increasing standards of living, plus an increase in tourism activity, will inevitably lead to greater amounts of solid waste for disposal. This issue does not appear to have been considered in the development programme

to date, yet has serious environmental implications. At present, solid waste is being dumped on a site immediately adjacent to a mangrove area, approximately 2-3 km north-east of Neiafu. From experience around the region, one could say that the location of the waste site is the worst possible, given the propensity of such sites to release leachates into nearby water bodies and groundwater, affecting water quality and the local aquatic biota. Management of the site does not appear to conform with normal sanitary landfill standards (separation of waste types, covering waste at frequent intervals, etc..). Without a specific waste management strategy, this situation will only get worse as the production of solid waste increases with economic development, producing long term problems for the land and adjacent marine areas and for the health of local communities. Out of sight, should not mean out of mind. It is interesting to note, for instance, that the road improvement programme necessitates the quarrying of coral limestone in various parts of Vava'u. These quarries might be possible sites for future landfills with solid wastes, within a programme of land restoration after quarrying finishes.

It is also worth noting that the biophysical impacts of tourism are reasonably well known and acknowledged (see the ESCAP document for example). But there is increasing concern around the world about the social impacts of tourism on small communities in areas of great natural values, such as Vava'u. The changes brought about in small communities can be dramatic: the structure and dynamics of the local economy change; the cohesion of family units can be disrupted as the relative economic roles of women and men, and young people, change; visitors can bring social and cultural lifestyle innovations that may be very different to local customs; the community experiences and influx of people from rural areas, outer islands, or from overseas attracted by the increased economic opportunities, putting pressure on housing, services, infrastructure and so forth. These changes can result in once cohesive communities becoming disrupted, with alienation of young people, greater economic disparities between people involved in tourism and those still in traditional activities, increasing prices of goods for local people, commercialisation of cultural activities and other similar changes. Together with a degradation of the local biological and physical environment through tourist activities, affecting traditional food gathering areas or recreational and cultural areas, these changes can have dramatic effects on local communities.

It is important that the trade-offs between the undoubted benefits of development such as tourism and the adverse effects on the social and biophysical environments are recognised and explicitly addressed by the local communities. Possibly the worst impact is a sense of helplessness as tourism growth seems to overwhelm a local community. Involvement in planning for tourism development, and retaining a strong interest in protecting the very resource base that supports the tourism development, gives local people a sense of control that promotes a successful and sustainable tourism industry. The Atkins report refers to the need to enhance tourist attraction whilst conserving the natural heritage and environmental balance of Vava'u. This fine sentiment needs a suitable implementation mechanism if it is to be realised. Ideally the mechanism would be an appraisal, involving local communities as well as commercial interests, of the environmental and economic implications of tourism development as the basis for identifying development options.

ASSESSMENT OF THE NEIAFU MASTER PLAN

As noted earlier, the Master Plan comprises a set of policies concerning land use and building standards, together with specific projects for upgrading infrastructure and enhancing the urban landscape in various ways. The scope of the Plan was largely determined by the terms of reference supplied by the Atkins report, but the relative emphasis and general treatment of the issues in the Plan are a product of the planning study itself. This assessment looks briefly at the treatment used in the Plan, reinforcing some of the comments above, before addressing specifically the environmental implications of the set of activities in the Plan.

Emphasis and Treatment

One main impression from the Plan is that the tourism aspect is given a high degree of prominence. This is not altogether unexpected, the town has a central role to play in tourism services in Vava'u, and with a regional development policy that is seeking to enhance the primary sector activities as well as tourism, Neiafu's part in that policy will tend to reflect the urban-based services and would naturally increase the emphasis on tourism issues.

However, this emphasis on tourism seems to go beyond what might be expected from the TOR. For instance, the proposals for creating a pedestrian-only area in the centre, allied with suggestions for the re-development of the buildings between that area and the proposed reclaimed waterfront, indicate a strong tourism focus. Many of the infrastructure projects are presented in terms of their benefits, not only for local people, but also for tourism prospects. In itself, this is understandable, the town does have the potential to be developed as a major tourist destination. But the broader policy basis of the Vava'u Development Programme also emphasises the importance of improving the primary sector, as well as improving basic living conditions for local people. The emphasis of the Plan might, therefore, have been better placed on an appraisal of the role of Neiafu in the primary sector activities of the region, and then considering the projects from the perspective of improving and enhancing that role. Wharf upgrading, market improvements, road improvements, etc.., would then be clearly seen from that perspective. Pedestrian areas would be developed if local people thought this would be a real benefit to their quality of life and/or it enhanced service functions. The Plan makes many proposals that may well improve the quality of life for local people, but one is left asking the question as to what extent do the proposals match the concerns and needs of the local community? Who will benefit most from the proposals, the local people or the tourist?

The point is not to ignore tourism, and certainly not to ignore the importance of protecting the environmental qualities that encourage tourism. However, the long term viability of the local economy and the local communities requires a balance of development intentions. The emphasis in the Plan does seem rather too strongly towards one particular economic sector, tourism. Moreover, there is no explicit recognition of the point made in the previous section, that encouraging Neiafu as a tourism centre will increase tourism activity, and consequently tourism impacts, over a wider part of the region. The environmental implications of this have not been recognised in the Plan.

Project Assessment

A simple impact matrix was formulated to review the broad environmental implications of the various project proposals. The intention is not to provide definitive judgements about the environmental impacts of each project. Properly constituted EIA studies will be necessary for such judgements. Instead, the matrix helps to compare the broad environmental implications across the various projects and provides guidance in identifying possible cumulative impacts, and interactions between projects that might create enhanced impacts or other problems, such as hazards. It can also be used to examine the distributional aspects of impacts, that is, who is winning and who is losing from the overall set of projects.

There are major limitations to impact matrix analyses. At this level, judgements can differ between impact assessors, also categories are very wide and some aspects of an environmental component may be affected whilst others may not be. Similarly, some geographical areas may be affected whilst others are not, or are affected in different ways. For instance, the pedestrian area proposal also envisages a loop road though the streets behind the town centre. These would become very busy roads, compared to their current status. Consequently, a pedestrian-only area would have benefits in the town centre, but adverse effects for the residents in the streets that will carry greatly increased traffic. Another example is the road construction programme which requires coral limestone to be quarried and crushed. The quarries are often in rural areas and have a number of impacts. Some of these are beneficial (employing local people), others are adverse (removing productive land from the agricultural sector, creating dust and noise that affect local communities etc.). Complex impact situations such as these, which involve direct and indirect effects, spatially differentiated (and perhaps temporally variable also) are impossible to portray in a simple matrix. Therefore, the matrix is used mainly as a device by the assessors to organise thoughts and to portray in a simple fashion information about the possible impacts of the projects. It is not a foolproof analytical method!

The completed matrix is shown in figure 1.

Main points from the impact matrix

1. The assessment explicitly differentiates between the construction phase of the projects (denoted by C in the matrix), and their subsequent operational phase (denoted by L, for long term, in the matrix). It is clear that many, if not all the proposed projects are likely to have adverse effects at the construction stage. These are mainly impacts such as noise, disruption of daily social and economic activities and the exposure of soil to rainfall and erosion processes during the construction period. The latter possible effect is largely responsible for the many - C entries for the marine environment in the matrix; this envisages the possibility of silt reaching the harbour during periods of heavy rainfall, affecting water quality and perhaps also marine organisms, as well as aesthetic values.

2. Most of the adverse effects fall on the local people and the marine environment, which is entirely as expected, given the projects will take place in a town by the sea. There are some indirect effects in the rural sector, mainly due to quarrying which provide crushed coral limestone for roading and pavement construction. The environmental

reserve, by preserving a major area of comparatively unmodified forest, is the only project that would impinge directly on natural ecosystem components (soil, fauna and flora). It can also be considered to have indirect benefits for the marine environment, by not contributing silt (and sewage!) as the nearby urban area does.

3. Local people should benefit from a number of the proposed projects, in a variety of ways. Health is a key area, and road construction (less silt, less airborne dust), better water supply (less chance of contamination), better sanitation (again, better groundwater quality) and better drainage (less overflowing of sewage tanks and pits, fewer puddles for insects to breed etc.) are all likely to improve aspects of health in the local community. Social activities (daily living activities), including interaction with other local people would be enhanced by many of the proposals, although adverse effects from construction activities will be felt (disrupted access to buildings or to certain parts of the town, dust and noise nuisance, etc.). There may also be long term adverse effects from re-routing the main traffic flow, and centralising all or most government offices into one building on Queen Salote Park (in fact this latter proposal does not seem to be going ahead, see the postscript at the end of the report). Visual amenity in the urban area would benefit in the long term from most of the proposals, although all construction activities can be considered adverse amenity impacts (but unavoidable) in the short term.

4. Economic activities show an interesting pattern. Tourism would probably benefit in the long term from all the proposals. They all improve the look or the functioning of the urban area in a way that would be beneficial to some aspect of the tourist industry. Of the other sectors, agriculture and fishing would probably only benefit from some of the other projects, such as better drainage in the town centre, while indirect benefits would also come from improvements in the agricultural and fishery sectors. However, the proposed removal of some old wooden buildings along the main street would adversely affect the shops and businesses located in them.

5. The last point indicates one area of adverse impact suggested by the matrix - the historical and cultural aspects of the urban landscape. Loss of old buildings and the loss of a central park would be changes that local people may not wish to see.

Comment

It is interesting to note that most of the cells in the matrix with entries are on the second half of the matrix (essentially the "social" impacts of the proposal). The effects on people, both beneficial and adverse, would seem to outweigh the likely effects on the natural environment. Even the effects on the marine environment can be seen in many ways as effects on the local community, these include limiting fishing, recreation, amenity and tourism use of the marine area.

When considering the likely impacts, we have assigned the labels "adverse" and "beneficial" depending on how we think various sectors of the community would respond to the changes. But these judgements are essentially value judgements, and ultimately the local people must make the judgement about the changes that may occur as a consequence of the proposals. They must decide if the old buildings along the main street are cultural assets

worth saving or dilapidated buildings that ought to be removed for site re-development. This type of value decision involves trade-offs between benefits and costs and it is the local community that has to live with the results of the trade-off calculations. For this reason it is important for the people to have some involvement in considering the proposals and their likely effects. (Ideally, an SEA should involve members of the local community, including representatives of the various interest groups, so that the values used in the assessment are those of the affected parties and not the study organisers).

In this regard one might ask the local community if they want the benefits of improved visual and amenity values in the town centre, and enhanced tourism values, when some local people will have to bear the cost of busier roads (with associated dirtier and noisier and more hazardous living conditions), and the agricultural and fishing sectors primarily benefit from only two of these projects.

As implied earlier, the Plan seems to be planning *for* people, rather than planning *with* people.

In terms of cumulative impacts, the most obvious one is the combined effects of the construction phases of all or several projects if they were to be undertaken concurrently. Being in a comparatively small geographical area the construction impacts could be severe. The disruption to traffic and pedestrian access, noise, dust, and the danger of large quantities of silt entering the harbour. Although the timetable for implementing projects is largely determined by the availability of funds, some thought could be given to the possibility of co-ordinating the construction phases of certain projects to minimise the potential for social and economic disruption and silt transport.

The marine environment is, not surprisingly, the major recipient of many of the possible adverse effects of the proposals, largely through the silt problem. However, the combined benefits would be large if the proposals were effective. Reduced sewage from seepage and surface run-off, and from yachts, and reduced silting in the long term as a result of sealed roads. At the same time, it must be recognised that a substantial contribution to the silt problem comes from the activity of pigs in local gardens, removing ground vegetation over large areas and exposing surface soil to erosion by rainfall. A comprehensive approach to managing marine water quality and the sedimentation problem in the harbour area will have to include strategies for dealing with these issues. One way to tackle this is to involve the community in recognising and solving the problems with the marine environment. Solutions to pig management (greater use of pens, for instance) will need to be initiated by the community and enforced by social pressure and sanctions if they are to be successful.

Land use policy framework

A key proposal not included in the matrix is the policy of land use management - influencing the location of residential, industrial and tourism development to minimise conflicts. This is to be achieved by identifying areas of the town in which those activities would be acceptable. The Plan also envisages a clear boundary to the town, to prevent ribbon development along the main roads leading out of the town.

The land use management policy requires a mechanism for development control. The current system is weak, with the type of development largely being determined by the land owners.

There are some licensing procedures, such as those linked to health considerations, but overall they do not constitute a strong and coherent framework for regulating land uses. In particular, a land use policy would require licensing agencies to turn down applications for development that may meet normal operating requirements but which are in the wrong land use zone. It is hard to envisage agencies being willing, or able, to implement such a procedure under current conditions. This situation is compounded by the lack of a local territorial authority with land planning functions.

The Master Plan recommended simple legislation at the national level. To provide such a framework, developments (residential or commercial/industrial) above certain size thresholds would require a permit or license from a specific statutory body. However, the government do not appear to have adopted this recommendation and there certainly do not appear to be any plans to introduce such a dramatic change in the legislative approach to land use management.

This means that the broad policy framework of the Plan cannot, in effect, be implemented. Even if existing licensing arrangements could be used more strenuously, there would have to be strong co-ordination between the various local offices of the government departments and the VDU in order to co-ordinate their actions to achieve the basic intent of the policy proposed in the Plan. Such co-ordination is not evident at present, although it might still be encouraged in the future. Given this state of affairs it is not surprising to see the start of ribbon development along the road from Neiafu to the airport, and the road to the Vaipua causeway, to the west of the town.

The implementation problems aside, it would also be important to consider the implications of such zoning measures before introducing them (there are undoubted attractions in separating and localising the main development types) as there are potential problems. First, land owners would be adversely affected if they were in a zone that did not allow the development they wished to pursue. In the case of industrial or tourism development, this would represent a real economic loss to the owner. Similarly, the value of the land would be affected by the development constraints. The question of compensation may then be an issue.

Second, concentrating tourism development in a particular area may have important consequences for the local infrastructure, particularly sewage and refuse disposal and water supply. There would be an increased likelihood of conflicts between local residents and a developing tourism focus, especially with increased road traffic, and there would probably be much greater use of the marine area in the vicinity of the development zone. The industrial zone can be examined in a similar way and potential problems identified.

Third, the separation of major economic activities from the main residential areas may have implications for employees travelling to work. For instance, locating major tourism development to the east of the town may encourage greater use of vehicles to transport employees from more distant parts of the town, which would increase road usage, possible contribution to congestion, and increased vehicle exhaust emissions.

It is clear that the land use policy framework will be difficult to implement, but may also require environmental and economic appraisal if it were to become a reality.

Impact assessment needs

Several proposals would probably need closer scrutiny for their environmental implications, despite the efforts made in the Master Plan to weigh up the benefits and disadvantages of the various options:

a. the proposal to develop a sewage system for central Neiafu, collecting the sewage generated in the area and piping it out to sea. This would require serious scrutiny and the various options considered in terms of their economic, technical but especially their environmental feasibility. Sewage is probably the most serious threat to the marine-based economy (fishing and tourism) and any such proposal must be rigorously appraised.

b. the proposed foreshore development, including a pedestrian access way along the harbour side from the tourism focus, would also need careful consideration. The potential adverse effects of these proposals for the local marine environment, together with possible amenity implications, should be examined.

c. a social impact assessment might be considered for the general set of proposals that would alter the physical nature of the town. The change in location of the market, the pedestrianisation of the centre, the re-routing of the main road around the centre, the concentration of government offices on Queen Salote Park and the concept of zoning land for development. The nature and extent of the cumulative effects of these proposals may not be anticipated by the local community and a social impact assessment would be a useful vehicle to address any concerns that might be evident before the proposals go any further.

d. while not strictly an impact assessment, a study of the local waste management system is an urgent requirement. The development proposals, if they have the desired effect, will increase the level of economic activity in the town, and probably result in a steady population increase over the next few years. Domestic refuse disposal must be managed more effectively than it appears to be at present, if environmental and amenity problems are to be avoided.

MONITORING REQUIREMENTS

The concept of sustainable development implies a concern to ensure that undesirable changes in the natural social environment are minimised. Impact assessment, at both the strategic and project levels, seeks to foresee such changes and to suggest appropriate modifications to the proposal in question, in order to avoid the changes predicted. However, forecasting possible changes is fraught with uncertainty. No prediction in the environmental arena is foolproof. More importantly there is always the possibility that we know too little about complex environmental processes and that we have failed to anticipate serious changes in important sectors of the environment. Sustainable development must therefore, also include the monitoring function - to provide information on the actual state of the environment so that appropriate management responses can be formulated.

At the simplest level, it would be useful to measure the effectiveness of wharf upgrading for the agricultural and fishing sectors, but more importantly, the state of the marine environment in Port of Refuge, and around the outer island, must be of concern with increasing tourism pressures. Monitoring will be necessary if the marine environment is to be managed effectively. The local community may change in a variety of ways as a result of the various proposals, and it might be thought useful to monitor community attitudes, health and behaviour in a systematic way, to assess the effectiveness of the infrastructure improvements as well as providing an early warning of less desirable social changes (such as increases in shop-lifting, damage to property, etc).

Neither the Atkins report nor the Neiafu Master Plan make provision for environmental monitoring activities and consequently, there are no mechanisms for detecting adverse changes in the environment and formulating management responses. This is an important issue. Increased economic activity in the primary sectors and in tourism will only be sustainable if that increased activity does not begin to damage the resources on which it is based. Monitoring is the only way this can be detected, which is the first step in developing a management response.

Monitoring assumes that if the current state of a system is known, then future observations can be compared with the earlier ones to detect changes and identify possible concerns. Therefore, environmental or resource inventories are necessary, which use indicator variables to characterise the current state of the environmental sector of interest. There are considerations about taking measurements that will allow for spatial and temporal characterisation of existing variability, so that the inventories have to be designed carefully, on a scientific, statistical basis. Then monitoring activities have to be designed with equal care, the indicator variables are periodically measured and compared with the baseline values to provide the basis for detecting changes.

Monitoring priorities in relation to the Neiafu proposals (and not including strict economic performance monitoring) are:

a. the marine environment, in Port of Refuge and around outer islands; water quality (turbidity, faecal coliforms, etc.); indicator organisms (algae, benthic organisms, diversity of reef fish, etc.); habitat indicators (health and integrity of coral, etc.); sedimentation processes adjacent to the town (and other local population centres) and so forth.

b. the Neiafu community, age/sex make-up of the population, household structure, employment characteristics, health indicators, public order indicators, attitudinal indicators, and so forth.

SUMMARY AND CONCLUSION

This strategic environmental assessment has identified a number of issues:

a. there is a basic sustainable development objective evident in the Vava'u Development Programme (VDP), especially as expressed through the Atkins report, and this is a promising and valuable stance;

b. there does not seem to have been any formal environmental assessment of development options during the early stages of the Programme;

c. there do not appear to have been any studies into such parameters as carrying capacities, environmental constraints, etc., that would indicate an environmental planning approach to the development programme;

d. there does not appear to have been a great deal of formal input into the Programme from local communities;

e. the Master Plan seems to accord tourism development a higher priority than that implied in the Atkins report. At the same time there is no apparent awareness of the wider environmental implications of upgrading tourism facilities in Neiafu;

f. the policy of enhancing tourism needs to be considered in terms of regional and local environmental implications (including possible social consequences) before specific projects are initiated;

g. most of the effects of the various proposed projects will probably fall on the local community and the marine environment. Many adverse effects are short term and related to construction activities;

h. the construction phase of several projects would probably lead to silt transport to the marine environment, especially near the harbour area;

i. social and amenity impacts tend to be adverse in the short term and positive in the longer term. Health in particular is likely to improve if the proposals are implemented;

j. the combined social impacts of the various proposals affecting the town itself could be quite marked;

k. agricultural and fishing activities would probably benefit mainly from two proposals (road upgrading and wharf redevelopment) whereas tourism would benefit from all the proposals;

l. the land use zoning policy, if it could be implemented, would have social and economic effects which need to be considered if the policy is to be implemented;

m. EIAs would be useful for the proposed marine disposal of sewage collected from the centre of Neiafu, also for the proposed foreshore development, and (as a social impact assessment) for the community attitude to the proposed changes to their townscape and functions;

n. a waste management study is needed;

o. baseline inventories and subsequent monitoring would be useful for the marine environment, coming under pressure from tourism as well as fishing. Also for the local community of Neiafu, for early identification of social problems resulting from the projects.

On a more general note, the extent of community participation in the development and planning process should be reviewed. It is difficult to draw definite conclusions from the reports examined in the course of the study, but it would appear that the local communities have not been given enough opportunities to contribute their ideas or to make known their concerns and values. Greater public participation, perhaps based on traditional local practices, would help in the design of more appropriate and more effective development proposals, as well as providing stronger community support for the proposals.

In conclusion, the environmental consequences of the proposed development projects for Neiafu have not been closely examined in the Master Plan, nor have the wider environmental implications been considered in the earlier Atkins report. The nature of the proposals enhancing existing activities means that there are unlikely to be major environmental problems arising in the short term. However, the increasing and cumulative effects of tourism are important and it might be advisable to initiate an environmental management programme targeted at the tourism sector as this would examine the current extent of tourism and the impacts (both beneficial and adverse) experienced to date. However, it should also consider the environmental factors that would limit the expansion of tourism in the region (environmental sensitivities, natural hazards, natural carrying capacities, etc.). In this way, the very features that attract visitors can be managed and protected in the longer term, to sustain the economic viability of the sector.

The ESCAP report (1990) has many useful strategies for dealing with the various environmental problems experienced in Tonga. This is a valuable source of environmental information and management ideas that could be utilised more extensively in formulating policies, programme and plans within the context of sustainable development.

Some aspects of the Master Plan may require closer environmental scrutiny (see m. above) and a particular gap in the Plan is the lack of a project to assess current and future waste management needs, and to suggest an improved waste management strategy (see n. above).

Finally, there should perhaps be provisions for monitoring key indicators of the marine environment, but also the local community in Neiafu. The early detection of undesirable changes allows appropriate responses to be devised and implemented in time to avoid major damage to the environment, including the social fabric of the town and the region.

Postscript

In the three years since the Master Plan was released, the VDC and the VDU have focused increasingly on the key infrastructure improvements contained in the Plan. The priorities are now seen to be road improvement, upgrading the wharf, and improvement of the town water supply. The latter is being addressed by the Tongan Water Board as part of its national programme of water supply improvement. The other two projects are being tackled by the VDU.

In effect, the main tourism related proposals, such as the foreshore re-development, and the construction of new retail outlets to cater for tourists, have been set aside, in favour of projects that will improve the immediate quality of life of local people and enhance economic activities in the agricultural, fishing, industrial and service sectors.

(A new market is being planned, as indicated in the Plan. The problems experienced in trying to negotiate affordable land purchase arrangements over the last 2-3 years have forced the VDC to use a site owned by the government, three "blocks" west of the current site. The prospect is a market site located away from the town centre, up a long hill. It will be closer to the Vaipua causeway and still within reasonable distance of the wharf area. However, one cannot help but wonder at the complex social impacts of re-locating such an important social facility as a market away from the central zone of the town. This particular proposal might well warrant a social impact assessment, to identify the complex nature of direct and indirect effects the re-location is likely to have on local people. If nothing else, it would allow local people to express their opinions on the proposal. They may well support the proposals, or they may be able to suggest alternative sites better suited to their needs).

Overall, the VDU seems to have reached similar conclusions as this SEA study that the Master Plan leaned too strongly towards the enhancement of tourism potential of the town, and that the local people would benefit more from the infrastructure projects rather than the beautification projects.

Reports consulted

Neiafu Master Plan. Draft Final Report. Kinhill Kacimaiwai, in association with Kinhill Riedel & Byrne. 1993. 55pp.

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Vava'u Regional Development Programme. Phase II Final Report. Project and Programme Dossiers.
WS Atkins International, Epsom, England. 1989. [The "Atkins" report]

Environmental Management Plan for the Kingdom of Tonga. ESCAP, Bangkok. 1990.

6th Development Plan 1991-95. Central Planning Unit, Government of Tonga. 1990.

NEIAFU MASTER PLAN IMPACT MATRIX	Harbour works	Road construction	Pedestrian access	Drainage	Water supply	Sanitation	Town centre	Public building	Landscape	Environmental reserves
Water:										
freshwater:										
*groundwater										
---quality					*	+L				(+L)
---supply					*					(+L)
*surface water										
---quality						(+L)				
marine:										
---quality	-C	-C/+L	-C	-C/+L		+L	-C	-C		+L
Soil:										
---fertility										+L
---structure										+L
---integrity										+L
---biota										+L
---organic matter										+L
Air:										
---pollution		-C/+L					-C/+L			
---flushing										
Fauna/flora:										
terrestrial:										
---individual sp. poplns.										+L
---species groupings										+L
---habitat well-being										+L
---habitat invasion										+L
marine:										
---individual sp. poplns.	?-C	+L	-C	+L		-C/+L		(-C?)		(+L)
---species groupings	?-C	+L	-C	+L		-C/+L		(-C?)		(+L)
---habitat well-being	?-C	+L	-C	+L		-C/+L		(-C?)		(+L)
---habitat invasion	?-C	+L	-C	+L		-C/+L		(-C?)		(+L)
Physical resources:										
---mineral depletion										
---gravel/aggregate usage										
---quarrying		-C	(-C)							
---restoration									+L	

key: +: benefit -: adverse C: construction phase L: long term (): minor or indirect ?: uncertain *: neutral if good practices

	Harbour works	Road construction	Pedestrian access	Drainage	Water supply	Sanitation	Town centre	Public buildings	Landscape	Environmental reserves
Rural landscape:										
---visual/amenity		(-C)	(-C)							+L
---degradation		(-C)	(-C)							
---historical/cultural										+L
---landuse					-L					-L
---tenure										-L
---loss of land areas		(-C)	(-C)		-L					
Urban landscape:										
---visual/amenity	-C	-C/+L	-C/+L	-C/+L	-C	-C/+L	-C/+L	-C/+L	+L	+L
---degradation									+L	
---historical/cultural				-L?			-L	-L		+L
---landuse				-L?				-L	+L	
---tenure			(-C)							
---loss of land areas			(-C)						+L	
---odours, noise nuisance	-C	-C	-C		+L	+L	-C(-L)	-C		
People:										
health		+L		+L	+L	+L	+/-L			
social services										
---education										
---other(medic, transprt,etc)				(+L)		+L	(-L)	+L		
infrastructure										
---power										
---sewage/waste disposal						+L		(-L)?		
---water supply					+L	-L?				
---roads		+L		+L	-C		+L?	-L		
social activities	(-C)	-C/+L	+L	+L	-C		-/+L	-/+L	(+L)	+L
economic activities										
---agriculture	-C/+L	-C/+L						(+L)?		
---fishing	-C/+L	-C/+L				(+L)		(+L)?		
---services	-C/+L	-C/+L		+/-L	-C		+L?	(+L)?		
---industry/technical	-C/+L	-C/+L			-C			(+L)?		
---tourism	-C/+L	-C/+L	+L	+L	-C/+L	+L	+L	(+L)?	+L	+L

key: +: benefit -: adverse C: construction phase L: long term (): minor or indirect ?: uncertain *: neutral if good practices