SAVAII

LAND RESOURCE USE

&

FOREST RESOURCE USE

ASSESSMENT

August 2007

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for the following Government Project

"The Conservation of Threatened Lowland and Upland Forests of Savaii"
(Project managed by the Division of Environment and Conservation, MNRE)

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Acronyms

AusAID – Australian Assistance for International Development
CDI - Capacity Development Initiative
CBD – Convention on Biological Diversity
CCD - Convention on Combating Desertification
CDC - Cabinet Development Committee
GEF – Global Environment Facility
GIS - Geographic Information System
GOS – Government of Samoa
IGA – Income Generating Activities
MEA – Multilateral Environmental Agreements
METI – Matuaileoo Environment Trust Inc.
MNRE – Ministry of Natural Resources and Environment
NBFI – Non-Banking Financial Institutions
NTFP – Non-Timber Forest Products
PICs – Pacific Island Countries
SDS – Strategy for the Development of Samoa
SIDS - Small Island Developing States
SDI - Sustainable Development Indicators
SAI - Sustainable Agriculture Indicators
SEI - Sustainable Energy Indicators
SFI - Sustainable Forestry Indicators
STI - Sustainable Tourism Indicators
UNDP – United Nations Development Programme

(i) Foreword

Sustainable economic development underpins wildlife conservation efforts on Savaii.

Savaii's remaining lowland and upland forests are under increasing threat, compounded by ongoing non-sustainable forest management practices, increasing global climate change impacts, more severe invasive species, etc. This study, therefore, focuses its attention at the village level, having one pertinent intent: to better understand how best to protect and restore the lowland and upland forests of Savaii by simply offering the resource owners a more profitable alternate economic option to logging

Based on the attitudes identified by the Project Team within these 7 Project Villages, and building on the considerable conservation concern already existing within these villages, there is fortunately today a more attractive range of relatively unknown economic options available to the resource owners. Taking an economic approach to increasing the commitment to a national wildlife conservation programme proved successful: Project Villages agreed to seeking organic status, agreed to commence new and more sustainable businesses, and even agreed to further discuss sharing Savaii's limited natural resources with each other. Matai from Sili were asked why they refused to share their water and potential power supply with neighbouring villages. Matai from Sili responded with "then why cut down Savaii's supply of oxygen-producing forests depriving your neighbours of a better air quality, soil quality, lifestyle quality?".

A possible future opportunity exists, therefore, to use the information presented in the following Assessment Report as an outreach tool, as an environmental management tool, and as a socio-economic tool to not only better protect the indigenous forests of Savaii, but also to facilitate the design and implementation an extensive agro-forestry programme on Savaii in the near future. However, the need for considerable future capacity building has been recognized by the Project Team and is hence highlighted in this Report based on the results of this Assessment. There is strong justification for a combined fono of all 9 villages responsible for the conservation of Savaii's remaining lowland and upland forests.

There is now, hopefully, sufficient evidence presented in this Assessment Report to change the course of forestry history in Samoa with respect to ongoing deforestation, as well as enough evidence presented to link conservation with sound economic principles. Taking this new economic approach to forest conservation has been sufficient to convince many resource owners of a more sustainable approach to development. The forest management emphasis is, therefore, now on furthering the protection status of remaining forests, restoring existing forests and creating new plantation agro-forests for an ever-increasing myriad of reasons.

Economists in Samoa today are now having to take a much longer term view, especially when it comes to sustainably harvesting the limited natural forest resources available. Economists are having to work closely with forest managers and environmentalists more so than ever before.

If the above sustainable economic development revelation is new to Samoan economists and environmental managers, then imagine the shift in the development paradigm required within the rural villages themselves. A call for a more holistic and long-term approach to sustainable development planning and management is well justified based on the results of the following Assessment Report. All the Project Villages now have a new vision for their future development, this time without having to face the dilemma of reluctantly felling their own precious native forest resources.

Delivering the results of this Assessment back to the 7 Project Villages has not only provided a sense of ownership of this Report, but a renewed commitment to the conservation programme especially when increased business opportunities were aroused along with improved natural resource management practices, possibly for the first time since commercial logging commenced on Savaii. Admittedly, these delays have been caused by economists not taking a more serious and sustainable long-term approach to Samoa's economic development. Ironically, these delays have now caused serious long-term economic hardships for Savaii's rural communities as they continue to lose their water supplies and forest foods, as they face increasing fire risks and food security issues, and as they lose their traditional survival skills as well as the fa'aSamoa.

With an open mind and a team-building spirit, all the village fono were anxious to learn with the economist and environmental planner how best to save Savaii's lowland and upland forests. It was this sharing of ideas between the villages concerned, as expressed in the analysis of the Questionnaire, that provided a forum for sound economic planning to take place.

There was also no doubt that the level of understanding of sustainability within the Project Villages has changed considerably over the past 10 years and will continue to change in a very positive direction provided Samoa's economic planners can help implement more sound and equitable strategic economic options. This overt eagerness of the key village fono to adopt and improve upon their development options to better utilize their land and forest resources was very evident by the fact that all the village fono were open to accept almost any results of the Project analyses and subsequent recommendations offered by the Project Team.

However, it was also evident that this process to bring about future sustainable economic development within the 9 Project Villages will require ongoing and persistent economic demonstrations, with proven markets, increasing 'farm-gate' prices and responsible trade relationships. Samoa is currently lacking many such economic processes and services, but it is the responsibility of the MNRE initially before a more national holistic approach to development can be achieved holistically by all vital stakeholders.

Proven sustainable economic development models are still non-existent within Samoa, especially within these 9 Project Villages. However, it will only take a small and intimate effort by the MNRE, with ongoing long-term services of the Project Team, to continually demonstrate the real economically sound, socially equitable and environmentally-responsible development practices to help consolidate the most sustainable livelihoods possible within these 9 Project Villages.

At present, this unwillingness of the village fono to share their respective natural resources, an unwillingness to adopt vital faatonu o atinae, and an unwillingness to overtly seize this opportunity to jointly agree on the path forward indicated to the Project Team either a lack of confidence in the MNRE on behalf of the village fono or a sense of economic hopelessness with increasing reliance on remittances and aid. However, the speed at which the respective fono agreed to adopt any new faatonu during the Project period was indicative of the faith placed in the constructive efforts being made by the MNRE.

The social, cultural, economic, political and environmental climate within these villages to help bring about sustainability at present could not be better. Now is the time to act. The 'acid test' for this receptivity of the village fono, and their eagerness to accept sound economic development advice (for the betterment of not only rainforest conservation) will be the speed at which Sili and Gautavai fono agree on the shared economic and environmental benefits of sharing their water and hydro-scheme potential with their immediate neighbours as outlined in the Terms of Reference for this Project.

To date, no pressure has been put on the resource owners of Sili and Gautavai by the other 7 Project Villages. However, the Project Team has acquired, during the extended duration of this Project, possibly a novel and unique insight into what can only be described as 'imminent agreement amongst all 9 Village fono to address this current non-sustainable economic development paradigm that is only exacerbating the real likelihood of future poverty within the 9 Villages'. All 9 fono are yet to learn from each others' respective insights acquired from the endeavours of this Project, and a collective fono, in one village, is essential this month to not only present all the following strategic economic develop plans, but to easily and seriously raise the capacity of village governance within these 9 Project Villages.

The proof of the accuracy and implementability of this Project Report will be an immediate adoption of a Joint Strategic Plan by all 9 Villages:

(i) to conserve remaining land and forest resources,
(ii) to adopt new and more sustainable economic practices that prevent further natural resource degradation,
(iii) to build 'corridors' between all the Project Villages, physically, culturally and politically-speaking,
(iv) to expand and strengthen sustainable agricultural and agro-forestry practices on degraded lowlands for both economic and environmental conservation purposes, and, most importantly,

(v) to agree amongst themselves jointly, immediately and purposefully to correct the short-sighted and selfish and self-destructive socio-economic practices adopted at present that are aiding and abetting the current non-sustainable practices that are depriving all future generations of ever acquiring sustainable livelihoods.

There is an opportunity here to recognize and adopt a basic tenet of the fa'aSamoa and that is to tautua our future generations, and ourselves, just as our Ancestors would have wished. Any further continuance of existing non-sustainable practices is an insult to our forefathers' foresight.

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(ii) Acknowledgements

The parties to this Assessment Report (MNRE, UNDP, GEF, Project Villages, NUSC and NUS) gratefully acknowledge the intense commitment shown by all 7 Project Villages to providing their full cooperation for the duration of the Project. While it may have been difficult for some villages and other stakeholders to share the same aspirations as the Project designers at the outset, what was, therefore, truly indicative of a successful assessment of the forest and land resource uses on Savaii Island was the encouraging responses to the Project designers' economic deliberations as expressed in this Report.

The Project Team has to also sincerely thank the pulenuu and the village fono, in fact all respective community-based organizations (CBOs), for their willingness to cooperate and commit to various stages of this Assessment. In fact 9 pulenuu from Aopo (Taimalelagi Ta'iai), Letui (Fiu Sefau), Sasina (Leituala Tuitoga), Fagae'e (Pepe Uesele), Sala'ilua (Vaovasa Avei), Siutu (Taua Masalo), Taga (Tamala Maka), Gautavai (Leota Ulutunu Feapule) and Sili (Tuala Faafoi) mobilized their alii and faipule, culminating in a sense of eagerness to see this wildlife conservation programme successfully implemented once and for all. In addition, the generous assistance offered by Faaofonuu Poi and Mataafa Levi with the final presentation of the results to the Project Villages was invaluable, leading towards a sense of future cooperation between all the villages concerned and a sharing of their limited natural resources, possibly for the betterment of all future generations. Assistance with translation and village arrangements was kindly offered by Kasia Faaofonuu.

The Project Team would also like to acknowledge the persistent assistance from all the staff of MNRE who have diligently provided the background information on which this Project was based. Special thanks must go to Faumuina Sailimalo Pati Liu, Tepa Suaesi, Susau Tiolo and Afele Failagi Saili for their constant attention. Additional contributions were sought from the Ministry of Finance (Statistical Services Division) and CEO MAF, Seumanutafa Malaki Iakopo. The Project Team would also like to acknowledge Nonu Samoa Ltd. for its helpful business and technical support kindly offered during this Assessment.

Finally, the assistance offered by Mr. Matavai Auvaa, Faculty of Business and Entrepreneurship at NUS, in assisting with the questionnaire survey is highly appreciated, and Mrs. Minerva for her inputting for the SPSS data analysis, is gratefully acknowledged.

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(iv) Executive Summary

1. Of the 126 respondents to the Survey Questionnaire, 44% were male, 86% were married, 45% were matai, most households were larger than 7 people, 58% did not complete primary school and only 5% had a tertiary education.

2. The Project Team conducted this Survey Questionnaire to assess the following local attitudes of forestry resource owners and stakeholders to forest conservation, and how these attitudes have helped serve their past needs, and of course helped serve their current and future aspirations. This Assessment Report, therefore,

(i) helped identify the attitudes that have allowed this current non-sustainable scenario of ongoing deforestation to exist for the past 50 years,

(ii) helped identify the economic opportunities which now lay ahead that may help offer an alternate to the current range of forestry malpractices and poor agricultural returns, and

(iii) took a holistic economic approach to mainstreaming environmental issues into Savaii's emerging sustainable development framework in order to meet the identified aspirations of these villagers, this time hopefully more sustainably (see Chapters 5 & 6).

3. All respondents had land in their villages, growing taro as the main crop, with only a small portion of their crops for sale to local consumers. Most households were allocated between 1-10 acres for farming, receiving more than $SAT100/day. The most popular reasons for their choice of only using traditional farming methods were low cost and less work. All the villages have had their forests logged at some stage under the general consensus of alii and faipule, on programmes driven by Government.

4. Economists need to play an increasing role in natural resource management in Samoa, combining their sustainability skills with those of environmental managers and resource owners.

5. In all the villages, it was perceived that there were still trees to be logged. There were areas set aside for special purposes such as water catchment and biodiversity. In terms of sustainable use of land resources, respondents had an understanding of the concept of sustainability which prompted them to use their resources wisely and to preserve them for future generations. However, it was obvious that these decisions to log non-sustainably in the past reflected too few alternate sustainable economic options.

6. The lowland and upland forests of Savaii are hence still under numerous and enormous ongoing threats to the point that the sustainable livelihoods of many villagers on Savaii can only be considered as declining further, as exemplified in the 2007 State of Environment Report which states categorically that *"The overall trend in the state of the environment in Samoa is one of progressive decline of a once traditional sustainable way*

of life ….now reliant on restoring the indigenous natural resources back to their original state ….".

7. Over the past 10-20 years, there has been a general desire to stop the practice of chemical application (weed killers) and deforestation for farming and logging. However, non-sustainable harvesting of indigenous and plantation forests on Savaii continues today at the expense of long-term wildlife conservation measures being adopted.

8. Village fono deliberations form a significant function in the social and cultural cohesion of alii and faipule authority. In terms of virgin land remaining unused, all the villages have some left, but have some future plans for its use. In most cases when there is a land dispute, there is no village mechanism for settlement (54%), though some form of punishment is enforced and the decision making procedure of the village fono for landuse is highly supported by 97% of respondents.

9. This traditional decision making process for landuse has made the villages better off economically and culturally, and the governing and managing affairs of the village have been fair to most respondents. In most responses, villages view their leaders as having good authority, thus needing few changes. However, 11% of respondents felt the need to change the village mayor, improve village affairs and change some of the village rules.

10. Whilst most of the village infrastructures are in place today in most of the 7 Project Villages surveyed, the cost to maintain, upgrade and pay for these services is increasing annually. Therefore, the demand for cash at the family level is increasing in order to help pay for such services. However, access to cash by most rural villagers, until now, has been restricted to a few non-sustainable options such as over-harvesting of the natural forest and fish resources, and/or rapid agricultural expansion into native forest areas. Rural families will continue to see these otherwise exploitative practices as essential unless an alternate economic system is devised and implemented.

11. The Project Team has, therefore, highlighted a convincing set of culturally-based socio-economic arguments behind the reasons for such large scale deforestation on Savaii since the early 1960s.

12. The general beliefs of the 126 respondents were such that the best possible resource use decisions can only be made by the village fono as the cultural authority is vested in the fono with respect to resource use management. Hence, cultural priorities are still taking precedence over all other factors, and it appears as if most villagers today, matai and non-matai, still strongly believe in the decisions of the village fono, even if they are later proven to be wrong from a sustainable economic development sense.

13. These perceptions and attitudes lay the groundwork for policy making in any form of village governance. Most respondents believed that more benefits could be obtained from their lands and resources in the form of cash and food. The level of economic development in the villages was perceived, however, to be satisfactory, and the majority of respondents believed that their villages were better off economically and culturally

than other villages. The basic needs that were most commonly desired by the villages included education, health care systems, inland roads and reliable water supplies.

14. However, one perception emerging towards the completion of the Assessment was an unwillingness for some Project Villages to share their water resources, electricity generating potential, oxygen production, soil conservation, biodiversity conservation, etc. with their neighbouring villages. This point cannot be under-estimated or overlooked any longer. All key villages involved in the conservation of lowland and upland forests on Savaii still need to meet to share ways in which, collectively, they can assist each village to attain sustainable livelihoods more rapidly, with least expense, without ongoing damages to their shared ecosystems, and in a more culturally-fitting manner, observing the real essence of the fa'aSamoa and fa'amatai: in this case, to serve future generations.

15. All villages have some forest and unused land left which are either inaccessible or much further inland, located on mountainous sites or preserved for conservation purposes.

16. Most respondents strongly support unused land and forestry resources to be under the control/management of the village fono, however, some desired more access to farming and plantation areas and a few supported conservation of biodiversity.

17. In terms of economic development, more and more respondents would want to use those lands and resources, yet village policies only permit conservation, and most Project Villages have since banned commercial logging and the use of agricultural chemicals, seeking organic certification. All villages expressed an eagerness to find new markets with higher prices for their siapo, ietoga, etc.

18. Given that all villages have had their forests logged in the past, the impacts of such acts on their local economies have been disastrous. Erosion is evident from deforestation, along with loss of indigenous birds and indigenous forests. However, some limited cash income received from commercial logging enterprises assisted with the development of residential houses, some such funds were invested in banks, whilst the remainder was distributed amongst matai, families and churches.

19. In terms of family aspirations, the respondents would desire greater benefits to be accrued to the development of their families and plantations. Consequently, residents leave their villages in search of employment and a better standard of living. Rural to urban drift is high, emigration is high with resultant social and cultural disruption.

20. The qualitative data presented in this Report have, therefore, identified the most recent landuse and economic trends emerging on Savaii, both good and bad. One such trend is the potential economic and biodiversity conservation benefits of future widespread forest protection and community agro-forestry project initiatives, rather than the current ongoing reliance on logging indigenous forests as a potential source of income.

21. The village fono will have to accept full responsibility for past and future non-sustainability. In most cases, residents agreed that all relevant information was provided to the village fono for wise decision making purposes as to the best use of land, and hence these respondents had overwhelmingly support for their fonos' decisions for supposedly ongoing sustainable use of village lands.

22. However, the main constraints to sustainable use of land were small-scale logging for agricultural expansion purposes, commercial deforestation of indigenous forest, use of chemicals and destruction caused by wild pigs.

23. Most respondents felt that these constraints can be remedied by their fonos' decision making processes and implementing further education programmes. However, in terms of sustainable resource use, the fono now has a long-term perspective for the interests of the village allowing land and resources for conservation, agro-forestry and ecotourism projects.

24. However, the economies of the 7 Project Villages varied in terms of land resource use, with a different emphasis on cash cropping and reliance on remittances. Most villages received income by way of remittances, plantations and fishing, but only a few villages received income from weaving of ietoga and the making of siapo.

25. Income from villagers working outside the village, albeit in Apia or overseas, is an important source of village income for all villages which mostly goes into family development, village and church obligations.

26. However, there is some form of income generated in the village where there is an exchange of goods and services for cash. Other forms of income which are not being explored by some Project Villages include sale of lopa, siapo, ietoga and nonu.

27. Farming and fishing were also viewed as good sources of income by the respondents. There is a general perception that farming and fishing provided food and income, but most have been discouraged due to lack of good farming practices, extensive damage by free-ranging pigs, over-harvesting (locally, nationally and regionally) and/or general laziness (few mentioned theft).

28. Most respondents had children living and working in the village, some were employed by beach resorts and plantations, with few employed as teachers in local schools. In about half of the cases, respondents had children working outside of the villages.

29. The Project Team saw an opportunity to design a village economic development plan that replaced all future non-sustainable commercial logging as the preferred source of income in these 7 Project Villages, created employment locally, hence strengthened social and cultural aspects, and tapped into numerous existing and emerging businesses that are currently capitalizing on organic certification and non-timber forest products

(NTFPs) such as honey, moso'oi perfumes, medicinal components, even virgin organic coconut oil.

30. One major economic trend emerging over the past 10 years is the well-established export of organic nonu products, now Samoa's major agricultural export crop.

31. The identification of any such economic practice which assists with the conservation of the remaining lowland and upland conservation areas must now be identified and encouraged. However, many of the Project Villages currently lacked the processes required to capitalize on any such economic opportunities identified by the Project Team.

32. In response, many Project Villages, after the presentation by the Project Team of the results of the Survey Questionnaire, agreed to ban pesticides (if not already banned), agreed to seek organic certification through Women in Business Foundation (WIBF) and NASA (National Association of Standards of Australia), agreed to pass a village law to ban the cutting down of nonu trees, even agreeing to work together amongst themselves to meet their own economic aspirations.

33. This Report, therefore, went to considerable length to re-assess the attitudes and aspirations of 7 villages which are primarily responsible for the majority of Savaii's remaining lowland and upland forest. However, these resource owners were neither cognizant of the repercussions of past negative impacts on future generations nor were they cognizant of the necessity to urgently accept full responsibility to help bring about immediate attainment of sustainable living within these 7 Project Villages. This required the full cooperation of all 9 villages responsible for the conservation of lowland and upland forests of Savaii (including Sili and Gautavai), but relies on a sharing of all natural resources between these villages (and their neighbouring villages) if a better standard of living was to be attained at a cheaper cost for basic infrastructure and services, with more sustainability, and with full cooperation with all stakeholders, including the Government of Samoa. Any further delays, unnecessary or otherwise, are not to be tolerated or condoned based on strict socio-economic and cultural grounds.

34. This Report, therefore, took this knowledge and position and formulated some innovative socio-economic scenarios that are not yet practiced in Samoa in such a holistic manner as described in Chapter 5.

35. Based on the in-depth interviews conducted by the Project Team, few resource owners really understood the negative global impacts of local deforestation (air quality-wise), non-sustainable tourism practices locally and globally (and their negative impacts on Samoan forests), and global climate change impacts on local forest and land resources such as:

(i) reduced food security,
(ii) increasing severity and frequency of cyclones and storms in the years ahead,
(iii) serious negative impacts on Samoa's marine and terrestrial resources, including possibly reduced river flows sufficient to cause concern for the efficacy of future renewable energy projects on Savaii (with futile arguments

that the proposed hydro-power projects in Vaiaata/Safua, Faleata/Vailoa, Sili/Vaitai and Gataivai will further reduce river flows were actually baseless on all technical grounds, and any further continuation of any such non-sustainable processes would simply cause further delays to help bring about sustainability for all future generations in Samoa). The actual reality is that by not having a hydro-scheme on Savaii, for example, further diesel generation in Salelologa will only exacerbate global climate changes with increasing negative impacts on Savaii's forests, with possibly less river flows due to altered rainfall patterns.

36. Very few forest resource owners knew how to take the appropriate corrective measures required to correct or mitigate global climate changes, let alone had an understanding of the causes of such drastic negative impacts on Savaii's remaining forest resources. The need for further capacity development emerged as the single most obvious outcome of the Project, followed closely by, surprisingly, a socio-economic solution centred around a non-food cash crop as an integral component of a potentially large-scale community agro-forestry programme.

37. This Assessment Report, therefore, now offers forest and land resource stakeholders the most appropriate corrective measures, hopefully economically palatable enough for them to embrace immediately, provided there is an effective and prompt capacity development initiative by the MNRE, MAF, MWCSD, MOF, MOH and other key stakeholders.

38. In conclusion, this may be, therefore, the first time in Samoa's economic history where, simultaneously, economists are taking an environmental stance to conserve the forested summit of Savaii, whilst environmentalists are taking an equivalent pertinent economic stance, both short-term and long-term, to also help convince natural resource owners of the preferred need to conserve such vital forest resources on a long-term basis whilst still meeting their growing economic needs for a rising cost of living.

39. Also, Government's recent macro-economic reforms have provided rural communities with increased services such as roads, electricity, water, telecommunications, schools, etc., but they in turn have increased the cost of living for Samoa's rural poor. Families are now, more so than ever before, seeking paid-employment opportunities outside their villages to help meet these mounting transport, power, water, telecommunication and imported food costs.

40. The resultant social disruption and cultural erosion in these key villages will continue unless economists immediately find and prove that a more sustainable and profitable economic option does exist in these rural Project Villages at such a magnitude to match the rising cost of living and meet the future aspirations of these villages.

41. The final recommendation in this Report is that a process needs to be put in place to catalyze and build upon the existing eagerness to find new and more profitable sustainable business opportunities and long-term partnerships with vital stakeholders,

including neighbouring villages willing to share all of Savaii's natural resources and services for the betterment of mankind.

42. In addition, reforestation above and below a potential hydro-scheme on Savaii can only help improve the overall efficacy of the proposed renewable energy programme. The development of a business partnership in renewable energy sales is considered by the Project Team as yet another sustainable economic development option.

43. Any opportunity to mainstream environmental issues into the development framework should be exploited. However, this cannot be possible without the collaborative inputs from all Project Villages, meaning an agreement to mutually cooperate to help bring about more sustainable practices if possible.

44. A holistic response is, therefore, presented in this Assessment Report, one that proposes some effective and innovative socio-economic development paradigms that are based on the *Fa'aSamoa*, the Samoan way of life.

45. The Project Team, therefore, would like to strongly recommend that a pertinent pro-active economic development planning process be immediately implemented and driven jointly by the MNRE and MAF, with considerable input from MWCSD and relevant NGOs. This is thought to be feasible in that the village-based economic development plans now need to be successfully implemented, with results being constantly shared between the 9 Project Villages.

46. To hasten this vital component, this may entail the formation of a dedicated team of environmental management, agro-forestry and sustainable economic development workers pro-actively creating this more enabling development environment. And if a Joint Strategic Development Plan is signed as an MOU by all 9 Project Villages, as requested in this Assessment Report, and a strong commitment is made by all 9 Project Villages to equally share their joint natural resources, then considerable forest conservation progress can be made on Savaii from an economic, environmental and even cultural perspective.

47. Also, METI plans in 2008 (March) to commence a 'train the trainers' Permaculture Project within targeted rural villages to help bring about sustainable agro-forestry. Special attention can be placed on the 9 Project Villages either through METI or an alternate, and more immediate Permaculture Project be planned specifically for these 9 Project Villages in accordance with the TOR of this Assessment Report. The 7 village fono consulted at the conclusion of this Project all agreed to further training, further sharing of resources, joint cooperation to explore new markets, even increasing 'farm-gate' prices for their produce, and ongoing assistance with small business development.

48. An opportunity arose for the Project Team to share these concluding findings and recommendations with Sili matai, namely Faaofonuu Poi and Mataafa Levi, who were both excited, to say the least, about the future potential to cooperate with resource sharing and economic development opportunities.

49. The Project Team has done its best to pre-sensitize all 9 Project Villages to:

(i) the importance of ongoing forest conservation requirements,

(ii) the need to coordinate conservation efforts jointly between all Villages,

(iii) a sharing of natural resources that may be the only way in which prompt action can be assured if sustainable economic development within these 9 Project Villages is to become an imminent possibility.

50. Finally, Sili may have embraced this very recent economic option of commercial organic nonu production because of nonu's already apparent economic viability. In addition, Nonu Samoa Ltd. pays a premium price for organically-certified nonu: Sili is possibly the only entire village which is certified organic. Also, Sili does not commercially log its forests so alternate incomes have always been strongly sought after.

Chapter 1 Introduction

The conservation of lowland and upland forests on Savaii is still of high priority for the MNRE and Savaii's forest resource owners because of past and on-going non-sustainable forestry practices. As the MNRE website (www.MNRE.gov.ws) states, "whilst some traditional practices have been quite sustainable, historically, Samoa has developed a cash economy by liquidating natural capital, a process having its origin in 'the frontier' culture of Western economies".

Whilst this traditional knowledge had been sufficient in the past to safeguard the integrity of these Samoan forests, however, more recently, community attitudes and aspirations have continued to change as economic pressures increase, placing even greater pressure on the remaining limited and diminishing land and forest resources within Samoa.

This Assessment Report is, therefore, an attempt to highlight this trend of the ongoing loss of Samoa's limited natural resources, especially land and forest resources, and also an attempt to understand why the ongoing destruction continues, thought to be:

(i) mainly because of poor capacity at all levels of stakeholders and decision-makers,
(ii) mainly because of very limited alternate economic options, and
(iii) further compounded by a refusal to commit to the sustainability initiatives already put in place within Samoa in the very recent past (e.g. 2007 National Native Forest Commercial Logging Ban Policy lifted within 10 weeks of its launching by the MNRE in January 2007, etc.).

In the absence of a dynamic national forest policy and an enforced Forestry Act, it is no wonder that sustainable forestry has never been achieved in Samoa in recent times. A national forest policy has just been completed for Samoa (August 2007), including justification for ongoing monitoring of all the most meaningful sustainable forestry indicators. Only then can future informed decisions be made by forestry stakeholders, and especially resource owners, with respect to the most appropriate forestry management decisions, in this case for the 7 Project Villages assessed in this study.

Without appropriate natural resource management legislation to help encourage and guide traditional resource owners, like the new EIA Regulations (June, 2007) and the newly proposed national forest policy (2007), unfortunately Samoa's potential to gain socially-equitable and environmentally-sound resource management practices remains unlikely.

Whilst Samoa has been identified as possibly having one of the highest national rates of deforestation within the Pacific since the early 1960s, commencing soon after gaining Independence in 1962, the Project Team has presented in this Assessment Report a convincing culturally-based set of socio-economic arguments supporting the reasons

possibly for such large scale ongoing deforestation, a practice condoned by village fono in the past and even currently.

This Assessment Report, therefore, attempts to offer convincing sustainable economic development arguments, possibly for the first time, in order to attain sustainable forestry. However, without successfully raising the capacity on-island to tackle major global and national environmental constraints immediately, Samoa's economic future alone must be deemed as grim.

A holistic response is, therefore, presented in this Assessment Report, one that proposes some effective and innovative socio-economic development paradigms that are based on the *Fa'aSamoa,* the Samoan way of life, as they pertain to modern rural lifestyles in the 7 Project Villages assessed by the Project Team.

Fortunately, the Project Team was given a unique opportunity to witness some excellent traditional resource management practices still in use on Savaii Island today. Today, an EIA process in Samoa must be able to offer the guiding principles to further such resource harvesting and resource regeneration opportunities, and it is the intention of this Assessment Report to woe not only villagers' support, but also the support of Samoa's national and local governments, as well as their aid partners.

Samoa's own deliberately impoverished communities, caused by over-harvesting of the comparatively very limited and highly vulnerable natural resource base within Samoa, were subjected to both in-depth interviews by the Project Team, as well as a Survey Questionnaire. A cost/benefit analysis, as presented in this Assessment Report, therefore highlights, in dollar terms, the level of this ongoing impoverishment within Samoa as the natural resource base continues to be eroded.

Finally, based on the failure of many stakeholders in the past to fully understand the complexities of global, regional and national environmental challenges facing Samoa's land and forest resources today, and based on this reluctance to share valuable resources such as forests, biodiversity, hydro-power and potable water supplies with neighbouring villages, a Survey Questionnaire was designed to highlight these attitudes, perceptions and aspirations of the resource owners within these 7 Project Villages.

1(a) Research Objectives

The Project Team needed to identify a convincing set of culturally-based socio-economic arguments behind the reasons for such large scale deforestation on Savaii since the early 1960s. In fact, the identification of every possible practice which can then assist with the future conservation of the remaining lowland and upland conservation areas of Savaii must now be encouraged.

This Report, therefore, will go to considerable length to re-assess the attitudes, perceptions and aspirations of 7 key villages which are themselves primarily responsible for the majority of Savaii's remaining lowland and upland forest. However, the Project

Team will take this knowledge and formulate some innovative socio-economic scenarios that may not yet be practiced in Samoa in such a holistic manner.

Without this in-depth cultural understanding, and without alternate socio-economic paradigms to initially offer these 7 Project Villages, and without the necessary legislations to help encourage such vital sustainability, the task ahead for Samoan economists, environmental managers and natural resource planners would be insurmountable.

This Assessment Report, therefore, addresses these natural resource management issues in a methodical and culturally-sensitive manner, reflective of the most recent attitudes, perceptions and aspirations of rural villagers living in the respective 7 Project Villages on Savaii Island. These following findings from this Assessment are presented for your consideration, possible implementation and finally as a pro-poor growth initiative in general with the intent to attain sustainable development in Samoa.

1(b) Methodology

The project site encompassed the village communities which own most of the remaining rainforest on central Savaii, namely Fagae'e, Sasina, Letui, Aopo, Sala'ilua, Si'utu and Taga. The Project Team and MNRE staff initially met with the pulenuu from each of these 7 Project Villages to seek the villages' support of the project goals, and then planned to meet with randomly selected members of each *matai fono* and key landholding stakeholders individually during a 3 month period. A detailed Survey Questionnaire (see attached CD-Rom) was completed for each 126 respondents, with NUS surveyors trained to successfully complete these questionnaires prior to inputting the results into the SPPS Programme for analysis.

From the inception of this Project, the Project Team agreed to consult closely with the MNRE in order to help develop and finalize the plan for the design and implementation of this Project, including conducting in-depth interviews with numerous interviewees (see Appendix 1).

The Survey Questionnaire was then designed to assess the following points in order to provide the Project Team with valuable background information, namely:

i. traditional and modern knowledge, patterns and types of landuse practices adopted by the communities for the development of their land resources, and the extent of their impacts,

ii. decision making structures and processes which govern land resource allocations and landuse, and the communities' level of satisfaction with these governing arrangements,

iii. perception, attitudes and aspirations on the current and future direction for the development of their land resources and communities,

iv. barriers in the way forward towards the development of more socially equitable and environmentally sound and sustainable land resources allocation and use,

v. major changes in the abovementioned issues in the last ten years, and

vi. what economic options and/or capacity-building activities can be recommended to possibly help implement the objectives of this wider project to protect the lowland and upland forests of Savaii.

(i) Questionnaires and in-depth interviews

Throughout the 7 Project Villages selected, a total of 126 Survey Questionnaires were completed, with additional in-depth interviews with selected stakeholders being conducted by the Project Team (see Appendix 1). The interviews were further designed to:

(a) assess the effectiveness of and level of community satisfaction with existing traditional governing systems, and

(b) identify the barriers to these systems to the establishment of environmentally sound and socially equitable landuse practices at the project sites.

A series of village meetings were held in the respective villages as a further means of discussing these issues, gathering the data required to assist the Project Team's assessments, and to help construct and re-present an economic cost/benefit analysis of the identified possible livelihood options, both short-term and long-term, back to the 7 Project Villages (see Chapter 6).

(ii) Data Analysis

Data collected by the Project Team was collated and analyzed accordingly, and presented in a format that is both convincing and replicable for possible future comparative reasons. The SPSSx 13.0 Programme was selected as the most appropriate software package and the Survey Questionnaire was designed accordingly to allow ease of inputting the data.

(iii) Reporting

Interim Reports were prepared for the MNRE and meetings were held throughout the duration of this Project, the findings being presented to MNRE staff outlining the progress being made with identifying all the relevant attitudes of key stakeholders, and/or highlighting any difficulties encountered with the Project.

This comprehensive Report on the results of the Assessment of the 7 Project Villages also includes further additional inputs from the 7 pulenuu and their respective village fono participants who participated in the final village-based project presentations which successfully culminated in:

(a) a sense of ownership of this Assessment Report,

(b) the commencement of possibly a new economic direction in the appreciation of hopefully more sustainable landuse practices,

(c) offering all key stakeholders direct feedback on the findings and recommendations of the Assessment phase, and

(d) a presentation by the Project Team to the respondents and their village fono participants of the newly proposed economic development plan and recommendations for their specific village (see Chapter 5). The Project Team took this opportunity to ‘test’ its findings, fine-tune its economic cost/benefit analysis options, and re-clarify any pertinent working case studies/examples.

Chapter 2 Village Profiles

The 7 Project Villages targeted in this Assessment Report have been subjected to a number of regular Agricultural Censuses as well as Population and Housing Censuses. In addition, the MWCSD have also had a number of programmes collecting data from rural villages, compiling their own 'village profiles'. The following 9 Village Profiles have been compiled as background information for this Assessment Project. However, the villages of Gautavai and Sili are yet to be fully assessed as part of "The Conservation of Threatened Lowland and Upland Forests of Savaii" Project.

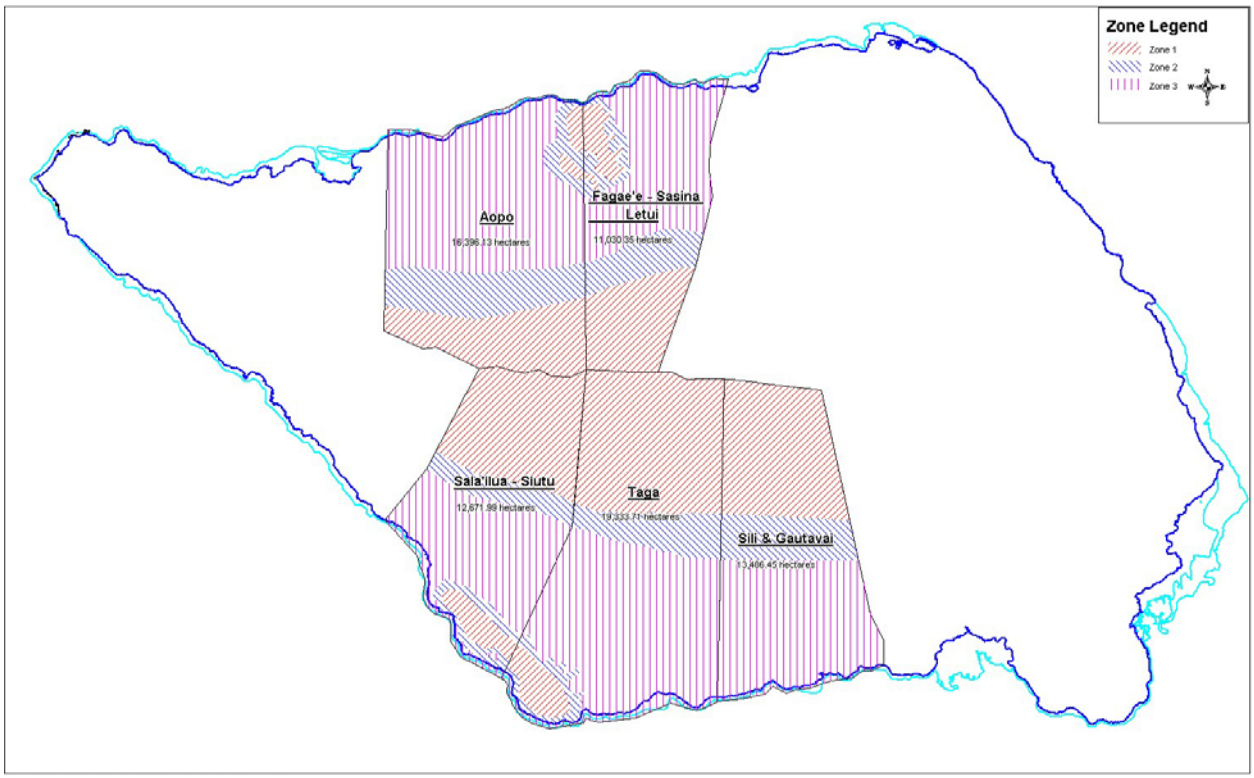

Figure 1 Map of initial 9 Project Villages
(Map supplied by MNRE from the UNESCO Man & the Biosphere Reserve Programme)

Figure 1 depicts Savaii Island, Samoa, with adjacent shaded lands belonging to 9 distinct villages, but divided into 5 major land areas (with respective areas given in hectares). The Assessment Report has compiled Village profile information from the following separate 9 villages, namely Aopo Letui, Sasina and Fagae'e on the North Coast and Salailua, Siutu, Taga, Gautavai and Sili on the South Coast. However, Letui, Sasina and Fagae'e were included in the Man and the Biosphere Programme as one distinct entity, likewise Salailua and Siutu were considered together, as were Gautavai and Sili, making a total of 5 distinct village-based entities. However, Gautavai has expressed an interest in being

involved as an individual village. For the purpose of this Assessment Report, the following 9 individual Village Profiles were prepared irrespective of any traditional ties with neighbouring villages, and irrespective of their level of involvement with the Survey Questionnaire and in-depth interviews.

Some areas have been heavily logged within the past 40 years or so, and are now used extensively for agricultural purposes and community developments including governmental infrastructures. These areas are being targeted for immediate alternate cash cropping as well as future extensive agro-forestry projects primarily designed to rectify the current threats to Samoan forests (see Appendix 2) and:

(i) improve timber resources in Samoa,
(ii) improve economic potential for the villagers and the nation,
(iii) introduce women to multi-purpose agro-forestry practices including the production of NTFPs,
(iv) take pressure off further logging,
(v) improve water catchment quantity and quality,
(vi) improve soil conservation in terms of not only soil fertility and crop production, but also retaining the carbon sink capacity of Samoan soils,
(vii) improve existing and future potential of water catchments for hydro-electricity,
(viii) improve climate change adaptation in terms of food security, oxygen production, creation of productive micro-climates, even improving cyclone-resistance by appropriate plantings in existing and proposed plantation forests,
(ix) improve access to medicinal plants,
(x) improve the traditional spirituality quality of forests,
(xi) improve access to vital forest products for traditional purposes such as handicraft-making, including woodcarving, and, of course, and
(xii) improve biodiversity conservation initiatives on Savaii Island.

These lands are primarily customary-owned, the resources being managed by their respective traditional resource owners in partnership with MNRE, especially DEC and Forestry Division. MNRE staff has consulted frequently in these 9 Project Villages and this Assessment Report has been designed to assist this ongoing consultative phase, improving the true profile of each village on an ongoing basis.

This Assessment Report, therefore, focuses on assessing the forest and land resource use practices and outcomes in 7 of these 9 particular villages in Savaii only, namely Aopo Letui, Sasina and Fagae'e on the North Coast and Salailua, Siutu and Taga on the South Coast.

The following 9 current Project Village Profiles have been composed as a background to this Assessment Report:

Fagae'e Village

Name of *Pulenuu* Pepe Uesele

Geographic Location Fagaee, Sasina, Letui and Aopo constitute the District of Gagaifomauga III

Population Using the 2001 Population and Housing Census, there were 205 people residing in Fagae'e comprising 14.1% of the District of Gagaifomauga III.

Economic Infrastructure Sealed roads, electricity, telephone including mobile service, water reticulation, septic toilets, fale komiti tumama and fale fono.

Forest Activities All commercial logging of indigenous forest has now ceased, but extensive logging in the past depleted most of the remaining closed native forests. However, considerable native timber stands still exist at high altitude, but are not commercially viable at current rate of return. Increased 'farm gate' prices or royalties need to be established. Also, a local societe has been formed with Sasina and Letui to collectively plant both ifilele and poumuli plantations with the expectation of continuously expanding this plantation forest. Any introduced agro-forestry programme in the future could also build on this existing initiative.

Future forest activities include on-going biodiversity conservation as part of the NPAS, agro-forestry, commercial plantations of nonu, water catchment for surrounding villages, water catchment enrichment with trees, carbon crediting for standing forests possibly, but also possibly carbon crediting for proposed agro-forestry schemes as being promoted by the AusAID Community Agro-Forestry Program Design Team. The local church needs serious refurbishment and commercial planatations of nonu are being considered as the possible source of funding for this project.

However, volcanic activity continues to pose a threat with nearby Mount Matavanu erupting from 1905-1911 with voluminous lavaflows reaching nearby coastal villages. In addition, invasive plant and animal species pose an on-going threat to existing and recovering forests, as does the strong likelihood of bushfires. Native vines, now exposed to direct sunlight, are also wreaking havoc (e.g. *Merremia peltata*).

Also, coastal wetlands have been protected because of their valuable ecological significance and potential tourism development.

Sasina Village

Name of *Pulenuu* Leituala Tuitoga

Geographic Location Fagaee, Sasina, Letui and Aopo constitute the District of Gagaifomauga III

Population Using the 2001 Population and Housing Census, there were 577 people residing in Sasina comprising 39.6% of the District of Gagaifomauga III.

Economic Infrastructure Sealed roads, electricity, telephone including mobile service, water reticulation, septic toilets, primary school, fale komiti tumama and fale fono. Also, the declared rainforest conservation area in Sasina-uta was recently severely damaged by fire with subsequent economic loss to the village. Assistance is being sought to hasten its recovery and again offer some unique attractions such as a medicinal plant walkway.

Forest Activities All commercial logging of indigenous forest has now ceased, but extensive logging in the past depleted most of the remaining closed native forests. However, considerable native timber stands still exist at high altitude and on the coast, but are not commercially viable at current rate of return. Increased 'farm gate' prices or royalties need to be established. Also, a local societe has been formed with Fagae'e and Letui to collectively plant both ifilele and poumuli plantations with the expectation of continuously expanding this plantation forest. Any introduced agro-forestry programme in the future could also build on this existing initiative.

Future forest activities include on-going biodiversity conservation as part of the NPAS, ecotourism businesses, agro-forestry, commercial plantations of nonu, water catchment for surrounding villages, water catchment enrichment with trees, carbon crediting for standing forests possibly, but also possibly carbon crediting for proposed agro-forestry schemes as being promoted by the AusAID Community Agro-Forestry Program Design Team.

However, volcanic activity continues to pose a threat with nearby Mount Matavanu erupting from 1905-1911 with voluminous lavaflows reaching nearby coastal villages. In addition, invasive plant and animal species pose an on-going threat to existing and recovering forests, as does the strong likelihood of bushfires. Native vines, now exposed to direct sunlight, are also wreaking havoc (e.g. *Merremia peltata*).

Finally, Sasina has declared a large tract of land as a coastal forest reserve and plans are being made to lease the adjacent 600 acres for a tourism and golf development.

Letui Village

Name of *Pulenuu* Fiu Sefau

Geographic Location Fagaee, Sasina, Letui and Aopo constitute the District of Gagaifomauga III

Population Using the 2001 Population and Housing Census, there were 278 people residing in Letui comprising 19.1% of the District of Gagaifomauga III.

Economic Infrastructure Sealed roads, electricity, telephone including mobile service, water reticulation, septic toilets, primary school, fale komiti tumama and fale fono.

Forest Activities All commercial logging of indigenous forest has now ceased, but extensive logging in the past depleted most of the remaining closed native forests. However, considerable native timber stands still exist at high altitude but are not commercially viable at current rate of return. Increased 'farm gate' prices or royalties need to be established. Also, a local societe has been formed with Sasina and Fagae'e to collectively plant both ifilele and poumuli plantations with the expectation of continuously expanding this plantation forest. Any introduced agro-forestry programme in the future could also build on this existing initiative.

Future forest activities include on-going biodiversity conservation as part of the NPAS, ecotourism businesses, agro-forestry, commercial plantations of Nonu, water catchment for surrounding villages, water catchment enrichment with trees, carbon crediting for standing forests possibly, but also possibly carbon crediting for proposed agro-forestry schemes as being promoted by the AusAID Community Agro-Forestry Program Design Team. Further complications may also exist for the villagers of Letui as they were kindly given access in the past to lands once belonging to Aopo and arguments over timber resource ownership have existed in the past. Ownership of future agro-forestry resources needs to be established also.

However, volcanic activity continues to pose a threat with nearby Mount Matavanu erupting from 1905-1911 with voluminous lavaflows reaching nearby coastal villages, as well as two eruptions close to Mount Silisili in 1902, immediately above Letui. In addition, invasive plant and animal species pose an on-going threat to existing and recovering forests, as does the strong likelihood of bushfires. Native vines, now exposed to direct sunlight, are also wreaking havoc (e.g. *Merremia peltata*).

Aopo Village

Name of *Pulenuu* Taimalelagi Ta'iai

Geographic Location Fagaee, Sasina, Letui and Aopo constitute the District of Gagaifomauga III

Population Using the 2001 Population and Housing Census, there were 398 people residing in Aopo comprising 27.3% of the District of Gagaifomauga III.

Economic Infrastructure Sealed roads, electricity, telephone including mobile service, water reticulation, septic toilets, primary school, fale komiti tumama and fale fono as well as a timber mill and health centre. However, the village relies on a pumped water supply from Sasina/Letui.

Forest Activities All commercial logging of indigenous forest has now ceased, but extensive logging in the past depleted most of the remaining closed native forests. However, considerable native timber stands still exist at high altitude but are not commercially viable at current rate of return. Increased 'farm gate' prices or royalties need to be established. Timber milling of plantation forests is still continuing today with some salvaging of cyclone-damaged trees.

Future forest activities include on-going biodiversity conservation as part of the NPAS, ecotourism businesses with birdwatching and summit treks along a designated nature trail, agro-forestry including fruit tree production and honey production, commercial plantations of nonu, water catchment enrichment with trees, carbon crediting for standing forests possibly, but also possibly carbon crediting for proposed agro-forestry schemes as being promoted by the AusAID Community Agro-Forestry Program Design Team.

However, volcanic activity continues to pose a threat with Mount o le Afi and Mount Mata o le Afi erupting in 1902 immediately above the village towards the summit. In addition, invasive plant and animal species pose an on-going threat to existing and recovering forests, as does the strong likelihood of further extensive bushfires in Aopo because of the drier micro-climate in the North-West corner of Savaii. Native vines, now exposed to direct sunlight, are also wreaking havoc (e.g. *Merremia peltata*).

Salailua Village

Name of *Pulenuu* Vaovasa Avei

Geographic Location Salailua, Siutu and Taga constitute a major portion of the District of Palauli West along with Satuiatua, Foalalo and Foaluga.

Population Using the 2001 Population and Housing Census, there were 594 people residing in Salailua comprising 18.6% of the District of Palauli West.

Economic Infrastructure Sealed roads, electricity, telephone including mobile service, water reticulation, septic toilets, primary and secondary schools, fale komiti tumama and fale fono. A small commercial *alia* fishing fleet operates out of this village. Income from surfing is also obtained.

Forest Activities All commercial logging of indigenous forest has now ceased, but extensive logging in the past depleted most of the remaining closed native forests. However, considerable native timber stands still exist at high altitude, but are not commercially viable at current rate of return. Increased 'farm gate' prices or royalties need to be established.

Future forest activities include on-going biodiversity conservation as part of the NPAS, agro-forestry, commercial plantations of Nonu, water catchment for surrounding villages,

water catchment enrichment with trees, carbon crediting for standing forests possibly, but also possibly carbon crediting for proposed agro-forestry schemes as being promoted by the AusAID Community Agro-Forestry Program Design Team.

However, invasive plant and animal species pose an on-going threat to existing and recovering forests. Native vines, now exposed to direct sunlight, are also wreaking havoc (e.g. *Merremia peltata*).

Siutu Village

Name of *Pulenuu* Taua Masalo

Geographic Location Salailua, Siutu and Taga constitute a major portion of the District of Palauli West along with Satuiatua, Foalalo and Foaluga.

Population Using the 2001 Population and Housing Census, there were 661 people residing in Siutu comprising 20.6% of the District of Palauli West.

Economic Infrastructure Sealed roads, electricity, telephone including mobile service, water reticulation and septic toilets. This village is renowned for its *siapo* production.

Forest Activities All commercial logging of indigenous forest has now ceased, but extensive logging in the past depleted most of the remaining closed native forests. However, considerable native timber stands still exist at high altitude, but are not commercially viable at current rate of return. Increased 'farm gate' prices or royalties need to be established.

Future forest activities include on-going biodiversity conservation as part of the NPAS, agro-forestry, commercial plantations of nonu, water catchment for surrounding villages, water catchment enrichment with trees, carbon crediting for standing forests possibly, but also possibly carbon crediting for proposed agro-forestry schemes as being promoted by the AusAID Community Agro-Forestry Program Design Team. Siutu has a thriving siapo-making industry and further plantations of *u'a* trees are proposed.

In addition, invasive plant and animal species pose an on-going threat to existing and recovering forests. Native vines, now exposed to direct sunlight, are also wreaking havoc (e.g. *Merremia peltata*).

Taga Village

Name of *Pulenuu* Tamala Maka

Geographic Location Salailua, Siutu and Taga constitute a major portion of the District of Palauli West along with Satuiatua, Foalalo and Foaluga.

Population Using the 2001 Population and Housing Census, there were 694 people residing in Taga comprising 21.7% of the District of Palauli West.

Economic Infrastructure Sealed roads, electricity, water reticulation intermittent, health centre, telephone including mobile service, primary school, septic toilets, fale komiti tumama and fale fono. Two small community tourism enterprises exist close to the Blowholes.

Forest Activities All commercial logging of indigenous forest has now ceased, but extensive logging in the past depleted most of the remaining closed native forests. However, considerable native timber stands still exist at high altitude together with an extensive but sparse coastal forest, but neither are commercially viable at current rate of return. Increased 'farm gate' prices or royalties need to be established. The targeting of lone 'seed' trees by loggers with mobile sawmills has had a devastating effect on re-growth of these secondary coastal forests.

Future forest activities include on-going biodiversity conservation as part of the NPAS, ecotourism businesses, possible agro-forestry, commercial plantations of Nonu, carbon crediting for standing forests possibly, but also possibly carbon crediting for proposed agro-forestry schemes as being promoted by the AusAID Community Agro-Forestry Program Design Team.

In addition, invasive plant and animal species pose an on-going threat to existing and recovering forests, as does the strong likelihood of bushfires. Native vines, now exposed to direct sunlight, are also wreaking havoc (e.g. *Merremia peltata*).

Gautavai Village

Name of *Pulenuu* Leota Ulutunu Fiapule

Geographic Location Gautavai and Sili constitute a major portion of the District of Palauli Le Falefa along with Gataivai, Vaiala, Puleia, Papa and Tafua.

Population Using the 2001 Population and Housing Census, there were 174 people residing in Gautavai comprising 5.1% of the District of Palauli Le Falefa.

Economic Infrastructure Sealed roads, electricity, telephone including mobile service, water reticulation and septic toilets. Footbridge across to Sili destroyed during Cyclone Val (1991).

Forest Activities All commercial logging of indigenous forest has now ceased, but extensive logging in the past depleted most of the remaining closed native

forests. However, considerable native timber stands still exist at high altitude, but are not commercially viable at current rate of return. Increased 'farm gate' prices or royalties need to be established.

Future forest activities include the establishment of the Sili Basin Conservation Area with UNEP and O Le Siosiomaga Society Inc. (OLSSI) and may also include on-going biodiversity conservation as part of the NPAS, ecotourism businesses, agro-forestry, commercial plantations of nonu, water catchment for surrounding villages, water catchment enrichment with trees, carbon crediting for standing forests possibly, but also possibly carbon crediting for proposed agro-forestry schemes as being promoted by the AusAID Community Agro-Forestry Program Design Team.

In addition, invasive plant and animal species pose an on-going threat to existing and recovering forests. Native vines, now exposed to direct sunlight, are also wreaking havoc (e.g. *Merremia peltata*).

Sili Village

Name of *Pulenuu* Toala Faafoi

Geographic Location Gautavai and Sili constitute a major portion of the District of Palauli Le Falefa along with Gataivai, Vaiala, Puleia, Papa and Tafua.

Population Using the 2001 Population and Housing Census, there were 885 people residing in Sili comprising 25.9% of the District of Palauli Le Falefa.

Economic Infrastructure Sealed roads, electricity, water reticulation, telephone including mobile service, primary school, hospital centre, septic toilets, fale komiti tumama and fale fono. Footbridge across to Gautavai destroyed during Cyclone Val (1991). Also, the economic returns from a hydro-power project within the village have been considered, but are subject to a recently completed Initial Environmental Evaluation (IEE).

Forest Activities Sili has never commercially logged its indigenous forests believing rightfully that their forests and their rivers are the future wealth of generations to come.

Future forest activities may include on-going biodiversity conservation as part of the NPAS, agro-forestry, commercial plantations of nonu, water catchment for surrounding villages, water catchment enrichment with trees, carbon crediting for standing forests possibly, but also possibly carbon crediting for proposed agro-forestry schemes as being promoted by the AusAID Community Agro-Forestry Program Design Team. Sili is the only Project Village organically certified, and has relatively vast untapped natural resources.

In addition, invasive plant and animal species pose an on-going threat to existing and recovering forests. Native vines, now exposed to direct sunlight, are also wreaking havoc (e.g. *Merremia peltata*).

In conclusion, the Project Team was unable to fully appreciate and realize the vast extent of the potential forest and landuse management benefits in 2 of the Project Villages because of access difficulties. The true Village Profiles of both Gautavai and Sili villages are yet to be fully appreciated from a comparative perspective with the remaining 7 other Village Profiles.

However, the Project Team recorded some serious yet unnecessary constraints to successfully managing Savaii's forest and land resources (See Section 4). Future influences, both negative and positive, will continue to differentiate the more sustainable villages from the less sustainable villages, their different Village Profiles possibly becoming even more pronounced.

Chapter 3 Forestry Profile

Introduction

In order to construct this supposedly more enabling forestry planning and development environment within Samoa, the following brief Forestry Profiles have, therefore, been prepared (past, present and future) providing all stakeholders hopefully with a clearer understanding of the best way forward (see Chapter 7). The FD maintains detailed forestry databases (SamFRIS Databases) and the recent 2007 State of the Environment Report gives an excellent summary of the current forestry profiles for Samoa, past and present.

However, compounding this general and ongoing climate of non-sustainability in the past, and an ongoing dis-enabling forestry development environment within Samoa, is the extremely poor planning at 4 different levels within the Forestry Sector, namely:

(1) at the legislative level,
(2) at the SDS national economic development planning level that still omits the necessity to mainstream environmental issues into its sustainable development framework,
(3) the ongoing delays by Samoa in ratifying numerous relevant forestry-related MEAs at the global and regional level, and
(4) an ill-defined failure of Pacific IGAs to holistically address natural resource management as a vital component of the Pacific's non-sustainable tourism sector, a key dominant sector that is possibly impacting negatively on Pacific cultures and Pacific natural resources, their delicate and vulnerable ecosystems and their very own sector's long-term survivability (see www.neweconomics.org and www.HappyPlanetIndex.org).

In order to gain, therefore, a full understanding and appreciation of Samoa's forestry profile, and hence further understand how villagers (and the nation's rural planners and decision-makers) view the future sustainability of their forest and land resources, especially on Savaii Island within the 7 Project Villages, it was considered important and foremost to take an objective socio-economic and cultural viewpoint based on the following significant changes witnessed in the past 10-20 years from a villager's perspective, namely:

(i) the decline in public expenditure for agricultural development in Samoa over the past decade, despite the fact that this is where the majority of the poor live (See Macroeconomics of Poverty Reduction in Samoa Report – 2006),
(ii) a worsening economic climate being faced by villagers, despite many of the macroeconomic reforms being put in place over the past 10-15 years,
(iii) a perceived lack of access to land in the past which has led to land-grabbing (which is only hastening even further deforestation),
(iv) an eroding fa'aSamoa, once capable of upholding traditional sustainability principles, and hence
(v) the ongoing vulnerability of the natural forest and land resources in Samoa.

In this Chapter, the short history of pro-active forest protection efforts in the past by the MNRE, MAFF and others, and concurrent non-sustainable deforestation practices which are continuing, are presented. The lowland and upland forests of Savaii have continued to be threatened because of all the previous non-sustainable advices and practices offered by GOS and individual stakeholders, much of it contrary to not only attaining sustainability, but also contrary to the many MEAs to which Samoa is, or should be, a signatory to, including the Mauritius Strategy for Sustainable Tourism.

The ongoing threats posed to Samoa's forests (including all its biodiversity) and land resources have already been adequately elucidated and quantified in numerous previous assessments and reports, namely:

(a) State of the Environment Reports (SOE), 1993 and 2007
(b) National Environment and Development Management Strategy (NEMS), 2004
(c) Bird Conservation Priorities and a Draft Avifauna Conservation Strategy for the Pacific Island Region (2001), etc.

and yet the same constraints to attaining sustainability which were recognized then have continued for a further 10-20 years more.

Whilst Samoa has reached this critical stage of its development and reached this critical stage of its natural resource management strategy, as this Assessment Report has confirmed (see Chapters 5, 6 & 7), some of these recognized constraints are still being ignored and even refuted.

3(i) Extent & quality of original Native Forest Resource – prior to commercial logging (for timber and agricultural expansion purposes)

Samoa was once covered entirely with lush tropical rainforests of various types, depending on soil quality and altitude, with abundant wildlife sufficient to sustain a human population for millennia. Past traditional uses of such forest and land resources equated with true sustainability. However, extensive deforestation has, over the past 200 years, managed to cause the subsequent on-going demise of Samoa's vital natural environments and subsequent degraded socio-economic status. The integrity of Samoa's cultural and natural resource base has been severely compromised.

Watershed quality and quantity was once sufficient in Samoa to maintain the ecological functioning of all existing rivers for the long-term benefit of all future generations. However, today, permanent water sources and rivers are drying-up and ceasing to function ecologically, much to the ongoing detriment of both villagers and local biodiversity.

Samoa's terrestrial biodiversity, aquatic biodiversity as well as its marine biodiversity are all dependent on an intact nearby forest ecosystem. However, ever since non-sustainable commercial logging commenced in Samoa in the 1960s, and extensive non-sustainable agricultural plantations (mainly for export purposes) took priority, Samoa's biodiversity has continued to be threatened as the original forests were gradually depleted.

Samoa's own cultural integrity continues to be undermined as the remaining forest resources dwindle with the subsequent loss of vital sustainability skills at a time when they may be needed most.

3(ii) Extent & quality of remaining Native Forest Resource

The FAO and Forestry Division of MNRE, from 2003-2005, compiled the 'Samoa Forest Resources Information System' or SamFRIS to help provide the database necessary to manage Samoa's remaining natural forest resources and plantation forests in a more sustainable way (FAO, 2005). The MNRE (Forestry Division) acquired the necessary equipment and training to upgrade its management capacity to assess and monitor the remaining forest resources of Samoa. Samoa's forest resources have been re-mapped based on 1999 aerial photographs and in-putted into a MapInfo-based Geographic Information System (GIS). Also, 400 forest survey plots were conducted to gather data about the structure and quality of Samoa's remaining forests, indigenous and plantation forests.

With approximately one third (23,885 ha) of the country's forests being cleared between 1977 and 1990, the clearance rate of 3% per year was recorded as being one of the highest in the world. At around 1000 ha/yr, the amount of forest clearance on Savaii was considerably greater than on Upolu (50 ha/yr) (IEE, 2006).

On Savaii alone, the land area under forest cover has been rapidly declining from almost 100% before the German plantation workers arrived in the mid 1800s, to 79% remaining by 1954, to 63% by 1987, to possibly 50% by 1990, and now estimated to be 69% remaining in 1999 (FAO, 2005). The Samoan forest is now extremely open and patchy with less than 0.05% classified as closed forest, with 32% of the total forest cover in Samoa in 1999 now classified as open forest (less than 40% tree cover) (SamFRIS, 2005). By 1994, only 19% of remaining forest on Savaii was considered merchantable indigenous forest (NEMS, 1994). Deforestation has, therefore, rightfully been identified as one of the main environmental challenges in Samoa (SOE, 1993, 2007) and was targeted in the National Environment and Development Management Strategies (1994) as one of the two most important environmental challenges along with the loss of biodiversity.

Unregulated clearance of native forests occurs as a result of logging, shifting cultivation and expansion of family plantations, therefore leading to soil erosion, increased risk of bushfires and the loss of other environmental assets and services.

As summarized in the 2007 SOE, "Today, areas designated for forestry purposes make up the largest portion of total land utilization in Samoa (about 30%). However, by 1999, based on aerial photographs, Samoa's agricultural plantations made up the largest portion of non-forest categories amounting to more than 63,000 ha (approx. 22.3% of the total land area of Samoa), an estimated 28,621 ha in Savaii and 34,476 ha in Upolu (MNRE 2006). However, the 1999 Housing and Population Census found the average household

controlled only 9 acres of plantation land compared to 15 acres in the 1989 Housing and Population Census. Plantation land that used to be under indigenous forest cover has had to be intensively managed to allow for this agricultural expansion, but because of poor soil fertility issues, rotational cropping practices are carried out or the land is reverting to secondary forests (FAO, 2005). ……Plantation lands today remain mostly under customary ownership, but it has been at the expense of native forests and vital water catchments (GOS, 2003b). The remaining native forests, if access is provided, are threatened. The practice of agricultural expansion into native forests today is still evident, especially with the on-going sealing of plantation roads and an increasing use of motorized transport such as pick-ups and trucks for transporting produce greater distances back to their respective villages. The extent of remaining native forests is, therefore, threatened, reducing its overall quality and functionality as intact ecosystems capable of supporting Samoa's threatened biodiversity." (SOE, 2007)

By 2004, undisturbed forests or uninfluenced natural vegetation were almost non-existent in Samoa (FAO, 2005), with most of the forests damaged or cleared in the past 200 years. However, historically, the Samoan archipelago was once the epitome of sustainability for the vast majority of the past 3000 years since human habitation. However, recent development projects over these past 200 years or more have brought with them a new dimension of challenges culturally, socially, economically, politically and environmentally. Environmental damage during this latter period has amounted to possibly hundreds of millions of dollars of repair bills, leaving Samoa today with less than 50% of its original native forests, with only 3% of it remaining as merchantable indigenous forest (NEMS,1994, SOE, 2007, FAO,2005).

Also, this Assessment Report highlights the fact that as long as the ecological integrity of Samoa's forest resources and land resources continues to decline, the hope of ever implementing a successful economic, environmental and cultural recovery plan can only be diminished exponentially. This Assessment Report, therefore, focuses on local communities' general attitudes to deforestation and land use management, and their general lack of understanding today of all the pertinent aspects of sustainable economic development, especially its relationship to:

(i) deforestation,
(ii) land degradation,
(iii) food security,
(iv) loss of biodiversity,
(v) poverty, and even
(vi) current and future global climate change impacts on Savaii Island's remaining forests.

According to FAO (2005), "heavy disturbance of natural forest stands are related to cyclones, some cyclones causing considerable and permanent crown and structural damage. Human activity (i.e. slash and burn farming, including commercial logging), have over the years contributed significantly to the reduction of the forest areas as well as their severe degradation, reducing their quality as a source of merchantable timber to 3% of remaining forest area, and of course reducing the ecological integrity of the native

forests……Changes in agricultural landuse patterns and the consequences of the taro leaf blight in the mid 1990s influenced the increase in the secondary forests and overgrown agricultural plantations….And introduction of alien species (e.g. African rubber tree) have caused further changes to the composition of the native vegetation…..At present, undisturbed or uninfluenced natural vegetation are almost non-existent in Samoa."

For a comprehensive description, Whistler (2001) offers an in-depth description of the different forest types and floristic composition, as well as accounts of historic forest cover.

> The recent State of Environment Report (MNRE, 2007) offers an excellent account of the remaining status of Samoa's forests based on the FAO (2005) SamFRIS information as presented in the attached CD-ROM.

3(iii) Potential value of remaining native forest resource for logging & conservation/biodiversity

Past forestry extraction techniques in Samoa were both primitive and destructive, sawmills were inefficient with huge timber resource losses, and the exported timber was sold for premium prices overseas with a marginal return to the Samoan land resource owners. Much of the sustainability advice offered in the past was ignored. Logging of any remaining native forest in Samoa should possibly be prohibited and legislated accordingly. Timber production should be targeted only from plantation forests specifically grown to help meet local consumption (unless local hardwood timbers are required for furniture manufacturing and other high utility purposes).

"Ward and Ashcroft (1998) indicate that about 56% of Samoa's land does not have severe limitations for agricultural use, and most of this land has already been cleared of forest and has at some time been put under agricultural or forestry use. Even if such land is currently underused in terms of its potential, because it has once been cleared and used, much of it was once thought to be held in the ownership of specific aiga or individuals and hence not available for general development. However, this is no longer the case as recent Lands and Tiltes Court rulings indicate that these cleared lands are still under the alii and faipule of their respective villages. Most customary land which is still forested lies at higher elevations and is either less suited climatically for agriculture, or has other

severe limitations to its use for anything other than conservation forest and watershed protection (ibid).” (cited SOE, 2007).

3(iv) Potential impact of the Government ban on commercially logging native forests

The Government of Samoa recognizes the necessity to protect the forest and land resources, especially the remaining lowland and upland forests of Savaii. Despite all the conservation efforts made in Samoa over the past 20-40 years, the trend of ongoing land degradation, deforestation, loss of biodiversity, subsequent degradation of water conservation areas, soil erosion and negative impacts on the hydrology all continue relatively unabated today, in fact in some locations, they may have even been progressively exacerbated. The SOE 2007 states an *“ongoing demise of our environmental integrity”* in Samoa despite numerous positive pro-active efforts. A new policy to ban the commercial logging of indigenous forests was proposed to Cabinet in 2006 and accepted.

Government’s response to this initiative on January 1st 2007 was to enforce this forest policy banning commercial logging of indigenous virgin primary rainforest. However, it was immediately reversed within 10 weeks by villagers on Savaii who were determined to continue logging their invaluable remaining forest resources. The logging lobbyists successfully presented their short-term socio-economic reasons for continuing their non-sustainable logging activities, thus being sufficiently convincing to Government simply because there was thought to be little to no other economic opportunities for these resource owners. This was the opportune time to present an innovative village development plan to the lobbyists’ villages that possibly offers a better economic return than commercial logging. Relaxing the ban sends the wrong message to the communities, an almost retrograde step in terms of conserving the remaining forests of Savaii.

The lobbyists also argued that these forests were their village’s own natural resources and that the village *fono* was the authority to administer local natural resources such as forests. However, as this Report clearly outlines, there may be a number of very serious and proven alternate sustainability and economic options that must now be considered, even more so by these 7 Project Villages and all other villages in Samoa if possible (see Sections 4 and 5).

Without sufficient capacity building at all levels within the forestry industry, and without sufficient targeted longitudinal Sustainable Forestry Indicator (SFI) research as alerted to in the draft national forestry policy, Samoa will never be in a position to fully recover from past impacts of non-sustainable logging of its forest resources. A ban, as such, on the commercial logging of indigenous forests makes sound environmental and economic sense. Until the SDS mainstreams all key environmental issues into the nation’s development framework, Government has no real meaningful national planning

document that takes a holistic and necessary approach towards attaining sustainable forestry and sustainable development.

3(v) Re-forestation projects and impact on forest resources

There is a recognized urgency to replace lost forest resources, rebuild degraded ecosystems and improve food security whilst simultaneously boosting rural economies. An ongoing pro-active effort at re-forestation must be made in order to also take pressure off further logging the remaining primary rainforests which, unfortunately, continues even until the present time.

Samoa has a long history of re-forestation since the late 1980s with the assistance of NZAID. However, many areas designated for re-forestation were subsequently used immediately by the villagers for agricultural expansion. The plantation forests that were established were mainly comprised of introduced fast-growing species, most of them quite susceptible to cyclones and of little ecological value for local biodiversity.

What plantation forests were established and managed by Government were subsequently handed back to the villages which had inadequate training in sustainable forestry, and which had inadequate resources to successfully manage these plantation forests on a long-term basis.

The conclusion to be drawn here is that the planting of plantation forests alone was not sufficient to take pressure off the remaining native forests. What is needed is an alternate and more sustainable and profitable economic option to logging: a more sophisticated agro-forestry system is needed.

However, appropriate legislation is also needed urgently to not only protect existing remaining native forests, but also protect new and proposed community forests, and even the proposed agro-forests that are being designed at present, in order to collectively enhance the nation's forest resources.

3(vi) Potential for reforestation

The potential for reforestation also includes natural regeneration (see below).

There exists in these 7 Project Villages considerable potential for deliberate re-forestation in order to attain true sustainability. However, the real potential for re-forestation is thwarted by:

(i) lack of cooperation by all stakeholders,

(ii) insufficient data sharing between responsible Ministries and their Divisions: this represents a major obstacle to designing much needed policies and management practices that may require the different use of such information. Therefore, the formulation of a National Data Sharing Policy in Samoa is essential.

Another real potential for re-forestation is Samoa's extensive coconut plantations, not only in terms of sheer acreage, but also in terms of a yet unrealized and untapped potential use of coconut timber. Carefully managed harvesting of this coconut timber resource may pave the way for an extensive agro-forestry programme which includes existing senile coconut plantations. In addition, multi-cropping of coconut plantations in some form of agro-forestry regime is also being considered.

However, the potential for reforestation in Samoa is being constantly reduced with ongoing land degradation, especially with the current rate of soil erosion and loss of soil fertility (MNRE 2006). In addition, the modern practice of monocropping, rather than the more traditional systems such as mixed cropping and integrated farming, has resulted in furthering the land degradation issues because of more severe soil erosion. Carefully designed agro-forestry regimes need to be implemented, especially if they increase soil fertility, increase productivity and possibly offer new economic opportunities for major reforestation initiatives as proposed by the recent AusAID Community Agro-Forestry Programme design team.

However, what has worked well in the past is family-owned agro-forestry, this time offering some new and exciting economically beneficial options such as fruit trees and nonu, poumuli, moso'oi, *Pandanus*, paper mulberry tree for siapo/tapacloth making, and mamala for example. Albeit fruit tree production, nonu, mamala, , etc., communities need to take a serious look at food security, self-sufficiency, import replacement, etc. as their cost of living increases and as global environmental impacts continue to reek havoc in Samoa for possibly many generations to come.

Finally, the real potential for reforestation lies in increasing capacity building of Forestry Officers and in forestry planning and management: whilst this is urgently requires, immediate and further in-depth training in the application and up-dating of SamFRIS is needed.

Also recently, Non-Timber Forest Products (NTFPs) are now also being targeted aggressively by various development workers, even medicinal plant export exploitations are being mooted such as nonu and mamala. However, these commercial exploits are either poorly resourced or are poorly understood by the community at large.

Alternatively, Samoa may be in a unique position to capitalize in the future on carbon credits for a variety of different reasons, even benefit economically from organic certification, and the economically advantageous possibility presented in this Report of offering 'sustainability credits' to those villages which adopt the best sustainability practices.

In addition, numerous expected incomes/acre/year/crop are also given as examples so that comparative studies can be made with other potentially more profitable crops, preferably crops that offer both direct and indirect environmental restoration benefits (e.g. fix nitrogen into the soil, used as cattle fodder, produce excessive amounts of oxygen, absorb

more than 500 tonnes of carbon/hectare/year, and even projects that attract more than $USD30/tonne of carbon exchanged in terms of carbon credits).

Samoa has, to date, witnessed numerous lost opportunities in natural resource conservation: this Assessment Report capitalizes on this by offering some immediate remedies and solutions for future resource management practices within Samoa (See Chapter 4). The real solutions are commensurate with the level of commitment within the highest stakeholders of the nation, and commensurate with the level of funding committed to this extensive forest and landuse restoration through increased public awareness, capacity development, training and implementation of extensive national agro-forestry projects.

For example, Samoa is now about to embark on an unprecedented environmental enrichment programme with an expenditure estimated in the tens of millions of Tala over the next 5-10 years. There is obviously great potential for reforestation as a result of this funding being spent on projects involving land degradation, biodiversity conservation and climate change adaptation. Funding has been provided already by the Global Environment Facility (GEF), with co-financing from the Government of Samoa and its long-standing aid partners.

3(vii) Lessons learnt from previous reforestation efforts

In the past, some villages ignored their logging contracts which encouraged the reforestation of their recently logged areas, preferring to use these newly cleared ‘pastures’ for lucrative agricultural export industries at the time (e.g. taro). Therefore, the post-logging reforestation effort was not as effective as expected.

Also, any expected economic benefits from logging were unlikely to outweigh the future costs to Samoa’s sustainability, despite possibly strong economic arguments for logging being accepted not only by the villagers and resource owners, but also the Governments of the day. For example, in Samoa in the past 5-10 years alone, major water infrastructure projects and environmental restoration projects of all descriptions have cost donors (and residents) hundreds of millions of Tala: it is unlikely that forest resource extractions in the past collectively amounted to anything close to this calculated repair cost, not to mention the on-going repair costs. In addition, the damage being caused globally by reduced forest resources, and a dying coral reef system globally, may also be possibly too difficult to calculate accurately.

An attempt has to now be made to restore Samoa’s natural resources to their original functionality: the planting of forests which bear fruits, medicines, oils and perfumes as NTFPs may be more attractive than planting commercial timber species because these timber species eventually have to be extracted (unless of course it is done only for local non-commercial timber production purposes). Future community agro-forestry projects, therefore, need to capitalize on such innovative agro-forestry regimes at the expense of planting agricultural crops for export purposes, especially if such agricultural practices

are done at either the expense of the remaining limited native forests or even at the expense of re-planting arid lands with more environmentally friendly crops, especially those that require organic certification and offer import replacement or are of high nutritional or medicinal value.

Further lessons learnt from previous reforestation efforts include the unexpected high labour costs involved with maintaining these plantation forests to the point that Government recently handed these plantation forests back to the resource owners to manage on their own. In addition, possibly the wrong species of timber trees were planted that were not as cyclone-resistant as native tree species. And besides, Samoa still lacks commercial timber drying facilities as well as timber preservation facilities: imported dried and treated softwood species are the better option at present.

Also, only timber species were planted as opposed to NTFP species such as nonu, moso'oi, etc. that may have a higher economic return based on today's pricing. Also, the lag time for timber production was too long for most villagers, whereas nonu production, for example, has an economic return commencing after only 9 months. Opportunities for inter-cropping were also not explored during previous reforestation efforts (e.g. nonu planted beneath moso'oi planted beneath coconuts/tiki, etc.).

Without an effective public awareness programme of the 30 or more benefits of forests see Appendix 3), any new reforestation project in Samoa involving forestry stakeholders should help exacerbate the real benefits of forests nationally and globally.

The lessons learnt today from previous reforestation efforts, therefore, include possibly insufficient public awareness of all the 30 or more benefits of planting and protecting forests. Had the awareness campaign been more effective at the time of the reforestation, possibly a different result may have been achieved. Awareness levels today are still very low, especially considering the past efforts taken to raise awareness, and considering the fact that never before have Samoa's forests been under such increasing commercial and environmental pressure, possibly more so than ever before. The lesson learnt in this case is that better business training is required in the villages with improved access to capital funds to help commence a business, preferably more environmentally and economically sound business options.

With SamFRIS now operating well, staff of the FD can continue to monitor many of the forestry variables that may allude forestry managers of progress or otherwise. Hence serious multi-purpose reforestation projects must be commenced if Samoa is to:

(i) improve global air quality and carbon exchanges,
(ii) repair degrading water catchments,
(iii) provide alternate energy sources such as hydro-power,
(iv) design new economic paradigms relevant to rural economies,
(v) authenticate an eroding culture,
(vi) help address major global climate change impacts,
(vii) address biodiversity loss, and

(viii) simultaneously encourage informal education opportunities that help with capacity building in rural villages.

However, an updated database is required and this facility and service has not been available until recently.

The authors are proud to announce in this Report that the findings below (See Chapter 4) are indeed significant, innovative and highly achievable provided rural communities can be assisted with improved sustainable economic development options. The lesson learnt here is that without inputting from economists with expertise in sustainable economic development, then all forestry efforts and investments were in jeopardy, often without this point being appreciated by the resource owners themselves. In addition, there is equally strong justification for an anthropological input today, especially one that can help ensure an improvement in village governance.

Also, there is an additional beneficial connection with targeted development projects designed specifically to hopefully help alleviate the pressure on commercially logging Savaii's remaining native forests, namely plantation forestry, community forestry, agro-forestry, commercial fishing, agricultural exporting, cattle production, nonu exports, hydro-power, dairying and milk-iceblock production, kava/cocoa/coffee production, even fruit tree and spice production have been mooted recently. Other tree/plant species are also considered in this Report, namely bamboo, *Pandanus* (fala), u'a or paper mulberry and moso'oi. But were these trees included in previous reforestation projects? The lesson learnt in this respect is that possibly a wider range of tree species need to be considered today, especially if new lucrative export markets can be found overseas.

A recent attempt to mainstream these environment issues into Samoa's development frameworks clearly illustrates this inter-connectedness between poor resource management, poor legal frameworks and, at present, insufficient viable economic options for all relevant Project Villages profiled below (Law Consult, 2007). Other factors such as social attitudes to reforestation and agriculture production, as well as receipt of remittances, also do impact on our ability to manage these natural resources more sustainably. This is discussed in Chapter 4 in more detail.

Chapter 4 Key Research Findings

Data analysis and interpretation

The survey questionnaire was constructed to conveniently analyze knowledge, perceptions and attitudes of respondents pertaining to landuse patterns and methods, governance structures, barriers and the economy.

Responses also to open-ended questions of the Survey Questionnaire have also been analyzed using open, axial and selective coding, as well as using a descriptive statistics and frequencies analytical methodology. Whilst line by line analysis of answers has been attempted, major ideas sorted in sentences and paragraphs were utilized to arrive at a general picture of the responses to a particular question. All open-ended responses have been arranged according to categories laid out in the SPSSx 13.0 Programme.

Description of demographic characteristics

Of the 126 randomized respondents interviewed, 44 per cent were male and 56 were female (see summary of all Survey Questionnaire statistics on attached CD). The minimum age was 18 with the maximum of 61 years. In respective terms, about 11 per cent of the respondents were between the ages of 18 and 25; about 12 per cent were between the ages of 26 and 33; about 9 per cent were between the ages of 34 and 41; about 15 per cent were between the ages of 42 and 49; about 21 per cent were between the ages of 50 and 60; and about 32 per cent were 61 years of age and over.

The marital status of respondents reveals 86 and 14 per cent were married and unmarried, respectively. Most respondents reside in the villages, with very few living outside the village and only visiting to engage in village gathering (fono, etc.,) as social, cultural and religious bonding responsibility. In most cases, the respondents lived all their lives in the villages. Most respondents were non-matai, with about 45 per cent matai who had held their titles for more than 20 years. Also, more respondents had between 5 and 7 children. Of the household numbers, most respondents were living in households of more than 7 family members.

The level of education revealed an uneven distribution pattern with high concentration in some categories. About 58 per cent of the respondents did not complete primary and high school, about a quarter of respondents completed high school and a small number completed technical school (2 per cent) and university (3 per cent).

Description of landuse patterns and methods

All respondents had lands in the villages used mainly for growing crops with some allotted to cattle farming. The main crop grown is taro yet, banana, coconut and cocoa appear to be low in priority in terms of landuse. Crops cultivated are mainly for food with some for cash. In most villages, taro, banana, coconut, cocoa and nonu are the main cash crops. Produce are sold directly to consumers via Salelologa market or family stalls.

Most families were allocated between 1 and 10 acres for farming. On average, households would receive more than $SAT100/day.

In terms of farming methods, the most commonly used is fallowing. Land clearing is done with basic tools such as knives with a few respondents opting for the use of chemicals such as paraquat. The most popular reasons for their choice of farming methods are low cost and less work.

All the villages have had their forests logged at some stage under the general consensus of alii and faipule, enticed by cash income offered by logging companies and endorsed by Government's Cabinet Development Committee (CDC). In all the villages, it was perceived that there were still trees to be logged. There were areas set aside for special purposes such as water catchment and biodiversity. In terms of sustainable use of land resources, respondents have an understanding of the concept prompting them to use the resource wisely and to preserve for future generations.

The comparison over the past 10 and 20 years regarding landuse practices appears notable for some changes. The general desire to stop the practice of chemical application (weed killers) and deforestation for farming and logging is evident. More and more villagers work on plantations/farms with the awareness of wise landuse practices.

Governance structures

Village fono deliberations form a significant function in the social and cultural cohesion of alii and faipule authority. The respondents revealed that about half participated in village fono deliberations. In terms of virgin land remaining unused, all the villages have some left, but have some future plans for its use. In most cases when there is a land dispute, there is no village mechanism for settlement (54%), though some form of punishment is enforced and the decision making procedure of the village fono for landuse is highly supported by 97% of respondents.

The decision making for landuse has made the villages better off economically and culturally, and the governing and managing affairs of the village have been fair to most respondents. In most responses, villages view their leaders as having good authority, thus needing few changes. However, 11% of respondents feel the need for change of the village mayor, improve village affairs and change some of the village rules. In terms of sustainable resource use, most village leaders have a long term view and perspectives of the interests of the villages.

Perceptions and attitudes

Perceptions and attitudes lay groundwork for policy making in any form of village governance. Most respondents believe that more benefits could be obtained from their lands and resources in the form of cash and food. The level of economic development in the villages is satisfactory and the majority of respondents believe their villages are better off economically and culturally than other villages. Basic needs are most commonly

desired by the villages, including good education, health care system, inland roads and reliable water supply.

All villages have some forest and unused land left which are either inaccessible or much further inland, located on mountainous sites or preserved for conservation purposes. Most respondents strongly support unused land and forestry resources to be under the control/management of the village fono, however, some desired more access to farming and plantation areas and a few supported conservation of biodiversity. In terms of development, more and more residents would want to use those land and resources, yet village policies only permit conservation, and have since banned logging and the use of agricultural chemicals.

Given that all villages have had their forests logged in the past, the impacts of such acts on their economies have been disastrous. Erosion is evident from deforestation, along with loss of indigenous birds and indigenous forests. However, some limited cash income received from commercial logging enterprises assisted with the development of residential houses, some such funds were invested in banks, whilst the remainder was distributed amongst matai, families and churches. In terms of family aspirations, the respondents would desire greater benefits to be accrued to the development of their families and plantations. Consequently, residents leave their villages in search of employment and a better standard of living.

Barriers

Barriers are impediments to village growth and progress and often reflect positively or negatively on village council authority decision making processes. Though there is overwhelming agreement with village fono decision making on allocation of lands, few have voiced their dissatisfaction. In most cases, residents agreed that all relevant information was provided to the village fono for decision making purposes as to the best use of land, and hence they had overwhelmingly support for their decisions for supposedly ongoing sustainable use of village lands. The main constraints to sustainable use of land are small-scale logging for agricultural expansion purposes, commercial deforestation of indigenous forest, use of chemicals and destruction caused by wild pigs. Most respondents felt that these constraints can be remedied by the fono's decision making processes and further education programmes. In terms of sustainable resource use, the fono has a long term perspective for the interests of the village allowing land and resources for conservation, agro-forestry and ecotourism projects.

Economy

Economies of the seven Project Villages vary in terms of land resource use, emphasis on cash cropping and reliance on remittances. Most villages receive income by way of remittances, plantations, fishing, weaving of ietoga and making of siapo. Income from villagers working outside the village is an important source of village income which mostly goes into family development, village and church obligations. There is some form of income generated in the village where there is an exchange of goods and services

for cash. Other forms of income which are not being explored by some Project Villages include sale of lopa, siapo, ietoga and nonu. Farming and fishing are viewed as good sources of income. There is a general perception that farming and fishing provide food and income, but most have been discouraged due to lack of good farming practices, extensive damage by free-ranging pigs, and general laziness. Most respondents have children living and working in the village, some are employed by beach resorts and plantations, with few employed as teachers in local schools. In about half of the cases, respondents have children working outside of the villages.

Chapter 5 Village economic development plans and recommendations

In order to build-up a village-based economic development plan, based on all the previous tenets presented in this Assessment Report, the following assumptions, prices and processes need to be considered:

i. Cost of today's environmental restoration to be costed in,
ii. Carbon trading soon to be a reality for Samoa,
iii. Carbon credits offered for renewable energy sources today,
iv. Future markets in carbon credits (standing forests),
v. Future markets in carbon credits (new agro-forests),
vi. Carbon credits worth $USD7/tonne,
vii. Forests absorb 200 tonnes of carbon/acre/year,
viii. Sufficient export markets existing already for nonu,
ix. Nonu income per acre = $SAT5-10,000 (assuming organic certified),
x. Food security in the future is a serious issue for Samoa
xi. Climate change adaptation essential today,
xii. Aquaculture technology available (ulavae, tuna, tilapia),
xiii. Organic farming raises profitability by 30%,
xiv. Ban on pesticide use improves soil fertility, crop profitability and health,
xv. Sandalwood plantations worth $SAT80,000/acre after 20 years,
xvi. Nonu/poumuli/sandalwood/etc. agro-forestry an imminent reality,
xvii. Subsistence agriculture can exist in Samoa in a sustainable manner,
xviii. Permaculture technology can apply to Samoan environments,
xix. Organic coconut oil business (WIBF) can earn $500/week/family,
xx. Nonu business can earn $700/week/family harvesting wild nonu,
xxi. Expanding NTFPs markets – e.g. Moso'oi perfume, etc.,
xxii. Established conservation areas are endorsed forever (e.g. Tafua, Salelologa, Aopo, Sili, Sasina, etc.),
xxiii. New markets needed for siapo with improved 'farm-gate' prices,
xxiv. New markets needed for ietoga with improved 'farm-gate' prices,
xxv. Recent forestry leases make no economic sense to the fono,
xxvi. More immediate business advice and support is needed,
xxvii. 'Nonu beneath coconuts' may be better than logging and tourism,
xxviii. No prior process exists for fono to access EIA support,
xxix. All 9 Project Villages need to be organic certified immediately,
xxx. Need to adopt immediate agro-forestry practices,
xxxi. Need to speed-up this process to attain sustainability,
xxxii. Need economic partnerships with Government,
xxxiii. Need constant feedback from this Project alone,
xxxiv. No single agency competent in community development,
xxxv. No effort being made to address (xxxiv) above,
xxxvi. Little if any access to micro-credit and business advice, and

xxxvii. Proven demonstration of economically viable agro-forestry models required to overcome any existing apprehensions.

Based on the above information, an estimated general family income/year (assuming a family of 8, including 4 able-bodied persons), but not including remittances and employment incomes from outside the village, is presented here.

General potential income sources	**$SAT**
Subsistence agriculture/fishing	Nil
Excess subsistence crops/fish for sale	100/week
Use of livestock for faalavelave/family	NIL
5 acre plantation of nonu	500/week
carbon credits for hydro-scheme	33/week
carbon credits for standing forest	33/week
carbon credits for new agro-forestry plots	10/week
loan capital - Dev. Bank (tree mortgage)	dev. opport
plantation timber sales	20/week
indigenous forest timber sales (new royalty rates)	30/week
organic produce sales (honey, coconut oil, etc.)	200/week
Non-Timber Forest Products (NTFPs)	50/week
Dairy ice-blocks	24/week
community tourism and ecotourism development	500/week
new tree crops (e.g. Moso'oi, bamboo, etc.)	25/week
Ietoga (fine mat) production (WIBF)	250/week
handicraft-making (e.g. woodcarving, etc.)	75/week
firewood production	100/week
	TOTAL $1950/week

The following 7 Project Village economic development plans have been proposed and adopted by their respective villages during the final stages of the project consultations:

Potential income sources for Aopo	**$SAT**
Subsistence agriculture/fishing	Nil
Excess subsistence crops/fish for sale	100/week
Use of livestock for faalavelave/family	NIL
5 acre plantation of nonu	500/week
carbon credits for standing forest	30/week
carbon credits for new agro-forestry plots	10/week
loan capital - Dev. Bank (tree mortgage)	dev. opport
plantation timber sales/leases	30/week
indigenous forest timber sales (new royalty rates)	30/week
Non-Timber Forest Products (NTFPs)	50/week
community tourism and ecotourism development	100/week
Ietoga (fine mat) production (WIBF)	250/week
handicraft-making (e.g. woodcarving, etc.)	50/week

firewood production	100/week

TOTAL $1250/week

(Aopo has an active timber mill within the village, has recently leased plantation forest lands, but has yet to explore nonu production at a commercial level as a more viable economic option to further leasing its valuable plantation forest resources.)

Potential income sources for Letui	**$SAT**
Subsistence agriculture/fishing	Nil
Excess subsistence crops/fish for sale	100/week
Use of livestock for faalavelave/family	NIL
5 acre plantation of nonu	500/week
carbon credits for standing forest	30/week
carbon credits for new agro-forestry plots	10/week
loan capital - Dev. Bank (tree mortgage)	dev. opport
plantation timber sales	50/week
indigenous forest timber sales (new royalty rates)	30/week
organic produce sales (honey, coconut oil, etc.)	200/week
Non-Timber Forest Products (NTFPs)	50/week
community tourism and ecotourism development	100/week
new tree crops (e.g. poumuli/ifilele, etc.)	25/week
Ietoga (fine mat) production (WIBF)	250/week
handicraft-making (e.g. woodcarving, etc.)	50/week
firewood production	100/week

TOTAL $1495/week

(Letui has allowed neighbouring villagers to harvest its wild nonu fruits, however, a proposed faatonu for nonu may open-up this lucrative market.)

Potential income source for Sasina	**$SAT**
Subsistence agriculture/fishing	Nil
Excess subsistence crops/fish for sale	100/week
Use of livestock for faalavelave/family	NIL
5 acre plantation of nonu	500/week
carbon credits for standing forest	30/week
carbon credits for new agro-forestry plots	10/week
loan capital - Dev. Bank (tree mortgage)	dev. opport
plantation timber sales	50/week
indigenous forest timber sales (new royalty rates)	30/week
organic produce sales (honey, coconut oil, etc.)	200/week
Non-Timber Forest Products (NTFPs)	50/week
community tourism and ecotourism development	100/week

new tree crops (e.g. poumuli/ifilele, etc.)	25/week
Ietoga (fine mat) production (WIBF)	250/week
handicraft-making (e.g. woodcarving, etc.)	75/week
firewood production	100/week

TOTAL $1505/week

Potential income sources for Fagae'e	**$SAT**
Subsistence agriculture/fishing	Nil
Excess subsistence crops/fish for sale	100/week
Use of livestock for faalavelave/family	NIL
5 acre plantation of nonu	500/week
carbon credits for standing forest	30/week
carbon credits for new agro-forestry plots	10/week
loan capital - Dev. Bank (tree mortgage)	dev. opport
plantation timber sales	50/week
indigenous forest timber sales (new royalty rates)	30/week
organic produce sales (honey, coconut oil, etc.)	200/week
Non-Timber Forest Products (NTFPs)	50/week
community tourism and ecotourism development	100/week
new tree crops (e.g. poumuli/ifilele, etc.)	25/week
Ietoga (fine mat) production (WIBF)	250/week
handicraft-making (e.g. woodcarving, etc.)	75/week
firewood production	100/week

TOTAL $1520/week

Potential income sources for Sala'ilua	**$SAT**
Subsistence agriculture/fishing	Nil
Excess subsistence crops/fish for sale	100/week
Use of livestock for faalavelave/family	NIL
5 acre plantation of nonu	500/week
carbon credits for standing forest	30/week
carbon credits for new agro-forestry plots	10/week
loan capital - Dev. Bank (tree mortgage)	dev. opport
plantation timber sales	20/week
indigenous forest timber sales (new royalty rates)	30/week
organic produce sales (honey, coconut oil, etc.)	200/week
Non-Timber Forest Products (NTFPs)	50/week
Dairy ice-blocks	24/week
community tourism and ecotourism development	200/week
new tree crops (e.g. Moso'oi, bamboo, etc.)	25/week
Ietoga (fine mat) production (WIBF)	250/week
handicraft-making (e.g. woodcarving, etc.)	75/week

firewood production	100/week

TOTAL $1564/week

Potential income sources for Siutu	**$SAT**
Subsistence agriculture/fishing	Nil
Excess subsistence crops/fish for sale	100/week
Use of livestock for faalavelave/family	NIL
5 acre plantation of nonu	500/week
carbon credits for standing forest	30/week
carbon credits for new agro-forestry plots	10/week
loan capital - Dev. Bank (tree mortgage)	dev. opport
plantation timber sales	20/week
indigenous forest timber sales (new royalty rates)	30/week
Non-Timber Forest Products (NTFPs)	50/week
community tourism and ecotourism development	500/week
new tree crops (e.g. Moso'oi, bamboo, etc.)	25/week
Ietoga (fine mat) production (WIBF)	250/week
handicraft-making (e.g. siapo, etc.)	450/week

TOTAL $1965/week

(Whilst Siutu is the main village producing siapo, village representatives would like to see new markets open-up with a better 'farm-gate' price to make the project more economically viable.)

Potential income source for Taga	**$SAT**
Subsistence agriculture/fishing	Nil
Excess subsistence crops/fish for sale	100/week
Use of livestock for faalavelave/family	NIL
5 acre plantation of nonu	500/week
carbon credits for standing forest	30/week
carbon credits for new agro-forestry plots	10/week
loan capital - Dev. Bank (tree mortgage)	dev. opport
plantation timber sales	20/week
indigenous forest timber sales (new royalty rates)	30/week
organic produce sales (honey, coconut oil, etc.)	200/week
Non-Timber Forest Products (NTFPs)	50/week
Dairy ice-blocks	24/week
community tourism and ecotourism development	150/week
new tree crops (e.g. Moso'oi, bamboo, etc.)	25/week
Ietoga (fine mat) production (WIBF)	250/week
handicraft-making (e.g. woodcarving, etc.)	75/week
firewood production	100/week

TOTAL $1564/week

These individual village-based economic development plans need to be further updated as new costings and new economic opportunities arise, and as increased cooperation is witnessed between all the 9 Project Villages.

In addition, planting of trees within water catchments, abandoned agricultural areas, along water courses, throughout the village, etc. allows for

(i) Hastened biodiversity habitat regeneration,
(ii) Improved soil conservation,
(iii) Improved water conservation,
(iv) improved aesthetics,
(v) increased oxygen production into the atmosphere,
(vi) decreased CO2 build-up in atmosphere,
(vii) greater tourism potential,
(viii) increased fruit production,
(ix) improved nutrition,
(x) improved health,
(xi) improved food security,
(xii) increased honey production,
(xiii) increased NTFP potential,
(xiv) improved natural disaster mitigation,
(xv) Improved pro-poor growth,
(xvi) Improved sustainability in forestry practices,
(xvii) Improved sustainability in agricultural practices,
(xviii) Improved sustainability in livelihoods,
(xix) Improved sustainability in tourism,
(xx) Improved sustainability in alternate energy sources,
(xxi) Improved sustainability in economic development,
(xxii) A more enabling development environment,
(xxiii) Improved sustainability in cultural assets,
(xxiv) Improved sustainability in social assets,
(xxv) Improved sustainability in education assets with development of new life skills,
(xxvi) Greater capacity development (e.g. carbon crediting, fair trade relationships, etc.), and
(xxvii) Increased utility factor of resources (e.g. furniture manufacturing, cold-pressed organic virgin coconut oil, nonu bottling, etc.).

Recommendations

The Project Team has recognized an untapped potential for sound economic development within these 7 Project Villages that can hasten sustainable economic development on Savaii and lead immediately to increased protection and increased restoration of lowland and upland forest resources.

There must be a strong recommendation made here for all Project Villages, including Gautavai and Sili, to jointly share their natural resources including biodiversity, water, renewable energy potential, oxygen production, carbon sink potential, etc.

Secondly, it is strongly recommended that all 9 Project Villages meet immediately to discuss the formulation of their own Joint Strategic Plan to help bring about a more prompt enabling economic development environment. The respective village fono have requested this sharing of both knowledge and resources, but the process to help bring this about was not discussed by the Project Team jointly with all fono simultaneously. However, the general feedback from the Village fono from the final presentation of the Project findings and recommendations was very positive and very encouraging, indicative of an eagerness to address the sustainability issues raised.

The following information in Chapter 6 offers a detailed cost/benefit analysis that was presented to the Project Villages successfully persuading them to immediately consider:

(i) alternate and more sustainable economic options to logging non-sustainably,
(ii) jointly sharing valuable natural resources amongst the key Project Villages,
(iii) introducing new faatonu for such sustainability purposes including an immediate ban on pesticide use, seeking immediate organic status, exploring the feasibility of potentially profitable NTFPs such as nonu, etc., and
(iv) adopting extensive agro-forestry projects that will only enhance the above recommendations and hasten economic returns that far outweigh current economic returns from commercially logging remaining native and/or plantation forest resources.

It was also strongly apparent to the Project Team and all the Village fono participants consulted during the Project period that the village fono, whilst it has the penultimate authority, ongoing development advice is a prerequisite to natural resource conservation. Without a strong economic input, bringing about sustainable economic development, natural resource degradation can only continue.

The Project Team, therefore, would like to strongly recommend that a pertinent pro-active economic development planning process be immediately implemented and driven jointly by the MNRE and MAF, with considerable input from MWCSD and relevant NGOs. This is thought to be feasible in that the village-based economic development plans presented here for each village (see attached CD-ROM) need to be successfully implemented, with results being constantly shared between the 9 Project Villages. This may entail a dedicated team of sustainable economic development workers pro-actively creating this more enabling development environment. And if a Joint Strategic Development Plan is signed as an MOU by all 9 Project Villages, and a commitment made to equally share their joint natural resources and hence endeavour to reduce their own cost of living, then considerable progress can be made economically, environmentally and even culturally.

Also, METI plans in 2008 (March) to commence a ‘train the trainers’ Permaculture Project within targeted rural villages to help bring about sustainable agro-forestry.

Special attention can be placed on the 9 Project Villages either through METI or an alternate, and more immediate Permaculture Project be planned specifically for these 9 Project Villages in accordance with the TOR of this Assessment Report. The 7 village fono consulted at the conclusion of this Project all agreed to further training, further sharing of resources, joint cooperation to explore new markets, even increasing 'farm-gate' prices for their produce, and ongoing assistance with small business development.

Chapter 6 Cost/benefit analysis

This Assessment Report clearly demonstrates that there are no longer any economic arguments supporting the non-sustainable harvesting of lowland and upland forest resources, especially when more profitable economic options are now available to all 7 Project Villages.

A price needs to be calculated for all these costs and benefits for one sample village for one year, for example:
the cost of loss of access to native foods,
the cost of loss of access to medicinal plants,
the cost of loss of access to potable supplies of drinking water,
the cost of loss of access to native hardwoods for traditional woodcarving industry,
the cost of loss of access to sites with ecotourism potential,
the cost of loss of sites of cultural significance (e.g. legendary & archaeological sites),
the cost of damage caused by severe bushfires to village plantations and infrastructure,
the cost of damage caused to soil fertility,
the cost of soil erosion,
the cost of loss of carbon sinks (e.g. timber and soil),
the cost of loss of oxygen production,
the cost of other aspects of global climate change impacts,
the cost associated with loss of culture,
the cost associated with loss of more sustainable economic options, etc.

Further proper environmental auditing (and targeted cost/benefit analyses) may be justified to convince Samoa's natural resource owners (and the poor) that an economically sustainable rural lifestyle is within reach in Samoa, provided a truly joint strategic plan is adopted holistically by all Project Villages, taking into account increased equity of wealth, environmental and cultural sustainability, as well as a great potential to strengthen social integrity.

Wildlife conservation and poverty reduction will not eventuate in Samoa unless this more holistic approach is taken and acted upon, preferably with a more informed decision-making process at the rural resource owner level. Government's significant macroeconomic strategies of the past decade have had an overwhelming positive effect on the poor, endeavouring to sustain pro-poor growth (but, unfortunately, it has been conducted in isolation of more appropriate forest and land resource use management practices, a major factor negating the potentially significant economic gains made possible from targeted macroeconomic reforms). These points have been eloquently highlighted in the recent Macroeconomics of Poverty Reduction in Samoa Report - 2006 (unpublished by UNDP as yet).

Another economic opportunity exists on Savaii to form a partnership in bottling organically certified nonu products for export: Sili Village already has such a proposed 'drinking water bottling project', but to bottle nonu juice with the same organic spring

water may make better economic sense. The export of dried nonu for processing overseas makes little economic sense. It would be better to increase the range of manufactured nonu products on-island: more research and development is required before such a bottling plant is feasible on Savaii.

Savaii's lowland and upland forests are viewed as 'unused' by the respective fono and available for future 'uses', most likely timber production. About 10% of total land are in Samoa is available merchantable forest, vulnerable to resource owners continuing, or even increasing, their economic gain from timber exploitations. Whilst the merchantable forests have been mapped by SamFRIS (2005) (see Figure 3.2 and Table 3.3 on the CD-ROM), an argument must be presented here to explain to resource owners that:

(i) this remaining lowland and upland forest has 30 or more other important uses and benefits other than just timber production,
(ii) timber production comes at a huge cost to current and future societies, and
(iii) the Project Team has presented here a convincing argument that will help resource owners make far more sustainable resource use decisions in the future, but provided the markets for these products continue to grow, locally and overseas.

This type of 'environmental auditing' has been used in Australia and elsewhere to convince governments, judges, juries, public sector, wildlife conservations and even foresters and logging companies to cease logging non-sustainably and seek greater economic returns by either adopting more sustainable logging practices or finding alternative economic activities.

Resource owners in the 9 Project Villages are now being presented with the following arguments for more appropriate resource management as a simple means of:

(i) explaining the consequences of continuing non-sustainable forestry practices, and
(ii) presenting a more sustainable economic option by offering a NTFP of high economic yield, possibly better than timber, possibly available to every Project Village irrespective of whether they have merchantable timber available or not for harvesting, and can be harvested weekly (native forest can only be harvested once every 10-25 years if the most inappropriate logging practices are being used).

There is an apparent interest and even anxiousness expressed by some respondents within the Questionnaire (see Chapter 4) as villagers wait for a more sound economic and environmental solution to attaining sustainable livelihoods within their own villages in terms of adopting a new innovative village-based economic development plan (EDP) as proposed in Chapter 5. However, no Project Village has achieved this goal as yet, but the Project Team has presented its proposed EDPs to each respective village for their serious consideration.

The Project Team took the liberty to showcase organic nonu production in two villages by orchestrating a small contract for $SAT120,000 of dried organic nonu for NSL (a 3

week period was set aside for production and delivery). NSL have assured the Project Team that:

(i) international markets are growing annually,
(ii) current demand is out-stripping supply, and
(iii) many villages have yet to be convinced of nonu as a reliable alternative source of income to past non-sustainable logging practices.

The results of this final consultation within the 9 Project Villages is as follows:

(i) Both Gautavai and Sili have established a short-term contract with NSL for organic dried nonu production,
(ii) The remaining 7 Project Villages considered subsistence harvesting of wild nonu in the past as their only option,
(iii) Few villages realized the commercial production of nonu on a large scale (10-50-100 acres) had already been proved economically in Saanapu, Sataoa, Lotofaga, Vavau and Aufaga villages on Upolu, and more recently on Savaii, including Asau, Tufutafoe and Saleaula for example,
(iv) Project Villages accepted the offer by NSL to provide plants, seeds and technical advice, as well as regular collection of dried nonu at $SAT3/kg provided it was organic certified,
(v) Project Villages were prepared to have their own commercial plantations, and possibly their entire villages, certified as 'organic' by WIBF and NASA who both offer an excellent service in Samoa, currently with over 180 plantations certified as organic (but only one entire village is currently certified, namely Sili),
(vi) Other NTFPs are emerging, especially organic NTFPs such as virgin coconut oil, organic honey and organic forest perfumes such as moso'oi. The 'farm-gate' prices for these products are rising as markets are slowly being developed overseas,
(vii) Some Project Villages are currently trying to manage their own plantation forests, choosing to lease these valuable plantation timber assets at ridiculously low contract prices simply because of their desperate need for cash today. These villages are unwilling to wait a further 10-20 years before harvesting their plantation forests, they don't have the sustainable harvesting skills and equipment, and thirdly, they may not realize the true international value of their plantation timber resources (e.g. timber assets on the New York Stock Exchange over the past 30-40 years have out-performed non-timber shares with a steady 13-14% annual return on investment, with attractive future prospects as the true range of values for such timber assets escalate),
(viii) As the resource owners within the 9 Project Villages became more aware of the 30 or more benefits of better managing their own forest resources, and as they realized the more attractive economic options of say NTFPs, then environmental awareness levels appeared to rise – access to cash is the prime motivator to many villages.
(ix) Many villagers within the Project Villages wanted to see working plantations of nonu, they wanted to meet the exporters, they wanted assurances that this new crop of nonu was not going to be another ginger or kava export failure.

The key role to be played here by the agricultural extension workers from MAF is yet to be determined as the MAF appears to have left the growth and management of the nonu export industry entirely up to the private sector industry itself.

(x) Villagers were excited about learning of new agro-forestry regimes that are currently being designed and that may also include nonu, bamboo, poumuli, tiki, etc.

(xi) Villagers were also excited about the fact that nonu as a commercial crop relies on no fertilizer or pesticides, can be cultivated from assisting just wild plants to multiply, relies on little technical assistance other than pruning, and that coppicing can be encouraged in order to maximize fruiting yields.

(xii) Applying this new-found sustainability knowledge across the board to other issues and sectors other than forestry and agriculture, such as energy and food security, pollution and global climate change, etc. was also a profitable exercise for the Project Team. This requirement of increasing the capacity development of the forest resource owners has either been unrecognized before or grossly over-looked or deliberately ignored as being of no socio-economic importance, despite cultural erosion and other environmental challenges being recognized for the past 20 years or more (SOE, 1993, 2007).

(xiii) Villagers have had very little opportunity to mainstream these important environmental issues into their own village-based development frameworks, some villages saying that they had never been presented with a village-based economic development plan like the one they received from the Project Team.

Whilst it was getting beyond the TOR of the Project Team, these ongoing consultations at the time of the presentation of the village-based EDPs suddenly became an ideal opportunity to further examine the resource owners in more detail with respect to their previous Questionnaire results. It became apparent that more detailed follow-up questionnaires were being justified if a more in-depth assessment was to be made of each individual Sustainable Forestry Indicator (SFI) as outlined in the new draft national forest policy.

However, assistance from local anthropologists, economists, agronomists, conservationists, sociologists, development workers, etc. is justified from two main perspectives: sustainable development planners within Samoa simply do not have the vital information required to act or the ability to incorporate such environmental issues into village-based development frameworks, and, secondly, the benefits of taking a long-term, research approach in terms of creating awareness through such extension services may prove to be too expensive.

The Project Team, therefore, appreciates not only the severity of the issue of insufficient forest and land use management skills within Samoa, but also the need for today's resource owners to play a more active role in all future forest management and landuse management initiatives. This is a challenge which has been accepted by the Project Team and hence resource owner organization capacitation is considered as an essential outcome of this Assessment. The Team is now sufficiently cognizant of some of the challenges

which underlie on-going non-sustainable natural resource management in Samoa. The challenge in this Assessment Project is to identify and articulate all the constraints to attaining sustainable landuse management, and why more sustainable and more profitable practices and opportunities are not being embraced by the respective Project Villages. It is apparent that all agro-forestry stakeholders need to work more closely together if key constraints are to be addressed to improve forest resource use and land resource use management skills in Samoa. Chapter 7 now provides the concluding remarks for this Assessment Report.

Chapter 7 Conclusions

The Project Team would like to conclude its findings by strongly suggesting the sharing of information freely between the Project Villages as well as the actual sharing of Savaii's limited natural resources between all Project Villages. This approach may help overcome the largest single constraint to attaining sustainable economic development and that is a gross lack of capacity development within the respective fono. In addition, often insufficient data is collected and hence the severity of resource management issues can be easily over-looked.

Secondly, as highlighted in the analysis of the Survey Questionnaire, few villagers seem to fully understand the full extent of the ramifications of ongoing deforestation in Samoa. The single most striking outcome of this Assessment is that 98.3% and 96.5% of respondents, respectively, answered two key questions truly believing that logging can be equated to sound village development, and that ongoing logging has been sanctioned by the highest authority, the fono, and hence it must be condoned. This rationale has allowed this practice of non-sustainability of Savaii's lowland and upland forests to continue for so long, right up until today (QA18 - Has the village used its natural resources sustainably? And QB8 – Do you always support the decision-making procedure [of the fono] for use of land?). Also, the answers to QB11 illustrate that more than 60% of ordinary people in the village view their village leaders as having good authority.

In fact, 97.4% and 92.2% of respondents, respectively, still think of the remaining lowland and upland forests as "unused" and still available for logging (QA14 – Are there still trees to log? And QB2 – Does the village have virgin land unused?). And 88.4% of respondents believed that the fono has further plans to use these unused lands (QB4). Even the answers to QC8 also illustrated that 65.4% of respondents agreed that their villages have unused forests and land with only one person (0.6%) disagreeing. However, if all 30 or more benefits of forests (see Appendix 3) were appreciated fully, respondents may have answered the Questionnaire very differently. Follow-up questionnaires are justified, and conducted possibly before and after a major public awareness programme, and also before and after an effective capacity building programme for village fono.

A further most striking outcome of this Assessment is that poor capacity development of the highest decision-making body was evident with 67.3% of respondents agreeing or strongly agreeing that "their elders in the fono have a long-term view and perspective of sustainable resource use" – QB14. One conclusion that the Project Team drew was that, despite the fono's understanding of sustainability, it was left with little choice but 'to log the forests irrespective of the long-term costs'. And if the economic plight for forest resource owners should worsen in the near future, as all indications seem to suggest, then no matter what legislation and capacity building is in place, the forest resources will continue to be reduced because of these ongoing aspirations to further 'develop' the village from proceeds from timber production. The only safeguard may be to have a more sustainable economic option to logging native forests.

In support of the above arguments, 99.1% of respondents (QC1) "think that the village can obtain even more benefit from its forest and land resources" by developing more plantations and growing more food and earning more money (see QC2), but the questions do not ask if this is at the expense of developing more sustainable practices.

Many of the decision-making matai have been unable in the past 10 years to see an alternative option to logging in order to meet their rising village development aspirations as the cost of living escalates fast as more public services and amenities are available (e.g. power, water, transport, telecommunications, imported foods, entertainments, etc.).

The third most striking outcome of this Assessment Report is that no sound and more sustainable economic alternative to logging native and plantation forests had been available. However, this Report argues that commercial organic nonu production is already providing, in some villages/families, a more sustainable economic alternative as it becomes Samoa's largest agricultural export crop. More so, expanding this commercial mono-cultured crop of nonu into a truly sustainable multi-cropping or agro-forestry venture is proving to be another real possible economic and development option for these Project Villages.

It may be worth noting here that timber assets have out-performed other stocks on the New York Stock Exchange (NYSE) over the past 40 years with a steady 13-14% annual return, and the investment predictions for the future performance of timberland stocks in North America at least are very buoyant and positively speculative: analysts are yet to realize additional future incomes from forests such as carbon credits for standing forests, pushing the expected annual returns even higher (www.timberland.com – Daily Investment Newsletter – Stug).

Generally speaking, there is an emerging interest in at least 7 of these 9 Project Villages in sustainability and conservation as typified by the results from questions A16 (with 78.4% emphasizing water conservation, biodiversity conservation and cultural reasons).

A unique opportunity was capitalized on with the final presentation of the Assessment Report to the stakeholder villages, advising them of the real future economic and environmental gains to be capitalized on from the export of processed NTFPs and the immediate economic benefits of having these villages certified 'organic' by WIBF and NASA. Only the Project Village of Sili has been certified with organic status.

This Assessment Report is, therefore, a guide only, highlighting the fact that villagers' attitudes and aspirations may be finally changing, fortunately for the better, as more economically and environmentally viable options are discovered. However, these discoveries are only possible as economists in Samoa begin to take traditional cultures more seriously (enhancing their cultural integrity), take environmental sustainability more seriously (enhancing the long-term profitability of previous economic ventures such as logging), and take into consideration pro-poor growth as espoused in the Macro-economics of Poverty Reduction in Samoa Report (2006).

Future generations will have to rely on more sound resource use decisions being made by the current generation of matai. This Report has helped illustrate the importance of making some very serious socio-economic decisions that will possibly affect all future generations, not only on Savaii, but nationally and globally as well.

In conclusion, the Project Team believes that all the stakeholders now have all the tools, experience and practical solutions necessary at their disposal to make rapid restorative progress economically, socially, culturally and environmentally. The problem, however, is that Samoa's team of environmental and sustainability advisers have never taken a satisfactory economic alternative to non-sustainable logging out to the villages. Instead, environmentalists and conservationists in Samoa, for the past 20 or more years, have advocated "stop eating the lupe, stop logging the forests, stop….". Unless the MNRE acquires a team of agro-economists with sound sustainability skills, the conservation messages from the GOS and the MNRE will continue 'to fall on deaf ears'. Most respondents interviewed have had no alternative but to agree to unwillingly logging their native forests for the past 40 years.

This Assessment Report has, therefore, been able to carefully define and decipher a wide range of very different perceptions, attitudes, practices and aspirations:

(i) detecting a sense of economic desperation in some to continue this non-sustainability,
(ii) a sense of environmental urgency in others to correct this current practice of non-sustainability,
(iii) a cultural sense of regret by some *matai* after they had allowed their indigenous rainforests to be logged and then cleared for agriculture,
(iv) a sense of social apathy for the remainder who lack the appreciation and understanding of the critical nature of this sustainable development predicament, and lastly,
(v) a sense of economic opportunism by some within these villages to eagerly exploit new commercial crops for export purposes.

It is now apparent, as highlighted in this Assessment Report, that many of these above forestry management initiatives that were implemented in the past were in vain and have been insufficient on their own, or collectively, to help bring about sustainability of the forest and land resources.

This Assessment Report, therefore, has identified numerous relatively untapped sustainable economic options that currently do exist in Samoan rural villages, albeit amidst fears of trepidation by many. However, a more pro-active, convincing and collective effort must be made by all stakeholders if there is to be a rapid capitalization on such existing economic options that are currently available to us, namely bamboo, nonu, poumuli, organic honey production and other small-scale community forestry exploits which are yet to be introduced to all Project Villages.

This Assessment Report, finally, gives us all an opportunity to re-examine the lessons learnt in the past as to why resource owners, collectively, continue to undermine their

own nation's long-term sustainability despite having all the forest conservation understanding thought necessary. Without this vital information at our disposal, Samoa's forests will continue to be without adequate effective policies and management, and will continue to be at the mercy of the villagers unless adequate alternate forest management philosophies and economic paradigms are found urgently.

This Assessment Report clearly showed that resource owners have a poor understanding of the threats facing the next generations, they clearly had little prior understanding of the severity of the current and past impacts on their livelihoods caused by widespread deforestation and poor landuse practices. It is evident, therefore, from both the literature and personal interviews, and targeted questionnaires carried out by this Project Team, that basically Samoa is ineffectively confronting, ironically, the most serious land resource use and forest resource use difficulties ever recorded in its history.

Rural communities are, therefore, losing their sustainability, and hence Samoa, therefore, may be losing its rural economic potential unless the search continues for tree and crop species:

- with higher economic value for local and export markets,
- with biodiversity conservation value,
- with water conservation value,
- with soil conservation value,
- with nutritional value,
- with medicinal value,
- with food security potential and
- with cultural value.

This Assessment Report can, therefore, be used as a planning document designed to convince land and forest resource use managers and stakeholders that a multi-sectoral, holistic, collective and immediate response is urgently required.

In addition, the economic arguments presented here are strongly founded on sound environmental management, so much so that 'sustainable living' is considered a prerequisite for the proposed economic development plans for each village.

In addition, in comparison to environmentalists and conservationists visiting these same 7 Project Villages 10-15 years prior with strong messages of conservation, these messages were being delivered without any economic alternate solution being offered to the villagers. The Project Team, therefore, was comprised of an economist with local expertise in sustainable development strategies, and an environmentalist with a strict entrepreneurial emphasis, identifying preferably a very profitable and proven current non-food cash crop that could be developed immediately within the 7 Project Villages should the respective fono choose to adopt such economic measures.

Whether there is or is not appropriate levels of capacity development within the respective fono regarding sustainability, what did matter is whether one village could successfully protect its forests forever. Only one village, Sili, can claim this

magnanimous feat. In addition, this same village has recently embraced the necessity to be organically certified, creating an option to become commercially involved in the commercial production of organic nonu for export purposes. The Project Team was presented with an opportunity to include a $SAT120,000 or 40,000Kg commercial contract within the newly proposed economic development plan for Sili. Sili may have embraced this economic option of commercial organic nonu production because of nonu's already apparent economic viability. In addition, Nonu Samoa Ltd. pays a premium price for organically-certified nonu: Sili is the only village which is certified organic throughout the entire village as all pesticides have been banned by the fono for many years. Also, Sili does not commercially log its forests so alternate incomes have always been strongly sought after.

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(vi) Appendices

Appendix 1 - List of in-depth interviews

Rev. Fepai Kolia - Eucumenical Council of Samoa
Leo Schwalger – Patamea
George Tinielu - Nonu Samoa Ltd.
Nanai Tony Leutele – ACEO, Forestry Division, MNRE
Pau Ioane – Senior Forestry Draftsman – MNRE
Faaofonuu Poe – Sili
Tinoifili Fiu – Sili
Toala Ioane – Sili
Toala Faafoi – Sili Pulenuu
Manufotu Tiatia – Sili
Mataafa Levi- Sili
Taui'a Schuster - Satuiatua pulenuu
Maculata Tuli – Siutu
Taulealeausumai Tiotio - Safune
Professor Art Whistler – Hawaii
Steve Rogers – Consultant
Seumanutafa Malaki Iakopo – CEO, Ministry of Agriculture & Fisheries
Epeloge Fafau - Gataivai

Appendix 2 – Threats to Samoan Forests

1. Logging
2. Global Climate Change
3. Attitudes – equate logging to village development
4. Invasive Plant Species
5. Invasive Animal Species
6. Poor legal enforcement of Forestry Act
7. Code of Logging Practices not observed
8. Bushfires
9. Roads
10. Agricultural expansion
11. Unexpected agricultural export boom
12. Insufficient monitoring of sustainable forestry indicators
13. Cyclones/storms
14. Reclamation of mangrove forests
15. Poor roading through mangrove forests
16. Poor development projects
17. Poor forest management for past 30-40 years
18. Inept National Forest Policy
19. Inadequate forest inventory
20. Inadequate compilation of forest data – SamFRIS
21. Inappropriate access to SamFRIS data
22. Unfair Trade Relationships – nationally
23. Insufficient funds for forestry research
24. Insufficient appropriate village laws - ideal village laws have worked well

Appendix 3 - 30 good reasons to sustain forests

1. Biodiversity habitats – increased biodiversity conservation
2. Water catchment protection – improved water conservation
3. Timber production – local consumption only
4. Maintain soil fertility – improved soil conservation
5. Prevent land degradation – importance as carbon sink
6. Forest foods and famine foods
7. Spirituality – fa'aSamoa
8. Medicinal plants – traditional healing
9. Material Plant Culture
10. Climate control – attract rainfall
11. Legendary and archaeological sites within – cultural preservation
12. Oxygen production – air conservation (good air quality) – attract carbon credits
13. Carbon sinks – good air quality (prevent global climate change)
14. Ecotourism potential – scenery, hiking, birdwatching
15. Non-timber forest products (NTFPs) – increased cash income (i.e. nonu and mamala)
16. Prevent spread of invasive plant species
17. Prevent major bushfires – Aopo, Asau, Falealupo
18. Genetic biodiversity retained
19. Coastal protection – e.g. mangroves
20. Sustainability skills perfected
21. Restorative environmental projects expensive/wasteful
22. Carbon crediting potential - $SAT100,000 per year for Sili hydro-power project alone
23. Carbon crediting potential for 'standing forests' in the future?
24. Food security issues in the future are reliant on intact forests
25. Pro-poor growth easier with intact natural resources – poverty alleviation
26. Tree mortgages (i.e. Development Bank)
27. Agro-forestry projects will help rehabilitate logged areas
28. Increase timber utility on par with world prices for ifilele, etc.
29. Increase timber royalties ('farm-gate prices') for timber resource owners
30. Acquire Sustainable Forestry Practices – Code of Logging Practices, Forestry Act
31. Monitor Sustainable Forestry Indicators long-term – update National Forestry Policy
32. Formation of business partnerships with GOS (e.g. hydro-power)?
33. Logging is inversely proportional to sustainable village development
34. Unknown potential future incomes yet to be derived from forests
35. Energy production – hydro-power as alternate renewable energy source to diesel