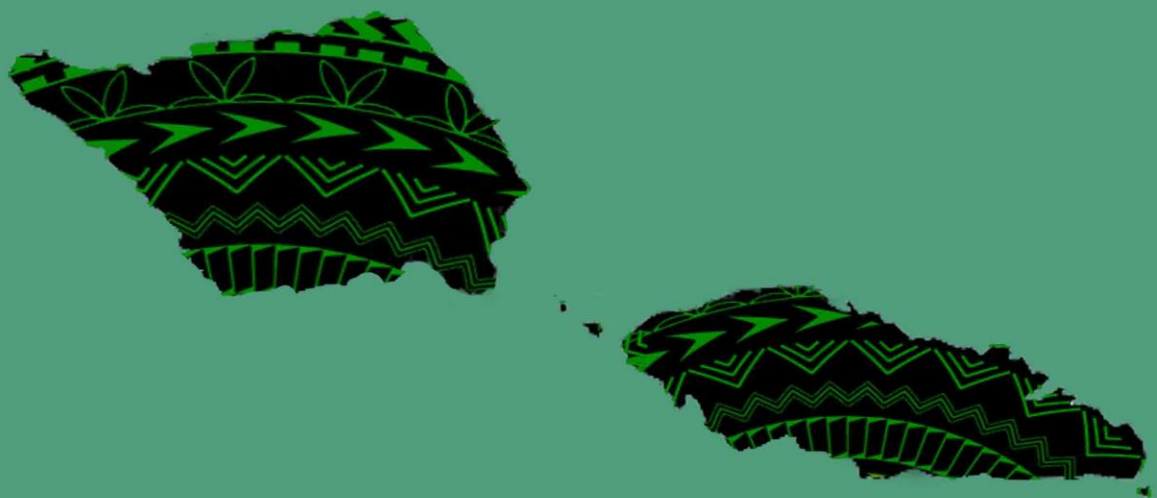








SAMOA'S 5th NATIONAL REPORT 2014 TO THE CONVENTION ON BIOLOGICAL DIVERSITY



MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

Convention on Biological Diversity

UNEP

Samoa's 5th National Report 2014

A report prepared for the Convention on Biological Diversity (CBD)
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Aerial photo of eastern coast of Upolu: Samantha Kwan

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ACRONYMS USED:

ABS	Access and Benefit Sharing
AusAID	Australia Agency for International Development
BIORAP	Biodiversity Rapid Assessment Project
CBD	Convention on Biological Diversity
CI	Conservation International
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EPC	Electric Power Corporation
GCRMN	Global Coral Reef Monitoring Network
GDP	Gross Domestic Product
GEF	Global Environment Fund
GoS	Government of Samoa
IUCN	World Conservation Union or International Union for the Conservation of Nature
KBA	Key Biodiversity Areas
LMO	Living Modified Organisms
MNRE	Ministry of Natural Resources and Environment
MAF	Ministry of Agriculture and Fisheries
MPA	Marine Protected Area
MSY	Maximum Sustainable Yield
NBSAP	National Biodiversity Strategies and Action Plan
NESP	National Environment Sector Plan
NP	National Park
PA	Protected Areas
PUMA	Planning Urban Management Agency
TLB	Taro Leaf Blight
TK	Traditional Knowledge
RE	Renewable Energy
SDS	Strategy for the Development of Samoa
SPREP	Secretariat for the Pacific Regional Environment Programme
SOE	State of Environment Report
STA	Samoa Tourism Authority
STDP	Samoa Tourism Development Plan

Executive Summary

Samoa's fifth national report to the Convention on Biological Diversity (CBD) examines trends and changes in the country's biodiversity and the status of NBSAP implementation since the fourth national report was submitted in 2008. The report's format and focus follow those recommended by the CBD Secretariat Guidelines for the Fifth National Report[1] for CBD parties.

Importance of Biodiversity to Samoa

Biodiversity is the ecological foundation of life support systems on which Samoa exists. The diversity of its species, ecosystems and genetic information in animals, plants and microscopic life forms provide biological resources and the ecosystem services that are fundamental to the country's physical, social, cultural and economic well-being. For a human population where 72% of households are agriculturally active[2], agro-biodiversity species such as taro (*Colocasia esculenta*), bananas (*Musa spp*) and breadfruits (*Artocarpus spp*) are major contributors to food security, local incomes and export revenues. There is a similar dependence on marine species of fin fish, shellfish, crustaceans, and echinoderms as a source of dietary protein for most families and for income for 25% of all households[3]. Many plant species are used for traditional medicines, building materials, fuel, and raw material for handicrafts, traditional canoes and many wooden implements.

Of ecosystem services, forests contributes to protecting catchment areas, stabilizing erosion-prone slopes, minimizing surface run-off, sequestering and storing atmospheric carbon, regulating microclimates, and ensuring the continued recharging of underground and surface water sources for human consumption, agricultural crops, hydropower generation, and for supporting freshwater species and habitats. Bird and mammal fauna contribute to pollination processes, and seed dispersal for many native trees species. Most if not all of these services, directly contributes to Samoa's pursuit of MDG goals of poverty eradication and environmental sustainability.

The biggest threat to Samoa's sustainable development is now widely acknowledged to be the extreme events - cyclones, flash floods and heavy rainfall events - associated with climate change. Recent experience with Cyclone Evan (2012) showed how these events set back gains in development progress made over the years, with the extensive damage and loss inflicted on physical infrastructure, crops, properties and human lives, not to mention the damage and degradation to fragile habitats and to native species, some of which were already critically endangered.

And while biodiversity is among the first victims of climate change, it is also an integral part of the strategies for combating it. Healthy coral reefs, mangrove forests and coastal vegetation provide protection to coastal communities and physical assets against coastal wave surges and sea level rise. Healthy forests act as sinks and sequesters of atmospheric carbon, as wind barriers to crops and human habitation, and as anchors and stabilizers of soils against floods, excessive surface run-off and coastal erosion. The resilience of communities against extreme climate change events, and their ability to adapt to rising temperatures and sea level rise is intricately intertwine with the proper function of healthy ecosystems and species.

[1] www.cbd.int/doc/nr/nr-05/NR5-Guidelines
[2] Ministry of Agriculture and Fisheries. 2010. Agriculture Sector Plan 2011-2015. Government of Samoa.
[3] Ibid.

Biodiversity Conservation and MDGs

Samoa's actions to implement the country's obligations under the CBD, directly contributes to the achievement of two Millennium Development Goals (MDGs), namely the eradication of poverty and hunger, and environmental sustainability. Many actions taken to conserve and promote sustainable use of species that are threatened with depletion and local extinction, are at the same time, facilitating the replenishment of stocks of resources that local population depends on for sustenance and income. This is most visible in community based activities promoting and facilitating the conservation and sustainable use of inshore marine resources, particularly fish and shellfish, which is the main source of protein for most households and an important source of income for 25% of the households.

Recent genetic improvements in taro *(C. esculenta)* through MAF's selective breeding program have produced new high yielding and disease-resistant[4] varieties that are now commercially produced. As an important traditional food crop, its implications for food security and the eradication of hunger and poverty are significant.

Similarly, environmental sustainability is advanced as biodiversity is protected in-situ, and species diversity is enhanced such as in agriculture through selective introductions and breeding. Samoa's increasing network of protected areas of parks and reserves, community based conservation areas and fisheries reserves, and forest areas protected for catchment protection are important components of biodiversity based strategies promoting this goal.

Major changes to biodiversity

Most of the changes reported in this fifth report reflect the continuation of trends identified in the fourth National Report, some of which were previously based on limited data and qualitative assessments but now confirmed quantitatively with the availability of new information.

Changes in biodiversity previously reported and are continually observed during the NR5 reporting period include the

- loss and increasing fragmentation of native forests, especially on the island of Upolu
- the degraded condition of coastal and inshore habitats especially along the entire northern coast of Upolu ;
- continuing spread and increasing threat of invasive species and the
- increasing domination of non-native forest species.

Part of the changes is attributed to the impacts of natural events including Cyclone Evan (2012) and several heavy flooding and high rainfall events. But the pressures from anthropogenic activities are also continuing albeit, in some cases (e.g. commercial logging), at reduced levels than previously reported.

A selection of other major changes and developments in biodiversity, both negative and positive, are summarized below –

1. Samoa's protected area network remains unchanged since NR4 but two new areas in the island of Savaii have been earmarked and informally treated as national parks in Government (MNRE) plans. Legal designation is pending. The proposed new NPs – the Asau-Aopo site and the Lata forest, will increase the total number of parks to 5 (2 in the island of Upolu and 3 in Savaii). In addition, the "O le Pupū Pu'e National Parks was re-surveyed in 2013 and was included in the area covered with Forest Plantation thus

[4] The Taro Leaf Blight (TLB) in particular

increased the total area under NP from 13,751 ha in the last report (2008), to 23,543.92 ha. **Annex III** lists all NPs and reserves and corresponding areas.

2. A review of the existing protected area network was completed in 2010, and an expanded network of Key Biodiversity Areas (KBAs) has been endorsed as the target for conservation management. The revised KBAs now targets for conservation management and protection 33% of Samoa's terrestrial ecosystems, and 23% of its inshore area, to ensure full representativeness of its native flora and the protection of species and habitats of high conservation value facing a high level of threat. These targets include the existing protected area network.

3. A 2013 survey (Biodiversity Rapid Assessment Program (BIORAP) of the upland forests of Savaii provided new information regarding the status of this biome, as well as those of a number of bird species of national and global significance. The status of the Upland (Cloud) forests of Savaii is of particular ecological importance given the fact that this biome constitutes (with the possible exception of the Big Island of Hawai'i) the largest intact block of tropical rainforest in Polynesia, having more than 700km^2 in area (CI, MNRE and SPREP 2010). The upland forests are considered a priority for the expansion of Samoa's conservation area network because of its large size and because it includes the habitats of many of the threatened terrestrial bird species in the country (ibid). The findings of the BIORAP survey confirmed that the area is densely vegetated with relatively undisturbed and pristine rainforests comprising 91% of the total area. The survey also found that the area has recovered well from the adverse impacts of Cyclones Ofa and Valerie in the early 1990's.

4. The BIORAP also found that the Samoan Moorhead or puna'e (*Gallinula pacifica*), long redlisted by IUCN and considered critically endangered, is likely to be already extinct[5]. No trace of it was found although a large area of its natural habitat remains to be explored. The last confirmed sighting was in 1873.

5. Other key findings of the BIORAP are -

   - Samoa's national bird – the iconic tooth-billed pigeon (*Didunculus strigirostris*) appears to be declining faster than previously thought and is a serious concern.
   - There was no sign of the friendly ground dove or tuaimeo (*Gallicolumba stairii*), another IUCN Redlist endangered species.
   - Small numbers of the ma'oma'o *(Gymnomyza samoensis)*, another endemic bird species of in IUCN's endangered category, were sighted.
   - The Samoan White Eye or mata pa'epa'e (*Zosterops samoensis*) another endemic and native species, previously feared to be declining in numbers, were found in 'good' numbers "… sufficient for the BIORAP team to recommend a change in its IUCN status."[6]

6. In terms of flora, two species new to Samoa, both orchids, were recorded by BIORAP, and they (*Calanthe* sp. and *Bulbophyllum* sp.) are now being studied; one or possibly both of them representing new, unnamed species.

7. A one year project funded by the Conservation Leadership Program (CLP) successfully re-discovered the tooth-billed pigeon at Salelologa, Savaii Island in 2013 (Uili et al. 2013). This is the first time both a juvenile and an adult have been observed from one location in almost a decade of searching[7].

[5] The last confirmed sighting on record was in 1873, according to the IUCN Red List.
[6] Atherton, J and Jeffries, B. eds. 2013. Rapid Biological Assessment of the Upland Forest of Savaii. Draft report.
[7] Uili, M., Fialelei, E., Fini, M and Vaatele, A. 2013. Samoa's Little dodo-Saving the Manumea: Second Progress Report to the Conservation Leadership Program. Ministry of Natural Resources and Environment, Apia.

8. Although, the friendly ground dove was not seen during the BIORAP survey, this bird was observed along the coastal forest of Salelologa, Savaii during the CLP bird monitoring program in December 2013.

9. Of the three mangrove species found in the country, one – *Xylocarpus molluccensis (grantum)* - is in danger of depletion and possible local extinction. Only a small population confined to an area of about 2 acres remains. The conservation of this species is a high priority under the National Environment Sector Plan (NESP) 2013-2016. The other two species *Rhyzophora samoensis* (red mangrove) and *Bruguiera gymnorrhiza* (Oriental mangrove) are well represented.

10. Of Samoa's tuna resource, current estimates show that exploitation is well within the Maximum Sustainable Yield (MSY) of 7,000 metric tonnes a years, - the recent highest level of catches amounting to 3,700 metric tonnes in 2008-2009. Albacore tuna (*Thunnus alalunga*) is the main species making up an estimated 80% of the total tuna stock.

11. Progress made in mainstreaming environmental sustainability and biodiversity conservation has been significant. Biodiversity conservation and sustainable use is now effectively mainstreamed and integrated in national and sector level development plans since environmental sustainability was first recognized as a national priority in the 2008 – 2012 Strategy for the Development of Samoa. This development coincided with the recognition of climate change as the main threat to Samoa's sustainable development aspirations. The current SDS 2012 – 2016, consolidates the central place of environmental sustainability in Samoa's planning framework, as one of four national priorities, with the building of resilience against the impacts of climate change a major focus. Biodiversity conservation plays an integral role in strategies for climate change mitigation, adaptation and resilience building.

Aichi Targets

Samoa's NBSAP update initially started in March 2014 in consultation with relevant stakeholders and in tandem with the compilation of this 5th National Report. As part of this update, the Aichi Targets are now incorporated albeit with modifications to suit Samoa's circumstances. The proposed Aichi Targets for Samoa are given in **Section Part II Q.5**.

In terms of implementation, this is only officially now starting. Samoa will be better placed to report on progress in implementation in the next (6th) National Report.

Having said that, significant actions were implemented during this reporting period as part of the old NBSAP targets, which themselves are well aligned to and compatible with the Aichi Targets. Some include the changes highlighted above. These are fully discussed under **Section Q.9** of this report.

Some Key Lessons Learned from Previous NBSAP Implementation

I. Variable implementation of the NBSAP between thematic areas

NBSAP implementation since 2002 is highly variable between the eight thematic areas. The main determining factors are the level of interest and available capacity and funding. Areas wherein implementation has been highest were in in-situ conservation and sustainable resource use, including biosafety, invasive species management and environmental mainstreaming. Areas of least implementation are (i) access and benefit sharing and traditional knowledge and (ii) financial mechanisms.

2. Access and Benefit Sharing and TK implementation – externally driven?

The relative low level of implementation of activities dealing with Access and Benefit Sharing and Traditional Knowledge may be attributed to both the relative lack of resources and capacities, but also the highly complex nature of the research required to investigate if TK

associated with local biodiversity has actual pharmaceutical value. As likely faced by other countries, Samoa's main concern was to put in place a regulatory framework to control and monitor access to biodiversity genetic resource, and to ensure equitable sharing of any benefits that may result from its use. Samoa signed its first agreement in 1989 before any formal framework was in place. Since then, two other ABS agreements have been entered into by the Government of Samoa. The three agreements are -

i. The Falealupo Covenant which allowed Dr Paul Cox to access a community-held rainforest area for biodiscovery purposes (1989).

ii. An AIDS Research Alliance (ARA) agreement with the Government of Samoa (2001).

iii. A University of California, Berkeley agreement with the Government of Samoa (2004).

All three revolved around access to and use of the local plant mamala (*Homolanthus nutans*) for prostratin extraction for HIV AIDS research. Details of these are given in **Case Study 1** in **Annex VI**. Since 2004, no further foreign or local interests have been registered. The extended timelines between the signing of agreements and when research produces any results are probably a reason for the lack of any visible activities. The case study however noted that despite the delay in finding out if any 'utilization' would result from current research, the Falealupo village have benefited considerably both financially and in other ways from its covenant.

3. Emerging importance of ecological services for combating climate change

Whilst concern over the loss of endemic and native species and habitats of national and global significance played a major role in Samoa's initial interest to sign and ratify the CBD in 1992, today, the emergence of climate change as the major threat to the country's sustainable economic development, has likewise elevated the value of ecological services as an equally important driving force for biodiversity conservation hence also CBD compliance. Of particular interest is the importance of protecting old growth forest as carbon sinks and of planting new forests for carbon sequestration.

The ecological value of non-native forests now dominating forest cover on the island of Upolu, was previously perceived as limited given their low utility as habitats for many native bird species with specific habitat requirements. Many species were considered invasive. However, the importance now placed on climate change mitigation and adaptation and other ecosystem services, have made these invasive exotics of value for carbon sequestration, water catchment and soil protection.

4. Inefficiencies in accessing GEF resources

GEF's evaluation of its Samoa portfolio in 2006 noted that the efficiency with which Samoa was accessing GEF funding had improved but with some obstacles still remaining. These include GEF project cycle having too many steps, and being too long and costly. Samoa's evaluation also found lengthy delays between project preparation and actual start-up, - in the case of some medium sized projects (MSP) and full-sized projects (FSP) , more than a year or two - often resulting in community frustrations and distrust, and loss of enthusiasm and readiness when project approval finally arrives. Samoa's experience is reported in the GEF 2006 evaluation. Samoa's concerns have also been reflected in the recently completed evaluations (2013) of GEF's Vanuatu and SPREP portfolios.

5. Difficulties in sustaining some GEF funded activities

Samoa's CBD implementation was largely made possible with funding support from the GEF. A number of regional GEF funded projects with nationally implemented activities in Samoa (e.g. South Pacific Biodiversity Conservation Project (1991 – 2001) and the International Waters

Project (years) initiated community managed conservation sites one of which continues to be a part of Samoa's protected area network. The two SPBCP conservation sites (Saanapu-Sataoa Mangrove Conservation Project and Uafato Conservation Area Project) also played catalytic roles in promoting the wider replication of community managed approaches to biodiversity conservation and resource management initiatives.

One of the main lessons learned from this experience is that sustaining any externally funded conservation area initiative is extremely difficult. A number of necessary and sufficient conditions need to be in place. In Samoa's experience, funding and community commitment to conservation objectives are critical ones, with other necessary conditions tending to fall into place when both are available. But there is also room for innovation and adaptation. For example, the failure of the Uafato Conservation Area project is a case where funding was available but community commitment to conservation wasn't, with internal village politics playing a part. The Sa'anapu Sataoa Mangrove Conservation Project shows that with the community's continuing interest and commitment in the project's conservation objectives, the level of activities can be adjusted to suit reduced level of available funding and other resources. Sa'anapu-Sataoa's scaled down activities allowed resources to be concentrated on two main areas, protecting the mangrove forests with the use of local taboos, and sustaining ecotourism activities based on mangrove canoe tours. This innovation seems to have played a part in sustaining this site, at a lower level of activity that complements community capacity.

6. Difficult to replicate large scale initiatives

Samoa has successfully demonstrated that community based approaches are effective for the conservation and sustainable use of biodiversity in communally owned and control areas. However recent experience shows that while adopting the right approach is a necessary condition for project success, it is not sufficient to ensure sustainability and long term success. The scale and complexity of an activity – relative to local capacities and available funding - is critical. Recent experiences show that small scale village based initiatives such as village fisheries reserves, are easier to manage and sustain than larger scale district-wide interventions. District level projects are more challenging with more complex governance systems with participating village councils having different issues and priorities that sometimes make district level consensus decision-making difficult. The two district-level Marine Protected Areas (Safata and Aleipata MPA) are examples of larger district-wide interventions facing sustainability challenges.

7. A programmatic approach to GEF funding

The logical takeaway from funding constraints and sustainability issues discussed above is the relevance of a programmatic approach to funding conservation activities by GEF and other funding agencies. This was recommended in the GEF 2008 evaluation of Samoa's portfolio, as a possible solution to challenges to achieving sustainability of project results and activities presently faced.

PART I: An Update on Biodiversity Status, Trends, Threats and Implications for Human Well-being

Q1: Why Is Biodiversity Important For Your Country?

The importance of Samoa's biodiversity to the well-being of its human population cannot be overemphasized. Simply stated, it is the ecological foundation upon which Samoa exists culturally, socially and economically. The ecological services of the water, clean air, soil and vegetation renewal, biodiversity maintenance, even carbon sequestration – are heavily dependent on biodiversity. The natural stock of resources – of forests for timber and non-timber products such as fuel, edible fruits and nuts, traditional herbal medicines; water for human consumption, agriculture and electricity generation; terrestrial and marine fauna and flora for food and for exports, – are intricately linked to or constitute parts of biodiversity. Tourism is a growing sector and the branding of Samoa as a tourist destination has a strong environmental flavour. Samoa's culture of folklores and proverbs are also enriched by the stories of human interactions with different species of fauna and flora.

With a population where 80% is largely subsistence and directly dependent on the terrestrial and marine environments for food, income and general sustenance, biodiversity plays a vital and central role in Samoa's social and economic development.

The following discussion examines the specific role of different sections of Samoa's biodiversity to Samoa's social and economic well-being.

Q.1.1 Biodiversity and Climate Change

The role of biodiversity conservation in the national agenda is rapidly evolving with the increasing recognition and importance placed on environmental sustainability and disaster risk reduction. The tipping point is the recognition of climate change as the biggest threat to Samoa's sustainable development aspirations. Extreme events associated with climate change – recently highlighted by Cyclone Evan in 2012 - severely set back Samoa's socio-economic progress with extensive damage to physical infrastructure, crops, and settlements. In response, development strategies in the SDS 2008-2012 and the current SDS 2012-2016 emphasizes the building of economic resilience against extreme events. These strategies not only elevated climate change as a threat to sustainable development but also raised the profile of biodiversity's protective qualities and services as crucial to combating it.

Consequently while biodiversity conservation was in the early days leading up to the signing and ratification by Samoa of the CBD, largely advocated for the protection of threatened species and habitats, the emerging threat of climate change has, to an extent, significantly shifted the focus on the protection of ecological services of biodiversity. Forests and trees appear to be of particular interest given their role in the storage and sequestering of atmospheric carbon, and in the protection of vulnerable coastal areas, steep slopes, and of coastal infrastructures and settlements against storm surges and coastal erosion, and of water resources.

Strategies to reduce dependence on fossil fuels as a means of reducing Samoa's carbon footprint also feature biodiversity elements such as replanting of forests and energy trees for renewable

energy generation, and the protection of catchment areas to sustain hydropower developments. A number of GEF funded initiatives are also in progress to facilitate climate proofing in vulnerable sectors such as agriculture, health, tourism and infrastructure. In agriculture, direct implications for biodiversity and resilience building can be seen in the introduction of genetically improved taro varieties that are higher yielding, disease resistant and adaptable to a range of soil types for improved food security.

In a nutshell, the roles of biodiversity and ecosystem services to Samoa's sustainable development agenda have broadened significantly as the country seeks to find ways to combat the impacts of climate change.

Q.1.2 Agro-biodiversity

The importance of agro-biodiversity to Samoa is discussed below in the context of deliberate policies and efforts to strengthen agricultural output based on strategies for species diversification and genetic improvements. These strategies purposefully seek to diversify and expand Samoa's narrow genetic pool for taro (*Colocasia esculenta)* to reduce its vulnerability against new diseases, predators and more aggressive competitors. New species of several fruit trees and livestock have also been introduced.

The development is set in the background of agriculture as the backbone of Samoa's economy up to the early 1980's, when it accounted for nearly 90% of total exports and around 60% of the country's total employment (MAF, 2010)[7]. Three main plantation crops, namely copra, cocoa and bananas accounted on average for about 80% of all agricultural exports during the same period (ibid.).

However for the last 30 years, the agriculture sector's contribution to the national economy suffered a steep decline "…from one half of GDP in the 1980's and one third of GSP in the 1990s to only 11% in 2009" (GoS, 20118). Employment levels in the sector had also declined over the last two decades from 60% in the early 1980's to 39% in 2006 according to the population census conducted that year (MAF, 2011, op cit). The biggest contributor to this decline was the decimation of Samoa's export taro industry in 1993 by the Taro Leaf Blight (TLB) – a deadly introduced virus that literally wiped out Samoa's traditional food staple and main export crop.

The collapse of Samoa's taro export industry in the early 1990s based on *Colocasia esculenta* illustrates the high level of ecological and economic vulnerability of an agricultural economy based on a native crop species with a narrow genetic pool. It also highlights the ecological vulnerability associated with island species endemism that evolved out of years of geographical isolation. That the impact had far reaching economic consequences underscores the vital links between biodiversity conservation and economic development. In response to this crisis, the Government embarked on a genetic modification and improvement program for taro, based on a strategy of importing non-native genetic material to expand the taro genetic pool, from which to produce hybrids that are TLB resistant, high yielding, and of export quality. Over 50 sub-species and varieties were introduced and tested, with germplasm sourced from other Pacific islands and South Asia. Today, after extensive inter-breeding, Samoa's taro agro-biodiversity now boasts a significantly expanded gene pool with 5 superior varieties widely propagated and cultivated for commercial and subsistence cultivation and now forming the backbone of a

[7] Ministry of Agriculture and Fisheries. 2010. *Samoa tuna management and development plan 2011 – 2015*. Government of Samoa.
[8] Ministry of Agriculture and Fisheries. 2011. *Agriculture Sector Plan 2011-2015. Vol.1.* Government of Samoa.

rejuvenated taro export industry. The percentage of land area under taro cultivation relative to the total area under cultivation by all crops dropped from 21.9% in 1989 (pre-Taro Leaf Blight) to 5.0% in 1999. Most recent statistics (2009) show 19.7% in an increasing trend[9]. Taro has also since the last few years regained its place as the main traditional staple food and source of carbohydrate in the diet of the majority of Samoan households.

Besides taro, Samoa's agro-biodiversity has been expanded with the deliberate introduction of new varieties and species of fruit trees and vegetable, as well as livestock in a purposeful strategy to broaden and diversify the sector's export and import substitution potential, and to diversify vitamin and protein sources to improve the quality of the local diet. Some of these species include a range of citrus varieties and sub-species (Tahitian lime and maya), and introduced fruit trees including lychees, mangosteen, pumello, five-star fruit, rambutan, papaya and bele. Similarly in livestock, introductions include a species each of sheep and goat from Fiji, and imported heifers and bulls from Australia to improve local breeds[10].

Q.1.3 Fisheries and Marine Species

Fishing engage 24.8% of all households (MAF, 2011; op cit) with 66% of these fishing for home consumption only while 32% sell fish to supplement income and 2% of households fish commercially. Forty two percent (42%) of the average households contain at least one fisherman. These numbers show a decline in the number of households engaged in fishing from 10,884 in 1989 to 5,572 (25%) in 2009, due to a range of factors. Important however is that fishing and fish is traditionally a main source of protein, as well as for income generation.[11]

In terms of possible impact, an indication is reflected in the fact that 86% of all fishing occurs in the reef and inshore area[12] that are the habitats to the bulk of Samoa's marine biodiversity. It is also the most degraded and overfished.

The severe decline of the inshore fishery of most villages is widely reported and is in large part attributed[13] to the outcome of unregulated open access fishing regimes which inevitable outcome is overfishing and resource depletion, a consequence consistent with Boulding's 'tragedy of the commons' scenario (Boulding, 1966)[14]. The destructive impacts of cyclones (1990, 1991, 2004 and 2012) on coral reefs and crown-of-thorns (COTs) are also reported as other contributors[15],[16].

Efforts to address this situation was led by an AusAID funded initiative in the early to mid-2000s and has continued with local funding support, to revive inshore fisheries resources using a community based management approach. Around 75 coastal villages (~ 30% of all villages)

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[9] Ministry of Agriculture and Fisheries; Samoa Bureau of Statistics. 2010. Agriculture Census: Analytical Report 2009. MAF & SBS, Government of Samoa. Pp. 107.
[10] Ibid. p. 76.
[11] Samoa Bureau of Statistics 2011 cited by Mohamed Nizar (2011). Pro-poor and MDGs Acceleration Policy Analysis in Samoa: Agriculture and Fisheries Sector. UNDP.
[12] Samuelu-Ah Leong, Joyce and Sapatu, Maria. 2008. *Status of Reefs in Samoa 2007*. In: Whippy-Morris (ed.). 2009. South West Pacific Status of Coral Reefs Report 2007. Coral Reefs Initiative for the Pacific. SPREP, USP, GCRMN and ReefBase Pacific. SPREP, Apia.
[13] MNRE, 2013. Samoa's State of the Environment Report
[14] Boulding, K. 1966. "The economics of the coming spaceship Earth." In: Holden, P and Ehrlich, P.R. (eds.) 1971. Global Ecology: Readings Towards a Rational Strategy for Man. Harcourt Brace Jovanovich, Inc. New York. P. 180-187.
[15] Zann L and Bell,L. 1991.
[16] Zann, L and Sua, T. 1991; Zann,L and Mulipola, A. 1997

have since been fully engaged. Part of the intervention involve the enforcement of no-fishing zones, and the reintroduction of locally extinct species e.g. trochus and giant clams, mainly with stocks imported from Tonga. The overall fishery was further diversified with the introduction of tilapia for aquaculture development as an alternative protein source for local consumption and to reduce local dependence on marine fish as a protein source.

Q.1.4 Forests

While commercial logging and local timber milling had declined markedly since the late 1980's with the near depletion of merchantable forests, forests continue to serve a vital role in supporting local livelihoods as a source of traditional building materials, herbal medicine, firewood, and nuts and fruits. Forests also play a central role in the provision of ecological services including the hydrological cycle, water for drinking, farming and for power generation, soil renewal and protection against erosion, and in carbon sequestration and storage, now important in the context of mitigating the impacts of global warming and climate change.

The growing importance of the protection functions of forests in the context of climate change is fourfold, for the sequestration and storage of atmospheric carbon, for the protection of coastal and hazard prone areas and physical assets, and catchment areas to sustain and support hydropower generation, drinking water and agriculture, and for their potential for biomass gasification as an alternative source of renewable energy.

Samoa's native vegetation also has major significance as the source of herbal medicine that continues to be widely used throughout the country. The practise of traditional healing methods and the importance of the role of traditional healers or taulasea in Samoan culture, even today, is testament to the continuing importance and relevant of traditional medicines and treatments – in particular herbal medicine – to Samoan everyday life, as an alternative to modern medicine. The bark , leaves, roots, flowers etc of trees, ferns, herbaceous plants and others are used in various forms and mixes in the treatment of external wounds and boils, and or otherwise mix in solutions that are drink as directed by healers.

Q.1.5 Terrestrial and Marine Fauna

There is limited dependence on bird fauna for food although some bird species (e.g. Pacific pigeon) are considered special traditional delicacies and are harvested seasonally in small numbers. Most vulnerable species are the Pacific pigeon, and flying foxes but many villages where harvesting was once common are increasingly tabooing this practise as a conservation measure. Feral pigs are also harvested on a small scale but anecdotal evidence suggests it is not a threat to the existing population.

Birds and marine fauna feature prominently in the cultural folklores and the oratory traditions of Samoa. Many traditional and oratory proverbs are associated with the traditional methods of fishing and hunting for birds.

Q.1.6 Biodiversity and Tourism

Samoa has since the early 1990's been promoting a vision of tourism that is strongly pro culture and pro environment. For instance, the Western Samoa Tourism Development Plan 1992-2001 promoted "… a cautious, planned approach to tourism" (STDP, 2002)[17] that was 'conservative'

[17] Notably the key issues discussed in the stakeholder consultations for the sector plan, was the scale of tourism - how much tourism is appropriate and what scale of facilities is desirable.

and 'low impact" (ibid.). More recently, this conservatism found expression in the concept of 'sustainable tourism' which the most current STDP 2009-2013 embraces and espouses in the following way:

> for "… conserving and enhancing the country's natural and built environment, and respecting and supporting the *fa'a-Samoa*"; the use of environmental impact assessment tools to assess all new and existing tourism projects; the identification, protection and management of important natural, cultural and historic sites, and the preparation of information promoting tourist awareness of the *fa'a-Samoa* (GoS, 2002).

The same policy document clarifies Samoa's definition of sustainable tourism in the following way:

> "… Samoa is not seeking what in world terms can be regarded as *mass tourism*. Indeed, on the contrary, there is concern to ensure that the quality of life and the *Fa'a-Samoa* are not in any way prejudiced or imperilled by possible downside risks of *mass tourism"*[18].

The essence of this philosophy is a brand of tourism that the Samoa Tourism Authority (STA) markets as the 'Samoa Experience' – a unique blend of traditional Samoan culture, pristine natural environment, a safe, relaxing and welcoming social environment, in addition to the usual attractions of sand, sun and surf that most tropical island destinations typically offer.

The impacts on biodiversity are seen in the emphasis on community based nature based or ecotourism activities, based around village owned marine protected areas and forest reserves, promoting activities such as snorkelling and diving in marine reserves, bird watching, forest hiking, mangrove canoe tours in community conservation areas and government managed parks and reserves, as well as cultural and historic sites. For communities and resource owners, income is earned from user fees, and the sale of souvenirs and local produce.

Q2: What Major Changes Have Taken Place In The Status And Trends Of Biodiversity In Your Country?

A number of major changes have taken place in Samoa's biodiversity over the last ten years. While these were identified and reported in the previous (4th) National Report based on qualitative and empirical evidences, recent data and results of analysis have provided a more quantitative assessment of their extent. Most of these changes were identified and discussed in Samoa's 2013 State of Environment Outlook Report –

Forest cover:

- The trend of continuing loss and degradation of native forest cover remains due to natural disasters (e.g. Cyclone Evans (2012) and compounded by continued anthropogenic activities. Logging activities are no longer a threat with the low level of merchantable forests remaining. A renewed emphasis in reinvigorating agriculture for food security and export purposes under the SDS 2012-2016 will likely see an increase in land clearing but this is expected to be mainly in secondary non-native stands that have colonized old logged-over areas, and areas previously cultivated. The more critical issue where non-native forests are concerned is the protection of catchments, erosion-prone slopes and ecological corridors including riparian strips.

[18] GoS. 2009. *Samoa Tourism Development Plan 2009-2013*. Samoa Tourism Authority. Apia.

- Forest cover assessment for the SOE 2013 estimates that the island of Upolu is predominantly (99%) of non-native forests. For the larger island of Savaii's upland forests (above 600m asl) is about 91% native, and in pristine condition. The BIORAP survey also confirmed this noting that the upland forests have recovered well from damages inflicted by cyclones of the early 1990s and was not adversely affected by Cyclone Evan (2012).
- The overall area under forests – native and non-native - has increased relative to previous estimates. This is shown in **Table 1**.

Table 1: Remaining Forest Cover in Upolu and Savaii

	Upolu Island				**Savaii Island**				
	native		**non-native**		**native**		**non-native**		**Total**
	%	ha	%	ha	%	ha	%	ha	ha
Upland	0	0	99	11,489	91.2	49,032	8.8	4,732	65,253
Lowland	0	0	69	73,460	0.08	146	48	80,784	154,390
Coastal	0	0	20	22,086	0	0	20	34,596	56,682
Total areas	**0**	**0**		**107,035**		**49,178**		**120,112**	**276,325**
NFA*	5,644				1,804				7,448

* - non-forested areas; Source: MNRE. 2013. State of Environment Report. Apia, Samoa

Inshore and marine habitats:

- A NOAA report (2012)[19] using combined monitoring data from several sources including Samoa's Fisheries Division and GCRMN[20], provides the most up-to-date assessment of the status of Samoa's coastal habitats, reefs and inshore fisheries. According to this report, the entire northern coastline of Upolu from the Manono-Apolima strait to the Fagaloa Bay is the most severely depleted and degraded in terms of coral and fish biomass and species diversity. The healthiest coastal areas using the same indicators are in north western Savaii.
- It is not possible to draw from these analyses any direct comparisons to show the rate and extent of change over time, other than to conclude that these quantitative results now provides confirmation of trends previously deduced based on qualitative and anecdotal information. The NOAA assessment also now establishes baselines for measuring changes going forward.

Agro-biodiversity:

- Important new varieties have been developed in agro-biodiversity for taro *(Colocasia esculenta).* Five genetically improved taro varieties were developed from over 50 introduced and local varieties, and are now commercially planted for export and local food consumption. These varieties are superior in terms of yield, resistance to TLB and appeal to

[19] Kendall & Poti (eds.). 2011. Biogeographic assessment of the Samoan Archipelago. NOAA, USA.
[20] Global Coral Reef Monitoring Network

consumers. As well, there have been new introductions of fruit trees and livestock (Fijian Fantastic sheep). For taro, the objective is to revive the taro export industry and as the main staple food crop which was decimated in the early 1990s as a result of the Taro Leaf Blight. Other introduced fruit tree species aims to increase exports and promote import substitution.

Invasive species:

- Invasive species continues to be a major threat to Samoa's biodiversity. These species were previously reported and efforts to eradicate and or control some of them during this reporting period have (e.g. *Merremia peltata*, myna bird) yielded limited success. In terms of flora, the most prolific of the vines are *Merremia peltata* (fue lautetele) and *Mikania micrantha* (fue saina). A long list of non-native species now dominating newly generated secondary forests are classified as invasive or potentially invasive. Those most widespread and prolific are *Albizzia spp* (tamaligi), *Castilla elastica* (Panama rubber tree; pulu mamoe), *Funtumia elastica* (African rubber tree; pulu vao) and *Spathodea campanulata* (African tulip; fa'apasī). Invasive fauna includes the myna bird, bulbul, rats and the African snail.
- The BIORAP survey provides the first report of the extent of spread of invasive species into the hitherto pristine upland forests of Savaii. *Clidermia hirta* (Koster's curse) and *M. micrantha* (fue saina) are reported below 1,300m, along old vehicle access roads, suggesting that humans play a role in their spread.

Endemic and native birds:

- The puna'e (*Gallinula pacifica*) – one of Samoa's rarest endemic bird species that for several years was categorized as critically endangered by IUCN's Red List - appears likely to be already extinct, after the 2012 BIORAP survey failed to find any trace. However, the survey only covered part of its natural habitat. The species last confirmed sighting according to the IUCN Red List was in 1873.

- The BIORAP team also reported on the following bird species –
  - The tooth-billed pigeon or *manumea (Didunculus strigirostris)* which is already Red Listed by IUCN as endangered was not sighted during the BIORAP survey and was reported that this condition may now be considered critical.
  - the Friendly Ground dove *(Gallicolumba stairii)* which was not observed during the BIORAP survey of the uplands of Savaii Island was observed and documented along the coastal forests of Savaii during the Conservation Leadership Program (CLP) survey in 2013.
- One bird species – the White Eye (mata pa'epa'e) currently listed as endangered by IUCN appears to be less threatened, with high numbers observed than previously estimated.
- A one year project funded by the CLP which aims at re-discovering the tooth-billed pigeon was carried out in partnership with the local communities. In 2013, two individual tooth-billed pigeons were successfully re-discovered from the village of Salelologa. The juvenile bird was seen on a 10m high perfume tree and was photographed (**Figure 1)** before it flew away while the adult bird was seen

Figure 1: Juvenile manumea on a perfume tree. Photo: Moeumu Uili, 2013.

flying from the understory canopy, diving into a low thick vegetation dominated by introduced shrubs and vines.

Native flora

- Two species new to Samoa, both orchids, were recorded during the expedition, and they (*Calanthe* sp. and *Bulbophyllum* sp.) are now being studied; one or perhaps both of them representing new, unnamed species.
- The Savaii Upland Cloud Forest is ranked 23rd in terms of conservation value in the South Pacific Islands by SPREP (2012). When combined with the montane forest below it, the area probably comprises (with the possible exception of the Big Island of Hawai'i) the largest intact block of tropical rainforest in Polynesia, more than 700km^2 in area (CI, MNRE and SPREP 2010). The upland forests is considered a priority for the expansion of Samoa's conservation area network because of its large size and because it captures many of the threatened terrestrial species in the country (ibid). According to the BIORAP study, the area is still relatively undisturbed and in pristine condition.

Protected Areas

- Two new sites have been informally added as new national parks on the big island of Savaii – the Aopo-Asau National Park and the Lata National Park – and will be added officially to Samoa's protected area network once legally designated. The proposed Lata National Park is a privately owned property which has the full consent and support of the landowner. The proposed Asau-Aopo NP is largely state-owned (the ex-Cornwall Estate) with large chunks consisting of remnants of planted mixed forests of natives and exotic species. There are officially 3 national parks – 1 in Savaii and 2 in Upolu – but the addition of these two sites, once legally designated, will increase the total area under official protection from 13,751 ha to 23,543.92 ha.
- A review and redefinition of key areas for biodiversity conservation to ensure better representativeness of Samoa's native ecosystems and species habitats was completed in 2010, and a larger and more extensive network that would bring under protection and conservation management 33% of Samoa's terrestrial ecosystems and 23% of its inshore marine area have been endorsed by the Government as the new targets for conservation work.

Q3: What Are The Main Threats To Biodiversity?

Q.3.1. Invasive Species and Diseases

Invasive species poses a major threat to Samoa's biodiversity and economy. The impacts are costly and often irreversible. Impacts can range from adversely affecting the productivity and subsequent economic output of primary industry, such as agriculture, forestry and fisheries, to impeding cultural practices and traditions, household food security and sustainable livelihoods, and threatening the integrity of natural ecosystems and the existence of rare and vulnerable species. Some 55 terrestrial plants have been identified[21] as invasive.

[21] SNITT Working Group and Samoa Invasives Prioritization and Management Planning Workshop, Apia, Augst 2007. Cited by MNRE, 2013. Samoa 2013 State of Environment Report.

Samoa has experienced the devastating impact of invasive species on the environment in general and on agricultural crops and birds in particular. In agriculture, the taro leaf blight (TLP), the giant African snail (*Achatina fulica*) has been most destructive. For birds, the myna bird (*Acridotheres tristis, A. fuscus*) and rats (*Rattus rattus*) are the most prolific. The merremia vine (*Merremia peltata*) and mile-a-minute *(Mikania micrantha*) are widespread and thwarting the growth of crops and trees in more open lowland areas.

The impact of the taro leaf blight virus has been discussed earlier in this report. It was extremely costly from an economic perspective[22], with taro production in Samoa dropped by over 95% and the export value fell from $US 3.2 million in 1993 to only $US 53,000 one year later (IPGRI, 2002). From an environmental point of view, it marked the eradication of an export species, but triggered a major endeavour to expand the taro gene pool that is now the foundation for a rejuvenated taro export industry.

There are other invasive weeds, vines and woody species that are major threats to Samoa's biodiversity. These include *Merremia* (*M. peltata*) vine, the mile-a-minute (*Mikania micrantha*), as well as a group of fast growing light demanding species of *Albizzia spp* (tamaligi), *Funtumia elastica* (Pulu vao), *Castilla elastica* (Pulu māmoe) and *Spathodea campanulata* (Fa'a-pasī) that have dominated Samoa's lowland habitats and much of the remaining forests on the island of Upolu (SOE, 2013).

Q.3.2. Natural Disasters

Samoa is prone to natural disasters and in particular cyclones, flash floods, earthquakes and fires. Climate change and climate variability has exacerbated this vulnerability with predicted future cyclones and other extreme weather events predicted to be more frequent and more intense. These predictions were voiced over a decade ago, and are now a reality. Cyclones in particular cause extensive damage and fragmentation to native forests, coastal ecosystems and coral reefs, as well as habitats of many threatened bird species.

Samoa's vulnerability is partly due to its geographic location (south of the equator) which is an area known for the frequent occurrence of tropical cyclones with damaging winds, rains and storm surge between the months of October and May (SPC-SOPAC, 2011)[23]. Cyclones within living memory include Cyclones, Ofa and Val (1990 and 1991), Heta (2004) and, recently, Evan (2012). All caused extensive damage to important terrestrial and marine habitats and species populations, as well as infrastructure, settlements and crops.

As in previous cyclones, the impact on the biophysical environment is observed in the severe degradation of terrestrial and marine habitats of high conservation value, defoliation of forest trees and extensive damage due to windthrows, loss of fauna populations including species that are already threatened, and the overall fragmentation to ecosystems that in and by itself, will diminish their ability to function optimally as ecosystem services providers.

The degradation caused by natural disasters also often creates conditions favourable to the spread of invasive species of vines and trees, aggravating the degradation of habitats and increasing the threat of extinction for some local species.

[22] Cited by MNRE.2008. *National Invasive Species Action Plan 2008-2011*. Division of Environment and Conservation, MNRE.

[23] SPC-SOPAC. September 2011. *Country Risk Profile – Samoa.* Pacific Catastrophe Risk Assessment and Financial Initiative. SPC, Noumea.

Table 2: Natural Disaster Record of Samoa 2004 - 2012

Date	Location	Type	Disaster Name	Killed/Affected	Estimated Damage US$
December 13, 2012		Tropical Cyclone	Evan	4 dead; 10 missing; 2088 households, in 164 villages , approx. 14,777 people (based on 2011 Census)	$480 million SAT ($210.7 million USD)
29 September 2009	Eastern and South Eastern Coast of Samoa	Tsunami	Tsunami	143 dead; 5 missing; Approx. 5274 people, approx. 685 households	Damage – SAT$211.96 (USD$84m) and losses – SAT98.16m (USD$39m)
8 – 16 September 2008	Asau and Aopo, Savaii	Bush fire	Asau and Aopo Bush fire	0	SAT$163,995.07
January 25, 2008	Apia	Flash flood	Apia flood	0	0
6 February 2006	Apia	Flash flood	Apia Flood	Approx. 20 – 30% of 38,836 population of Apia (2001 Census)	Approx. SAT$300,000.00
February 16, 2005	Savai'i and Upolu Islands	Tropical Cyclone	Olaf	0	0
January 05, 2004		Tropical Cyclone	Heta	1 dead; Affected people - 30,000	500,000

Source: MNRE. 2013. Samoa's 2013 State of Environment Report

Q.3.4. Unsustainable Exploitation of Resources

Unsustainable exploitation of resources will continue to add stress to Samoa's biophysical environment. It has already significantly altered the distribution and composition of Samoa's forests. It is also reported in fisheries and water resources.

The unsustainable exploitation of native forest resources for sawmilling and agriculture is well documented (Sesega, S. 2005). It is the result of a combination of factors including food production, cash income generation, expansion in settlements and land profiteering (ibid.). At present, the low volumes extracted in the few remaining logging activities[24] are indicative of the largely depleted nature of Samoa's native merchantable forests. Existing logging is small scale and centres around the salvaging of remnant trees in previously logged areas and in agricultural lands. In the foreseeable future, the low level of logging is not expected to be an important environmental issue except where it may affect water catchment areas, areas prone to soil erosion, and habitats earmarked for conservation within approved Key Biodiversity Areas. There are also recurring reports of harvesting of mangroves in some communities for fuel.

In the fisheries sector, overfishing in the inshore area is a major issue that will continue to threaten the integrity and sustainability of coastal resources and coral reefs. The underlying drivers are the combined effect of population, the open access nature of coastal fisheries resources, and the increasing demands of an increasingly cash based lifestyle in rural communities. Recent statistics (MAF, 2011)[25] showed that 24.8% of households were engaged

[24] Estimated at around 3,000 – 5000m3 per year

[25] Ministry of Agriculture and Fisheries. 2011. Agriculture Sector Plan 2011-2015.Vol 1. MAF Apia.

in fishing. Ah Leong et al (2009)[26] noted that 86% of all fishing is carried out in the reef area, with 42% of the average household containing at least one fisherman. The catch per unit effort has steadily increased, from 1.8kg/hr in 1990, to 2.1kg/hr in 1997 to 2.24kg/hr in 2007 (Valencia et al. 2007)[27] which Ah Leong et al (op cit.) noted as indicating overfishing.

Of Samoa's tuna resource, the total annual tuna catch is within sustainable levels (i.e. within the Maximum Sustainable Yield), but there is overfishing of larger and older albacore stock. Langer (op cit) attributes this to the combined effect of a high level of fishing effort from Samoa's domestic longline fleet and a small and restricted EEZ. The result of both is a dwindling stock of large and older albacore as the natural process of stock diffusion and replenishment from neighbouring seas lags behind the rate of exploitation.

MAF (op cit) also observes that the growing practice of sending consignment of seafood as gifts to relatives' overseas ('fa'aoso') is a contributing factor.

Q.3.5. Poorly Planned Development Activities

Despite efforts on the part of the Government to provide a framework within which all development activities are properly screened and vetted for environmental sustainability, many local initiatives and activities are occurring without proper vetting. Many are coastal in nature involving sand mining, coastal reclamations and constructions within hazardous zones. Many mangrove areas are destroyed to make way for construction, by waste dumping and for firewood. Water is abstracted without proper licenses and formal assessments. Cultivation in sensitive habitats including catchments, forests of high conservation value and on steep erosion-proned slopes is widely observed.

The larger issue is the lack of integrated land and resource use planning but it's a complicated issue with drivers including the land tenure system coming into play. However some positive developments and progress can be seen with the host of planning frameworks and guidelines now in place for regulating developmental initiatives. Prominent among these are PUMA's regulatory mechanisms as set out in the PUMA Act 2004, PUMA (EIA) Regulation 2006 and the Environment Code of Practice (2006). The PUMA legislation's requirement for the development of Sustainable Management Plans (SMPs) was recently tested using the Vaitele peri-urban area. District Coastal Infrastructure Management (CIM) Plans is a useful guide with specific recommendations to Government, private developers and communities for improving the resilience of coastal communities and developments.

PUMA's regulatory framework for Development Consent Applications (DCAs) framework is complimented and supported by similar permitting systems for regulating sand mining and coastal reclamation activities administered by the Land Management Division of MNRE, for underground water exploration and abstraction administered by the Water Resources Division. In agriculture, the pesticides registry lists approved agricultural chemicals that are safe and environmentally friendly for importation. MAF has also developed the technical capacity for matching crops to land use productivity to optimize land use and productivity and this advisory service is available to farmers to guide crop selection. Risk assessment procedures are in place for screening potential biosecurity threats posed by any imported living modified organisms.

[26] Samuelu-Ah Leong, Joyce and Sapatu, Maria. 2008. *Status of Reefs in Samoa 2007*. In: Whippy-Morris (ed.). 2009. South-West Pacific Status of Coral Reefs Report 2007. Coral Reefs Initiative for the Pacific. SPREP, USP, GCRMN and ReefBase Pacific. SPREP, Apia.

[27] Cited by Ah Leong et al (2008).

Q4: What are the impacts of the changes in biodiversity for ecosystem services and the socio-economic and cultural implications of these impacts?

Socio economic implications

The main socio-economic implications of biodiversity loss will be in services directly dependent on healthy intact forests. Such include the role of forests in a number of ecosystem services such as facilitating water infiltration into the soil to become part of subsurface storage that feeds drinking water sources, minimizing surface run-off and sedimentation into streams which in turn reduces coastal pollution and incidences of eutrophication, algae blooming and degraded lagoons and reefs; and helping to sustain stream flow that feed hydropower schemes.

The adverse socio-economic implications are therefore those of unreliable and polluted water supplies, with flow-on effects on health and poverty. Low stream flows reduces hydropower generation, with flow-on effects on increase fuel costs from petroleum substitutes, and unreliable electricity supply will affect industrial output. Reduced hydropower potential of rivers is a major setback to Samoa's ambitious target of 20% renewable energy by 2030. Degraded coastal areas as a result of increased sedimentation will affect inshore fisheries that are an important source of food and income for many rural households.

When these scenarios occur in the context of an extreme event such as, a cyclone, the severity of socio-economic impacts are compounded several times over. Likewise is the cost of physical reconstruction and restoration, as well as of social hardship and loss of livelihoods.

A positive change in biodiversity from a socio-economic perspective is reported earlier in efforts to revive Samoa's taro export industry with the deliberate introduction of new varieties and sub-species of taro from other Pacific Island countries and South Asia. An expanded gene pool for taro *(Colocasia esculenta)* has produced five new varieties that are high yielding, resistant to TLB and of wide consumer appeal. These are now commercially produced and exported, and directly contributing to Samoa's drive for food security and the attainment of the MDG 1 – eradication of poverty and hunger.

Cultural Implications

The loss of native forests and its continued fragmentation as a result of cyclones, is rapidly resulting in the spread and dominance of non-native forest species and the decline of many native bird species which specialised habitats and food sources are degraded or destroyed. The socio-economic implications may be less apparent as there is little local dependence on the harvesting of birds for food and or for household income. But the ecological and cultural implications in the long run of the absence of native birds and mammals – especially those species that feature in local oral traditions and folklore - is an intangible cost to a culturally conservative country as Samoa is where traditions form an integral part of everyday life.

With some birds and mammals playing critical roles in the germination and dispersal of seeds of many native plants (e.g. flying foxes), the future composition of native forests will change. Some native species may disappear altogether, while others – many of which are introduced and considered invasive - may become more prominent, including fast growing light demanding species. The predicted increase in the frequency of cyclones of increasing intensities will only facilitate the spread of fast growing light demanding tree species especially in the lowland and coastal habitats. The implications are not favourable for native fauna (some birds, turtles) with

specialized habitat needs, with habitat loss and fragmentation likely to lead to declining populations and eventual extinction unless Samoa has an adequate system of protected areas and ecological corridors to provide protected habitats.

There are a few tree species of cultural importance which scarcity is already evident. One such species is *Intsia bijuga* (ifilele), which is highly valued for the carving of *ava* bowls and artifacts. Already, *ava* bowls carved out of exotic mahogany *(Swietenia macrophylla)* is commonly seen in handicraft stalls in Apia's flea market.

The use of traditional herbal medicines remains widespread and common in Samoa. Many flora species with known medicinal properties are found in the littoral and beach zones. Some of these are affected by continuing coastal erosion and sea level rise, and in some cases destroyed in the course of seawall constructions for coastal protection.

Biodiversity and Climate Change Adaptation/Resilience

The impact of climate change especially of climate change induced events such as cyclones and flash floods, has been discussed elsewhere in this report. It is now seen as the biggest threat to Samoa's sustainable development aspirations. Recent experiences point to the high cost of losses to physical infrastructure, crops, houses and human lives. **Table 2** in **Section Q.3.2** provides estimates of losses as a result of major cyclones and floods in Samoa over the last 20 years.

The priority now assigned to environmental sustainability in the national development agenda is mainly driven by this threat. Strategies adopted for combating it involves the strengthening of community resilience, a large part of which revolves around the ability of natural systems to buffer the impact of cyclones and floods, and their own ability to withstand and recover quickly. So called 'soft solutions' utilizes the protective functions of forests, coral reefs, sand dunes and mangroves to either complement or replace the use of costly hard 'engineering' solutions to protect coastal infrastructure and human settlements. The overall perceived value of the environment and ecosystem functions are, to a significant degree, increased as a result.

PART II: The National Biodiversity Strategy And Action Plan, Its Implementation, And The Mainstreaming Of Biodiversity

Q.5: What Are The Biodiversity Targets Set By Your Country?

Samoa has redefined its strategic goals and targets to align with the Aichi Targets. These are tabulated below alongside the corresponding proposed Aichi Targets.

Strategic Goal A: Address the underlying causes of biodiversity loss by consolidating the mainstreaming of biodiversity across government and society

Aichi Targets	*Samoa NBSAP Targets*
Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	***Target 1:*** *By 2020, at the latest, the people of Samoa are aware and appreciative of the values of biodiversity, the threats it faces and the steps they can take to conserve and use it sustainably.*
Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	***Target 2:*** *By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting and budgetary processes, as appropriate, and reporting systems.*
Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	***Target 3:*** *By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.*
Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	***Target 4:*** *By 2020, at the latest, Government agencies, private sector organizations and groups, NGOs, civil society and stakeholders at all levels have taken steps to achieve or have [developed and] implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.*

Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	**Target 5:** *By 2020, the rate of loss of all natural habitats, including forests, is at least halved [50%] and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.*
Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	**Target 6***: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that* • *overfishing is avoided,* • *recovery plans and measures are in place for all depleted species,* • *fisheries have no significant adverse impacts on threatened species and* • *vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.*
Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	**Target 7:** *By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.*
Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	**Target 8:** *By 2020, land based and marine pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.*
Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	**Target 9:** *By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.*
Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	**Target 10:** *By 2020, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.*

Strategic Goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.	**Target 11***: By 2020, at least (17) per cent of terrestrial and inland water, and (10) per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.*
Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	**Target 12:** *By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.*
Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	**Target 13:** *By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is at least maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.*

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services.

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	**Target 14**: *By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, ~~indigenous~~ local communities, and the ~~poor and~~ economically vulnerable.*
Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing	**Target 15:** *By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.*

to climate change mitigation and adaptation and to combating desertification.	
Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	**Target 16:** *By the end of 2015, Samoa has ratified and or acceded to the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization with national legislation enacted to support its implementation.*

Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building.

Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	**Target 17:** *By 2015, Samoa has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.*
Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	**Target 18**: *By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are fully protected by national legislation and relevant international obligations, and fully integrated and reflected in national and sector plans and budgetary processes.*
Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	**Target 19:** *By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.*
Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be	**Target 20:** *By 2020, at the latest, the mobilization of financial resources for effectively implementing the Samoa's NBSAP 2014 - 2020 from all sources is increased substantially from the current levels.*

subject to changes contingent to resources needs assessments to be developed and reported by Parties.	

Q.6. How has your national biodiversity strategy and action plan been updated to incorporate these targets and to serve as an effective instrument to mainstream biodiversity?

The consultation process that contributed to the NBSAP Update for Samoa began in 2012 when consultations for Samoa's State of Environment (SOE) report and National Environment Sector Plan (NESP) 2013-2016 started. As a whole-of-environment assessment, this process examined all aspects of Samoa's environment including biodiversity. This include the status of the country's biomes, ecosystems and habitats, its endemic and native terrestrial, aquatic, and marine species, the progress made in in-situ conservation efforts for targeted areas and species, the pressures and drivers acting on them and affecting their conservation and, as appropriate, their sustainable use, the impact of climate change, and other drivers of changes including population, economic development and other human-induced impacts.

The process was inclusive of all stakeholders and workshops were held in both the main island of Upolu as well as Savaii, with the draft findings of the SOE report presented and discussed. The Samoa SOE report was launched in October 2013.

Consequently, with respect to the formulation of the NBSAP, while the formal process for updating the NBSAP was launched in November 2013, much of the initial public discussion and consultations on issues and priorities had already been done.

The sequence of activities for the NBSAP Update are given below.

1. Recruitment of NBSAP Update Consultant

2. First Inception workshop

- Agreement on NBSAP Update process
- Setting milestones etc for producing NBSAP outputs
- Formation of Technical Working Group
- Review of NBSAP (2001) Implementation – stakeholders input into activities matrix

3. Technical Working Group continuing consultations and discussion via email

- Received draft Targets from Consultant
- Commented and agree on revised Aichi Targets, vision and mission statements
- Commented on NBSAP Assessment report and Implementation matrix

4. Second NBSAP Workshop 21 March 2014

- Reviewed second draft of 5th national report to CBD
- Reviewed proposed National Targets derived from Aichi Targets
- Reviewed remaining process for finalizing NR5 and NBSAP including the submission of NR5 in draft before 31 March to CBD
- Provided comments and additional input into the draft NR5

This workshop also agreed as followed –

- that a draft NR5 will be submitted before the 31 March deadline with the NR5 to be printed, and formally launched on the National Biodiversity Day.

- The Biodiversity Targets will be reviewed further as part of the remaining activities of the NBSAP Update, given the lack of consensus on the wording of some targets now in the draft NR5.

- This means the NBSAP Targets will be finalized when the finalized NR5 is properly completed and formally submitted to the CBD Secretariat.

5. Submission of draft NR5 to CBD Secretariat before 31 March deadline

6. Review and update taking into account any comments from CBD Secretariat and stakeholders and finalization

7. Submission of finalized NR5 report to CDC for endorsement

8. Submission of final NR5 Report to CBD Secretariat

9. Formal launch now scheduled on National Environment Week.

Q.7: What actions has your country taken to implement the Convention since the fourth report and what have been the outcomes of these actions?

The full matrix of actions taken by Samoa to implement its NBSAP since 2001 is in **Annex VIII**. The following summarises the main actions implemented since the fourth national report and outcomes. They are organized firstly according to the three main goals of the Convention, and secondly there is commentary on progress made within each of the 8 thematic areas. A commentary on the status of efforts to mainstream biodiversity to date is also given separately.

Q.7.1 Conservation of biological diversity –

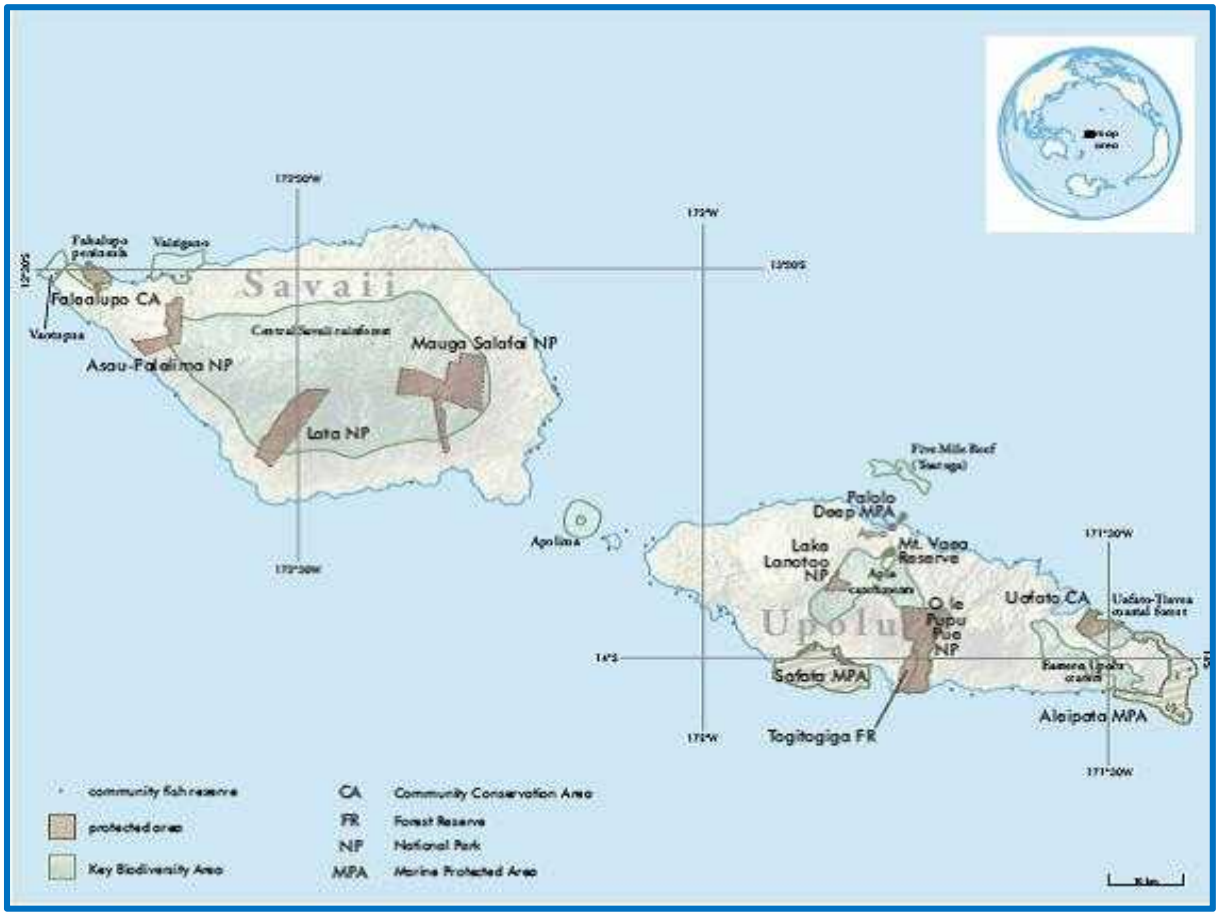
Terrestrial areas:

The 4th National Report noted that Samoa's protected area network contained 5% of the total land area amounting to 13,751 hectares, which is relatively short of the 10-15% target set by the NBSAP. It also reported that Samoa had 60% of its forest cover remaining with no primary forests remaining primarily due to the impact of cyclones. Twelve priority ecological sites were targeted for protection based on earlier studies with three sites under various degrees of conservation management - Uafato-Tiavea Coastal Forest, Aleipata Islands, Saanapu-Sataoa Mangrove Forests, with Aleipata Islands currently undergoing intensive rat eradication. The remaining 9 sites are at various levels of vulnerability with at least three seriously degraded as a result of a combination of clearing for agriculture, logging and settlement.

The above protected area network is expected to increase once two new sites – currently unofficially designated - are officially designated and managed as national parks in the island of Savaii. These are the Aopo-Asau National Park (2,494 ha) and the Lata National Park (4,982 ha). Their addition will increase the total area under national parks from 13,751 ha as reported in the previous Report to 23,543.92 ha during this reporting period, or a percent increase of 71%. The updated list of Terrestrial Protected Areas is given in **Annex III**.

Equally significant, Samoa has reviewed and approved a higher area target for strict protection and conservation management for its protected area network. This followed a review by the Government of Samoa and its conservation partners[28] based on criteria of representativeness and degree of threat in 2010. The review identified gaps in area representation and recommended an expansion of the PA network to include additional land and seascapes that would increase the total area for conservation management and strict protection from the current target of 15% to 33% for terrestrial biomes and ecosystems. The proposed expanded protected area network is illustrated in **Figure 2** which also shows existing parks and reserves.

Figure 2 - Key Biodiversity Areas targeted for protection and conservation management.



Source: 2013 State of Environment Report, MNRE Government of Samoa.

Marine areas:

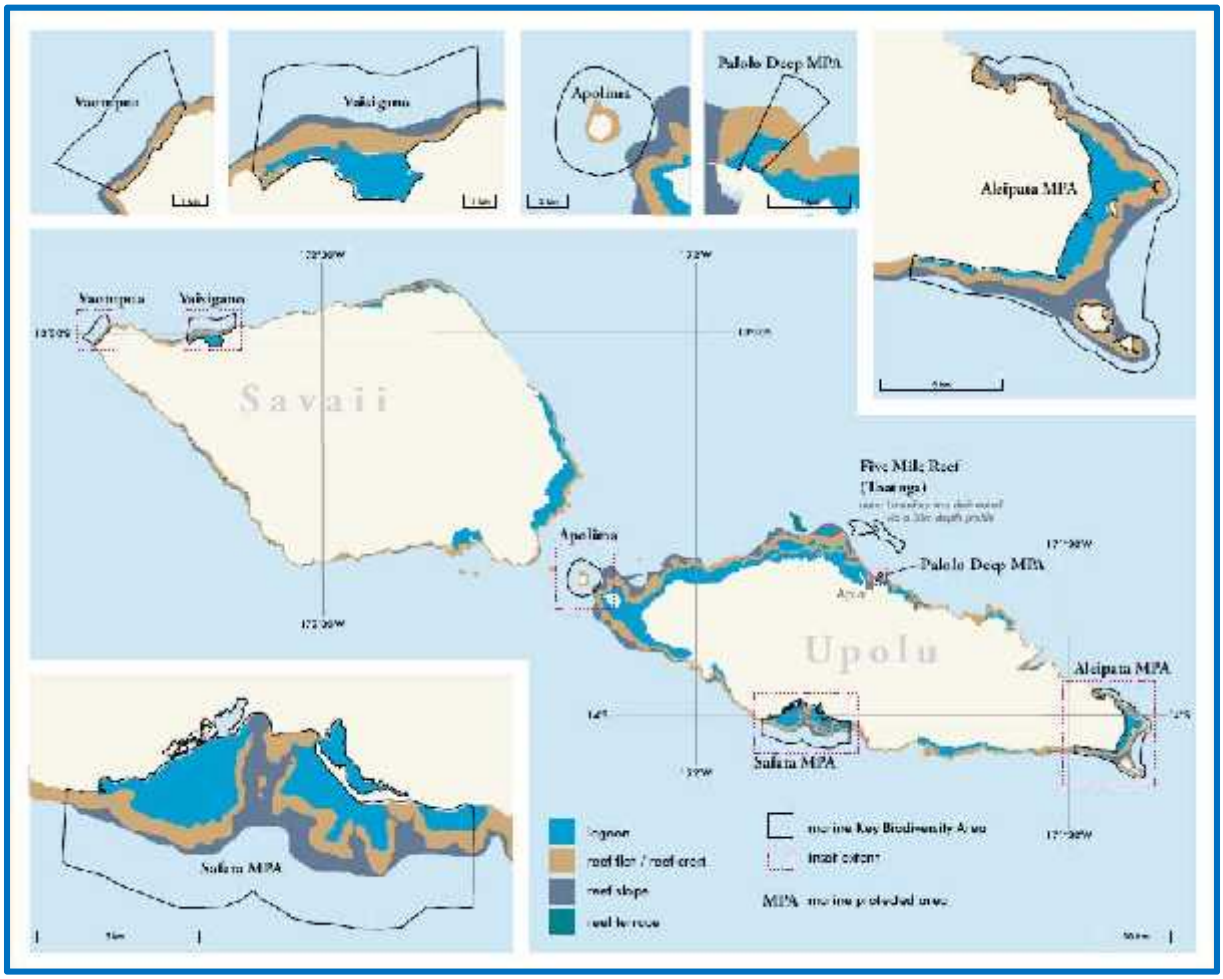
Samoa's system of marine reserves remains officially unchanged since the 4th National Report. This network consisted of

- Samoa's EEZ which was declared a sanctuary for whales, dolphins, turtles and sharks in 2002, Samoa's marine protected area network now stands at 12,011,437 hectares.
- the Palolo Marine reserve,
- the Aleipata Marine Protected Area and
- the Safata Marine Protected Area.
- A network of village based fisheries reserves (no area estimate is available) but numbering about 71 functional reserves of various sizes.

[28] Conservation International and Secretariat for the Pacific Regional Environment Programme (SPREP)

The review exercise referred to above by the Government of Samoa also examined the marine protected area network using the same criteria and recommended an increased target of marine conservation areas to be increased from the previous NBSAP target of 15% to 23%. Targeted marine inshore areas are illustrated in **Figure 3** below.

Figure 3: Expanded key biodiversity marine areas endorsed and targeted for protection



Source: CI et al. 2010. Priority Sites for Conservation in Samoa: Key Biodiversity Areas. Apia, Samoa.

Freshwater ecosystems

Previously reported as representing a significant information gap in Samoa's knowledge of its biodiversity, this status has not changed. In terms of species diversity, Jenkins et al (2008) which formed the basis of the status reported in the NR4, reported 30 freshwater fish species and 17 species of crustaceans in the small sample of streams covered. This brings the total of known freshwater species to 86 and crustaceans to 22[29]. There has not been any new information since.

Two tilapia species (*Oreochromis mossambicus and O. niloticus*) were reported previously as introduced for aquaculture (FAO, 2008). There were some concerns about its invasiveness. There are also anecdotal reports of both being deliberately introduced into the wild but there have not been any attempts to assess its status especially in terms of its distribution and possible impacts on other freshwater fauna.

[29] Government of Samoa. 2009. Samoa' Fourth National Report to the Convention on Biological Diversity. MNRE. Apia, Samoa.

Agro-biodiversity

The status of agro-biodiversity has not changed significantly since the fourth National Report. Genetic improvement in taro (*Colocasia esculenta*) in response to the Taro Leaf Blight (TLB) have been the main change with five new varieties approved for commercial production for export. Recent introductions in fruit trees (citrus, rambutans, lychees) were also reported in the NR4 and are now widely planted. There has not been any new introduction of livestock species following those previously reported i.e. of sheep (Fiji Fantastic) and goats (Anglo-Nubian X Fiji local).

Threatened Species

IUCN's Redlist of Endangered Species monitors 13 Samoan endemic and native species. Of the eight land bird species listed, one is critically endangered and possibly extinct (*Gallinula pacifica*). A 2012 scientific expedition by the Government of Samoa, Conservation International and SPREP did not find any trace of the puna'e or *G. pacifica* in its natural habitat and although a large part of the birds' natural habitat remain unexplored, the survey tends to confirm the view that it is extinct (last confirmed sighting report 1873).

The tooth billed pigeon (*Didunculus strigirostris* (local name – *manumea*) is categorized as 'Endangered' but recent findings suggested that its population is declining despite the presence of a large number of its food trees, raising concerns that its situation may now be critical. However, the recent sightings of a juvenile and adult manumea in 2013 under the CLP survey carried out by the Division of Environment and Conservation of the MNRE shows that there is still a need for further conservation efforts and surveys to assess the population status of the manumea birds in Samoa. Their rediscovery from the same location on Savaii Island indicates successful breeding where there are probably other pairs (male and female bird) surviving at suitable habitats on the island. MNRE is strengthening partnerships with relevant stakeholders and more importantly with the local communities to ensure there is support and commitment to continue conservation work for protection of the tooth-billed pigeon. An official request was submitted to the IUCN Secretariat in 2013 by MNRE to re-list the status of the manumea from endangered to critically endangered primarily based on the species being rare on both islands.

The *ma'oma'o* (*Gymnomyza samoensis*) also categorized as 'Endangered' was found by the BIORAP in small numbers. Likewise the *Matapa'epa'e* or Samoan White-eye *(Zosterops samoensis)* – currently categorized as Vulnerable. BIORAP noted that *mata pa'epa'e* numbers are sufficiently numerous to recommend a change in its current IUCN status. **Table 3** below gives an update of the status based on recently generated information.

Table 3 - IUCN Red Listed Samoan Bird Species and Status Updates

Species	IUCN Red List Status (2012)	Update based on recent information (BIORAP)[30]	MNRE surveys
Gallinula pacifica (Samoan moorhen;	**Critically endangered**	No sighting or trace in 2010 survey. Further confirmation that	No sighting or trace in 2010 survey. Further

[30] The BIORAP report is understood to have already been passed on to the IUCN with recommendations for reviewing and possibly updating species statuses.

local name – *Puna'e*)	(possibly extinct in Samoa)	it is possibly extinct	confirmation that it is possibly extinct.
Didunculus strigirostris (Tooth-billed pigeon; local name Manumea)	**Endangered**	Population appears to have seriously declined; there is concern that its status may now be critical.	Population appears to have seriously declined; there is concern that its status may now be critical and recommend to list as Critically Endangered.
Gymnomyza samoensis (Mao; local name – ma'oma'o)	**Endangered**	Declining; species has special habitat requirements which are now hard to find.	Rebecca survey 2011.CEPF
Gallicolumba stairii Friendly Ground dove; local name – Tuaimeo)	**Vulnerable**	No recent information from BIORAP (known habitat outside area covered by BIORAP study).	Surveys on Nuutele Island done under CEPF and CLP confirmed good habitat for Tuaimeo on Nuutele island and Salelologa in Savaii
Zosterops samoensis (Samoan White Eye; local name – Mata pa'epa'e)	**Vulnerable**	Found in good numbers by BIORAP; BIORAP to recommend a change in IUCN status.	Found in good numbers, however, these were only sighted in one surveyed area during BIORAP.
Nesofregetta fuliginosa (Polynesian Storm Petrel; local name – taio)	**Vulnerable**	No recent information from BIORAP (known habitat outside area covered by BIORAP study)	No recent information from BIORAP (known habitat outside area covered by BIORAP study)

Source: Based on SOE 2013 info and BIORAP report 2010.

Other species of Samoa's biodiversity of concern and listed by the IUCN Red List as having a 'vulnerable' or higher level of threat are tabulated in **Table 4** below:

Table 4: Other Samoan Species on IUCN Red List

Species	IUCN Red List status (2012)	Updated Status
Pacific Sheath-tailed bat (Emballonura semicaudata)	**Endangered** (possibly extinct in Samoa)	No sighting or trace in 2010 BIORAP survey. Further surveys need to be conducted to confirm that it is possibly extinct. Status unchanged.
Hawksbill turtle *(Eretmochelys imbricata)*	**Critically endangered**; decreasing trend in population.	SOE 2013 reported population is declining.
Green turtle *(Chelonia mydas)*	**Vulnerable** with decreasing trend in population	No new information; status unchanged.
Humphead wrasse *(Cheilinus undulates)*	**Endangered** with decreasing trend in	No new information; status unchanged.

	population	
Staghorn coral *(Acropora ruds)*	**Endangered** with decreasing trend in population	No new information; status unchanged.

Q.7.2. Sustainable Use of Biodiversity

Forests

The native forests classified as 'merchantable' was previously reported as all but depleted. This remains the case although small mobile logging operations are scavenging remnant trees in previously logged over areas, and areas being cultivated.

The forests on the island of Upolu is effectively non-native and mostly of highly invasive low quality species. These forests are, in general, more valuable for their protection functions and for maintaining ecosystem services than for wood products except, to an extent, fuelwood.

There is no large scale exploitation of forests for any purpose, except for household use for fuel. There is no data on biomass volumes for fuel but a comparison between biomass and other energy sources i.e. petroleum products and hydro-electricity, show a declining dependence. This is illustrated in **Table 5** below:

Table 5: Biomass as an energy source – 1989 - 2011

Year	Biomass (%)	Petroleum products (%)	Hydro-electricity (%)
1989	60	26	5
1998	50	39	7
2000	47	45	8
2009	31	66	3
2010	33.3	63.8	2.9
2011	28.6	69.0	2.4

Source: MNRE. 2013. Samoa State of Environment Report. Government of Samoa.

Strategies for achieving the renewable energy target of 20% by 2030 include the option of biogasification using biomass from planted energy species.

A number of GEF funded projects aimed at addressing the impact of climate change on a range of land uses are in progress. The ICCRIFS Project – Integration of Climate Change to Forest Management in Samoa – engages 26 villages in the conservation and sustainable management of their lowland agroforestry areas (25,000 ha) and three upland rainforests covering more than 10,000 hectares (Lake Lanoto'o National Park, Mauga o Salafai NP, and the community upland forests of the Laulii-Falevao area).

Marine resources

The exploitation of inshore marine resources for local sustenance and income remains unregulated for many villages. These areas are communally controlled and access is unregulated (open access regimes). But increasing collaboration between the Government (Fisheries agency) and local villages Councils have resulted in about 75 villages establishing fisheries reserves and community based fisheries management plans that are progressively stemming unsustainable fishing. Fisheries management plans establish no-fishing zones wherein marine flora and fauna are replenished, and establish village bylaws to regulate the use of unsustainable fishing practises such as the use of poisons and chemicals, and dynamites. Many villages where bylaws are yet to be established use traditional tapu or taboos that are effectively enforced within villages themselves. Unsustainable land based activities including poor cultivation practises that adversely affect lagoons and coral reefs are also regulated as part of village fisheries management plans and by-laws.

A recent NOAA report (2012)[31] identified coastal areas most depleted of fish and coral biomass that is now informing local strategies and plans for coastal fisheries development[32].

Samoa's tuna resource is effectively and sustainably managed. A Maximum Sustainable Yield of 7,000 metric tons is estimated per year. Available data shows that tuna harvesting fluctuates between 3,700 mt in 2008-2009, 2,350 mt in 2009-2010, and 2,937 mt in 2010-2011 – well within the MSY.

Birds, Mammals and Reptiles

There are anecdotal reports of continued hunting of birds (pigeons), flying foxes and in some cases, marine turtles. Pigeon hunting is seasonal but there are no available statistics or any on-going monitoring to assess its overall impact on species population. The same applies to flying foxes. The main threats to both species however is from the degradation and loss of habitats, mainly as a result of recent cyclones, cultivation, over-harvesting and invasive species

Q.7.3. Equitable Sharing of benefits Arising from the Use of Genetic Resources

Further strengthening of the legal framework for regulating bio-prospecting and other aspects of work related to Access and Benefit Sharing is included in the Environment Management and Conservation Bill currently awaiting enactment by Parliament. This legislation will repeal the existing Lands, Survey and Environment Act 1989.

Since 1989, three ABS agreements have been signed between the Government of Samoa and foreign parties for bio-prospecting and Research & Development (R&D) using Traditional Knowledge (TK) from local healers and the local plant 'mamala' for AIDS research. The 1989 Falealupo Covenant preceded the adoption of the existing legal framework. The three ABS Agreements – (i) the Falealupo Covenant which allowed Dr Paul Cox to access a community-held rainforest area for biodiscovery purposes (1989); (ii) an AIDS Research Alliance (ARA) agreement with the Government of Samoa (2001) and a University of California, Berkeley agreement with the Government of Samoa (2004) – are discussed in detailed in a **Case Study 1** in **Annex VI**.

[31] Kendall & Poti (eds.). 2011. *A Biogeographic Assessment of the Samoan Archipelago*. NOAA, USA.

[32] MNRE. 2013. 2013 State of Environment Report; 2013-2016 National Environment Sector Strategy

Q.7.4 Legislation

The full list of biodiversity related laws in Samoa is found in **Annex V**. The following are legislation that were enacted during the NR5 reporting period –

1. *Water Resources Management Act 2008* – key sections for biodiversity are in Part VIII-Watershed Management, section 23(c) which requires the watershed management plan to include provisions of water for the conservation of flora and fauna, and recreation; and 24(f) which requires that Watershed Management Plans ensure the protection of biodiversity within watershed.

II. *Forest Management Act 2011* – key sections are Part III on Sustainable Forest Management which stipulates the formulation of a National Forest Plan for the sustainable management of all forests, including "… the declaration and effective management of all protected areas, protected lands and forest reserves;" and Part VIII on Protected Areas which provides for protection of all declared protected areas from all forestry operations; recognizes obligations under international conventions for protection and conservation of forests (Section 57 (2)(c), and empowers the Head of State to declare for protection any forests for a range of reasons including protection of forests, and protection of genetic resources and access to it.

III. *Marine Wildlife Protection Regulation 2009* – this regulation covers activities all activities within Samoa's exclusive economic zone (EEZ) as defined by the Maritime Zone Act 1999, and prescribes regulatory measures to protect, and ensure the sustainable management of all marine mammals with special focus on (i) whales and dolphins, (ii) sharks (iii) turtles (iv) species that migrate in schools to spawn and (v) species of conservation concern. Regulation also regulates ecotourism activities including dolphins and whale watching, and prescribes fines for non-compliance.

IV. *Waste Management Act 2010*
This legislation provides for the collection and disposal of solid wastes and the management of all wastes in Samoa. The Act ensures the formulation and implementation of a National Waste Management Strategy, that adequate waste management facilities are in place, regulate the operation of waste treatment, storage and disposal facilities and to promote recycling to minimize wastes which may have implications for human health and the environment.

V. *Environment Management and Conservation Bill 2013*
This legislation will repeal the Lands Survey and Environment Act 1989 that currently gives the MNRE its legal mandate for environmental management and biodiversity conservation. The Bill strengthen the existing legal framework and will expand its scope and the powers of the Ministry to cover (1) the identification and monitoring of biodiversity (ii) species, populations and ecological communities (iii) migratory species, (iv) recovery plans (v) threats to biodiversity (vi) registration of critical habitats (vii) community conservation areas (viii) bioprospecting (ix) and biosafety. Part V of the Bill deals with national parks and reserves.

VI. *Trade in Endangered Species Bill 2013*

The Trade in Endangered Species Bill specifically looks at the protection and conservation of CITES listed Appendices species which are threatened from uncontrolled trading. The Bill ensures that species (and any derivative parts) listed as endangered, threatened or exploited are regulated through a permitting system. The Bill also establishes a scientific

committee that assesses and determines that any proposed export of a species for commercial purposes will not be detrimental to the survival of the species in the wild.

It is expected that this will be enacted before the end of 2014.

Q.7.5 Relevant Policies and Plans

Samoa's National Energy Policy 2007

The Government has officially targeted a 20% shift to renewable energy from all sources by 2030. The aim is the over dependence on costly imported petroleum products and to buffer against external shocks associated with highly fluctuating petroleum prices. It is also seen as part of efforts to reduce Samoa's carbon footprint. The Samoa National Energy Sector Plan 2012 – 2016 noted that "…there is an abundance of biomass available as well as other forms of renewable energy, hence energy diversification based on indigenous energy sources is being encouraged and promoted for electricity generation immediately and for transportation in the future as it becomes economical."[33] This has far reaching implications for forests – both native and non-native, as well as planted biomass, including the introduction of so-called 'energy' species that are also potentially highly invasive and a possible future threat to native biodiversity. The likely increase in the use of streams for hydropower generation is an option that carries a risk to downstream biodiversity from river damming and or diversion schemes. There are provisions for setting environmental flows to protect downstream values including freshwater biodiversity. Determining proper and environmental flows demand a level of expertise that MNRE currently lacks; MNRE's ability to enforce environmental flows also remains to be tested.

Samoa's National Environment Sector Plan 2013 – 2016.

The Ministry of Natural Resources and Environment (MNRE)'s NESP 2013-2016 sets out priorities for biodiversity conservation including the higher target for 33% and 23% respectively of terrestrial and marine areas earmarked for conservation management and protection. The NESP also emphasizes, among others,

- the need for a systematic on-going monitoring of environmental health including biodiversity using SMART indicators to better track environmental changes and the status of endemic species of national and global significance.
- Urgent actions to protect endemic flora and fauna species including those targeted by the BIORAP assessment; and the remaining stand of red mangroves in Siutu Salailua;
- On-going research and assessments to provide up-to-date planning information including a new assessment of national forest cover
- The continuing mainstreaming of environmental values in national accounting and budget processes, and
- Strengthening of the agencies capacity for monitoring and environmental management.

Other policy instruments and frameworks currently being developed that will contribute to this objective include the following –

- Samoa National Forest policy (in progress) and the
- Samoa National Forest Plan (in progress).

[33] Ministry of Finance. 2012. Samoa's Energy Sector Plan 2012-2016. Government of Samoa.

Some of these frameworks are being developed as activities of GEF funded projects that are facilitating climate proofing, including tourism, agriculture, forestry, health and infrastructure. These projects include – ICCRAHSS (Integrating Climate Change Resilience into Agriculture and Health Sector Strategies), ICCRIFS (Integrating Climate Change Resilience into Forestry Sector), ICCRITS (Integrating Climate Change Resilience into Tourism Sector).

Q.7.6 Funding for Biodiversity Conservation

Available information on external and local funding for biodiversity during this reporting period is incomplete, and in different currencies which makes analysis difficult. Some projects are not directly for the biodiversity focal area however they contribute indirectly to the maintenance of ecosystems services such as forest replanting schemes and agroforestry projects in the GEF climate change focal area.

There are currently nine (9) on-going donor funded projects addressing directly and indirectly various Aichi Targets. The full list of completed, on-going and pipeline projects are given in **Annex IV**.

Q8: How effectively has biodiversity been mainstreamed into relevant sectoral and cross-sectoral strategies, plans and programmes?

The following measures and actions have been taken to progress biodiversity mainstreaming in Samoa:

i. The 2008-2012 Strategy for the Development of Samoa (SDS) integrated and elevated 'environmental sustainability' as one of 7 national priority areas; although climate change was the emphasis, the importance of biodiversity was reflected in the choice of indicator used to measure progress – which was the following – 'the percentage of land area covered by forests increases.'

ii. The 2008-2012 Strategy for the Development of Samoa (SDS) also called for integration of environmental sustainability into all sector plans.

iii. The current 2012-2016 SDS consolidates the mainstreaming of environmental sustainability from the earlier SDS, making it one of 4 national priority areas. The SDS also re-iterated the need for the continued integration of environmental sustainability into all sector plans. The emphasis on climate change and building resilience against extreme natural events was the main thrust but indicators for measuring progress have a strong biodiversity conservation influence. Within the 'environmental sustainability' priority area, ten (10) strategic areas are identified and the following two are directly related to biodiversity –

   - Strategic Area 1 – Sustainable management of resources
   - Strategic Area 5 – Protection of critical ecosystems and species

   For monitoring and measuring progress for environmental sustainability, the SDS proposed several indicators including the following biodiversity indicators –

   - Increase percentage of land area covered by forests

- Proportion of land area planted under the community forestry programme
- Increased number of terrestrial and marine areas and critical ecosystems and species protected
- Number of species threatened with extinction decreased
- Proportion of invasive species eradicated
- Percentage of rehabilitated degraded lands and improved critical landscapes
- Increase land areas declared as water catchment reserves

iv. In response to the SDS call for the integration of environmental sustainability into sector plans, plans for agriculture, tourism, water resources, physical infrastructure and health have made this change. The Samoa Tuna Management and Development Plan 2011-2015, uses a Maximum Sustainable Yield (MSY) allocation derived from the application of well-tested models using the most up-to-date tuna stock assessment data available to Pacific Island Countries from its regional organizations[34]. For Samoa, recorded annual catches over the last three years show a continuing trend of harvesting well below the MSY with Samoa keen to see more fishing vessels sign up to take advantage of the unassigned allocation. These figures are discussed under Q.1.3 and Q.3.4.

v. Other recent policy documents consolidating the mainstreaming and integration of environmental sustainability is the 2013 State of Environment (SOE) Report and National Environment Sector Plan (NESP) 2013 – 2016. Both were formally launched in September 2013. Both strongly advocate for consolidating environmental sustainability in national accounting and budgeting processes, an area where mainstreaming is limited.

vi. Other policy instruments and frameworks currently being developed that will contribute to this objective are discussed under Q.7.5 above.

vii. The effectiveness of mainstreaming beyond their integration into plans remains to be seen. An important measure of this that is readily measurable is the level of local budget support for MNRE. This is tabulated below.

Table 7: Local budget allocation for environmental management in MNRE

	2008	2009	2010	2011	2012	2013
Total MNRE	18,530,421	22,115,704	21,143,709	25,131,733	19,734,217	24,904,528
DEC	212,000	117,000	148,771	145,742	118,663	151,668
DMO						
Forestry	421977	144,027	173,434	164,566	181,066	191,599
Water Resources	Not yet an output	94,232	60,044	532,442	56,848	331,954

Source: MNRE, 2014.

Table 7 shows an increasing trend in local funding for the Ministry (MNRE) but a widely fluctuating pattern of funding for the Division of Environment and Conservation (DEC), Forestry

[34] The Pacific Fisheries Forum Agency (FFA) and the Secretariat for the Pacific Commission (SPC)

Division (FD) and the Water Resources Division (WRD). For DEC and FD, significant reductions in local funding of 28% and 55% respectively can be derived between 2008 and 2013. It is most likely that this reduction coincide with a corresponding increase in external project funding support for specific projects, but this cannot be confirmed for this report. Existing allocations are for staff salaries and operating costs.

In terms of mainstreaming of biodiversity conservation, the importance and priority assigned to environmental sustainability in the SDS is not matched by the low and declining level of local budget support indicated by the allocations of the recent past.

Q9. How fully has your national biodiversity strategy and action plan been implemented?

The first NBSAP (2001) has just been updated as part of this GEF funded Enabling Activity. An Updated NBSAP (2014) has therefore been just endorsed by Cabinet and will now enter into implementation.

The first NBSAP (2001) was implemented over a period of 13 years (2001 – 2014). A review was undertaken in 2004 and again in 2014 as part of this NBSAP updating exercise. A matrix showing all NBSAP prescribed activities and the status of implementation of each is annexed to this report. The main findings are summarized below

Overall Findings

1. Overall, the NBSAP consisted of 8 thematic areas containing 39 Objectives and 183 activities. Based on information received from various sources and participants of the first NBSAP Update workshop, and the assessment criteria used in this report, 19 activities were assessed to have been implemented to a 'very high' level, 62 were assessed 'high', 53 were assessed to have been implemented to a 'medium' level, and 49 were assessed to have been implemented to a 'low' level.

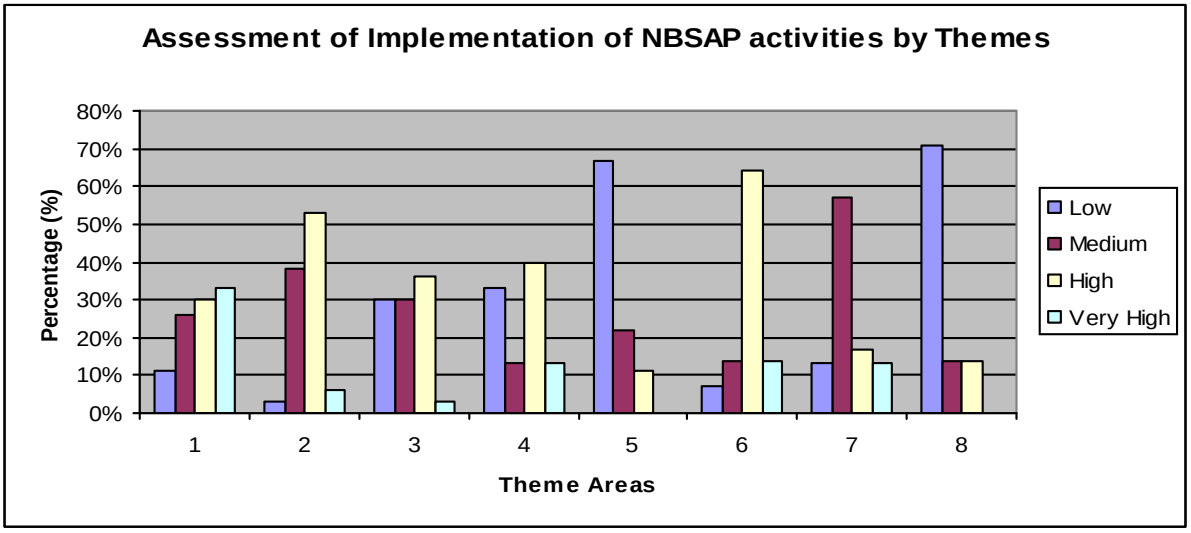
2. Implementation varied widely between the eight thematic areas of the NBSAP.

3. The numbers and percentages of activities within each Themes and their corresponding assessment are given in **Graph 1** and **Graph 2**. Combining the numbers of 'high' and 'very high' results, the analysis found that Theme 1 (Mainstreaming Biodiversity) reported the highest number (63%) of prescribed activities assessed to have been implemented to either a 'high' or 'very high' level, followed by Theme . Twenty seven (27) activities were prescribed under 5 different objectives. Twenty six (26%) percent of prescribed activities were assessed to have been implemented to a 'medium' level.

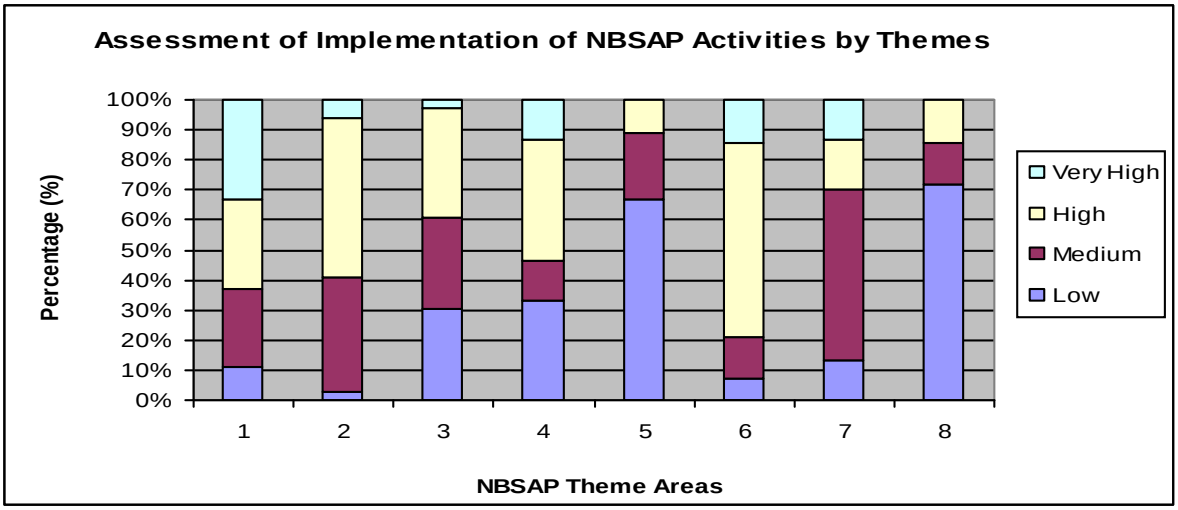
4. Theme Area 6 (Biosecurity) is the most heavily implemented with over 80% of all prescribed activities implemented to either a 'high' or 'very high' level of implementation. This is followed by Theme 1 (Mainstreaming Biodiversity) 63% and Theme 1 (Mainstream Biodiversity, 62%) and Theme 2 (Ecosystem Management; ~ 60%).

5. The most poorly implemented areas were Theme Area 8 (Financial Resources and Mechanisms) and Theme 5 (Access and Benefit Sharing from the use of genetic resources) with a high percentage of prescribed activities not implemented at all.

6. Implementation appears to be largely ad hoc reflecting more a project-based donor driven approach for most activities.



Graph 1: Bar graph showing levels of implementation of NBSAP by themes



Graph 2: Stacked bar Graph showing levels of implementation of NBSAP by themes

Legend

Themes	Implementation ratings:
Theme 1: Mainstream biodiversity	**Low** - Either no actions taken and or completed or minimum and marginally relevant actions are reported
Theme 2: Ecosystem management	**Medium** - Some marginally relevant actions have been completed, and or continuing
Theme 3: Species management	**High** - A number of directly relevant actions have been completed and or continuing/on-going
Theme 4: Community	**Very High** - Directly prescribed action(s) have been undertaken and successfully completed, and or continuing.
Theme 5: Access and Benefit Sharing from the Use of genetic resources	
Theme 6: Biosecurity	
Theme 7: Agro-biodiversity	
Theme 8: Financial Resources & Mechanisms	

4.2 Comments by Theme Areas

Within each Theme Areas, the following observations are made –

Theme 1: Mainstreaming Biodiversity

This theme is highly successful albeit implementation was ad hoc and unsystematic. Mainstreaming is now observed at the macro level of national planning (i.e. SDS) wherein 'environmental sustainability' has been elevated into a national goal, possibly following and in response to global trends of donor pressures and the MDG's. Be that as it may, biodiversity conservation is now an integral part of strategies for achieving environmental sustainability.

Environmental sustainability and biodiversity conservation mainstreaming is also seen in other sector plans including agriculture, infrastructure, tourism, education and health, most of these pre-date the SDS inclusion of environmental sustainability as a priority goal. The challenge going forward for mainstreaming in the NBSAP Update is one of consolidation and implementation. Relevant indicators must include an increasing trend in local budget funding of both project activities and staff.

Objective 3: Legislation is well achieved in most sectors except where it matters the most i.e. the EMC Bill 2013. This Bill needs to be enacted as a matter of priority. Several other requirements for strengthening national legislation to support CBD implementation i.e. for bio-prospecting, access and benefit sharing from the use of genetic resources, and biosafety, are being addressed by this draft legislation.

The approach of setting up formal mechanisms to promote and facilitate multi-sectoral collaboration (Theme 1 Objective 2) is at best, a good idea. Several such mechanisms are proposed throughout the NBSAP but consistently there is little evidence of their being set up and or of being sustained over the years. On the other hand, where interagency collaboration is needed to support a donor-funded or government initiative, the relevant agencies are always able to cooperate in response to a CDC directive. Past experience, thus shows that formal mechanisms are quickly rendered inactive when an activity or project is completed, but can be quickly reactivated in response to the needs of a new project. Such a flexible approach appears workable in the context of limited capacities with in MNRE.

Theme 2: Ecosystem management

This theme area is highly successful and with a planning framework in place for achieving the original strategy goal of 10%. This goal remains valid in my assessment, and the KBA, if successfully implemented, will eventually bring under conservation management and or full protection 33% of Samoa's land area. The KBA report is significant in that the ad hoc approach of the past in selecting areas for conservation management, is now replaced by a sound science-based and systematic approach based on clear conservation criteria. The NBSAP Update's challenge is to promote its effective implementation i.e. giving areas legal status if possible, develop management plans, secure funding and begin implementation.

Worthy of note is the fact that much of this 33% identified for conservation management is under customary tenure. This is a challenge but one wherein Samoa is well placed to address with its extensive experience in community based conservation approaches which are showing good results in coastal and inshore protection (e.g. village fisheries reserves and MPAs) and in other terrestrial areas. The NESP 2013 – 2016 strongly advocates for the effective participation and close collaboration between MNRE and other Government agencies on one hand, and villages on the other, to ensure success. This is already widely recognized but should be strengthened even more, with more innovative ideas that generate benefits to surrounding and land owning communities.

The science part of ecosystem management is also well advanced with recent studies and current projects (e.g. BioRAP, ICCRIFS, FPAM). It is important for the next phase of the NBSAP to refer to the recommendations of these studies/initiatives for the way forward in terms of priority ecosystems studies and conservation management interventions.

Other priority actions are prescribed in the NESP 2013 – 2016 which the NBSAP Update must draw on, including an on-going ecosystem health monitoring program, possibly based around a regular (5 yearly) aerial photography and or satellite imaging exercise for forest/vegetation cover assessment.

There is a marked improvement in marine habitat information especially the biogeography study by NOAA that provided a more holistic analysis of available monitoring data from both MAF monitoring sites and those of American Samoa. The result is a comprehensive assessment (refer to SOE) of coral reefs health and of fish populations. The NOAA report provides a sound basis for prioritising sites for intervention in the MAF Village Fisheries reserves program.

The NOAA report is also a reminder of the benefits that closer collaboration with American Samoa through the Two-Samoa Initiative can yield. Closer collaboration and sharing of monitoring data should be fostered and encouraged by MAF as a continuing strategy for capacity building and for MAF to tap into the considerable marine science expertise available in American Samoa from NOAA and the National Parks and Wildlife Service.

Theme 3: Species management

The management of native and endemic species of high conservation value made notable progress – especially for birds with the BIORAP which sought to ascertain the status of the critically threatened *puna'e, tuaimeo*, *ma'oma'o*, and *manumea*. The lack of confirmed sightings for some species is a concern but it suggests continuing surveys. There is also now a strong case for a captive breeding program, for those species wherein sufficient individuals may be found, as the only remaining option for saving them. This is a direction the NBSAP Update should now consider, an idea which has previously been mooted by MNRE using the Aleipata Islands.

Other species are well documented in the IUCN's Red List of Threatened Species and Samoa must collaborate and provide regular information for this list to be kept up-to-date.

Samoa's flora does not have flagship species that can be said to be similarly threatened with extinction, possibly because we do not yet know given the lack of research and information. But species such as *ifilele*, and *poumuli* are not yet in any danger of extinction although existing biomass has dwindled significantly below merchantable levels. Other native species including malili, tava, pau etc have been genetically improved under the SPRIG project and mass produced in the Forestry nurseries. The mangrove species *Xylocarpus molluccensis (grantum)* is recommended by the NESP for priority conservation action including the option of ex-situ conservation.

Samoa's state of knowledge of marine species (fish, corals, reptiles, cetaceans etc.) has increased but is an area in need of continued research. There are on-going monitoring activities for marine turtles with targeted activities to protect nesting beaches and these activities require continuing support. Inshore fisheries appear to be more regularly monitored for biomass and species diversity and monitoring results led to the reintroduction of species such as clams and trochus in some villages where local extinctions were observed. Part of this work is analysed and reported under the NOAA Biogeography report which has been discussed in Theme 2 above.

Several other species monitoring activities are reported but reflecting the interests of outside institutions and scientists. Be that as it may, their contributions are important and these foreign interests must be encouraged and supported as a strategy of accessing expertise and funding that would otherwise be inaccessible. Perhaps it is an area wherein NUS can play a larger role to liaise with other outside agencies and universities with such interests. Likewise continued collaborations with international organizations including Conservation International, BirdLife International and the Pacific Islands Roundtable for Nature Conservation are other options that in the recent past MNRE have produced mutually beneficial associations.

Theme 4: Community

Important progress has been made in this thematic area especially in capacity building, public awareness and education. Seriously lacking are activities to preserve traditional knowledge and practises involving the use of biodiversity. Having said this, banning unsustainable traditional fishing practises are regular themes in village sustainable fishery management plans, and in some cases, land use practises.

The lack of sui generis legislation to protect traditional knowledge, practises and innovations is something the EMC Bill 2013 will partly address. This is a theme area for continued emphasis in the NBSAP Update.

Theme 5: Access and Equitable Sharing of Benefits from the use of genetic resources

Theme 5 is the least implemented of the NBSAP, with about 65% of prescribed activities either not implemented at all or with negligible actions reported. Policies governing access and equitable sharing are seriously lacking and the EMC Bill 2013 is hoped to partly address this. The lack of activities to promote public awareness and education is notable.

The lack of activities is perhaps indicative of the low priority of issues in this theme area and of their immediate relevance to the work of MNRE, and to biodiversity conservation in particular, notwithstanding the requirements of the CBD that parties like Samoa must comply with.

The latest incident of bio-prospecting was in 2004 with a formal agreement between the Government of Samoa on behalf of several local healers and villages, and the University of California Berkley, governing the use of mamala extracted prostratin for HIV research. There are reports of progress made in this research which is discussed in Part III Q.12.1 below. Two earlier agreements (Falealupo Covenant (1989) and ARA Agreement (2001) have been signed. It would be in Samoa's interest that close liaison is maintained with the University of California and its agents conducting the research.

Theme 6: Biosecurity

A high level of relevant activities is reported for biosecurity which underscores the relevance and priority given to this theme by MNRE, MAF and other agencies especially in controlling the impact of invasive species. Achievements are noted in policy and legislation, as well as in activities to control and eradicate a number of introduced species, and in public awareness and education.

Biosecurity will continue to feature in the NBSAP Update given the importance of biodiversity (including agro-biodiversity) to the national economy, and threats to it from a range of alien invasive species.

Theme 7: Agro-biodiversity

This is an important area of growth with Samoa's agro-biodiversity expanded with the introduction of new sub species and varieties to enlarge the gene pool for taro, following the decimation of the taro industry in 1995 by the Taro Leaf Bight. Agriculture's policy of crops and livestock diversification has also seen the introduction of new species of fruit trees and livestock (sheep and goats for example) into the country.

The introduction of exotic species in agriculture as a strategy for improving agricultural output must be counter-balanced with efforts to preserve native and endemic species, notwithstanding their limited economic value. Ecological stability is first and foremost depended on ecological diversity. Ex-situ options such as herbaria and botanical gardens, should be explored to achieve this purpose and a direction in agro-biodiversity conservation that the NBSAP Update should now be promoting. Promoting the replanting of native species should also be maintained, not only in agro-biodiversity but in forestry and other areas.

Theme 8: Financial Resources and Mechanisms

This is the least implemented of all 8 theme areas. The lack of activities to implement the main goal of securing long term financial sustainability is perhaps indicative of the high level of donor dependence in biodiversity conservation, the dominance of project-based modality in donor funding, and the lack of local budget appropriation for conservation activities. It's been noted elsewhere in this report that a key indicator of effective mainstreaming is the increasing percentage of local funding committed to biodiversity conservation. Using this indicator, biodiversity conservation is far from effectively being mainstreamed.

An important objective under this theme is Economic Valuation wherein implementation is low. There are however strong links with ecotourism and nature-based tourism. Activities under these names are widely occurring and could be documented and studied to better understand the economic values users and resource owners place on biodiversity. For instance, there is the common practise of charging user fees for activities such as snorkelling at Palolo Deep, or for taking the Saanapu-Sataoa mangrove canoe tour or the entrance fees charge by families for the

use of village inshore areas for diving, swimming, snorkelling, and entrance fees into reserves and parks, etc.. This should contribute to data for analysing and measuring willingness-to-pay for environmental services, and to a more comprehensive economic valuation study. A pilot study of payment of ecosystem services (PES) with a focus on the role of forests for carbon sequestration, water resources management, soil retention and as habitats for birds of global and national significance needs to be explored.

There are objectives such as capacity building, public awareness and education that are clearly on-going and long term that perhaps should attract a programme approach from interested donors. Similarly a longer term approach to funding training and support for local entrepreneurs in nature-based income generating activities including ecotourism, bee-keeping, etc is worthy of donor consideration.

The lack of local funding for biodiversity conservation is a concern from the viewpoint of gauging the extent of mainstreaming and integration. On the other hand, available funding e.g. from GEF SGP for community based projects, are under-utilized. Similarly GEF resources are available. There are issues with the effectiveness and efficiency of processes and procedures for accessing these resources which was raised by the GEF Evaluation of the Samoa portfolio (2008) and more recently echoed in the similar evaluation of the Vanuatu and SPREP portfolio (2013/14).

PART III: PROGRESS TOWARDS THE 2020 AICHI BIODIVERSITY TARGETS AND CONTRIBUTIONS TO THE RELEVANT 2015 TARGETS OF THE MILLENNIUM DEVELOPMENT GOALS

Q.10: What progress has been made by your country towards the implementation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets?

The Aichi Biodiversity Targets have not been factored into biodiversity plans in Samoa until the current NBSAP Update exercise. Consequently, in terms of implementation, this is just beginning. However, as can be seen in the modified Aichi Targets for Samoa's NBSAP, most of the adopted targets are compatible with the original NBSAP targets.

Section Q.6., Q.7. and Q.8 report on actions taken that contribute to the Aichi Targets. Significant progress has been made in areas such as mainstreaming biodiversity conservation, in-situ conservation and protected areas, and sustainable use. Furthermore, **Annex IV** lists the full range of projects and initiatives that have been implemented that directly addresses the goals of the Strategic Plan and its Aichi Targets.

Q.11: What has been the contribution of actions to implement the Convention towards the achievement of the relevant 2015 targets of the Millennium Development Goals in your Country?

CBD implementation directly contributes towards the achievement of two MDG goals namely **Goal 1: Eradicate extreme poverty and hunger** and **Goal 7: environmental sustainability.**

The main issue highlighted as threatening Samoa's environmental sustainability is the impact of climate change - especially of extreme natural events such as tropical cyclones, floods, droughts and tsunamis. Recent experiences with tropical cyclones and the 2009 tsunami show how environmental and economic sustainability and growth can be severely set back with such extreme events. But a number of CBD inspired goals can be said to have contributed significantly to progressing Samoa's pursuit of both environmental sustainability and national food security. The following are the main areas –

Q.11.1 Links between in-situ conservation and environmental sustainability

The past emphasis of CBD implementation on in-situ conservation, including the extensive expansion of the country's terrestrial and marine protected area network, is providing a strong ecological foundation on which to build climate adaptation and mitigation strategies for environmental and economic resilience. Such strategies involve the protection of existing forests and the replanting of new ones for carbon sequestration, coastal protection, catchment rehabilitation flood control and soil stabilization, etc.. In most cases, these habitats have already

been protected, as part of existing protected area network. In many cases, there is already an increased level of public awareness and appreciation of the ecological services forests provide following many years of awareness raising activities by Government agencies – many of which as part of GEF funded capacity building activities.

An illustration of the direct link between in-situ conservation and the goal of 'environmental sustainability' can be seen in the choice of indicators chosen by the SDS 2008-2012 i.e. *'percentage of land area covered by forest increases'*. In a review of progress made in implementing the SDS 2008-2012 in the SDS 2012-2016 update, the following **Table 8** is given, showing changes in the area under forest cover from 2008 to 2011 (with 2013 added by this report).

Table 8: SDS Environmental sustainability indicator and area 2008 - 2012

SDS GOAL	INDICATOR or TARGET	BASELINE FIGURE 2007/08 OR EARLIER DATE	2008/09	2009/10	2010/2011	2013	SOURCE
Goal 7: Environmental sustainability & disaster risk reduction	Percentage of land area covered by forest increases	90,444 ha (31%)	121,000 ha	171,000 ha	154,987 ha	276,325 ha[35]	MNRE

Source: Government of Samoa. 2012. Strategy for the Development of Samoa 2012 – 2016.
Note: 2013 forest area is extracted from the 2013 State of Environment Report, MNRE, Government of Samoa.

Q.11.2. Links between sustainable use of biodiversity and food security/poverty and hunger eradication

Activities promoting the sustainable use of biodiversity inspired by and emanating from the CBD obligations are also now forming an integral part of strategies for improved livelihoods, food security, and environmental sustainability. For instance, while fish traditionally provided most of Samoa's source of protein, for many coastal communities, inshore fisheries were severely depleted as a result of overfishing over many generations. A Government and AusAID funded program began in the late 1990's and is continuing to rehabilitate village controlled inshore fisheries resources. It revolves around compliance with village enforced sustainable use regimes and fisheries replenishment based on respecting closed/no-fishing zones. The 2013 State of Environment (SOE) report noted many villages increasingly reporting improved fish catches per unit of effort, and increase in fish population and species diversity in coastal fishing areas, as a result of spill-over of improved fish population from nearby no-fishing zones. Similarly the health of coral reefs is improving with increasing biomass and coral diversity in many coastal areas, in particular those with fisheries reserves. These activities - strongly

[35] It is noted that the increase in forest area since the 2010/2011 assessment appears unrealistic. The larger than expected change is due to changes made in the definitions of different types of forests, based on the estimated basal area per hectare. This 2014 statistic is indicative of a lowering of the basal area threshold resulting in areas previously unqualified now included.

supported by MAF and MNRE as strategies for marine resources conservation objectives - are also at the same time, advancing the food security goal of the MDGs.

The genetic improvement program by MAF to counter the impact of the taro leaf blight is both an example of where biodiversity is diversified for ecological stability as well as to ensure sustained food production and food security. Similarly CBD's concern with regulating the movement of living modified organisms (LMOs) and tackling the threat of invasive species not only protects local endemic and native species from unwanted and dangerous predators and competitors, but directly contributes to ensuring agricultural food crops are safe for consumption and reducing the risk of diseases and pests to food production. Herein also is the link between the CBD and MDGs quite evident.

Q.12. What lessons have been learned from the implementation of the Convention in your country?

Q.12.1. ABS and TK implementation – more externally driven than internal

After 20 years of CBD implementation since the country ratified the Convention in 1993, a review of the NBSAP implementation show that some areas and objectives of the CBD are of greater interest than others. In this report, the disproportionate distribution of effort NBSAP implementation is both a function of limited capacity and funding, and to a lesser extent, of low level of national priority.

For instance, there is limited action taken by Samoa on Access and Benefit Sharing and Traditional Knowledge. Part of the reason is the lack of resources, but the externally driven of interests in ABS and TK issue contributes to this inaction.

To elaborate, the three interests expressed in the healing properties of 'mamala' (*Homolanthus nutans*) and which have been formalized in three separate ABS agreements, remain the only actions taken, the latest in 2004. Since then, little action has taken place – possibly until a new interest is expressed - with little formal communication of any progress to date with R&D of ABS parties.

The lesson from these experiences is that ABS and TK are more externally driven than internal. For Samoa, the strategy was and continues to be (i) to put in place the legal and administrative mechanisms and systems to protect the interests of the rightful beneficiaries in the event of any such foreign interest coming forward in the future (ii) vigilant in monitoring against illegal bio-prospecting. Hence, Samoa's Government, through the Division of Environment & Conservation (DEC) of the MNRE is currently and with retrospect implementing the bio-prospecting process to control and monitor the utilisation of both biological and non-biological natural resources. The proper consent is developed between the Samoa Government (provider) and the researcher (user) through the signing of the Letter of Agreement (LoA) or the Prior Informed Consent (PIC) and the Mutually Agreed Terms (MATs). Again it is part of the learning experience from what had happened before, that the ABS and TK are now internally driven through the Government control and guidance to accessing Samoa's natural resources rather than externally through the negotiation with communities.

Q.12.2. Emerging importance of ecological services of biodiversity

Whilst concern over the loss of species and habitats of national and global significance played a major role in Samoa's initial interest to sign and ratify the CBD in 1992-1993, today, the emergence of climate change as the major threat to the country's economic development aspirations, has likewise elevated the value of ecological services as the main driving force for biodiversity conservation thus CBD compliance.

Consequently while, for instance, Samoa's native forests have been largely depleted on the island of Upolu, with the replacement non-native forests serving limited roles as habitats for many endemic and native species with specific habitat requirements, the importance of these non-native forests has not diminished largely due to the ecological services they can still provide, for water catchment protection and carbon sequestration. Carbon sequestration and renewable energy generation have also been the main rationales for a number of forest replanting activities including the AusAID funded Samoa Agroforestry and Tree Farming Project, and a number of energy trees replanting schemes.

Q.12.3. Access to GEF resources

GEF's evaluation of its Samoa portfolio in 2006 noted that the efficiency with which Samoa was accessing GEF funding had improved but with some obstacles still remaining. These include GEF project cycle having too many steps, and being too long and costly. Most of these obstacles is noted to be partly the result of the lack of project information. Samoa also found lengthy delays between project preparation and actual start-up, and the lengthy delays, in some cases for MSP and FSP modalities up to more than a year or two, often result in community frustrations and distrust, and loss of enthusiasm and readiness when project approval finally arrives. Samoa's experience is reported in the GEF 2006 evaluation, and while this may now be considered dated, the same concerns were again expressed by GEF's 2013 evaluation of the SPREP and Vanuatu portfolios.

Q.12.4. Sustainability of GEF funded activities

Samoa's experience with CBD implementation has largely been made possible with funding support from the GEF. A number of regionally (SPREP) implemented GEF funded projects with nationally implemented activities in Samoa (e.g. South Pacific Biodiversity Conservation Project (1991 – 2001) and the International Waters Project (years) established important community managed conservation sites that are part of Samoa's protected area network. The two sites have also played catalytic roles in promoting the wider replication of community managed approaches to biodiversity conservation and resource management initiatives. The two areas, however, have been seriously jeopardized due to inadequate financial follow up support since the end of GEF funding.

The issue of sustaining conservation activities and the benefits from GEF funded initiatives is a complex one with funding availability one of several necessary and sufficient conditions. In Samoa's experience, funding seems to be the most critical of these conditions with other necessary conditions tending to fall into place when funding is available. Most often, the Government is relied on to provide follow-up funding, but even a supportive Government is sometimes forced to reallocate resources to other more urgent priorities as one can expect in the aftermath of Cyclone Evans, accordingly. Often, commitments made to environmental activities lose out.

The lesson is that sustainability of GEF funded project outcomes is extremely difficult without continued outside funding support.

Q.12.5. Difficult to replicate large scale initiatives

Samoa has successfully demonstrated that community based approaches for the conservation and sustainable use of biodiversity can work to curb unsustainable resource exploitation in communally owned and control areas. However recent experience shows that while adopting the right approach is a necessary condition for project success, it is not sufficient to ensure sustainability and long term success. The scale of an activity is critical, mainly to suit local capacities and available funding. Recent experiences show that small scale village based initiatives such as village fisheries reserves, are easier to manage and sustain than larger scale district-wide interventions. The two projects cited above (district level MPAs) are example of larger district wide interventions facing sustainability challenges.

Q.12.6. A programmatic approach to GEF funding

Finding alternative funding after the expiration of GEF funds raise questions about the need for GEF to consider a more programmatic approach to funding. This observation is made in the context of capacity building activities that by their very nature are on-going. Some include public awareness and information management and dissemination activities, or specific training programmes for interested entrepreneurs and local resource owners in the design and management of biodiversity dependent income generation activities such as ecotourism and bee-keeping.

ANNEX I: Information concerning the reporting Party and Preparation of the 5th National Report

A. Reporting Party

Contracting Party	Samoa
National Focal Point	
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Submission: Details of Reporting Officer	
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Signature of officer responsible for submitting national report	
Date of submission	15/09/2014.

B. Process of Preparing the 5th National Report

The 5th national report was prepared by a consultant who was contracted by the Government of Samoa to compile and draft the report. The following process was followed:

I) Commission of consultant – briefing on terms of reference, workplan and CBD guidelines for the preparation of the fifth national report
II) Collation of reports and publications from relevant sources
III) Preparation of the drafted report
IV) Initial stakeholder consultation workshop on 24 March 2014 to present draft report for comments
V) Second stakeholder consultation workshop on 26 April 2014 to present updated draft report with comments incorporated
VI) Finalization of report and submission to MNRE

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ANNEX III: Terrestrial Protected Areas

Terrestrial Protected Areas	Year established	Area (ha)
Apia Central recreational reserve	2000	2.42
Vaigaga Reserve	2000	0.4
Lelata Reserve	1999	0.2
Vaimoso Reserve	1999	0.1
Faleata Nature Reserve	1999	8.1
Samoa National Botanical Garden Vailima	1978	12.1
Togitogiga Recreational Reserve	1978	12.1
Robert Louis Stevenson Historic Reserve	1978	0.4
Mt Vaea Scenic Reserve	1958	170.5
Sinave Reserve	2006	0.1
Tiafau Reserve	2011	0.16
Lotoosamasoni Reserve	2007	0.09
Mulinuu Mangrove Reserve	2003	2.42
Matautu Tai reserve	2002	0.1
Vaitele fou Reserve	2006	4.71
Ao-ole-Malo Reserve	2001	8.1
Faavae I le Atua Reserve	2001	0.81
Taumeasina Reserve	2000	2.4
Vaitele East and West Reserve	2000	0.81
Falealupo Forest	1989	1,215
Laulii Conservation Area	2000	400.0
Uafato Conservation Area	1997	1,161
Saanapu-Sataoa Mangrove Forest Conservation Area	1997	52.9
Total Area of Reserves and Conservation Areas		**3054.92**
National Parks		
O Le Pupū Pu'e NP*	1978	5,019
Lake Lanoto'o NP	2003	1,050
Mauga o Salafai NP	2003	6,944
Aopo-Asau NP (earmarked but not yet legally designated)	**2012**	**2,494**
Lata NP (earmarked but not yet legally designated)	**2009**	**4,982**
Total Area (NPs and reserves)		**23,543.924 ha**

* Area was resurveyed in 2013. Previous area was 2,800ha.

ANNEX IV: Projects and Initiatives Implemented that Directly contribute towards the Implementation of the Strategic Plan for Biodiversity 2011 – 2020 and its Aichi Targets

Project title	Duration	Source of Funds	Project Award	Status
Mangrove Ecosystems Climate Change Adaptation & Livelihoods (MESCAL)	2011 - 2013	German Government through the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)	US $200,000	Completed
Improving our understanding on the distribution and monitoring trends of humpback whales migrating through Samoa	2012 - 2014	Australian Government through the Department of Environment	AUD $60,000	On-going
Improving the implementation of CITES	2013 - 2014	New Zealand Government through the Department of Conservation	NZD $20,000	On-going
2 Samoa Environmental Collaboration Initiative	2013 - 2015	NOAA CRCP International Coral Reef conservation Cooperative Agreements	US $76,000	On-going
Myna bird control program	2008	Government of Samoa	SAT $250,000	On-going
GEF-PAS	2011 - 2015	GEF	US $324,040	On-going
Building capacity for effective participation in Biosafety Clearing House	2007 - 2009	UNEP-GEF	US $48,262	Completed
Eradication of Mongoose project	2009 - 2011	CEPF/PII	US $16,800	Completed
Aleipata Island Restoration Project	2007 - 2010	CEPF	US $347,448	Completed
Project for Enhancing Management Capacity for National Reserves of Samoa	2008-2009	JICA	SAT$600,000	completed
Program of Work on Protected Areas	2007 - 2011	UNDP-GEF	USD$250,000	Completed
Mt Vaea Restoration Project	2007-2014	JICA/JICS/RLS Foundation/CI	SAT$432,398	On-going
Saving the Manumea	2013-2014	CLP	US $15,000	Completed
J-PRISM	2010 - 2015	JICA	N/A	On-going
Shibushi Model	2013 - 2015	Government of Japan	N/A	On-going

ANNEX V: List of Legislations and Regulations

Legislations	Regulations
The Stevenson Memorial Reserve and Mount Vaea Scenic Reserve Ordinance 1958.	Protection of Wildlife Regulation 2004
Constitution of the Independent State of Samoa1960	Protection of Ozone Layer Awareness Regulation 2006
Taking of Land Act 1964	Plastic Bag Prohibition on Importation Regulation 2006
Alienation of Customary Land Act 1965	Marine Protected Areas (MPA) By-Laws 2007
Land Titles Investigation Act 1966	Marine Wildlife Protections Regulations 2009
Main Roads Development Act 1972	Planning and Urban Management (Environmental Impact Assessment) Regulations 2007;
Lands, Surveys and Environment Act 1989	Planning and Urban Management (Development Consent Application and Fees) Regulations 2008
Land for Foreign Purposes Act 1992/1993	Survey Regulations 2011
Alienation of Freehold Land Act 1972	Land Title Registration Regulation 2010
Building Alignment Ordinance 1932	
National Parks and Reserves Act 1974	
Potlatch Act 1967	
Planning & Urban Management Act 2004	
Public Service Act 2004	
Disaster and Emergency Management Act 2007	
Land Titles Registration Act 2008	
Water Resources Management Act 2008	
Unit Titles Act 2010	
Survey Act 2010	
Land Valuation Act 2010	
Spatial Information Agency Act 2010	
Waste Management Act 2010	
Forestry Management Act 2011	
Trade in Endangered Species Bill 2013	
Environment Management & Conservation Bill 2013	

ANNEX VI: Case Study 1
Access and Benefit Sharing Experience - The Falealupo Covenant and R&D on Mamala, Samoa[36]

The Mamala tree (*Homolanthus nutans)*

This case study examines the discovery of an anti-viral phorbol (prostratin) from ethnobotanical study of Samoan remedies in the late 1980s, and the agreements put in place to benefit the community of Falealupo and the people of Samoa. Prostratin was identified by Dr Paul Cox of the Institute for Ethnobotany as an isolated extract from traditional healer remedies that used the rainforest tree 'Mamala' (*Homalanthus nutans*).

Three agreements are relevant:

- The Falealupo Covenant which allowed Dr Paul Cox to access a community-held rainforest area for biodiscovery purposes (1989).
- An AIDS Research Alliance (ARA) agreement with the Government of Samoa (2001).
- A University of California, Berkeley agreement with the Government of Samoa (2004).

The biodiscovery and research activities

Dr Paul Cox conducted ethnobotanical studies in the Falealupo rainforest, reputedly collecting many plants. Mamala was identified as a plant of interest during discussions between Dr Cox and some of the village healers (see Figure 5). According to Dr Cox's field notes: Several healers, including Epenesa Mauigoa, Pela Lilo, and Seumantufa's wife Lemau, told me that water infusions of *Homalanthus* are used to treat yellow fever[36] and intestinal complaints… (Cox, 2001, p35). Cox found that although there was broad knowledge in Samoa of the use of *Homalanthus* to treat intestinal complaints (the use indicated by Lemau Seumantufa), that only two healers, e.g. Epenesa Mauigoa and Pela Lilo, knew of the use of the plant to treat acute viral infection (pers. comm, 6/6/12). Interviews with a number of members of the community confirmed Dr Cox's ethnobotanical activities in the late 1980s, including an interview with Lemau (noted above, interview 23/5/12).

Subsequently, Dr Cox received an invitation from the US National Cancer Institute (NCI) in 1986 to collaborate in screening the plants for anti-cancer activity. While they did not identify

[36] reference

[27]This was incorrectly understood by the healers or translated by Dr Cox – the treatment was in fact for hepatitis as evidenced by jaundiced yellow skin.

activity against cancer, subsequent testing by the NCI identified the prostratin molecule displayed 'potent cytoprotective activity' – the capacity to protect healthy cells from a range of pathogens. In vivo studies with mice also showed that, despite being a phorbol (which often promote tumor growth), prostratin did not promote tumours (Cox, 2001).

Conformance with ABS principles, legislation and permits

Dr Cox (2001) explains that, having previously spent considerable time living in Samoa (and having learnt the language); he returned with funding from the US National Science Foundation to conduct an ethnobotanical study in the mid-1980s and settled in the village of Falealupo on Savaii. Dr Cox indicates that he initially obtained verbal prior informed consent for his ethnobotanical studies:

My first introduction to the village was a kava ceremony with the village chiefs where I explained the purpose of my research, and asked their permission to study with the village healers and to collect their medicinal plants for laboratory analysis. I also told them that there was a slight chance that a discovery could result in a commercial interest, and pledged to do my best to ensure a return to the village from any discovery. The village chiefs unanimously agreed to grant me permission to conduct the research and to assist me in any way that they could (Cox, 2001, p35). This research was prior to the CBD, and therefore ABS principles had not yet been developed. There does not appear to have been a specific research permit requirement in Samoa at the time – many countries have implemented such requirements following ratification or accession to the CBD.

Access/prior informed consent procedure followed

Following the verbal admission of consent from the Falealupo chiefs, Dr Cox continued his research in the Falealupo forest from c1985 to 1988. In 1988 the Samoan Government required the Falealupo community to build a primary school for the community, which had led to a deal with a logging company which began felling trees in the local forest to raise sufficient income for the school construction. In late 1988/early 1989, Dr Paul Cox met with the community to negotiate a covenant for the protection of the forest and repayment of the community's $85,000 USD debt, in exchange for continued ethnobotanical research access (Cox, 2001). Several interviews confirmed this agreement was made, that the community was happy with the payment of the debts and establishment of the rainforest reserve (Fuiono Patolo, interview, 23/5/12; Seumantufa Fale mai, interview, 23/5/12; Manu Toifotino, interview, 24/5/2012; Taii Tulai, interview, 24/5/2012) (figure 6 is a photo of the rainforest preserve). Dr Cox was subsequently titled 'Nafanua', which is an honorary title named after a goddess warrior from Falealupo who conquered and united Samoa.

Consultation with relevant parties

The Falealupo Covenant described briefly above was signed by every chief in Falealupo in a kava ceremony attended by the village (with the exception of one 'banished' family, as noted by several current chiefs).[37] Dr Cox also met with the Samoan Prime Minister Tofilau Eti, the Samoan Minister of Agriculture Solia Papu Va'ai (confirmed by interview in March 2012), and a

[37] Fuiono Aleki, Taii Tapana, Tapua Tamasi, Manutuaifo, Kelemete, Gaga Sanele, Ulufanua Aleuna, Kolone Va'ai, (pers. comm 15/3/12) and Solia Papu Va'ai (pers. comm. 13/3/12)

number of members of parliament to notify them of the preliminary research findings and the NCI's commitment to both honour the Falealupo Covenant and to require any licensee to negotiate fair and equitable terms of benefit-sharing of any proceeds arising from a patent (issued later in 1996) (Cox, 2001). Dr Cox later was involved in the negotiation of two memoranda of understanding establishing terms for potential benefit-sharing between the Samoan Government, the AIDS Research Alliance, and University of California Berkeley.

These negotiations involved Mr Solia Papu Va'ai, who was the Member of Parliament for Falealupo at the time. It is unclear to what extent the Falealupo community was involved in negotiation of these two agreements. According to Cox, he took representatives from both the AIDS Research Alliance and the University of California to Falealupo where the village chiefs reviewed and signed the respective benefit-sharing agreements (Cox, pers. comm. 6/6/2012).

Photo 2: The Falealupo Rainforest[38]

Terms of benefit-sharing agreements

Falealupo Covenant:

The main terms in summary include:

- The payment of a debt of $77000 WST to the Bank and $31,000 WST to Samoa Forest Products for the construction of the school (total of approximately $85,000 USD at the time),
- An acknowledgement of the perpetual sovereignty of the Falealupo community over the rainforest,
- A commitment by the community to preserve the rainforest for 50 years, including limitations on hunting and allowance for traditional uses,

[38] Robinson, D. Photo taken 15/3/12, in Falealupo, Samoa.

- Allowance for Dr Paul Cox and his associates to access the rainforest for scientific research in perpetuity, as long as they do not damage the rainforest. If Dr Cox is successful in finding new drugs, he will return to the village 33% of the income received.

Seacology which has provided a number of benefits to the Falealupo community including:

- The construction and maintenance (costing over $100,000 USD) of a rainforest walkway which generates ecotourism income for the community,
- The re-construction of the school, water tanks and a clinic, plus emergency supplies after hurricanes Ofa and Val (costing over $160,000 USD),
- Plus subsequent personal contributions by Dr Cox to a perpetual endowment fund and village retirement funds.

Dr Cox estimates that over $480,000 USD in contributions have been made to Falealupo village by himself, his associates and Seacology (Cox, 2001). Interviews with some members of the community in May 2012 confirmed the approximate individual costs of specific contributions would tally to this approximately amount (Seaumantufa Falemai, interview, 23/5/12; Manu Toifotino, interview 23/5/12). Cox donated his share of the 1997 Goldman Environmental Prize to Seacology to create an endowment for benefit of the Falealupo Forest. These funds have been used to pay for annual maintenance on the Falealupo Rainforest Canopy Walkway, and, prior to the stock market collapse in 2008, annual payments to the village (Cox, Pers. Comm., 6/6/2012). From the interviews conducted there was little knowledge about the way the perpetual fund operates, and a number of community members noted that annual payments had recently stopped (Taii Tulei, interview, 23/5/12; Fuiono Patolo, interview, 23/5/12).

The ARA – Government of Samoa Agreement

Subject to a number of qualifications such as the passing of three phases of testing and USFDA approval, and the capacity for ARA (a not for profit) to partner with a company and generate surplus revenue net of expenses for ARA, the ARA agreed to pay the following to the Samoan Government:

- USD $5000 as a good faith payment,
- $10,000 as a milestone payment for the passing of phase 1 trials,
- $20,000 for passing phase 2 trials,
- $40,000 for passing of phase 3 clinical trials, and
- Once passed USDA approval if ARA realises revenues that exceed costs, they agree to pay royalties of this revenue at:

  - 12.5% to the Samoan Government;

  - 6.7% to Falealupo village;

  - 0.4% to the lineal descendants of Epenesa Mauigoa, late of Pesaga village (being the first healer to identify for Dr Paul Cox ‘mamala’ as having potential anti-viral qualities); and

- 0.4% to the lineal descendants of Pela Lilo, late of Falealupo village (who shared ethnobotanical knowledge concerning formulation and use of mamala as a treatment for illness).

While interviewed members of the community had some knowledge of this agreement, noting that Dr Cox had visited and discussed it in 2001, they only had basic knowledge of the division of potential royalties (Taii Tulei, 23/5/12; Fuiono Patolo, 23/5/12; Manu Toifotino, 23/5/12). Seaumantufa Falemai and his mother Lemau were surprised that they were not listed as direct beneficiaries in this agreement (interviews, 23/5/12 and 24/5/12). However Cox indicates that although Lemau taught him many things about Samoan healing plants, she did not teach him about the use of *Homalanthus* to treat viral illness and only used it to treat intestinal complaints (Cox, Pers. Comm. 6/6/12).

The UC Berkeley – Government of Samoa Agreement:

Subject to a number of terms, 50% of the net revenue proceeds (after reimbursing costs and legal fees) that arise from UC Berkeley's licensing of intellectual property directly from this research on *Homolanthus nutans* will go to the NGO Seacology to be distributed as follows:

- 50% to the Samoan Government
- 33% to Falealupo village
- 2% to Saipipi village
- 2% to Tafua village
- 8% to other villages that participate in the research or allow collection of mamala, grow crops of mamala at the time of FDA approval of prostratin or its analogues as a drug in a reasonable and equitable manner as decided by Seacology.
- 2% to the lineal descendants of Epenesa Mauigoa.
- 2% to the lineal descendants of Pela Lilo.
- 1% to Seacology for handling the royalty payments.

Several interviewed members of the community had only limited awareness of this agreement, and very little knowledge of the terms or progress of the R&D.

Summary of monetary and non-monetary benefits

The community has received considerable monetary benefits from the initial Falealupo Covenant, the subsequent philanthropic contributions made by Dr Cox and Seacology, and there are considerable terms of royalties and milestone payments established in the subsequent agreements (although almost entirely contingent upon successful commercialisation).

Monetary (USD)	Non-monetary
$85,000 to pay for the school in return for agreed access for R&D (Falealupo Covenant)	Conservation of the rainforest area in Falealupo.

Over $100,000 for construction and maintenance of a rainforest walkway[39].	Community benefits including the schools and health care clinics.
Several other charitable donations to the community from Seacology and Dr Cox (approximately another $300,000).	Social recognition for the healers who have provided the knowledge about mamala.
Up to $70,000 in milestone payments under ARA agreement if clinical trials are passed (ARA Agreement).	Opportunity for Samoan farmers to provide extract from the mamala plant (employment in biotrade activities) for further testing (although this case study could identify no evidence of this occurring in practice – synthetic analogs of prostratin appear to have been used recently in the US instead of sourcing from Samoa).[40]
6.7% royalties of revenues to Falealupo (net of expenses) if the ARA are able to license and commercialize a drug. Total returns to Samoa would be 20% of profits.	
16.6% of royalties of revenues to Falealupo (net of expenses) if UC Berkley is able to license and commercialize a drug of a total of 50% of profits to be returned to Samoa.	

Tangible impacts derived from these benefits

Although royalty payments 'arising from the utilisation of genetic resources' have not yet been made, a number of benefits for Falealupo community are visible. These have been made under the Falealupo Covenant (much like an 'upfront/access fee') and through philanthropic donations made by Dr Cox and Seacology.

From several interviews, every respondent indicated that they were happy that the community has been receiving benefits to the village fund through ticket sales for the rainforest canopy walkway (see figure 7). Several of the Falealupo Chiefs[41] explained that ticket sales are distributed to the community under a split as follows: 10% to the individual collecting ticket revenue, 45% to his/her family, and 45% to the village fund. The Chiefs estimated that 800-1000 WST ($342-428 USD) in fees are collected in average weeks in the high season and weekly collections are more like 200 WST ($85 USD) at the bottom of the low season.

[39] Although this is a philanthropic contribution, rather than a benefit arising from access to genetic resources, it has been included here because it demonstrates a subsequent commitment to the community post-access and during R&D.

[40] See Wender et al. (2008).

[41] Fuiono Aleki, Taii Tapana, Tapua Tamasi, Manutuaifo, Kelemete, Gaga Sanele, Ulufanua Aleuna, Kolone Va'ai, (Pers. Comm 15/3/12).

Other benefits do not appear to have arisen directly from the R&D, with the exception of an upfront milestone payment by the ARA to the Government of Samoa.

Products of the research and development

Research on anti-retroviral applications of prostratin has not yet passed phase 1 clinical trials in the US. Pre-clinical studies are still being conducted by ARA. Given that a patent relating to prostration was filed in 1996, it appears likely that this patent will lapse prior to commercialisation of an anti-viral drug. Recently, the ARA have filed additional patent applications in 2009 on 'Methods of administering Prostratin and Structural Analogs Thereof'

(US Application no. 12/937364; EPO Application No. 09730430.7; ARA accessed 5/6/12). As Dr Cox and associates have noted:

> Synthesis of analogs… raises interesting issues concerning indigenous intellectual property rights. Because knowledge of prostratin's antiviral activity originated from ethnobotanical studies with Samoan healers, the AIDS Research Alliance (ARA) and the Government of Samoa agreed that 20 percent of ARA's profit from prostratin will be returned to the Samoan people. Similarly, Samoa and the University of California, Berkeley, agreed to share equally in commercialization of the prostratin gene sequences. In the spirit of these previous agreements, we encourage future developers of prostratin analogs for antiviral therapy to negotiate fair and equitable benefits with the Samoan people (Cox, et al. 2008, p1589).

It is yet to be seen if the future users of synthetics analogs of prostratin will share benefits upon commercialisation of any drugs.

Figure 7: The Rainforest Canopy Walkway Ecotourism Attraction in Falealupo[42]

[42] Robinson, D. Photo taken 15/3/12, in Falealupo, Samoa

Challenges and lessons

Although there have been few benefits provided to Falealupo directly 'arising from' the utilisation of genetic resources and traditional knowledge (taking a narrow view of the wording of the CBD and Nagoya Protocol), there have been considerable monetary and nonmonetary contributions made to the conservation of the Falealupo rainforest, and to the Falealupo community. These reflect an acknowledgement of the contributions made by traditional knowledge holders to the potential development of a useful medicine, and the provision of access to genetic resources in the Falealupo rainforest. The establishment of a rainforest preserve directly responds to the first objective of the CBD, with caveats for traditional and sustainable use activities. Also, the related charitable contribution of the rainforest walkway provides a perpetual income for the village to be utilised for community activities, projects or infrastructure.

While some in the Samoan press have been critical of the ARA and UC Berkeley agreements, the royalty rates are quite high in comparison to many other negotiated figures for use of natural products in drug development. One issue that some interviewees raised was that expectations of short term royalties were quite high following a visit from Dr Cox in approximately 2001, when he explained the ARA agreement (Fuiono Patolo, interview 23/5/12; Seaumantufa Falemai, interview 23/5/12; Manu Toifotino, 24/5/12; Lemau Seaumantufa, interview, 24/5/12; Taii Tulei, interview, 24/5/12). Subsequently, interviewees and Chiefs indicated they had not heard about recent progress by the ARA and other researchers[43]. This highlights that it is important that the risks involved and long timelines for pharmaceutical R&D are clearly communicated to potential beneficiary communities with regular updates on progress.

Some other members of the public have also highlighted that prostratin was identified by researchers in New Zealand, some time prior to 1986. However, it does not appear to have been screened for anti-viral qualities until sent to the NCI and then subsequently patented for this intended use. Others have pointed out that the *Homolanthus nutans* tree is found across the South Pacific from approximately New Caledonia to French Polynesia (Whistler, 2004). Article 11 of the Nagoya Protocol highlights that in such circumstances; that Party to the Protocol should 'endeavour to cooperate, as appropriate, with the involvement of indigenous and local communities concerned, where applicable, with a view to implementing this Protocol.' The extent to which cooperation and transboundary benefit-sharing will occur is likely to be something that the Parties will resolve amongst themselves, through regional agreements, or through further negotiations at the Intergovernmental Committees of the Nagoya Protocol (ICNP).

The case study also raises an interesting question about requirements for benefit-sharing relating to R&D towards synthetic analogs that are based on a naturally occurring compound. The Nagoya Protocol definition of 'utilization of genetic resources' includes derivatives, meaning 'naturally occurring biochemical compounds'. Because analogs are synthetically produced, they probably do not fall under the scope of the Nagoya Protocol.

[43] Fuiono Aleki, Taii Tapana, Tapua Tamasi, Manutuaifo, Kelemete, Gaga Sanele, Ulufanua Aleuna, Kolone Va'ai (Pers. Comm 15/3/12) and Fuiono Patolo, Seumanu Tafa Faaolo, Seumanu Tafa Falemai, Manu Toifotino, Lemau Seaumantafa, Taii Tulei, Marianive Fuiono (interviews, 23-24/5/12).

However, this does not preclude Governments from specifying in benefit-sharing agreements that synthetic analogs utilised by the researchers involved must also share benefits (see Article 5.1 of the Nagoya Protocol on 'subsequent applications'). Enforcing third party benefit-sharing upon the development of synthetic analogs would be complex.

ANNEX VI: Case Study 2
Inter-country Collaboration: Two Samoas Environmental Collaboration Initiative

The Two Samoas Environmental Collaboration brings together governments agencies, NGOs, and institutions from American Samoa and Samoa to implement environmental measures, enhance effectiveness, conserve resources, and provide better overall environmental governance for the Samoan Archipelago. The "Two Samoas" provides a platform for a single concerted effort to manage a multitude of threats to environmental resources within the Samoan Archipelago, such as the management of fisheries, land-based sources of pollution, climate change, invasive species, and key or endangered species

The proclamation of the "Two Samoas" was sealed at the Seventh Meeting on the Cooperation Issues Between the Two Samoa's in September, 2007, where the Governor of American Samoa and the Prime Minister of Samoa issued a joint statement for their respective jurisdictions to "hold annual meetings" to discuss overlapping environmental issues.

Since then further developments on the "Two Samoas" initiative include;

- A Memorandum of Understanding (MoU) was established and signed between the two environmental institutions (MNRE and DMWR) at its meeting on **5th November 2010** officiating this collaboration of the Two Samoas.
- Two Samoas Operations / Governance Structure already in place and consist of a Steering Committee and stakeholders from both jurisdictions with meetings to be held annually. The Steering Committee is comprised of;
    A. Samoa
        1. Chief Executive Officer of the Ministry of Natural Resource and Environment;
        2. Chief Executive Officer of the Ministry of Agriculture and Fisheries;
        3. Chief Executive Officer of the Ministry of Foreign Affairs and Trade
    B. American Samoa
        1. Director of the Department of Commerce
        2. Director of the Department of Marine and Wildlife Resources
        3. Director of the Environmental Protection Agency
- A Secretariat/Coordinator is already on board (commenced on 16th December 2013) and housed under the MNRE whose duties include, but are not limited to, ensuring continued collaboration between the two governments through facilitation of communication and organization of meetings, act as point of contact for the collaboration in third party interactions, identify and actively pursue funding opportunities, manage the day to day operations of the Two Samoas, and carry out the various directives of the Steering Committee.
- A Strategic Plan for the Two Samoas Environmental Collaboration is already in place which guides the actions and efforts of the Two Samoas to direct future investments in activities that both jurisdictions agree will be beneficial to the Samoan archipelago. Future actions and investments will be designed in consideration of cross-boundary cooperation, and should fall under the Goals and Objectives outlined in the document. The Strategic Plan is a living document and will be continuously updated to reflect projects and activities done from time to time to address objectives and issues as outlined in the Strategic Plan. Most of the parallel projects (externally funded projects) carried out in various sections/ divisions of MNRE and MAF in Samoa as well as DMWR and EPA in American Samoa address some of the goals/

objectives as outlined in the Two Samoas Strategic Plan. Significantly, one of the key responsibilities of the newly- appointed Coordinator was to facilitate the implementation of activities under the SP and to ensure that the SP was maintained and updated.

The initiative is funded by the National Oceanic Atmospheric Administration (NOAA) – USA through its Coral Reef Conservation Program (CRCP) for the first two years and funding will be continuously sought for the sustainability of the initiative.

ANNEX VIII: Matrix showing status of implementation of NBSAP Activities

Matrix of NBSAP Activities Showing Status of Implementation		
NBSAP Themes, Goals & Objectives	**Corresponding NBSAP Actions**	**Status of Implementation**
3.1 Theme 1: Mainstream Biodiversity **Strategic Goal:** The conservation and sustainable use of biodiversity which is vital to the development of Samoa, is integrated into national, sectoral and cross-sectoral plans, policies and programmes.		
Objective 1: Policy To integrate concepts of conservation and sustainable use of biodiversity into all relevant sectoral policies, plans and programmes of all the Government ministries. **Monitoring Goal:** Conservation and sustainable use concepts have been integrated and used in policies, plans and programmes of all the Government ministries.	1.1 To include issues identified in the NBSAP in the next Statement of Economic Strategies along with CBD principles such as the precautionary principle, and issues such as financing biodiversity, ensuring that biodiversity considerations are effectively incorporated in the Government's developmental policies.	✓SDS 2008-2012 Priority Area 3: Public sector management & environmental sustainability. Goal 7: Environmental Sustainability & disasters risk reduction. ✓SDS 2012-2016 Priority Area 4: Environment Sector. Key Outcome 13: Environment sustainability. Key Outcome 14: Climate and Disaster resilience ✓NESCP 2013-2016
	1.2 Provide Policy Advice regarding amendments to existing policies and development of new policies, to fall within the NEMS framework.	✓Environment component has been included in many of the new/revised policies eg, waste management act, biosecurity act 2005, marine wildlife protection regulation 2009, NISAP 2008- 2011, NAPA 2005, National Waste Management Strategy 2000 - 2010, Samoa National Energy Policy 2007, National Chemical Management strategy ✓Le Pupū Puē Management plan,

		✓One million tree planting campaign strategy 2009, ✓**D**raft Lake Lanutoo National Park Management Plan 2012 ✓NESP 2013-2016
Objective 2: Multi-sectoral collaboration: To improve and strengthen multi-lateral collaboration in promoting conservation and sustainable use of biodiversity in Samoa.	2.1 Enhance and strengthen the links between the Biodiversity Policy Committee, who will oversee the implementation of the NBSAP, and other Government Agencies, NGOs, Private Sector and Community Groups to advise on the sustainable management of Samoa's biological and genetic resources, and contribute to Samoa's participation at international and regional environmental consultation.	✓MNRE working collaboratively with SUNGO on the implementation through NGOs (bee keepers organization)
	2.2 Establish a multi-sectoral team of scientists and experts to conduct biological studies and undertake monitoring programmes on biodiversity.	✓Ad hoc committee undertaking surveys eg, Dave Butler & Associates - BIORAP, Maomao/manumea, rat eradication. Cedric Schuster - bird survey Nuutele ✓Ma'oma'o Bird Survey – Rebecca/KBA ✓Leading the recovery of two of Samoa's most threatened bird species the tooth-billed pigeon and ma'o, through ecological research to identify current threats: 2013; Butler D and Stirnemann R.
	2.3 Establish and maintain regular consultations and communication links between all stakeholders on international and regional treaties for the conservation and sustainable use of biodiversity.	✓Consultations with stakeholders are normally undertaken during reviews or public presentation of draft national reports under the various conventions, such as the 4th National report to CBD. • Proposed ecological survey for ICCRIFS sites in mid-2014
Objective 3: Legislation	3.1 Review the Lands, Survey and	• The MNRE Bill 2003 was initially drafted

To ensure that appropriate legislation is developed and effectively enforced to sustainably manage Samoa's Biodiversity.	Environment Act 1989 to incorporate relevant actions from the NBSAP.	• The Lands, Survey and Environment Act 1989 was reviewed and updated in the form of the Environment Bill 2013. The Bill incorporates relevant actions from NBSAP. This is expected to be enacted sometime in early 2014 (Sala J Stowers)
	3.2 Develop, adopt and enforce EIA legislation to minimise the adverse impacts of developments on the environment.	✓PUMA Act 2004 and the PUMA (EIA) Regulation 2007 is actively implemented and enforced, and gaining wide public acceptance.
	3.3 Ensure the integration of the objectives and actions of NBSAP into legislative amendments being undertaken by relevant departments, to ensure consistency across all sectors concerned.	✓Many of the actions identified in the NBSAP have been incorporated into programs/activities of other Sectors eg, Biosecurity Act 2005, Marine Pollution Prevention Act 2008, Forestry Management Act 2011
	3.4 Integrate the protection of species from the impact of oil spill and marine pollution into the appropriate legislation.	✓Marine Pollution Prevention Act 2008 ✓Pacific Islands Regional Marine Spill Contingency Plan (PACPLAN) 2013 (Regional)
	3.5 Review the conservation status of wildlife and make appropriate monitoring and enforcement amendments to the Wild Animals Ordinance 1993.	✓Protection of Wildlife Regulations 2004 to address the flying species endemic to Samoa ✓Environmental Management and Conservation (EMC) Bill 2014/ Investigations & enforcement manual
	3.6 Develop appropriate legislation on biosecurity to include risk management on genetically modified organisms, invasive alien species, and effective border control.	✓Quarantine (Biosecurity) Act 2005 in place with strengthened risk assessment provisions. ✓Samoa's National Biosafety Framework developed ✓National Invasive Species Action Plan 2008-2011 partially implemented; needs updating. ✓EMC Bill 2013 includes a section on biosafety

	3.7 Develop appropriate sui generis legislation for the protection of traditional knowledge and equitable benefit sharing, which are important for the conservation and sustainable use of biodiversity.	✓Provisions for the protection of traditional knowledge and equitable sharing of biodiversity are proposed as part of the EMC Bill 2013 ✓ **MCIL is also preparing with the AG's support a TK legislation mainly to protect traditional cultural designs etc.(2014)**
	3.8 Finalise, enact and enforce Environment (Bioprospecting) Regulations.	✓Bioprospecting Regulation 2000 ✓EMC Bill 2014
	3.9 Amend the Village Fono Act and set up relevant by-laws to decentralise the enforcement of some biodiversity destruction offences.	✓Village Fono Act 1990 ✓By-laws developed under the Fisheries Act and the Water Resources Management Act are in place in several villages e.g. Aufaga village, Tafitoala, Savaia etc. defining communities responsibilities etc for environmental management.
Objective 4: Environment Impact Assessments To ensure that EIAs are conducted for all development projects to minimise any adverse impacts on Samoa's Biodiversity.	4.1 Develop relevant EIA policies.	✓Planning & Urban (EIA) Regulation 2007 ✓Vehicle Parking Policy, Noise Policy, Samoa Code of Environmental Practice (COEP) are in place. ✓ Environmental flow requirements under the Water Resources Act and PUMA Act protect downstream biodiversity values from potential impacts of upstream abstraction or water diversion activities.
	4.2 Undertake biological surveys and assessments as an integral part of EIA procedures.	✓Biological surveys undertaken as part of the DCs and EIAs process.
	4.3 Integrate the assessment of development impacts on biodiversity as part of the code of practice for natural resource extraction.	✓LSE Act 1989, and currently in the EMC Bill 2014 ✓PUMA Act 2004, as part of the EIA process ✓Forestry Management Act 2011

	4.4 Integrate economic valuation into EIA as an integral part.	• National economic evaluation of terrestrial & marine resources was completed in 2001 but it is not confirmed as to what extent this is integrated, if at all, into existing EIA procedures.
	4.5 Regularly review and update existing EIA procedures.	✓ Regular review and updating of EIA procedures are on-going by PUMA ✓IEA regional/SPREP – links to SPREP
Objective 5: Capacity Building: To develop and enhance local capacity to ensure the effective implementation and enforcement of policies and legislation for the conservation and sustainable use of Samoa's Biodiversity.	5.1 Develop a national clearinghouse mechanism based on the CBD-CHM for disseminating and sharing of information on biodiversity work.	✓**The Samoa's Biodiversity Website and National Database Information System was launched (2003?) and is** a publicly accessible; include a wide range of scientific and technical, policy information on Samoa's biodiversity. ✓CHM is covered by the revised environmental legislation (EMC Bill **2013)** ✓ICCRIFS webpage under MNRE website ✓Information hub identified as one of the key priority areas under the NESP ✓CHM to help centralize and update reports for monitoring
	5.2 Conduct national seminars involving all key stakeholders on policies and plans relating to conservation and sustainable management of biodiversity.	✓Workshops with stakeholders on policies, SOE 2013, NESP 2013-2016; NBSAP Update (2004), National Forest Policy by ICCRIFs etc ✓ ICCRIFS project public consultations to introduce upland forest conservation, lowland development management (Agroforestry) and a range of project management tools 2011 - 2014
	5.3 Develop public awareness material on all legislation relating to biodiversity use for disseminating to the people.	✓Biodiversity legislation booklet - Conservation laws booklet 2013 ✓Investigation & enforcement manual 2012 ✓Conservation billboards erected in Upolu and Savaii in 2002
	5.4 Implement and co-ordinate media	✓Conservation messages billboards at selected road junctions in

	programmes to raise awareness.	Upolu & Savaii developed in 2002 ✓Newspaper columns on environmental issues were produced targeting schools mainly but also general public.
	5.5 Promote and encourage access to and the use of advocacy material on biodiversity available at the various departments.	✓LSD disseminates factsheets on selected laws not yet on CBD ✓MNRE provides this service (provide information) to the public on request. ✓Career advisory events
	5.6 Encourage the use of the Participatory Rural Appraisal approach in awareness and educational programmes.	✓A similar training on this community consultative tool had already taken place in 2011 ✓ICCRIFS 3D Model for a number of sites/villages including Laulii-Falevao (ICCRIFS sites), ✓Very useful method but not used by the Ministry
	5.7 Develop training programmes for: i. All personnel involved in the formulation and implementation of conservation related policies and legislation. ii. Communities on the enforcement of policies and legislation. iii. Inclusion of policies and regulations in educational curriculum.	✓Training programs already with selected divisions on respective laws ✓ Policies training by ICTP through SUNGO & Chamber of Commerce ✓Community workshops on formulation of WR by-laws at Tafitoala; other communities are being targeted. ✓ On-going consultations and awareness raising workshops with communities on a range of issues including land, forestry, waste etc – as part of SOE, and project specific activities lead by MNRE.
	5.8 Provide capacity building training for local communities on the principles and benefits of EIA, so they can apply EIA on developments at their local level.	✓ PUMA staff through SECCA underwent this training. ✓ Train the trainers program in 2008/2009 by PUMA

3.2 THEME 2: ECOSYSTEM MANAGEMENT

Strategy Goal: To increase the percentage of Samoa's protected and conserved areas from the existing 10 % of total land, including coastal areas.

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Objective 1: Research and Monitoring To promote and encourage research for the identification, documentation and monitoring of Samoa's ecosystems for the implementation of appropriate management programs.	1.1	Undertake biological surveys of Samoa's freshwater ecosystems.	✓Surveys of Afulilo and Taelefaga streams, and Fagaloa Bay as part of EIA of Afulilo Power Project noted fish, insect fauna and crustacea for freshwater (SPREP/SMEC. 2011) ✓Nerite snail survey 2004 consultant collected freshwater invertebrates from catchments near Apia (August 1995) ✔ Jenkins, A.P., Keith, P; Marquet, G; Mailautoka, K.K.; 2008. *A preliminary survey of Samoan freshwater macro-faunal biodiversity.* Wetlands International – Oceania & Paris Museum of Natural History. ✓ Apolima-uta marshland conservation project initiated by METI (2002)
	1.2	Undertake biological surveys of key upland sites not visited in the National Upland Ecological Survey of 1998, e.g. Sili Upland forest, Itu Salega and Gataivai Upland forest.	✔ Jeffries, B., Atherton, J. and Foliga, S.T. 2012. "Enhancing Knowledge and understanding of the Biodiversity of Upland Central Savaii". BioRAP Survey Debriefing to MNRE, October, 2012. Final Report pending. ✓Schuster, C; Whistler, A., Tuailemafua, T Siuli. 1999. *The Conservation of Biological Diversity in Upland Ecosystems of Samoa*. Division of Environment and Conservation, Department of Lands, Surveys and Environment, Apia. ✓A small-scale private search for the possibly extinct Samoan woodhen or moorhen (*Gallinula pacifica*) failed to find any sign of the bird although large areas of potential habitat remain unsurveyed. ✓Status of endangered plants including possible species new to

		Samoa ✓Priority habitats/areas, based on the endangered fauna and flora they support, are identified, mapped, and provided with GPS coordinates (as part of CI/MNRE KBA study?) ✓Presence, or absence, of Samoan swallowtail butterfly is assessed (Report?) – Eric Edwards ✓Status of invasive species and other threats is assessed (Report?) • **Ecological survey for ICCRIFS sites in mid-2014 (this is being proposed and has not yet been undertaken).** ✓**Forest inventory currently undertaken for Savaii (Upolu – completed** ✓**SAMFRIS to update** ✓Whistler, A. 2011. Rare Plants of Samoa. ✓Capacity building to secure endemic Samoan swallowtail butterfly as a model for valuing and conserving butterflies distinctive in the Polynesia-Micronesia hotspot (Eric Edwards & Brian Patrick; 2011) ✓Leading the recovery of two of Samoa's most threatened bird species the tooth-billed pigeon and ma'o, through ecological research to identify current threats: 2013; Butler D and Stirnemann R.
	1.3 Undertake a complete survey of Samoa's inshore biodiversity.	Inshore biodiversity surveys completed and published include - ✓Skelton, P; Bell, L; Mulipola, A; and Trevor, A. 2000. *The Status of Coral Reefs and Marine Resources of Samoa.* Internal Report, Fisheries Division. MAF, Apia. ✓Skelton, P.A. 2005 *A survey of benthic marine algae of the Apia District, Samoa.* ✓Oremus, Marc; Ward, Juney; Penaia, Lillian; Ifopo, Pulea; and

		Pesaleli, Toetu. 2007. *Report on dolphin and whale watching feasibility survey in Samoa and biopsy training, May-June 2007* . Unpubl. SPREP, Samoa. ✓Zann, L. P. (1991). *The inshore resources of Upolu, Western Samoa: coastal inventory and fisheries database*. Report prepared for the Government of Western Samoa. FAO/UNDP SAM/89/002 Field Report. Unpubl. ✓Kendall & Poti (eds.). 2011. *A Biogeographic Assessment of the Samoan Archipelago*. NOAA, USA. ✓Langley, Adam. M. 2006. *The South Pacific Albacore Fishery: A summary of the status of the stock and fishery management issues of relevance to Pacific Islands Countries and Territories (PICTs).* Technical Report 37. Noumea, New Caledonia: Secretariat of the Pacific Community. ✓Marine recovery survey post-tsunami Aleipata (supported by Conservation International – James Atherton & Schannel van Djken)
	1.4. Develop and implement a long term monitoring programme for Samoa's native ecosystems including invasive species.	✓Myna bird control program implemented ✓SNITT response team to eradicate immediately reported invasive species eg, mongoose, cane toads etc. ✔ MNRE-Forestry SAMFris Project developed a GIS based data management system that generates mapping data and information on the extent of forests and protected area coverage, and the spread of invasive plant species. ✔MNRE also undertook a survey within the Apia harbour to identify invasive/introduced marine species ✔ CI-SPREP/NZDoC funded Aleipata Islands Restoration Project monitors rodents population as part of its invasive species

			management activities. ✔MAF on-going monitoring programme for the Giant African snail. ✓MNRE-SPREP-MAF Myna Control Project monitors and seeks to control myna bird populations. ✓MNRE trial eradication of *Merremia peltata* vine. ✓Iakopo. M. 2006. *Mangroves of Samoa: Status and Conservation*. Ministry of Natural Resources, Environment and Meteorology, Samoa. 40pp. ✔ Premus, Marc; Ward, Juney; Penaia, Lillian; Ifopo, Pulea; and Pesaleli, Toetu. 2007. *Report on dolphin and whale watching feasibility survey in Samoa and biopsy training, May-June 2007* . Unpubl. SPREP, Samoa. *(must move this activity to appropriate column)* ✓Lake lanutoo NP rehabilitation work report 2013 ✓Hoffman, Ben. 2012. The status and impacts of the Yellow Crazy Ants (*Anaplolepis gracilipes*) on Nuutele, Aleipata Is, Samoa. Final Report. CSIRO, Australia. ✓Preliminary site visit to lake lanutoo 20 Nov 2012 ✓Report on Aleipata Island restoration ✓Report on mongoose ✓Report on the myna bird project
	1.5.	Develop a list of priority research topics and monitor techniques to be used by students and staff of natural resource sectors.	✓The NBSAP has a list of high priority areas for research and information gathering. ✓Local high schools focus on student research (for Year 12 and Year 13) has been on coral reef, mangroves, Protected Areas ✓National surveys/priority areas are identified under the 2013 – 2016 National Environment Sector Plan (NESP)
	1.6.	Develop a code of conduct for biodiversity and bio-prospecting	✓Bio-prospecting research application form with criterias developed

		research in Samoa	
	1.7.	Publish and make available to the public research reports.	✓Research reports available on MNRE website ✓ Most reports listed above are publicly accessible and available from MNRE. Several are published either as stand-alone technical reports or as part of compendiums of conferences etc.. ✓NUS Faculty of Science holds Seminar Hour on Weds 12pm at the Aoa Conference room (during semester) to present research findings including findings on biodiversity related research.
	1.8.	Develop a program for the identification of genetic resources from Samoa's biological resources.	✓Samoa (MNRE-Forestry) participated in the AusAID funded SPRIG project which conserved forest genetic resources, mainly high quality native timber species. ✓MAF has been implementing a taro breeding program following the decimation of the local taro by the Taro Leaf Blight with several new sub-species and varieties now introduced and commercially produced for exports.
	1.9.	Develop and implement a programme for monitoring the impacts on biodiversity from climate change.	✓ 1999 aerial photos were updated with ground truthing surveys in 2004 show changes in forest cover; ✓ New forest mapping exercise is currently in progress as part of the Govt of Japan funded Forest Preservation Program (2013). New aerial photos will update MAPFris, ICCRIFSm ICCRIFAS, STA, CIM Plans/PPCR plans ✓DEC undertakes monitoring in 05/06 and 08/09 on Aleipata Islands. ✓DEC conducts similar monitoring in the Aleipata and Safata MPAs; including monitoring of coral bleaching and COT outbreaks.

		✓MAF-Fish supports a monitoring of inshore fisheries for the existing network of village based fisheries reserves under its Village Level Monitoring. ✓Regular Reef Checks by MAF monitors against outbreaks of coral bleaching and crown-of-thorns. ✓Integrating climate change risks – inception report, PIR, V&A report (Draft) ✓2010 survey of status of vegetation re-growth on the tsunami affected area along the coastal areas from Aleipata to Matafaa, Lefaga. Survey was carried out in 2010, after one year of the tsunami.
Objective 2: Conservation Areas To enhance the management of existing protected areas and establish new ones to increase coverage of protected areas to 15 % and achieve a full representation of Samoa's ecosystems. ***Monitoring Goal:*** Total land area under conservation or sustainable management framework.	2.1 Develop and implement plans for the existing protected areas in Samoa.	✓Management plans developed for many existing PAs eg, ASMPA, national parks, fisheries village marine reserves ✓Existing PA network consists of 5 national parks, 22 terrestrial reserves, 2 marine protected areas (MPA), 1 marine reserve and 71 village fisheries reserves. ✓Samoa also formally designated its entire EEZ in 2003 as a sanctuary for whales, dolphins, turtles and sharks. ✓Draft Lake Lanoto'o MP, Le Pupū Puē NP, Vailima Reserve, Laulii – Falevao CCA (under ICCRIFS)

	2.2 Establish conservation areas in under represented ecosystems e.g. mangrove areas.	✓Mangrove areas established as PAs under the ASMPA programs, UNDP small grant programs, POWPA, Fisheries village marine reserves Mangroves areas under current PA system include – • Saanapu-Sataoa Mangrove Forests Conservation Area; • Taumeasina Reserve • Matautu tai Reserve • Mulinuu Mangrove Reserve • Matafa'a Mangrove Forest (?)
	2.3 Establish large conservation areas which include more than one ecosystem, in high priority sites identified in lowland and upland ecological surveys such as Aopo, Sili, Salailua and Eastern Upolu, utilizing community management approaches.	✓Key Biodiversity Areas (KBAs) have been identified to ensure full representativeness of all important ecosystems and species for conservation purposes. Eight terrestrial KBAs have been endorsed totalling 940km^2 or 33% of Samoa's total land area. ✓ Other community based conservation areas include Saanapu-Sataoa Marine Conservation area, Sataoa MPA and Aleipata MPA. (NB. Uafato CAP is no longer officially under conservation management since 2008 when the community of Uafato agreed to withdraw due to internal conflicts). ✓Laulii-Falevao Community Conservation Area (CCA) is under development
	2.4 Encourage the development of a representative system of marine protected areas built upon the existing programmes.	✓Existing marine protected areas consist of 2 marine protected areas (MPA), 1 marine reserve and 71 village fisheries reserves. Samoa also formally designated its entire EEZ in 2002 as a sanctuary for whales, dolphins, turtles and sharks. ✓Seven proposed marine KBAs cover approximately 173km^2 or 23% of Samoa's inland reef area. The KBAs incorporate all the existing marine protected areas. MNRE is progressively

			seeking legal status to formalize some of these as marine protected areas.
	2.5	Develop appropriate information systems such as GIS to store and share information of ecosystems and protected areas.	✓Mapping section stores all GIS related information eg, update on mangrove maps under MESCAL project ✓Existing protected area network including KBAs are digitized and stored in GIS based SamFRIS system within Forestry Division, MNRE. Both MNRE Technical Division and Forestry Division have GIS units with complete (2004) forest cover data sets. Update aerial photo and ground thruthing ✓Current/on-going Govt. of Japan funded Forest Preservation Project is updating forest resources mapping including protected areas. ✓ICCRIFS
	2.6	Extend the watershed programme to all the priority areas and the smaller village-based water catchment areas.	✓Five (5) watershed management plans have been endorsed by the Cabinet Development Committee. A number of other plans are being developed together with on-going rehabilitation and awareness work. Watersheds areas are under the Water Sector Programs ✓SLM Project implemented pilot demonstrations on degraded lands and watersheds. ✓GEF 5 project address critical landscapes ✓By-laws have also been endorsed and approved –Aufaga and Tafitoala approved, Faleseela (1), Fuluasou (2) Gasegase, Palauli drafted. ✓ICCRIFS communities support/integrate protection of catchment areas
	2.7	Develop and implement programmes for the restoration of	✓POWPA project did restoration and rehabilitation of Vaitoloa, Vaiusu etc which included removing the debris and rubbish

		degraded ecosystems such as the Vaitoloa rubbish dump, mangrove areas and watershed areas.	from the original rubbish dump site. ✓196.6 ha of watershed areas have been rehabilitated according to the Water and Sanitation Annual Report (2011/2012). A further 24.6 ha is reported in the more recent 2012/2013 Annual Report, taking the total area under rehabilitation to 221.93 ha. ✓ MNRE carried out hydrological study of Lake Lanoto'o in 2011 (SOE, 2013). ✓SLM program rehabilitation of Vaipouli water catchment area with FD and WRD
	2.8	Formalize the conservation of biodiversity in traditional sites identified as important for tourism.	✓Several reserves of observed significance and popular with tourists have been formally gazetted including (i) Palolo Deep Reserve (ii) Mt Vaea Scenic Reserve (iii) Robert Louis Stevenson Historic Reserve and the Samoa National Botanical Garden (Vailima).

Objective 3: Sustainable Use of Ecosystems To develop and effectively manage programs that promote the sustainable use of Samoa's ecosystems. ***Monitoring Goal:*** Number of sustainable use guidelines and management plans developed for different ecosystems in Samoa	3.1 Develop guidelines for the sustainable use of biodiversity resources through activities such as eco-tourism, and the marketing of non-timber forest and other natural products.	✓Drafted guidelines for whale/dolphin watching and turtle kept in captivity and turtle watching ✓National Parks Management Plans, OLPP & Lake Lanutoo (Reserve Management Plans)
	3.2 Undertake economic valuation of ecosystem services for terrestrial, aquatic and marine area use.	✓Draft report on economic valuation of mangroves under MESCAL program
	3.3 Identify sustainable management options for the cultivation of land.	✓MAF has completed (2010) a crops-land capability mapping matching land and crops, to promote sustainable land use based on topographic and soil data from MNRE as part of ICCRA HSS Project (Agriculture Component) ✓MAF has completed Soil Resources Interpretative Reference Manual for Samoa (2011) as part of the above ICCRA project. ✓Samoa Agroforestry and Tree Farming Project (SATFP) promotes agroforestry and other plants-trees mixes that promotes sustainable land management. Similar techniques and land use practises are promoted under ICCRIFS, FPAM
	3.4 Identify options to allow all marine biodiversity to be managed sustainably.	✓Aquaculture programs by the Fisheries Division eg, tilapia and reintroduction of giant clams, trochus etc in areas where stocks have been depleted. ✓By-laws developed for sustainable utilization of marine resources and use of non-destructive fishing equipments, mainly by villages with Fisheries Reserves as part of Fisheries

		Management Plans with the support of MAF Fisheries. ✓Samoas tuna resources is allocated sustainably in the *Samoa Tuna Management and Development Plan, 2011 – 2015*. ✓Fisheries regulates minimize sizes for a range of fin fish species. ✓Villages with fisheries reserves under MAF support have Fisheries Management Plans stipulate sustainable management regimes.
	3.5 Develop and promote integrated management approaches for all lands under customary tenure.	✓Samoa Agroforestry and Tree Farming Project (SATFP) encourages crops and trees integration on customary lands to improve climate change resilience and promote forest resource development. ✓Agriculture Sector Plan SPO 4: Sub-sector strategy 4.1.3 – Strengthen the integrated climate change adaptation measures in crop and ground cover and water irrigation for farming. ✓ICCRIFS, FPAM
	3.6 Develop and implement integrated coastal management programmes.	✓Integrated coastal management approaches are applied in the two district MPAs. ✓Coastal Infrastructure Management (CIM) Plans
Objective 4: Capacity Building To develop and enhance local capacity to ensure the sustainable management of Samoa's ecosystem. ***Monitoring Goal:*** Number of biodiversity research projects and associated training undertaken by Samoans.	4.1 Develop and implement local capacity building programmes on biological surveys, monitoring techniques and ecosystem management.	✓Surveys conducted by Terrestrial and Marine Conservation Sections and National Parks for various surveys which has built the personnel capacity including monitoring techniques. ✓Forestry inventory training – staff ✓NUS Faculty of Science – BSc program in Environmental Science
	4.2 Establish a multi-sectoral group of national/local experts to co-ordinate and undertake biological surveys and	✓Wildlife Working Committee to address wildlife watching for eco-tourism operations.

	monitoring programmes.	
	4.3 Provide and implement national/local training on community-based conservation management approaches.	✓Learning exchange program between the MPAs and Fisheries Village reserves (Samoa) and PAs of Am. Samoa. ✓UNDP Small Grant Program - part of the requirements is to do vulnerability assessments and engage communities to identify threats of their marine environment and establish MPAs.
	4.4 Develop and implement appropriate training for communities on sustainable income generating activities.	✓MWSDC small business schemes for communities. ✓Sa'anapu/Sataoa mangrove conservation boardwalks, as part of the GEF funded South Pacific Biodiversity Conservation Project (SPBCP) Saanapu-Sataoa Mangrove Forest Conservation Area Project. ✓WIBDI organic farming initiative
	4.5 Establish a Conservation Management committee of key agencies to assess and review appropriate approaches for improving the management of conservation areas.	
Objective 5: Public Awareness and Education To increase public awareness and understanding on the importance of Samoa's ecosystems to ensure their sustainable management. ***Monitoring Goal:*** Proportion of Samoa's population with good understanding of the importance of	5.1 Coordinate a programme between relevant agencies to utilize information on Samoa's biodiversity for use and integration into school curricula, youth and rural development programmes.	✓Environment component integrated into the Year 11 curriculum ✓Awareness programs, field trips, presentations conducted by the Ministry at various schools and levels ✓NUS/USP open day to promote MNRE work ✓National awareness programs eg, Water Day, Biodiversity Day, RAMSAR etc ✓Environment Week (First week of November)
	5.2 Develop and implement public awareness and educational programme on the importance and management of	✓Awareness programs - presentations, field trips conducted for schools that have mangroves, coral reefs, Palolo Deep Marine Reserve as their topic for assignments.

the conservation of biodiversity.	ecosystems.	✓ Regular newspaper articles targeting primary and secondary schools focused on different environmental issues including different ecosystems, endemic species of conservation importance, invasive species etc.
	5.3 Develop national public awareness campaigns based on the Sea Turtle and Manumea programmes as flagship species for ecosystems.	✓*Manumea* was the official mascot for the South Pacific Games 2007 ✓Pacific Year of the Turtle in 2006 ✓Marine turtle flagship species for the Pacific region including Samoa. ✓Both sea turtles and *manumea* have been the subject of intensive public awareness programmes over the years with *Manumea* officially declared the National Bird of Samoa.
	5.4 Establish networking and information sharing on the importance of Samoa's ecosystem through educational programmes.	✓Presentations, field trips conducted based on topics of schools assessments for SC and PSSC ✓Established Samoan Association of Science educators provides a network of science teachers to share ideas for teaching their environment topic of the science curriculum
	5.5 Disseminate information on the importance of Samoa's ecosystem through local media.	✓National awareness days eg, RAMSAR provides opportunities to promote and disseminate biodiversity information to the general public including the media.
	5.6 Develop a core set of public awareness material and displays on conservation for public display, promotional tours, and distribution to local communities.	✓Various posters, fact sheets and awareness materials made available to the public, including MNRE website ✓Conservation signs on buses eg, MESCAL, myna bird, protection of turtles, sharks, whales, water conservation etc. ✓P3D model training for ICCRIFS project sites
Theme 3 – Species Management **Strategic Goal** – *To promote the conservation of Samoa's native and other important species and provide mechsnisms for their sustainable use.*		
Objective 1: Conservation of	1.1 Establish and maintain a complete	✓List of marine species of conservation concern completed

species: *To enhance the status of native and other important species in Samoa through effective conservation programmes.*	threatened species list for Samoa and provide regular updates to appropriate regional and international organisation directories.	✓ Samoa generally relies on the IUCN Red List of Threatened Species with updates from time to time based on information from individual experts.
	1.2 Review the list of threatened species to determine those appropriate for recovery programmes (including propagation) and develop and implement these programmes.	✓Recovery program developed for some of the threatened species e.g., manumea/maomao recovery plan ✓Marine species action plan 2013 (drafted)
	1.3 Fully develop Botanical Gardens to house collections of Samoa's native plant species.	✓Forestry nursery & Vailima National Parks nursery ✓The Vailima Botanical Garden is under development for this purpose. ✓Several other botanic reserves have been established for ex-situ conservation of native plant species e.g. Fuluasou Botanic Reserve, Apia Central Recreation Reserve.
	1.4 Assess the need for Samoa's participation in international and regional efforts to protect migratory species.	✓Signed CMS in 2005 ✓Samoa regularly participates in CMS meetings ✓Samoa signed Regional MoU for the Conservation of Cetaceans and their habitats in the Pacific Islands region ✓Samoa actively participates in regional (SPREP coordinated) conservation efforts for the protection of a number of cetacean species (whales and dolphins) and migratory species such as hawksbill turtles.
	1.5 Explore the feasibility of establishing captive breeding/spawning programmes as a security from the impacts of natural disasters and alien invasive species introductions.	✓Aquaculture program with the Fisheries Division ✓Tuaimeo aviary during the rat eradication program
	1.6 Explore and assess the feasibility of	

	setting up an aquarium/zoo for conservation of species.	
Objective 2: Research and Monitoring To promote and encourage research for the identification, documentation and monitoring of species and the implementation of appropriate conservation and management programmes. ***Monitoring Goal:*** Number of research, surveys and monitoring programmes in place.	2.1 Establish and undertake monitoring programmes for threatened species to assess the status of those that may be included or taken off the Wild Animals Ordinance. .	✓Maomao monitoring ✓Manumea monitoring ✓Whales and dolphins survey ✓Turtle surveys ✓Bat surveys – report from Ecosure for Samoa?
	2.2 Undertake a research programme to complete the collection and identification of Samoa's fauna and flora.	✓KBA report ✓Lizard survey ✓Butterfly survey ✓Marine Invertebrate survey 2005 ✓BIORAP survey 2011 ✓Erikson, Hampus. 2006. Sea cucumber abundance, diversity and fisheries in Samoa: an assessment of lagoon occurring sea cucumbers. Uppsala University, Sweden. ✓Yeeting, Being & Samuelu-Ah-Leong, Joyce. 2008. A first survey of the marine aquarium fish resources of Upolu, Samoa: a look at the status and potential of the resources for marine aquarium trade operations. MAF – Fisheries Division, Secretariat for the Pacific Community (SPC). Pp. 37 ✓MNRE Forest Division is currently implementing forest inventory for Savaii.....Upolu inventory is completed (2013)… as part of Govt of Japan funded Forest Preservation Project.
	2.3 Develop a project to search for the *Punae*	✓BIORAP survey (2013) targeted the Punae (Samoan moorhen). No sightings recorded. Report title needed.

	2.4 Carry out a survey to determine the status of Samoa's seabird population.	
	2.5 Establish a herbarium for Samoa.	✓Japan – NUS herbarium project 2001. NUS has herbarium collection
	2.6 Establish a database for the technical, financial and marketing assistance for all environmentally friendly technologies and developments (such as organic farming).	
	2.7 Develop a monitoring programme to monitor the adverse impact of coral bleaching in Samoa	✓Monitoring of reported coral bleaching have been conducted by Fisheries Division and DEC (reports titles?) ✓Coral bleaching alert system registered. under the NOAA coral reef watch
	2.8 Develop monitoring programmes to monitor the effects of invasive species in Samoa.	✓SNITT established ✓Monitoring of invasive species conducted by Terrestrial Conservation Section ✓Mongoose monitoring ✓Myna bird monitoring ✓Water lettuce ✓Ti'iti'i, Ulusapeti. T. 2011. *Report on the collection of Crown-of-Thorns (COTs or alamea) at Lepa, Falealili and Siumu Districts in Upolu.* Fisheries Division, MAF, Samoa. Pp.8 . ✓Hoffman, Ben. 2012. *The status and impacts of Yellow Crazy Ants (Anoplolepis gracilipes) on Nu'utele, Aleipata Is, Samoa. Final Report.* CSIRO, Australia. Pp.42.
	2.9 Evaluate and assess the effectiveness of past species campaign approaches to assist with the development of new	

	conservation programmes.	
Objective 3: Sustainable Use and Management of Species To ensure the sustainable use and management of species for social and economic development. ***Monitoring Goal:*** Number of sustainable use and management plans in place for species.	3.1 Develop a management plan for the sustainable harvesting of *lupe* as a pilot study for culturally important species.	
	3.2 Build on existing programmes and extend them to cover other areas for the sustainable harvest of indigenous forest timber and non-timber trees.	
	3.3 Support the extension of the indigenous forest regeneration and rehabilitation programmes.	✓1 Million tree planting Initiative for native trees completed in 2012. ✓Tree planting during Environment Week ✓Parks and reserves planting of native trees by MNRE ✓ICCRIFS conducting rehabilitation programs at Lake Lanotoo NP project site 2...proposed rehab activities to conduct for Laulii to Falevao and Mauga o Salafai NP project sites - Draft rehabilitation report on Lake Lanotoo NP 2013 – ICCRIFS project, is available from MNRE Forestry ICCRIFS office
	3.4 Develop programmes for the sustainable harvest of inshore/offshore fisheries.	✓Fisheries regulation ✓Marine Wildlife Protection regulation ✓Village by-laws in association with Villages Fisheries Management Plans for Fisheries Reserves. ✓Samoa Tuna Management and Development Plan 2011 - 2015 ✓Ti'iti'i, Ulusapeti. & Fepuleai, Faasulu. 2011. *Inshore Fisheries Landing Statistics for FY 2010/2011.* Inshore Section, Fisheries Division, MAF. Samoa. Pp. 12.
	3.5 Develop and encourage sustainable	✓Aquaculture programs established by Fisheries Division eg,

	aquaculture/freshwater and marine culture.	tilapia, giant clam, trochus ✓Reintroduction of depleted species including trochus and giant clams in village fisheries reserves.
	3.6 Develop programmes for sustainable harvesting of ornamental plants.	
	3.7 Develop nurseries and botanical plots by local communities for growing medicinal plants	✓Nurseries established under forestry and water sector program with communities. This is focused on watershed rehabilitation and upland forestry and agroforestry plots. Part of it includes encouraging the planting of traditional medicinal plants. ✓ Conducted training of traditional healers on the replanting and conservation of medicinal plants (2001)
	3.8 Identify significant species important for the ecotourism industry and develop programmes that promote their sustainable use (e.g. game fishing, whale watching, bird watching, medicinal tours, mangrove tours, tropical agriculture tours).	✓Sa'anapu/Sataoa Mangrove Conservation Project with ecotourism activities including mangrove tours, and board walks. ✓Turtle watching/swim-with ✓Annual Game Fishing Tournament organized by Samoa Game Fishing Association.
	3.9 Establish environmental certification (green products) for natural resource extraction within the private sector for products that are produced according to sustainable standards (e.g. forest stewardship certification, marine stewardship council and tropical fisheries).	

	3.10 Provide technical, financial and marketing assistance and support for all environmentally friendly developments (such as organic farming).	✓ SATFP assist farmers in agroforestry and woodlots development; ✓ICCRIFS project support marketing assistance for agroforestry farmers within the project sites. Technical assistance including nursery training are available and have been received by some farmers already. ✓Several other similar programs involving Women in Business Inc (WIBD) include those promoting bee-keeping; organic farming, nonu, forest tree nuts farming including canarium (*Canarium indicus*) and fetau (*Calophyllum samoensis*).
Objective 4: Public Awareness & Education To enhance knowledge and understanding of the public on the conservation, sustainable use and management of species. ***Monitoring Goal:*** Proportion of population with commitment to conserve and sustainably manage native species.	4.1 Develop public awareness campaigns to increase the appreciation of the functions and benefits of biodiversity to Samoans utilising the previous campaign approaches.	✓Annual Environment Week on first week of November ✓Arbor Day – first Friday of November annually
	4.2 Develop public awareness programmes for all stakeholder groups on the sustainable use of native and other important species.	✓Educational workshops have been conducted by the ICCRIFS project to project sites (Laulii to Falevao (14), Fusi Safata – Lotofaga Safata (4), Iva – Faga(8) on forest resources protection and management.
	4.3 Integrate information on the sustainable use and management of native and other important species into the school curriculum at all levels.	✓Environment incorporated into the Year 11 & 12 curriculum
Objective 5: Capacity Building To enhance and strengthen the capacity of all Samoans to ensure the sustainable use, management	5.1 Develop and implement local capacity building programmes on biological surveys, monitoring techniques and species management.	✓Surveys conducted involving communities. ✓Whale survey 2012 included final year students from NUS Environment and Conservation unit. ✓NUS Faculty of Science Environmental Science program

and conservation of native and other important species.		provide training for students in surveying and monitoring techniques.
	5.2 Establish a multi-sectoral group of national/local experts to coordinate and undertake species conservation, biological surveys and monitoring programmes.	✓Some groups are established but on an ad hoc basis e.g. Multi-sectoral group to conduct surveys eg, turtle in captivity working group to address turtles in captivity – STA, MWCSD, MAF, SPREP ✓ICCRIFS engaged local experts/stakeholders to monitoring visits to Lake Lanotoo NP rehabilitation works seeking to provide their professional comments on ways to improve the work done – draft report is available.
	5.3 Provide and implement national/local training on community-based species conservation management approaches.	✓Local training on propagating and regenerating ifilele (Intsia bijuga) provided for Uafato woodcarvers as part of the GEF funded SPBCP Uafato Conservation Area Project. • Turtles in captivity ✓P3D model training which was conducted to local communities of ICCRIFS project site encouraging local people in identifications of their land resources and impacts as well as management actions
	5.4 Develop and implement appropriate training for communities to promote the sustainable use of species as a possible income generating activities.	✓ Local training on the sustainable use and management of the Ifilele resource (Intsia bijuga) provided for Uafato woodcarvers as part of the GEF funded SPBCP Uafato Conservation Area Project.
	5.5 Assess and review appropriate and effective approaches for the conservation and management of species.	✓Recovery and action plans developed to address conservation measures for threatened species eg, manumea/maomao recovery plan, marine species action plan ✓NUS Faculty of Science Environmental Science 200 & 300 level courses.

3.4 THEME 4: COMMUNITY **Strategy Goal:** Empowering and encouraging traditional communities to protect, conserve and sustainably use and manage our biodiversity.		
Objective 1: Traditional Knowledge, Practices and Innovation Preserve traditional knowledge and practices of Samoa that are important for the protection, conservation and sustainable use of biodiversity. ***Monitoring Goal:*** Number of programmes undertaken to preserve traditional knowledge, practices and innovations.	1.1 Conduct research and develop a national register to document and preserve traditional knowledge, practices and innovation important for the conservation of biodiversity.	
	1.2 Develop sui generis legislation to protect traditional Samoan knowledge, practices and innovation, and to provide benefit sharing mechanisms for appropriate knowledge holders.	✓ MCIL & AG currently (2004) developing legislation to facilitate patenting of traditional knowledge ✓ provisions for the use of TK related to biodiversity is strengthened in EMC Bill (2013) currently before Government.
	1.3 Develop appropriate legislation that promotes the decentralization of monitoring and enforcement of Environmental regulations to village and local communities.	
	1.4 Integrate modern science and technology with traditional knowledge, practices and innovation to promote the conservation and sustainable use of biodiversity.	• This will be part of the mandate for the new NUS Marine & Environment Research Center to be housed at the NUS Ocean Campus to be built at Mulinuu by the Chinese Govt.
Objective 2: Empowering	2.1 Review approaches for village and	✓SUNGO worked collaboratively with MNRE on this – Uafato bee

Communities Empowering communities to conserve and sustainably manage biodiversity under customary resource tenure. ***Monitoring Goal:*** Number of villages with conservation areas or who have incorporated sustainable uses guidelines into village decision-making processes.	district community programmes for the conservation and the sustainable use of biodiversity and improve their implementation.	keepers (NGO) ✓By-laws for managing inshore fisheries resources as part of Fisheries Management Plans, completed and approved for a number of villages e.g. Savaia, Aufaga, with earliest by-laws reported in 2002. ✓ Completed management plans for Safata and Aleipata Is MPA – 2003. ✓ funding of national expert assistance incorporated into national annual budget from 2003 ✓ established Sili village water supply system and upland forest conservation area in 2003
	2.2 Integrate activities that promote the conservation and sustainable use of biodiversity into relevant agencies' outreach programmes.	✓MESCAL project ✓Marine Protected Areas
	2.3 Encourage the full participation of all the different target groups in villages in the coordination and implementation of conservation and sustainable use programmes.	✓Different groups have been consulted during the ICCRIFS project consultation. Questionnaire surveys conducted targeting these groups (women, untitled men, matai) seek their understanding on forestry resources and their management, etc....
	2.4 Establish an award/incentive scheme for environmentally friendly villages that promote conservation and the sustainable use of biodiversity.	✓Village beautification project - STA
	2.5 Promote inter village/district exchange programmes for the dissemination of information and sharing of experience on	✓Inter-village exchange is encouraged by GEF-SGP, with one workshop in Tafagamanu (2009/2010?) bringing reps of villages with SGP projects from Savaii and elsewhere to share

	the conservation and sustainable management or use of biodiversity.	information and experiences. ✓ OLSSInc facilitated visit by Sili chiefs to Fagaloa to Taelefaga to observe the Afulilo hydropower project and to discuss issues of environmental degradation in Fagaloa Bay. ✓Information from this exchange was cited by Tafitoala village during consultations with EPC in 2011 which contributed to their decision not to support a hydro development using the Tafitoala stream. ✓ GEF SGP workshop in Tafagamanu (2009/2010?) involving reps of villages with SGP funded projects sharing experiences and information.
Objective 3: Public Awareness & Education To promote, encourage and strengthen awareness and understanding of local communities on the importance of protecting, conserving and ensuring the sustainability of any use of biodiversity, through appropriate awareness campaigns and educational programmes.	3.1. Develop and implement public awareness programmes for village councils and relevant target groups on the functions and benefits of conserving and the sustainable use of biodiversity.	✓AIREP ✓Waste management (3Rs) ✓One million tree planting ✓Mangrove replanting ✓Tsunami recovery work ✓Coastal tree replanting initiative
	3.2 Promote and conduct public awareness campaigns and programmes through media, workshops/seminars and information materials for communities to enable them to make appropriate decisions on the use of their natural heritage.	✓Aeipata Is Rat Eradication Project (AIREP) ✓Manumea ✓Waste management (3Rs)

	3.3 Integrate information on traditional knowledge that is important for the conservation and sustainable use of biodiversity into the education curriculum.	✓ GEF SGP workshop in Tafagamanu (2009/2010?) involving reps of villages with SGP funded projects sharing experiences and information. ✓ Villages Fisheries Management Plans under MAF project have been doing this, and include bans in the FMPs on traditional fishing practises such as tu'iga 'amu (for tu'u'u) and use of ava niu kini.
Objective 4: Capacity Building To build the capacity of traditional communities in the coordination and implementation of conservation and appropriate biodiversity programmes.	4.1 Provide capacity building training for traditional communities in undertaking community-based biological studies and monitoring programmes.	
	4.2 Provide training for villages on their legal rights and appropriate procedures for reporting environmental offences.	✓Simple Law group had a series of workshops in 2006/7 to explain laws to villages.
	4.3 Provide training programmes for traditional communities on the development and management of conservation programmes.	✓SUNGO trainings – through ICTP for community based organizations; ✓ METI, CSSP, GEF-SGP, MNRE (?) also implement similar activities.
3.5 THEME 5: ACCESS & BENEFIT SHARING FROM USE OF GENETIC RESOURCES **Strategy Goal:** Samoa's genetic resources are accessible for utilisation and benefits derived are equitable shared amongst the stakeholders.		
Objective 1: Access to & Equitable Sharing of Benefits of Genetic Resources	1.1 Finalise and enact the Environment (Bioprospecting) Regulations.	• Draft bioprospecting regulation yet to be enacted. Framework however has been used in two ABS agreement in 2001 and 2004.
	1.2 Develop procedures to ensure that the	✓Application form

To establish appropriate national measures to effectively access genetic resources and carry out fair and equitable sharing of benefits from the use of these resources.	Environment (Bioprospecting) Regulations are effectively enforced and monitored**.**	✓Requirements for access to local biodiversity ✓Export permit ✓Letter of Agreement (LOA), Consent
	1.3 Review the need for a National Bioprospecting Coordinating Body.	
	1.4 Develop benefit sharing mechanisms for holders of knowledge and owners of resources utilised in bioprospecting.	✓ Three ABS Agreements have been signed - Faealupo Covenant (1989), Agreement between AIDS Research Alliance (ARA) and the Government of Samoa (2001), and Agreement between the Univ of California Berkley and the Government of Samoa (2004) for R&D using Homolanthus nutans and traditional knowledge of its healing properties from healers in Falealupo.
	1.5 Develop mechanisms for access to traditional knowledge and genetic resources.	✓ a bio-prospecting permit system is in place but the appropriate legislation to support it remains to be enacted.
	1.6 Explore opportunities to restore Samoa's endemic biodiversity, held in collections outside of Samoa. Identify outside ex-situ collections holding Samoa's biological and genetic resources, and develop agreements for the restoration and repatriation of ownership rights.	• No confirmed actions taken to date.
Objective 2: Public Awareness and Education To raise awareness and understanding of all Samoans on Access and Benefit Sharing from the Use of Genetic Resources.	2.1 Develop and implement public awareness campaigns on Environment (Bioprospecting) Regulations.	
	2.2 Conduct national Seminars involving all key stakeholders on Access and Benefit Sharing programmes on the use of	

	Genetic Resources.	
	2.3 Coordinate and implement Media programmes to raise awareness.	
3.6 THEME 6: BIOSECURITY **Strategy Goal:** To protect Samoa's native biodiversity from impacts of alien invasive species, through effective border control, effective quarantine and eradication programmes.		
Objective 1: Policy and Legislation To develop appropriate policies and legislation to ensure the effective management of biosecurity.	1.1 Establish a coordination committee on the protection of indigenous biodiversity from alien introduction.	✓Samoa National Invasive Task Team
	1.2 Develop policy and actions for the management of biosafety issues.	✓Quarantine Biosecurity Act, 2005 ✓National Invasive Species Action Plan (NISAP)
	1.3 Review and make appropriate amendments to the screening process for alien species introductions to include assessment of impacts on native biodiversity.	
Objective 2: Control and Eradication To identify and develop appropriate programmes to ensure effective control and eradication of pest outbreaks.	2.1 Strengthen facilities and procedures for border control and quarantine services.	✓Surveillance program of Samoa's EEZ (MAF Fisheries) ✓MAF's border and quarantine services at international seaports and airports.
	2.2 Develop programmes for the	✓African Snail project

	eradication and control of priority invasive species; African land snail, mint weed, Kosters curse, night blooming cestrum, cane toad, rattan, and others.	✓Myna bird control project ✓Merremia vine eradication demonstration trials in collaboration with SPREP ✓Rattan eradication program by MNRE Forestry/DEC ✓Mt Vaea restoration project ✓ICCRIFS conducting control/eradication of invasive tree species targeting mainly *tamaligi, puluvao* and *fa'apasi* on Lake Lanotoo NP through the rehabilitation program
	2.3 Develop a programme for the eradication of rodents from small islands which can be used for the conservation of rare species such as the tuaimeo.	✓Aleipata Is Rat Eradication Project (AIREP)
	2.4 Implement the PacPOL programme to protect native marine biodiversity through the discharge of ships' ballast water.	
Objective 3: Research and Monitoring To carry out systematic and scientific research based on regular monitoring of the biosecurity management system.	3.1 Review pest species present amongst Samoa's trading partners and develop response procedures to eradicate any that arrive.	✓Mongoose project
	3.2 Strengthen national research stations to be able to undertake appropriate scientific research and testing of introduced species.	• New marine & environment research center at NUS Ocean Campus Mulinuu expected date of completion (July 2015)
	3.3 Review and update the list of invasive species in Samoa.	✓National Invasive Species Action Plan **(**NISAP) list of invasive species

	3.4 Assess the risks on native biodiversity from recent species introductions such as the myna, bulbul, tamaligi, pulu vao, etc.	✓Mt Vaea restoration project
Objective 4: Capacity Building To strengthen capacity of local staff through the implementation of relevant training programmes to ensure effective border control and quarantine services.	4.1 Provide training and capacity building for local staff on the screening of any new species introduction	✓Biosecurity Training
	4.2 Undertake capacity building training for Quarantine staff on border control and quarantine services	
Objective 5: Public Awareness and Education To enhance knowledge and understanding of the public on the importance of protecting and conserving our biodiversity from the impacts of alien species.	5.1 Develop and implement a national public awareness programmes for invasive species to prevent illegal introductions and encourage control.	✓Myna awareness programs ✓ Aleipata Is Rat Eradication Project (AIREP) consultation program ✓Community consultation program on mongoose
3.7 THEME 7: AGROBIODIVERSITY **Strategy Goal:** The conservation and sustainable use of agrobiodiversity contributes to national development and the preservation of traditional knowledge and practices.		
Objective 1: Conservation and Sustainable Use of Agrobiodiversity	1.1 Promote methodologies for sustainable use of Agrobiodiversity.	✓MAF's Taro Breeding Program ✓MAF Coconut Breeding Program ✓MAF's Agriculture Sector Plan ✓Agroforestry encourage under the ICCRIFS and directly

To ensure the effective implementation of appropriate conservation measures for the sustainable use of agrobiodiversity.		supported under SATFP encourages the mixing of timber trees and crops and livestocks. SROS (soil biodiversity research) – in progress
	1.2 Eliminate unsustainable Agrobiodiversity use.	
	1.3 Establish incentives which encourage conservation and sustainable use of Agrobiodiversity.	✓Coconut bio-diesel pilot project (on-going) ✓World Bank funded SACEP (2013 – on-going) promoting sustainable agriculture and use of IPM & providing credit for eligible farmers.
	1.4 Promote environmentally sound agricultural practices such as 'farming systems', Agroforestry and organic farming.	✓SROS taro cross breeding research ✓Bee keepers farming – Uafato ✓ village training in vegetable gardening using native species by WIBDI from 2002 ✓ planting programs promoting pandanus replanting by METI and WIBDI from 2000
	1.5 Place greater emphasis on the importance and establishment of botanical gardens.	✓ICCRIFS project (elaborate acronym) ✓Forest Preservation and Management Project (FPAM with JICA funding) ✓Several botanic reserves have been established since last NBSAP e.g. Fuluasou Botanic reserve
	1.6 Expand in-situ/ex-situ conservation and sustainable activities, protected areas, aquaculture/mariculture.	✓ICCRIFS ✓ Forest Preservation and Management Project (FPAM with JICA funding) - Organic farming – needs more information

	1.7 Develop new and enhance existing programmes for the preservation of traditional species, varieties and breeds.	✓MAF's and MWCSD's Talomua program ✓MNRE's I Million Tree Planting Campaign 2010 - 2012
Objective 2: Research and Development To conduct relevant research critical to the development of Agrobiodiversity.	2.1 Develop programmes for the protection of native/useful species and varieties from the impact of alien and invasive species.	✓Mt Vaea Reserve restoration project (MNRE) ✓ Forest Preservation and Management Project (FPAM with JICA funding)
	2.2 Assess the impacts of new biotechnologies (genetic expressions, Living or Genetically Modified Organisms and Genetically Engineered Organisms) on Agrobiodiversity.	• Biosafety Clearing House Mechanism
	2.3 Conduct inventories and promote surveys of existing Agrobiodiversity resources. .	• FPAM • ICCRIFS
	2.4 Establish herbaria to preserve specimens of native species.	✓ National University of Samoa – this work is in progress.
	2.5 Develop new and expand existing markets for local species and varieties	✓ WIBD Inc reported success in exporting oil extracted from *Calophyllum inophylum* (fetau)
	2.6 Document and publish research findings.	• NUS Center for Samoan studies journal
	2.7 Develop and implement a Code of Conduct/Code of Ethics for carrying out	

	research.	
	2.8 Develop and implement research and development training programmes for all relevant institutions involved in Agrobiodiversity programmes	• ICCRIFS – training conducted in three project sites for local farming households on various land use techniques including agroforestry practises.
Objective 3: Food and Health Security To fully enhance and strengthen the critical importance of food and health security through the use of sustainable Agrobiodiversity practices.	3.1 Encourage sustainable breeding practices.	✓MAF's Taro Breeding program has produced several new varieties of taro that are highly resistant to TLB, high yielding and of export quality. These new varieties have since been mass propagated and are forming the basis of a resurgent taro export drive.
	3.2 Develop and implement Agrobiodiversity programmes that not only increase food productivity but also restore and enhance agrobiodiversity.	
	3.3 Develop new and existing programmes that promote the production of nutritional food.	
	3.4 Increase and improve inspection criteria on the quality of both locally produced and imported food.	
Objective 4: Public Awareness and Education To raise awareness and understanding of Agrobiodiversity through both formal and informal educational programmes.	4.1 Undertake national awareness programmes through all media, workshops, seminars utilising the involvement and commitment of communities, on the sustainable use of Agrobiodiversity.	
Objective 5: Capacity Building	5.1 Undertake systematic training to	

To strengthen human and institutional capacity to ensure the effective implementation of Agrobiodiversity programmes.	enhance understanding and awareness of and also to strengthen public involvement in and commitment to Agrobiodiversity practices.	
	5.2 Increase collaboration and coordination of the institutions directly involved in Agrobiodiversity programmes.	
	5.3 Integrate traditional and modern practices to further improve the Agrobiodiversity of Samoa.	
3.8 THEME 8: FINANCIAL RESOURCES & MECHANISMS **Strategy Goal:** To secure long-term financial sustainability of all Conservation and Biodiversity related programmes by way of access to funding mechanisms from local and international sources.		
Objective 1: Financial Plans To develop long term Financial Plans for undertaking Conservation Programs. ***Monitoring Goal:*** Long term financial plan for financing biodiversity work developed.	1.1 Develop a long-term financial plan for undertaking conservation programmes in Samoa.	
	1.2 Establish a programme for increasing financial assistance for conservation work through Foundations and other aid donors.	
	1.3 Coordinate an annual or biannual donors meeting to present biodiversity priorities for funding	
Objective 2: Conservation Trust Fund To establish a Conservation Trust	2.1 Identify funding sources for the establishment of a Conservation Trust Fund to provide long term financial	• Limited relevance to the prescribed activity but the Aleipata & Safata Trust Fund was reviewed with lessons learned documented that will benefit future similar endeavours.

Fund for the implementation of the NBSAP and relevant Biodiversity Work.	sustainability for the implementation of NBSAP and relevant biodiversity related work.	
	2.2 Establish a Conservation Trust Fund and provide guidelines and set criteria for its use.	
	2.3 Explore the feasibility of establishing conservation taxes and charging for permits for the use of Samoa's biodiversity.	
	2.4 Develop guidelines for establishing community-based conservation trust funds.	
Objective 3: Economic Valuation To undertake an Economic Valuation of Samoa's Biodiversity. ***Monitoring Goal:*** Report on the economic values of Samoa's biodiversity.	3.1 Conduct a study on the introduction of user fees for national parks and reserves, to supplement government funding for work in these reserved areas.	
	3.2 Institute environmental economic valuation methodologies for assessing the full economic value of biodiversity.	
	3.3 All user fees, taxes, fines and other revenues determined in the economic valuation should be deposited in the Conservation Trust Fund.	
	3.4 Integrate biodiversity valuation as an integral part of land use and coastal use	✓ MAF's land-crop capability matching maps (2010) facilitates agricultural valuation of lands with potential for agriculture.

	planning.	
Objective 4: Information Systems To establish Information Systems of all Potential Donor Assistance. ***Monitoring Goal:*** Number of donors on the national biodiversity database.	4.1 Establish and regularly update a database of all potential donor assistance programs.	
	4.2 Develop a mechanism to determine different funding sources channeled to NGO's for implementation of Biodiversity related programs.	
	4.3 Maintain and strengthen existing networks with donor agencies	
Objective 5: Income Generating Activities To identify and promote sustainable Income Generating Activities for the community. ***Monitoring Goal:*** Number of income generating started in conjunction with conservation and sustainable use initiatives.	5.1 Identify and develop appropriate programs to promote sustainable income generating activities at the community level.	Aquaculture – MAF Division ✓GEF funded South Pacific Biodiversity Conservation Project (SPBCP) and International Waters Program actively promoted sustainable income generating activities in participating local communities including initiating the mangrove based ecotourism activities at the Saanapu-Sataoa Mangrove Conservation Project, and forest bird watching activities and hiking activities in the Uafato Forest Conservation Project.
	5.2 Establish a network with public and private sectors including donor agencies to support Income Generating Activities.	
	5.3 Conduct feasibility studies for newly proposed Income Generating Activities.	
	5.4 Establish and update a database to record all Income Generating Activities implemented locally.	

Objective 6: Partnership To strengthen the Partnership with the Private Sector, NGOs, and Local Communities. ***Monitoring Goal:*** Number of partnerships for conservation between private sector, Government, NGOs and Local Communities.	6.1 Develop and implement programmes to strengthen the partnership with the private sector, NGO's and local community in implementing Biodiversity related programmes.	✓METI Inc is subcontracted to implement part of the SATFP utilizing its strong links and extensive networks with farmers groups and local communities as well as in-house capacity and expertise. ✓NGOs are engaged to the implementation of agroforestry component of ICCRIFS
	6.2 Establish a special award for an environmentally-friendly company to be integrated in the Exporter of the Year Award programme.	
	6.3 Establish an award programme for environmentally-friendly community development.	
Objective 7: Accounting System To establish an Accounting System for recording revenues and expenditures for Biodiversity related activities. ***Monitoring Goal:*** Number of agencies and projects with accounting systems to record revenues and expenditures for biodiversity related activities.	7.1 Set up a network with relevant Biodiversity agencies for recording revenue from and expenditure on biodiversity-related activities.	
	7.2 Produce regular progress reports (including financial statements) for each biodiversity project.	✓Quarterly progress reports are provided by ICCRIFS since 2011 ✓First Biosafety National Report to CBD ✓Second Biosafety National Report to CBD
	7.3 Establish mechanisms for the establishment of national green accounting in Samoa.	

Objective 8: Capacity Building To strengthen the local capacity in the coordination and implementation of Biodiversity and Conservation Projects.	8.1 Identify existing capacity development needs in addressing biodiversity and conservation related programs.	✓ Comprehensive assessment of capacity needs is identified in the National Capacity Self-Assessment Project, a GEF funded initiative that covers capacity needs for the implementation of all GEF supported conventions including CBD.
	8.2 Secure financial assistance to develop and implement capacity development programs.	
	8.3 Develop capacity building programs to improve financial management planning and implementation of biodiversity conservation projects.	
Objective 9: Public Awareness To raise public awareness of existing and potential financial resources.	9.1 Publish and disseminate as widely as possible information on funding mechanisms.	