Scientific Research Organisation of Samoa

Corporate Plan
2017 - 2020

Contents

FOREWARD

Hon. La'aulialemalietoa Asiata Leuatea P.F. Schmidt
Minister of SROS

The Scientific Research Organisation of Samoa (SROS) was established in 2006 to provide scientific and technical research for the Government and to develop new technologies to benefit Samoa's local industry and in turn the economy.

Moreover, SROS's inception was based on the realization that adding value to the development of primary produce for import substitution and export, will reduce economic leakage and overcome some of the trade challenges currently experienced, respectively, and contribute towards increased economic benefits. Reducing Samoa's dependence on imported fossil fuel through local research into renewable and sustainable alternatives will also benefit Samoa's economy greatly in terms of foreign exchange savings and address climate change associated threats to Samoa's environment. Thus, research and development in these two focal areas will serve the mandate of SROS, which is to promote the national economy through scientific research and development. It must be pointed out that this rationale is also in line with the Government's new Strategy for the Development of Samoa (2017-2020), key outcomes of which include revitalizing the agriculture and manufacturing sectors to produce value added goods and services that will ultimately assist with the overall growth of the national economy.

This is the sixth Corporate Plan prepared for the Organisation and it was developed after extensive and elaborate review and consultation with the relevant stakeholders, comprising key representatives of the private and public sectors, and civil societies with diverse expertise and experiences covering agriculture, food processors, rural community development, and business to name a few. Their considerable contributions have enhanced the relevance of the strategies and activities of the Corporate Plan, and strategically places SROS in a solid position to deliver on its mandate, and be more responsive to the research interests and needs of our stakeholders, thereby contributing to the overall development of Samoa. Also, the involvement of the SROS Board of Directors, Management and Staff in the review process is aimed to encourage a strong sense of ownership and commitment, to successfully deliver on the objectives and strategies set out in the Corporate Plan for the next four years, 2017–2020.

This blueprint provides a clear and well documented framework of the Organisation's priorities and goals and despite the many challenges anticipated ahead, there are opportunities to make positive, lasting differences. I am confident SROS will continue to be Samoa's flagship in research and development, producing significant breakthrough initiatives for the betterment of our economy and people.

Honourable La'aulialemalietoa Asiata Leuatea P.F. Schmidt
MINISTER
SCIENTIFIC RESEARCH ORGANISATION OF SAMOA

OFFICE OF THE MINISTER OF AGRICULTURE and FISHERIES
The Common Seal of

1. EXECUTIVE SUMMARY

This Corporate Plan sets out the Scientific Research Organisation of Samoa's (SROS) future research and development strategy for the next four-year period, identifying its research objectives and priorities in light of its opportunities and constraints.

It was formulated in a consultative manner involving the relevant stakeholders of SROS from the public and private sectors, civil societies, SROS's Board of Directors and Management that was held in April 2016. The Plan is based on the review of SROS's 2014-2017 Plan, the assessment of existing and proposed new research priorities according to their economic value and benefits, alignment to SROS's mandate and Act, and most importantly it looks at the potential to support key stakeholders with their research and development initiatives and efforts, and provide valuable contribution and support towards achieving the national goals and strategies set in the new Strategy for the Development of Samoa (SDS) 2017-2020.

Vision

"Achieving a significant improvement in Samoa's GDP and social benefits through research and the development of value adding to Samoa's goods and services"

Mission Statement

"To conduct scientific research and develop technologies of great value in the sustainable development of value added goods and services for export, and to achieve reduction in fuel imports and greenhouse gas emissions"

To support its vision and mission statement, SROS is committed to delivering on the following key objectives contained in the Scientific Research Organisation of Samoa Act 2008 that is derived from the Research and Development Institute of Samoa Act 2006 ("the principal Act").

Objectives

a) To promote the national economy of Samoa based on research and development;
b) To undertake scientific and technical research with the primary aim of adding value to local resources and services;
c) To develop functional prototypes of products and processes based on scientific and technical research for the local or overseas markets;
d) To establish partnership with the private sector and commercial interests to support the Organisation's activities**;**
e) To ensure effective training for researchers and professionals engaged in scientific and technical research work;
f) To conduct analysis of narcotics or precursors for the purposes of investigations and prosecution of offences; and,

g) To undertake environment impact assessments.

Functions

(1) The Organisation also performs various functions such as:
   a) To carry out scientific research and develop technologies for any of the following purposes:
      (i) contributing to the achievement of national goals in the Strategy for the Development of Samoa and any other national plan of Samoa;
      (ii) assist local industries, Government Ministries, corporations and agencies;
      (iii) furthering the interests of the community;
      (iv) any other purpose determined by the Board; and,
      (v) conducting analysis of narcotics or precursors for the purposes of investigations and prosecution of offences.
   b) To encourage and facilitate the application of the results of any other scientific research;
   c) To act as a means of liaison between Samoa and other countries in matters related with scientific research and development;
   d) To train and to assist in the training of researchers and workers in the field of science and to cooperate with tertiary education institutions, both local and overseas, in relation to education in any field of science;
   e) To establish and award fellowships for students to do research, and to make grants in aid of research, for a purpose referred to in paragraph (a);
   f) To collect, interpret and disseminate information relating to scientific and technical matters;
   g) To publish scientific and technical reports, periodicals and papers; and,
   h) To carry out environment impact assessments.
(2) In performing its functions, the Organisation shall take into account relevant Government policies as communicated to the Organisation by the Minister or the Board of Directors.
(3) The Organisation shall also treat the functions referred to in a) and b) as its primary functions, and treat the other functions referred to in c) to h) as its secondary functions.
(4) The Organisation may:
   a) Carry out food analysis and testing required under any food legislation or other enactment; and,
   b) Issue reports or certificates regarding food analysis and testing under a).

Inextricable links exist between economic growth, trading of value added goods and market price of fuel imports. By advancing scientific research and technological developments in priority areas such as food production, food processing and alternative energy sources that are renewable, considerable benefits could be gained to improve the prospect of the national economy. The selected strategies and activities range from new product development including postharvest technologies, and quality management systems through to renewable energy and positive impacts on the environment.

This Plan remains in line with the promotion of commercial investment as highlighted in the new SDS 2017-2020, given its emphasis on the revitalization of the agriculture sector through the development of value added products and services and the strengthening of self-reliance in food production and nutritional security to reduce import of agricultural products.

In addition, SROS currently uses tests accredited by International Accreditation New Zealand (IANZ) to provide technical service support to our key Government agencies, farmers, food processors and exporters, by certifying local products for conformance to local and international safety and quality standards. The Government's drive to aggressively explore and harness the use of reliable and affordable indigenous energy resources to generate sustainable and environmentally sound energy services and supply is also another priority of SROS, with research focus on biofuels and biogas developments for electricity generation and transportation.

Financially, whilst SROS continues to be heavily reliant on core funding by the Government, it is committed to continually build and strengthen its earning capacity through the provision of its IANZ certified technical services (including narcotics analysis) and specialized consultancy expertise to key industry and public stakeholders. It also continues to actively seek and pursue alternative funding and mutually beneficial partnerships, to undertake various critical research projects and translate research results (products and processes) into commercial reality and application by individuals and communities. This will be the ultimate goal during this four year life cycle of the Plan, with the desired aim to positively contribute towards Samoa's economic development.

2. MANDATE

The SROS exists to promote the national economy of Samoa through scientific and technical research that add value to local resources and services, and form partnerships with public and private sectors, commercial interests and communities, to apply and commercialise research outcomes of products and processes developed to test domestic and overseas markets.

SROS is a public beneficiary body constituted and operating under the provisions of the:

- Public Bodies (Performance and Accountability) Act 2001;
- Research and Development Institute of Samoa Act 2006 (the Principal Act);
- Scientific Research Organisation of Samoa Act 2008;
- Labour and Relations Act 2013; and,
- Public Finance Management Act 2001.

SROS also adheres to specific reporting requirements required of Public Bodies to Government as laid out by the Ministry for Public Enterprises and Ministry of Finance.

In terms of contribution and support towards the priority areas of the new SDS 2017-2020, SROS plays important roles across all four sectors:

- Priority Area I: Economic Sector
  - Key Outcome 2: Re-invigorated Agriculture

- Priority Area II: Social Policies
  - Key Outcome 6: Healthy Samoa

- Priority Area III: Infrastructure Sector
  - Key Outcome 9: Sustainable Access to Safe Drinking Water and Basic Sanitation
  - Key Outcome 12: Sustainable Energy Supply

- Priority Area IV: The Environment
  - Key Outcome 13: Environment Sustainability
  - Key Outcome 14: Climate and Disaster Resilience

SROS's contributions in these priority areas are summarised in the following sections of this Plan.

3. ENTITY PROFILE

3.1. Organisational Profile

The Public Beneficiary Body was established in 2006 and was known as the Research and Development Institute of Samoa (RDIS) mandated under the principal Act, the Research and Development Institute of Samoa (RDIS) Act 2006. Further amendments to its objectives and functions were enacted in 2008 and its name subsequently changed to the Scientific Research Organisation of Samoa (SROS) under the Scientific Research Organisation of Samoa (SROS) Act 2008. SROS's set up to provide scientific and technical research, and develop technologies that would add value to the goods and services provided by the private and public sectors, and ultimately contribute to the national economy of Samoa.

3.2. Organisational Structure

SROS has a Board of Directors with membership comprising of seven representatives from both private and public sectors to conform to the Composition of the Boards of Public Bodies Act 2001. Since April 2012, a new Chairman of the Board was appointed by Cabinet from the seven members (photo 1) to replace the Minister responsible for SROS or the Shareholding Minister on the Board. The Management of SROS is vested in the Board, which is responsible to the Minister of the Organisation.

The Board of Directors of SROS performs the following functions:

- Ensures the proper and efficient performance of the functions of SROS;
- Determines the policy of SROS with respect to any matter;
- Gives directions relating to the administration of the SROS Act 2008 to the Chief Executive Officer; and,
- Such other functions as are conferred on it by the SROS Act 2008.

The Chief Executive Officer (CEO) as a non-voting Board member is responsible for leading and managing employees of SROS in accordance with requirements determined by the Board. Assisting the CEO are the Divisional Leaders, and together they form the Senior Management Group that assists the CEO in managing the research, development and operational activities of SROS.

SROS consists of four technical divisions, namely Environment and Renewable Energy Division (ERED), Plant and Postharvest Technologies Division (PPTD), Food Science and Technology Division (FSTD) and Technical Services Division (TSD), which are supported by the Administration and Finance Division (AFD).

Photo 1: SROS Board of Directors [Sitting (L to R) Jewell Monica Cook, Sulamanaia Montini Ott (Chairman), Tusani Iosefatu Reti, Fonoiava Sealiitu Sesega; Standing (L to R) Tilafono David Hunter, Dr. Satupa'itea Viali, Dr. Sonny Lameta, Suluimalo Amataga Penaia (insert)].

3.3. Functions of the Divisions

The main function of SROS is the administration and implementation of the development of new or the review of existing strategic policies relating to scientific research and development. Other functions of the Organisation are also subject to related Cabinet Directives and other related government laws.

- ERED is responsible for research on the scientific development and sustainable management of renewable energy resources, and the evaluation of the environmental stability of agricultural practices and other related activities.

- PPTD is responsible for research and development on plant resources with commercial, medicinal, cosmetic and export potentials, with a particular focus on the development and application of relevant postharvest technologies to minimize losses, ensure food security as well as adherence to international standards, which could improve prospects of the national economy.

- FSTD is responsible for research on food material, to develop appropriate technologies to advance commercial prospects in new product development prototypes, packaging, and food preservation, sensory and agro-processing that would improve prospects of the national economy.

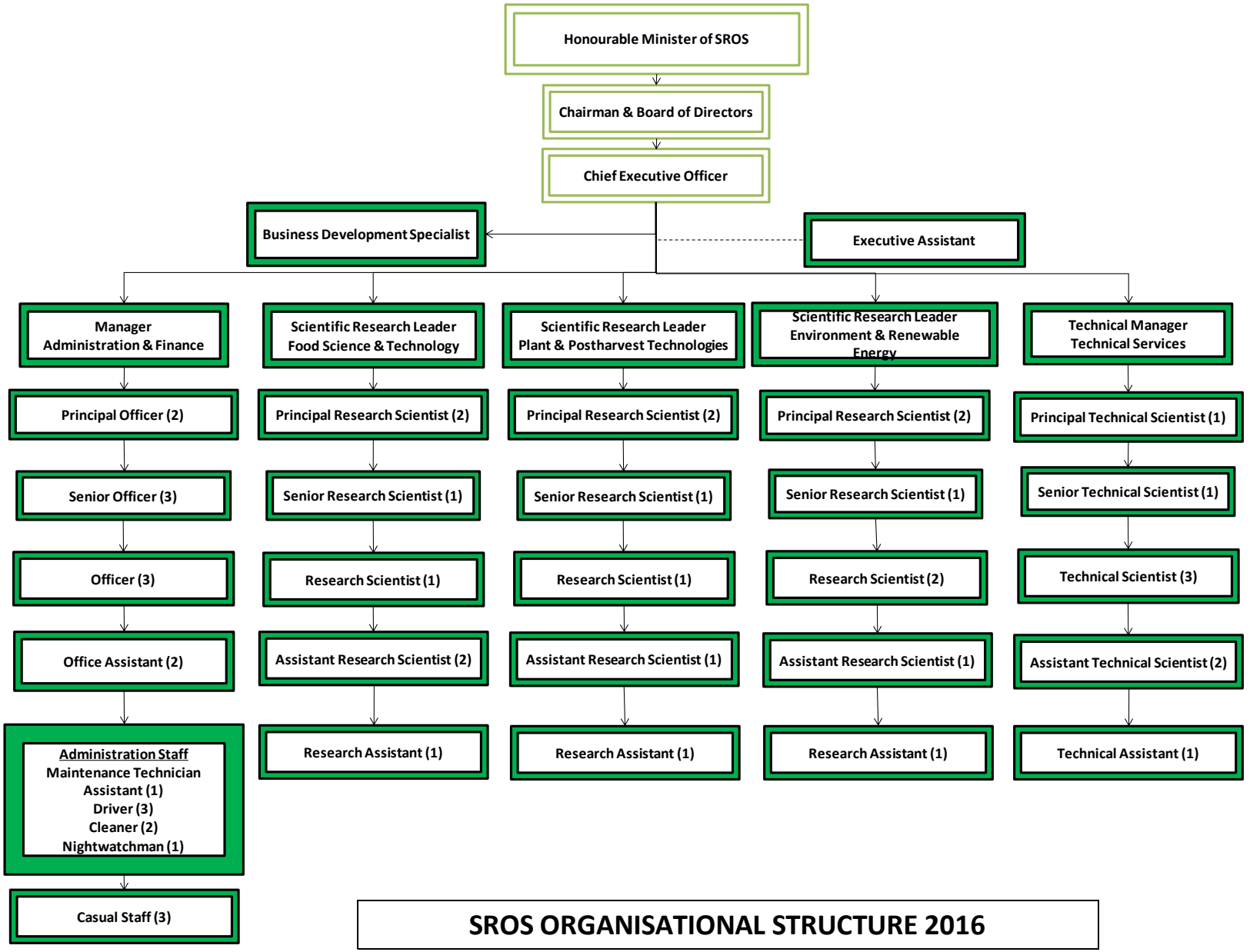
- TSD is responsible for the provision of relevant technical and quality services to goods, food and food products to ensure excellent quality, food safety and suitability for trade. It is also

responsible for narcotics analysis for the purposes of investigations and prosecution of offences.

- AFD is responsible for the management of SROS's financial resources, necessary administrative and support services to the technical divisions, and oversight and coordination of the human resources of SROS.

At present, SROS is core funded by Government to the level of 95% of its budget annually, with a commitment to continuously strengthen its earning capacity to provide some level of self sufficiency and lessen its dependency on Government funding. Ongoing revenue earning streams for SROS are technical and consultancy services provided to key stakeholders. New revenue streams are being sought from the commercialisation of key research outcomes to establish operations in partnership with business and industry stakeholders, and our communities.

For scientific research and development programmes designed to have positive economic and social benefits for our country, SROS continues to seek Government funding support while concurrently pursuing external financing of specific research projects from development partners, business partners in industry, and relevant Government and international agencies.


Honourable Minister of SROS
Chairman & Board of Directors
Chief Executive Officer
Business Development Specialist
Executive Assistant
Manager Administration & Finance
Scientific Research Leader Food Science & Technology
Scientific Research Leader Plant & Postharvest Technologies
Scientific Research Leader Environment & Renewable Energy
Technical Manager Technical Services
Principal Officer (2)
Principal Research Scientist (2)
Principal Research Scientist (2)
Principal Research Scientist (2)
Principal Technical Scientist (1)
Senior Officer (3)
Senior Research Scientist (1)
Senior Research Scientist (1)
Senior Research Scientist (1)
Senior Technical Scientist (1)
Officer (3)
Research Scientist (1)
Research Scientist (1)
Research Scientist (2)
Technical Scientist (3)
Office Assistant (2)
Assistant Research Scientist (2)
Assistant Research Scientist (1)
Assistant Research Scientist (1)
Assistant Technical Scientist (2)
Administration Staff
Maintenance Technician
Assistant (1)
Driver (3)
Cleaner (2)
Nightwatchman (1)
Research Assistant (1)
Research Assistant (1)
Research Assistant (1)
Technical Assistant (1)
Casual Staff (3)
SROS ORGANISATIONAL STRUCTURE 2016

4. STRATEGIC ISSUES

4.1. Assessment of Results

4.1.1. Non-Financial

The following table 1 outlines SROS's non-financial objectives as outlined in the last Corporate Plan 2014-2017 and the main outcomes achieved up to April 2016.

Table 1: Non-financial objectives as indicated in SROS Corporate Plan 2014–2017, and outcomes achieved up to April 2016.

	Strategies	Performance Measures	Outcomes achieved up to April 2016
		Objective 1. To promote the national economy of Samoa based on research and development.	
	S1.1 Develop postharvest technology for at least 2 crops to facilitate the revival of agricultural produce & products (e.g., taro, breadfruit, cocoa, coconut).	P1.1.1 Ongoing consultation of relevant stakeholders to ascertain national postharvest requirements.	• Consultations with the Pacific Horticultural & Agricultural Market Access (PHAMA) Market Access Working Group (MAWG) comprising representatives from SAME, MAF, MCIL, SFA, WIBDI, Bee Keeping Association, Pacific Oil, Taro Industry & STEC, on frozen pathways for taro & breadfruit, & cocoa drying & fermentation. • Consultations with the Pacific Agricultural Research Development Initiative (PARDI) project partners (SPC, USP, MAF & SFA) on screening of new taro lines from joint SPC-USP-MAF taro breeding programme. • Consultations with FAO with regards to consultancy on postharvest losses and food security. This has now led to a second consultancy for capacity building for SROS. • Consultations with MCIL-coordinated TCM Committee on EIF Tier 2 project for cocoa & coconut value adding activities.
		P1.1.2 Secure start-up funding & acquire necessary equipment & supplies by December 2014.	• Funding secured: o PARDI-funded taro screening project (AUD$35k); o PHAMA-funded frozen taro pathway project (AUD$22k); o PHAMA-funded cocoa drying & fermentation project (AUD$10k); o SPC-funded soil biodiversity & taro growth project (AUD$50k); o Government of Turkey-funded breadfruit phylogenetics project (USD$50k); o NZ Tindall Foundation/VSA-funded activity to send breadfruit flour

			samples to NZ, Japan & elsewhere for market testing (NZD$10k); o ACIAR- funded regional Fruit Tree Postharvest Handling Systems project (AUD$311k); o FAO funded capacity building for SROS technical services on food safety (USD$18k); and, o TCM EIF Tier 2 project on value adding for cocoa & coconut (USD$400k).
		P1.1.3 Provide ongoing progress reports to key stakeholders starting in 2014.	• Progress reports provided to above-listed stakeholders as required.
		P1.1.4 Develop fresh & frozen taro & breadfruit & extend shelf life for export markets by December 2015.	• PARDI-funded Taro Revitalisation Project completed; • PHAMA-funded frozen taro pathway project completed & promoted in Sydney, Australia in March 2015; • Government of Turkey-funded breadfruit phylogenetics project ongoing; • NZ Tindall Foundation/VSA-funded activity to send breadfruit flour samples to NZ, Japan & elsewhere for market testing completed; and, • PHAMA-funded cocoa drying & fermentation project ongoing. Sensory evaluation of chocolate bars made by Devonport Chocolates (Auckland, NZ) from dried & fermented cocoa beans sourced from Upolu completed. Sensory evaluation of chocolate bars made by Devonport Chocolates from dried & fermented cocoa beans sourced from Savaii is being planned to be implemented in 2016.
		P1.1.5 Produce at least 1 scientific and/or technical publication from postharvest research findings by December 2015.	• Kuinimeri Finau-Asora, Siope Pele, Alfram Nukuro, Militini Tagoai, Annie Toailoa, Sosaiete Fa'atuiese and David Hunter (2015) "Developing a clean seed system for market ready taro cultivars in Samoa – screening of Cycle 8 taro lines for taste and nutritional composition". End of Project Report – SROS Component. *46 pp*. • Kuinimeri Asora-Finau, Alfram Nukuro, Siope Pele, Annie Toailoa, Militini Tagoai and David Hunter (2015) "Ready-to-cook frozen taro for Samoa Export Market". Research on the combined effects of blanching, methods of packaging and freezing on consumer preference for frozen taro after 3 & 6 months storage. *26 pp*. • Promotion of Gluten Free Breadfruit Flour Project. Funded by New

			Zealand Tindall Foundation/Volunteer Service Abroad (VSA). Report prepared by the Scientific Research Organisation of Samoa (SROS). February 2015. *17 pp*. • Fiame, L., K.Y. Wong and S.J. Tauati (2014) "Risks to soil biodiversity on the islands of the South Pacific". PACIFIC CONSERVATION BIOLOGY Vol. 20, Surrey Beatty & Sons, Sydney. *15 pp*. • Kuinimeri Finau-Asora, Siope Pele, Alfram Nukuro, Militini Tagoai and David Hunter (2015) "Analysis of microbiological risks for selected leafy green vegetables chains in Samoa". *15pp*.
	S1.2 Expand/improve current production processes to increase use of sustainable energy.	P1.2.1 Refine process for commercial biodiesel production to comply with international specifications by December 2015.	• Process for commercial production of biodiesel from coconut oil refined & completed. • IUCN-funded evaluation of *Jatropha* oil for biodiesel production ongoing (USD$150k).
		P1.2.2 Collaborate with relevant local & overseas partners to commercialise biodiesel production.	• Establishment of a semi-commercial oil mill plant (3 oil expellers, 2 cutters & 1 decorticator) in partnership with STEC & MNRE to promote the commercialization of biodiesel production from coconut & *Jatropha* oils. • Approval in December 2014 of a joint SROS/STEC/MNRE/Pacific Oil Ltd soft loan application to the International Renewable Energy Agency (IRENA)-coordinated Abu Dhabi Fund for Development (ADFD), to the value of USD$7M to co-finance the commercialization & co-implementation of biodiesel production & biomass gasification via a public-private partnership for electricity generation. Soft loan later declined by our Government due to the foreseeable inability of the project partners to service the soft loan repayments.
		P1.2.3 Collaborate with relevant stakeholders to ensure effective use of biogas technology in communities.	• Ongoing collaboration with YWAM, MNRE & STA on biogas production. A 34-page joint concept with NZ NIWA on "Renewable Energy & Nutrient Extraction from Wastewater in Samoa (RENEW-Samoa)" submitted to NZ DFAT Aid Programme in March 2015 for funding considerations was not successful.
		P1.2.4 At least 1 scientific publication from research findings by December 2015.	• Woo, C., Kook, S., Rogers, P., Marquis, C., & Tupufia, S. C. (2015) "A Comparative Analysis on Engine Performance of a Conventional Diesel Fuel and 10% Biodiesel Blends Produced from Coconut Oils" SAE Int. J. Fuels Lubr. 8(3):2015, doi:10.4271/2015-24-2489.

	S1.3 Upscale & commercialise research outcomes.	P1.3.1 Establish commercial partnership(s) for avocado oil producing plant by December 2015.	• Not yet achieved. Negotiations with the winning bidder – Apia Bottling Co. Ltd – on the Sale & Purchase Agreement, & Memorandum of Understanding (MOU) for the SROS industrial avocado oil production equipment ended with the official withdrawal by Apia Bottling Co. Ltd citing financial resources being reallocated to one of their current development projects. EOI will be re-advertised in compliance with government procedure due to interests expressed after closing date.
		P1.3.2 Establish commercial partnership(s) for flour production by December 2015.	• Partially achieved. SROS's ongoing efforts in partnership with Vailima Breweries Ltd with the brewing & sale of their new Vailima Natural beer, to induce local manufacturers to commercialize breadfruit flour production finally materialized in December 2014 with a local manufacturer, Natural Foods International, formalising a supply contract with Vailima Breweries Ltd & has taken over from SROS to supply the flour for the continuous brewing of Vailima Natural beer. Negotiations with another potential uptaker are still ongoing, & SROS remains open to future collaborations with other interested stakeholders.
	S1.4 Review SROS Act to accommodate new challenges.	P1.4.1 Consult stakeholders by December 2015.	• Consultations with AGO, MOH, MAF & MCIL, & subsequent public consultations via Parliament committee on SROS amendment bill to include the following completed. o Conduct analysis of narcotics or precursors for the purposes of investigations & prosecution of offences; o Carry out environment impact assessments; and, o Carry out food analysis & testing required under any food legislation or other enactment, & issue reports or certificates regarding food analysis & testing.
		P1.4.2 Complete draft of amendments by June 2016.	• SROS amendment bill enacted by Parliament in 2015.
	S1.5 Encourage primary production of feedstocks relevant to processing needs.	P.1.5.1 Import avocado seedlings for nursing & distribution to relevant stakeholders to bulk up sufficient supply of the fruit long term for avocado oil processing & margarine making by December 2015.	• Not yet achieved.

		P1.5.2 Establish partnerships with relevant private & public sector entities to develop promotional strategies (e.g., distribution of planting materials) by December 2015.	• Not yet achieved.
	S1.6 Support livestock sub-sector of Agriculture sector on research into animal feed formulation using locally available resources.	P1.6.1 Analysis of nutritional values of locally sourced potential ingredients for animal feed formulations by December 2015.	• Analysis of nutritional content of animal feed ingredients from MAF Livestock Division under SACEP ongoing.
	S1.7 Support fisheries sub-sector of Agriculture sector on establishment of a small scale fish cannery.	P1.7.1 Develop a concept on the technical and commercial viability of establishing a small fish cannery by October 2015.	• First draft of concept submitted to Organic Farming Advisory Committee in October 2015. Writing of second draft of concept in collaboration with MAF in progress.
		Objective 2. To undertake scientific and technical research with the primary aim of adding value to local resources and services.	
	S2.1 Continue development of technologies & processes utilising locally available resources (products & services).	P2.1.1 Develop a process for the purification of coconut oil by December 2015.	• Not yet achieved. Laboratory scale research on filtration methods using locally sourced river sand & produced activated biochar to strip the coconut odour ongoing.
		P2.1.2 Develop an efficient process for the extraction of vanilla by December 2015.	• Partially achieved. Laboratory scale research to expedite vanilla extraction using alcohol & ultrasound ongoing.
		P2.1.3 Develop a process for fruit spirit production by June 2016.	• Funded by South Korean Government (USD$140k), various locally available & abundant fruits are evaluated as feedstocks for fruit spirit production – star fruits, taro corms, ripe bananas, mangoes, coconut water, Vi & Samoan arrow roots. • Fruit spirit prototypes were showcased & taste tested during the UN SIDS Conference in September 2014, &in collaboration with STA, a sensory evaluation was conducted in March 2015 with members of SAME & SHA. • Refinement of fruit spirit prototypes ongoing.

		P2.1.4 Develop a processed taro product by December 2016.	• Research on taro flour production ongoing.
		P2.1.5 Develop a process for fermenting and drying of cocoa by December 2015.	• See P1.1.4.
		P2.1.6 Evaluate the processing of cocoa to various chocolate products by December 2016.	• See P1.1.4.
	S2.2 Develop new products from terrestrial plants or marine organisms for medicinal or cosmetic benefits.	P2.2.1 Explore and establish at least 1 methodology to evaluate medicinal & cosmetic application of select organisms (terrestrial or marine) by December 2016.	• Funded by US Embassy Samoa Office (USD$5k), measurement of antimicrobial activity using agar well diffusion method adopted & modified to assess medicinal application of select terrestrial & marine organisms.
		P2.2.2 Identify at least 1 compound or extraction product with potential health benefits by December 2016.	• Screening of 60 plant & 40 marine samples collected from Vailima Botanical Garden, & Vailele & Vaigaga reefs, respectively, showed that 4 plant species & 2 marine species showed promising effectiveness in inhibiting the activity of the α-glucosidase enzyme which is responsible for high sugar levels in blood causing diabetes. Research ongoing.
		P2.2.3 Characterize the identified compound or extraction product by December 2016.	• Characterization of bioactive compounds ongoing.
	S2.3 Develop opportunities for by-products and waste.	P2.3.1 Determine the most appropriate use of by-products from avocado oil and breadfruit flour production by June 2016.	• Evaluation of potential of dried avocado pulp to be utilized as an animal feed ingredient or fertilizer on going.
		P2.3.2 Develop uses for by-products from coconut oil production by December 2016.	• Biochar production from coconut shells & coconut margarine formulation using coconut water ongoing.

		Objective 3. To develop functional prototypes of products and processes based on scientific and technical research for the local or overseas markets.	
	S3.1 Develop margarine product utilising local produce.	P3.1.1 Complete development of a margarine prototype product containing avocado oil by December 2015.	• Partially achieved & work is currently in progress as different formulations for the prototype have been developed and will be sensory tested by the end of 2016.
	S3.2 Develop dehydration methods for food processing (e.g., tea from local plant, breadfruit, taro).	P3.2.1 Evaluate different low cost designs (e.g., passive solar, biomass & biogas) by June 2016.	• Evaluation of 2 locally fabricated solar driers for drying breadfruit slices & cocoa beans ongoing.
		Objective 4. To establish partnership with the private sector and commercial interests to support the Organisation's activities.	
	S4.1 Design & construct a new laboratory.	P4.1.1 Design completed by December 2015.	• Not yet achieved.
		P4.1.2 Secure funding for laboratory construction by June 2016.	• Funding is still being explored from Developments Partners.
		P4.1.3 A new laboratory built by June 2017.	• A revised deliverable date is recorded in the next Plan.
	S4.2 Operate as the national laboratory for the certification of imports & exports, and for the provision of other essential testing services.	P4.2.1 Complete training of at least 2 scientists for hard drugs analysis & expert witnessing by April 2015.	• Pousui Dr. Fiame Leo (Manager, TSD) & Luanda Ainuu (Senior Research Scientist, TSD) completed training on "Sampling & Drug Analysis" in October 2014 conducted by ESR, Auckland, NZ, to qualify them as authorized analysts for methamphetamine and its precursors.
		P4.2.2 Upgrade the narcotics laboratory to test for selected hard drugs (e.g., methamphetamine, cocaine) by June 2015.	• SROS Narcotics Laboratory services extended to hard drugs in March 2015. • SROS formalized a revised service contract with MOP in July 2015 to test controlled substances including methamphetamine (or ice) and cocaine to name a couple, for court cases related to narcotics crimes under the Narcotics Act 1967.
		P4.2.3 Extend the accredited scope of tests for fish & fish products by	• Tests for histamine & mercury in fish & fish products included in the scope of IANZ accredited tests in December 2014.

		June 2015.	
		P4.2.4 Develop capacity to test for alcohol & drug levels in biological samples (e.g., urine) by June 2016.	• Discussions with MJCA to establish SROS testing capabilities for alcohol & drug levels in biological samples ongoing.
		P4.2.5 Implement methods & complete successful runs in the Inter-Laboratory Comparison Program by November of each year.	• Inter-laboratory comparisons of tested samples undertaken were completed in November 2014 & 2015.
		P4.2.6 New methods are accepted by IANZ & added on to the list of accredited methods each year.	• Microbiology test method to test *Vibrio* presence in undercooked seafood, and the chemistry test method to measure energy included in the scope of IANZ accredited tests in December 2014.
	S4.3 Continuous involvement in food safety work through Codex & agreements with relevant stakeholders.	P4.3.1 Ongoing partnership with relevant stakeholders for monitoring relevant food &water standards every year.	• Requests from PUMA for water sampling & analysis for EIA purposes (e.g., MNRE/PUMA Waterfront project). • Samples from local manufacturers for both chemical & microbiological analysis. • Ongoing MOH-coordinated microbiological testing of bottled water samples for compliance to national drinking water standards. • Testing of wastewater for both government ministries & local manufacturers.
		P4.3.2 Develop capacity to test for selected pollutants from pesticides, sewer treatment plants & industrial discharge by December 2015.	• Not yet achieved.
	S4.4 Assist stakeholders in the development & testing of new products.	P4.4.1 Complete assessment of the heat content of biomass feedstock for a gasification project by December 2015.	• Not yet achieved.
		P4.4.2 Provide additional testing & advisory services for a biomass gasification project starting in	• In progress.

		2016.	
		P4.4.3 Develop at least one business case each year for discussion with the private sector & other stakeholders.	• Breadfruit flour making & avocado oil production business cases modified/updated in June 2015. • Development of biodiesel business case in progress.
		P4.4.4 Prepare a position paper (feasibility, regulatory assessment, EIA) on the availability & potential use of wood resources for bioenergy by June 2017.	• Not yet started.
	Objective 5. To ensure effective training for researchers and technical research.		
	S5.1 Established educational partnership with overseas universities.	P5.1.1 At least 1 university will be approached each year to discuss partnership opportunities.	• Partnership with University of Sunshine Coast, Queensland, Australia for two FAO-funded consultancies in November 2014 (USD$17k) & March 2016 (USD$88k) on postharvest losses & food safety, & ACIAR-funded Tropical Fruit project (AUD$311k) in April 2016.
		P5.1.2 Have at least 1 staff member enrolled in a tertiary institution each year.	• Seeseei Molimau-Samasoni (Principal Research Scientist, PFTD), PhD studies, VUW, March 2013-May 2016. • Notise Faumuina (Principal Research Scientist, IRD), PGD studies, VUW, March 2014-June 2015. • Tulia Samasoni-Samuelu (former Principal Research Scientist, IRD), MSc studies, UQ, February 2014-July 2015. • Annie Toailoa (Principal Research Scientist, PFTD), MSc studies, VUW, February 2015-November 2016. • Luanda Ainuu (Senior Research Scientist, TSD), PGD studies, VUW, July 2015-November 2016.
	S5.2 Maintain networks with national & international colleagues & distinguished honorary fellows in technical fields.	P5.2.1 Establish at least one new collaborative project or activity every three years.	• See P5.1.1. • Partnership with NZ VSA on volunteers to support the commercialization activities of SROS [Dr Kenneth Wong (Jan 2012-Oct 2014); Sililo Iuli (Jan-Dec 2016)] • Partnership with distinguished international scientists to support the research activities of SROS [Professor Ron Wills (postharvest technologies; ongoing); Dr Ron Bowrey (oil & margarine processing; ongoing)]

			• Partnership with JICA on volunteers to support the research activities of SROS [Dr Kenji Sakamoto (medicinal herbs, orchid propagation & essential oils; Jan 2014-Jan 2016)]
		P5.2.2 Have each scientist participate in at least 1 scientific/technical conference, workshop, forum or outreach activity every year.	• Pousui Dr Fiame Leo (Manager, TSD) & Luanda Ainuu (Senior Research Scientist, TSD): Alcohol & Other Drugs Treatment Workshop, Samoa, April 2014. • Luaao Faatili (former Research Scientist, IRD) & Moon Chan (Principal Research Scientist, ERED): Management System Internal Auditor Workshop, Samoa, April 2014. • Pousui Dr Fiame Leo (Manager, TSD): Laboratory Quality Management course, Auckland, NZ, May 2014. • Semua Militini Tagoai (Research Scientist, PFTD): JUNCAO Technology for Latin American, Caribbean and South Pacific Region seminar, Fuzhou, Fujian Province, China, June 2014. • Gaufa Salesa Fetu (former Manager, IRD): Regional Breadfruit Initiative organizing and planning meetings, Honolulu and Kona, Hawaii, June 2014. • Tuimaseve Kuinimeri Asora-Finau (Manager, PFTD): 29th International Horticultural Congress, and Pre-Congress Training, Brisbane, Australia, August 2014. • Lilo Samani Tupufia (Manager, ERED): Asia Pacific Clean Energy Summit and Expo, Honolulu, Hawaii, September 2014. • Annie Toailoa (Principal Research Scientist, PFTD): Food Security – Postharvest, Processing and Quality Assurance of Selected Agro-Industrial Products course, Bangkok, Thailand, September, 2014. • See P4.2.1. • Oiner Leutu Moa (former Research Scientist, ERED): Seminar on Renewable Energy, Environment and Hygiene Management of Latin America, Caribbean and South Pacific Regions, Nanchin City, Jianxi Province, China, October 2014. • Tilafono David Hunter (CEO, SROS): Pacific Soil Partnership workshop, Suva, Fiji, October 2014. • Tilafono David Hunter (CEO, SROS): PACE-NET Plus bi-regional dialogue platform, entitled: *Moving towards a policy dialogue in Science, Technology and Innovation (ST&I) – Science diplomacy to serve policy demands*, Auckland, NZ, December 2014.

			• Lilo Samani Tupufia (Manager, ERED) & Isamaeli Time (former Principal Research Scientist, ERED): MNRE Stakeholder Consultation Workshop on National Biodiversity Strategy Action Plan for Samoa, Samoa, January 2015. • Isamaeli Time (former Principal Research Scientist, ERED), Julian Wong Soon (Principal Research Scientist, ERED) & Oiner Leutu Moa (former Research Scientist, ERED): Training on Environment Impact Assessment (EIA), Samoa, February 2015. • Lilo Samani Tupufia (Manager, ERED) & Isamaeli Time (former Principal Research Scientist, ERED): Consultation Workshop on Development of Project Design Document (PDD) for Energy Bill and Development and Implementation of Sustainable Bioenergy in Samoa, Samoa, March 2015. • Tilafono David Hunter (CEO, SROS): UN-funded meeting on the SAMOA Pathway and the Science-Policy Interface in Small Island Developing States (SIDS), Saint Lucia, Caribbean, March 2015. • Lilo Samani Tupufia (Manager, ERED): Inception Workshop for Implementing GEF/UNDP/GoS SMSMCL Project on Strengthening Multi-Sectoral Management of Critical Landscapes in Samoa, Samoa, March 2015. • Pousui Dr Fiame Leo (Manager, TSD) & Mamea Samuel Ieremia (Manager, AFD): "2 Samoas Trade Fair", American Samoa, April 2015. • Tilafono David Hunter (CEO, SROS): 2nd PACE-NET Plus bi-regional dialogue platform, Brussels, Belgium, June 2015. • Moon Chan (Principal Research Scientist, ERED) & Fa'ataga Junior Fa'ataga, (Research Scientist, TSD): NZQC-coordinated Microbiology Laboratory Quality Assurance Workshop, Auckland, NZ, June 2015. • Tuimaseve Kuinimeri Asora-Finau (Manager, PFTD): PARDI end of programme workshop, Suva, Fiji, June 2015. • Tuimaseve Kuinimeri Asora-Finau (Manager, PFTD): International symposium on Breadfruit, University of West Indies, Trinidad and Tobago, Caribbean, July 2015. • Pousui Dr Fiame Leo (Manager, TSD): Laboratory Quality Assurance workshop, Suva, Fiji, July 2015. • Lilo Samani Tupufia (Manager, ERED): Workshop on Ecosystem Conservation and Sustainable Development in SIDS, Jeju, Republic of Korea, July 2015. • Mamea Samuel Ieremia (Manager, AFD): Laboratory Management

			Workshop, Suva, Fiji, July 2015. • Tilafono David Hunter (CEO, SROS), Siope Pele (Senior Research Scientist, SROS), Semua Militini Tagoai (Research Scientist, PFTD) & Alfram Nukuro (former Research Scientist, PFTD): FAO workshop on CODEX and GAP/HACCP, Samoa, July 2015. • Sara Vaai-Toomata (former Research Scientist, ERED) & Alesana Malo (Research Scientist, TSD): Training Course on Biotechnology Application in Food Industries for Developing Countries, China, September 2015. • Tuimaseve Kuinimeri Asora-Finau (Manager, PFTD): Familiarisation visit to Devonport Chocolates, Auckland, NZ, September 2015. • Helmy Sasulu (Assistant Research Scientist, TSD) & Semua Militini Tagoai (Research Scientist, PFTD): Quality Management Systems (ISO9001:2008) workshop, Samoa, October 2015. • Notise Faumuina (Principal Research Scientist, IRD): GAP/HACCP training course, Samoa, November 2015. • Sara Vaai Toomata (former Research Scientist, ERED): Training on assessing biodiversity impacts through the EIA process, Samoa, December 2015.
	S5.3 Increase public awareness & education of the work of the Organisation	5.3.1 Provide at least 3 students each year experience in a scientific project undertaken by the Organisation.	• Attachment of 6 NUS, 1 Beijing & 1 Otago University students at SROS for practical experience during the year and during the Christmas break in 2014. • Attachment of 2 NUS, 1 USP (Fiji), 1 Otago & 1 Waikato University students at SROS for practical experience during Christmas break in 2015. • Attachment of I PhD student from Mendel University in Brno Czech Republic, July-August 2015.
		P5.3.2 Hold at least 1 public awareness activity every year to promote widely the functions of the Organisation.	• TV1 Le Lali programme on research & services undertaken by SROS, May 2015. • Technical Services advert on TV1 & TV3, July 2015-June 2016. • Newspaper articles in Samoa, Australia & American Samoa via the internet (Pacific Trade and Invest) on SROS initiatives; SROS's collaborative efforts with Dr. Diane Ragone on Breadfruit initiative (2014), FAO project on postharvest (2015 & 2016), Essential Oils Project (2015) and Fruit Spirits (sensory evaluation) March 2015, attendance at SAME and SCCI trade shows in both Australia and American Samoa to promote SROS products and services (2015).

Objective 6. Augment and effectively manage financial and human resources of the Organisation.			
	S6.1 Enable informed budgetary control by effective use of a budgetary monitoring system.	P6.1.1 Each divisional budget is submitted to CEO before the end of February every year.	• Divisional budgets completed & submitted as required.
		P6.1.2 The organisation's facilities & asset register are maintained, & necessary repairs are completed according to set schedules.	• Asset register updated annually & necessary repairs completed as required.
		P6.1.3 Quarterly & annual reports are completed on schedule.	• SROS annual report FY2014-15 not completed on schedule. • Some quarterly reports not completed on schedule.
		P6.1.4 Financial position is updated for monthly review by the Senior Management Group.	• Monthly reports of divisional & project finances provided to Senior Management Group as required.
		P6.1.5 Year-end variance is within budget.	• Budget surplus recorded for financial years ending June 2014 (SAT$45k) & June 2015 (SAT$170k).
	S6.2 Ensure SROS has the manpower capacity to fulfil its mandate.	P6.2.1 Performance feedback to individual staff is formally provided at least once a year via the staff performance appraisal process.	• Annual performance review of all staff for 2014 & 2015 according to HRM Policy Manual not completed on schedule.
		P6.2.2 Each staff member is provided a development opportunity each year.	• See P5.2.2.
		P6.2.3 Develop a workforce plan.	• Not yet achieved.
	S6.3 Increase the external (non-core) income & earning capacity of the Organisation.	P6.3.1 At least 2 businesses, agencies or other stakeholders are proactively approached each year to develop MOUs for the provision of research services or the commercialisation of research	• MOU negotiation with Fuatino Natural Products Ltd re: product development using coconut oil by-products in progress. • Non-Disclosure Agreements signed with Aluminium Designs, Fuatino Natural Products Ltd & Yazaki EDS, respectively in 2014 and 2015 for design and product development initiatives. • MOUs developed and in the pipeline with interested companies to work

		results.	with SROS on product development initiatives. • Interest expressed and discussions carried out with 1 local meat company and 1 food and beverage company on possible long term contracts with SROS on technical services provision.
		P6.3.2 Contracted services are provided on time with the agreed level of reporting.	• Some delays experienced.
		P6.3.3 At least 1 new consultancy service contract is secured each year and delivery is on target.	• See P5.1.1. • Effectiveness of photosynthesis bacteria to reduce hydrogen sulphide levels in water (MNRE funding of SAT$20k; in progress). • Monitoring of microbiological, chemical & pesticide residue levels of water sources (MNRE funding of SAT$90k; in progress). • Monitoring of microbiological pathogen levels of water in pre-selected locations in Apia Waterfront (MNRE funding of SAT$40k; in progress).
		P6.3.4 Market information is compiled and maintained for every research project in support of discussions with stakeholders.	• SROS Customer survey carried out in 2015. Information collected & report prepared to provide both Board and Management with feedback on service delivery by all technical divisions of SROS, as well as adhere to annual International Accreditation New Zealand (IANZ) surveillance assessment compliance requirements.

4.1.2. Financial

The SROS is expected to draw from the surplus achieved in 2013-2014FY as well as 2014-2015FY to continue the maintenance of its old buildings and other assets where appropriate (table 2). Going forward, additional efforts will be taken to make effective use of its limited resources. In particular, TSD of SROS will be promoted to the private sector, and its business partnerships will be sought for major commercialisation efforts and initiatives, in order to develop new revenue streams through successful research and development projects.

Table 2: Statement of income and expenditure for the period 2013–2016.

	FY2013/2014 Actual	%	FY2014/2015 Actual	%	FY2015/2016 Budget	%
Total Revenue	3,994,564	100%	3,648,512	100%	3,483,483	100%
Total Expenditure	3,949,332	99%	3,478,275	95%	3,437,773	99%
Surplus(Deficit)	45,232	1%	170,237	5%	45,710	1%
Surplus as % of revenue	1%		5%		1%	
Proportion of Gov't Funding	3,432,584	86%	3,300,902	90%	3,334,495	96%
Proportion of Other Income	561,981	14%	347,609	10%	148,988	4%
Current Ratio	2.3:1		2.3:1		2.5:1	
Total Assets	1,895,289	92%	1,903,120	52%	2,203,092	63%
Equity	3,233,460	84%	3,403,696	93%	3,449,406	99%

At the end of 2014-2015FY, SROS's revenue constituted $3.6M in Government grant and $0.348M in other income. The reduction in Government grants has been partially compensated by increases in external funding. Although this is an encouraging sign of SROS's ability to attract external funding, continually securing external and long-term funding remains a major challenge for the Organisation.

Whilst Government through MOF as well as MPE highlight the current priorities of Government in other areas, and Government Grant Funding for capital and research projects will be limited over the coming years, SROS will continue to pursue and lobby Government where appropriate and Development Partners for support. Business plans are also being used to develop additional revenue streams through commercial partnerships with local businesses and industries as well as foreign investors. SROS will continue to strive to achieve commercial outcomes from its research activities, while contributing to Samoa's national development goals.

4.2. Analysis of the Business Environment

4.2.1. External Business Environment

The full impacts of the tsunami of 2009 and cyclone Evan in 2012 on the physical losses of infrastructure, businesses and damages to agricultural production all increased the downside risks to the already frail Samoan economy. There is little doubt that financial resources are still being stressed as the Government and affected businesses and communities continue to rebuild. This is on top of earlier indications that economic growth will be sluggish in upcoming years in the aftermath of the global financial crisis that was triggered in 2008. Among our major development partners, earthquakes, flooding, cyclones and droughts in Australia and New Zealand could be expected to impact negatively on their economies and may therefore stress their ability to provide development assistance in upcoming years.

As a result of cyclone Evan, local markets showed a severe decline in the availability of many fruits and vegetables. Even during 2015, businesses relying on coconuts continue to indicate that supply has not fully recovered at least in Upolu. Moreover, according to the Samoa Bureau of Statistics (SBS), the low level of employment in the food manufacturing sector of about 1.8% of total formal employment in 2015 reflects generally on a weak sector. These had affected discussions and negotiations with the private sector with regards to the commercialization of avocado oil production and breadfruit flour processing, to name a couple. The development of high-value exports remains a key strategy for improving the country's balance of trade. It is also critical to promote international awareness of the unique offerings from Samoa and their quality because international buyers are necessary to attract investments and production of relevant products. Another key strategy for improving the balance of trade is to increase import substitution, particularly for products and services that have knock-on effects on other economic activities. SROS will therefore continue to work with its partners to research alternative renewable and sustainable energy sources to support the critical energy sector. The development of export and bioenergy opportunities as well as other projects at SROS, aim to improve the performance and sustainability of the agricultural, manufacturing and export sectors of Samoa.

4.2.2. Internal Environment (Assessment of Resources)

Samoa is blessed with enormous natural resources with untapped commercial potential. Classic examples of under-utilised resources include breadfruit and avocado fruit that are potentially valuable and commercially viable food feedstock. Product developments for consideration include breadfruit flour, avocado oil, coconut oil, coconut and avocado margarine, vanilla extract, cocoa and fruit spirits. Local industries based on local raw materials have considerable potential for growth and expansion. Not only do certain products have potential for import substitution leading to economic benefits, certain products could be competitive in international markets for high value products. Examples of internationally competitive products include healthy oil from avocado fruit and gluten-free flour from breadfruit, both command high prices in overseas market. Researching the technical and commercial feasibility and the

market potential of these and other products would help Samoa make the best use of her abundant natural resources.

The recent realignment of SROS with MAF under the leadership of the Minister of Agriculture & Fisheries is a sensible move by Government, given that about 70% of scientific research projects completed and work in progress at SROS, are on secondary production/value adding activities, and are related to and fit well in the agriculture sector. Furthermore, most of the technical and consultancy services rendered by SROS to our stakeholders and clients are on food and food products, fish and fish products, and water samples destined for local consumption and export markets. One of the greatest challenges for SROS presently is to promote and support the establishment of supply of the preferred plant varieties of the raw materials/feedstocks, to ensure long-term stable supply of the desired quantities for large scale/commercial processing of some of the abovementioned products, especially breadfruit flour, avocado oil and margarine, and cocoa and coconut products. This is a critical activity that our MAF is mandated and better equipped to implement, and the unification of MAF and SROS at least for the next five years, should expedite this important supply component of the value chain.

4.2.2.1. Finance

As a Public Beneficiary Body, SROS relies on Government for about 95% of its annual budget. To complement Government funding, SROS has sought project financing from funding agencies such as development partners, international and regional agencies as well as from the private sector including potential business partners and investors. An important part of SROS's strategy is the evaluation of the research and development needs of individuals, communities, industry, and government, and the possible technical assistance that could be provided by SROS and research partners. As SROS seeks to establish partnerships with the private sector, business plans and allied financial models have been and are being developed for select projects in order to prepare investment profiles for discussion (e.g., breadfruit flour, avocado oil). Future plans include the preparation of business cases for opportunities selected from the assessment of market opportunities and resource availability, which would be used to open discussions with relevant business people and investors to attract funding for technical research or technology deployment. Successful commercialisation of research outcomes is a key long-term goal of SROS and it will be a priority during the lifespan of this Plan, as SROS aims to grow its portfolio of research activities and reduce its reliance on Government funding.

4.2.2.2. Human Resources

SROS currently employs 56 employees who are actively involved with the implementation of its various research, technical and support activities to realise its mandated objectives, functions and performance measures (photo 2). Given the scientific nature of SROS's work, human resource continues to be an important aspect of the Organisation, and ongoing staff development efforts are in place to ensure that the staff are trained and up-skilled with the relevant know-how via formal training at Victoria University of Wellington (VUW) in New

Zealand under a Memorandum of Agreement (MOA) with them, and short-term training opportunities overseas received via the Ministry of Foreign Affairs and Trade (MFAT).

The SROS staff rules and regulations are clearly stipulated in the HRM Policy Manual, with the progressive inclusion of newly approved amendments. The HRM Policy Manual also conforms to the following Acts:

- Public Bodies (Performance and Accountability) Act 2001;
- RDIS Act 2006 (the principal Act);
- SROS Act 2008;
- Labour & Relations Act 2013;
- PSC Working Conditions & Entitlements Manual 2015; and,
- Public Finance Management Act 2001.

Photo 2: Staff of SROS in 2016.

4.2.2.3. Technology Transfer and Information Technology

Technology transfer between SROS and its key stakeholders is the responsibility of the Business Development Specialist of the Organisation, overseen by the CEO and guided by the section on "Intellectual Property Rights" of the SROS Act 2008, and the revised SROS Commercialisation Policy that was endorsed by the SROS Board of Directors in 2016. Long-term partnership with individuals, communities, businesses and investors will be based on mutual trust and respect, in order to:

- Achieve common aims that complement or derive from core work of SROS;
- Share fairly the intellectual property rights and net financial benefit from technical development and commercial activities; and,
- Contribute to improving the national economy of Samoa.

The SROS's website www.sros.org.ws is easily accessible and mobile-technology friendly. It hosts important information about SROS and includes a digital gallery of promotional images of research and other activities that it undertakes. SROS houses two in-house servers for file sharing and efficient and cost-effective communications within the Organisation and its partners and stakeholders.

4.2.2.4. Efficiency of the Organisation's Administration

The CEO, assisted by the Senior Management Group that includes Divisional Leaders and Managers has ultimate responsibility for the science and business strategies of SROS. Following endorsement by the SROS Board of Directors, responsibility for implementing the research strategy and coordinating research activities are devolved to Divisional Leaders and Managers assisted by the Divisional Research Scientists. Likewise, the Manager of the Administration and Finance Division and support staff are responsible for the organisational activities supporting the technical divisions. Internal audit procedures are in place and verified by an external certified accounting firm. Steps have been taken with tax planning to ensure the tax free status of SROS is maintained.

4.2.2.5. Plant and equipment

SROS has seven buildings in its leased compound at Nafanua which house staff offices and laboratories for its administrative, technical and research activities. It has a fleet of four vehicles which service the transportation requirements of the CEO, office services and off site technical and research activities. SROS also benefits from equipment and capacity building opportunities that are funded by Government and externally funded projects by donor partners.

4.2.2.6. SWOT Analysis

Strengths	Weaknesses
• Strong Government support and interest to boost national economic development. • Strong alignment with the Government's Strategy for the Development of Samoa. • Advanced laboratories and facilities. • Internationally recognised status with IANZ. • Reasonably qualified and capable local staff. • Knowledge and technical expertise in processing technologies and analytical methodologies. • Partnerships with international universities and research providers to enhance research quality and staff training. • Strong reputation for technical expertise among local businesses, government agencies and international development partners. • Increasing linkages with key industry stakeholders.	• Heavy reliance on Government funding. • High expenses incurred in many research activities and technical analyses cannot be afforded by most local customers. • Dependence on external supply of raw materials for research projects. • Dependence on overseas suppliers of many laboratory supplies and equipment. • Adverse foreign exchange fluctuations impacting overseas payments for supplies and services. • Only able to rely on freely available research and development databases and electronic journals for the most recent information. • Few staff with business experience. • Insufficient linkages to key stakeholders at other parts of the supply chain.
Opportunities	**Threats**
• Essential testing services required by Government and exporters. • Increasing demands for standards and certification of food safety, trading compliance, and health and environmental status. • Potential high-value markets overseas for healthy foods from exotic locations. • Potential high-value markets overseas composing of expatriates from Samoa and other Pacific islands. • Government initiatives to revitalise agriculture. • Urgent needs for sustainable energy technologies to mitigate the impact of climate change. • Abundance of underutilised biological resources for the development of products to increase exports and import substitution. • Consensus among Government, development partners, international and regional agencies, and the private sector that wealth creation is necessary for the future development of Samoa. • Recognition by other regional and international organisations as a competent research partner.	• Funding sustainability. • Competition from other Government ministries/departments and regional research organisations for research funding and development assistance. • International consultants and providers of turnkey technologies. • Insufficient and inconsistent supply of local raw materials required for research and business development. • Staff and expertise retention. • Inability to sustain the priority given to technical developments by government strategies and policies as well as business and public perception. • SROS lack of flexibility to act in a commercial environment. • Shortage of formally trained food technologists/researchers.

4.3. Analysis of the Key Risks and Issues

Heavily reliant on Government funding for core business operations, SROS will need to continuously produce tangible and meaningful research outcomes that positively contribute towards the achievement of goals outlined by the Government's Strategy for the Development of Samoa. With the increasing competing requests to Government and donor agencies for funding assistance, SROS will also need to increase its commercialisation activities to generate revenue to support its core operations. Such activities range from critical testing services to expert consultancy services to partnerships in business ventures based on research outcomes.

SROS needs to maximize benefits from IANZ accreditation and technical reputation to expand its provision of essential testing services and specialized consultancy services. Establishing critical and mutually beneficial partnerships with key stakeholders is also vital to ensure research activities are customer driven to benefit the private sector, the national economy and the communities of Samoa. There is a need to continuously review and streamline research priorities to make the best use of the available budget and resources. Developing and implementing smart funding strategies to support SROS's research mandate is also critical to reducing its reliance on Government funds.

The push for sector wide collaboration and accountability of outcomes is a vital strategy undertaken by key industry stakeholders. SROS plays an important role as provider of scientific research development and analytical services for different segments of the value chain, and must continue to effectively perform and promote activities that contribute towards the achievement of national development goals. It is also ready to partner with critical contributors to the value chain to ensure success for the benefit of Samoa.

The availability and consistent quality of raw materials is critical to successfully translate SROS research findings into viable commercial ventures. In this regard, it will continue to cooperate with the MAF, Samoa Farmers Association (SFA), Federated Farmers Inc. (FFI), Samoa Trust Estate Corporation (STEC), Women in Business Development Inc. (WIBDI), Samoa Association of Manufacturers and Exporters (SAME) and Samoa Chamber of Commerce and Industry Inc. (SCCI), and other key players to promote commercial production and supply of relevant feedstocks. Commercial success also needs effective distribution networks to commercial buyers and consumers. Its realisation will require business partners and financial investors, and this has encouraged SROS to become more familiar with business and commercial practices and collaborate with relevant Government Ministries (e.g., MPE, MCIL and AGO) to prepare business plans, financial models, commercialisation policies and confidentiality agreements for business discussions and activities with relevant parties in the private sector.

Scientific research is a relatively expensive endeavour that is challenging in a resource-limited environment such as Samoa. Keeping abreast with international scientific development requires ready access to research publications, and this was greatly enhanced with the successful registration to OARE (Online Access to Research in the Environment) and HINARI (Health Inter-Network Access to Research Initiative) that are offered by UNEP and WHO,

respectively. Strengthening collaborative links with international universities and research institutions have also contributed to elevating technical aspirations of SROS and could eventually provide access to more advanced scientific equipment and expertise. The current suite of analytical and processing equipment is being maintained and replaced as appropriate, and future additions will be judiciously selected to maximise benefit relative to cost.

In the face of ongoing challenges, SROS continues to build a better and stronger foundation to positively contribute towards the economic, social and environmental development of Samoa in the years ahead.

5. OBJECTIVES, STRATEGIES AND PERFORMANCE MEASURES

This section of the Corporate Plan outlines the work plan of SROS over the four years from 2017 to 2020 and the key strategies and activities in delivering its main objectives.

Vision

"Achieving a significant improvement in Samoa's GDP and social benefits through research and the development of value adding to Samoa's goods and services"

Mission Statement

"To conduct scientific research and develop technologies of great value in the sustainable development of value added goods and services for export, and to achieve reduction in fuel imports and greenhouse gas emissions"

To support its vision and mission statement, SROS is committed to delivering on the following key objectives contained in the Scientific Research Organisation of Samoa (SROS) Act 2008 that is derived from the Research and Development Institute of Samoa (RDIS) Act 2006 ("the principal Act").

Objectives

a) To promote the national economy of Samoa based on research and development;
b) To undertake scientific and technical research with the primary aim of adding value to local resources and services;
c) To develop functional prototypes of products and processes based on scientific and technical research for the local or overseas markets;
d) To establish partnership with the private sector and commercial interests to support the Organisation's activities**;**
e) To ensure effective training for researchers and professionals engaged in scientific and technical research work;
f) To conduct analysis of narcotics or precursors for the purposes of investigations and prosecution of offences; and,
g) To undertake environment impact assessments.

Functions

(1) The Organisation also performs various functions such as:
    a) To carry out scientific research and develop technologies for any of the following purposes:
        (i) contributing to the achievement of national goals in the Strategy for the Development of Samoa and any other national plans of Samoa;

(ii) assist local industries, Government Ministries, corporations and agencies;
(iii) furthering the interests of the community;
(iv) any other purpose determined by the Board; and,
(v) conducting analysis of narcotics or precursors for the purposes of investigations and prosecution of offences.

b) To encourage and facilitate the application of the results of any other scientific research;
c) To act as a means of liaison between Samoa and other countries in matters related with scientific research and development;
d) To train and to assist in the training of researchers and workers in the field of science and to cooperate with tertiary education institutions, both local and overseas, in relation to education in any field of science;
e) To establish and award fellowships for students to do research, and to make grants in aid of research, for a purpose referred to in paragraph (a);
f) To collect, interpret and disseminate information relating to scientific and technical matters;
g) To publish scientific and technical reports, periodicals and papers; and,
h) To carry out environment impact assessments.

(2) In performing its functions, the Organisation shall take into account relevant Government policies as communicated to the Organisation by the Minister or the Board of Directors.
(3) The Organisation shall also treat the functions referred to in (1) a) and b) as its primary functions, and treat the other functions referred to in (1) c) to h) as its secondary functions.
(4) The Organisation may:
a) Carry out food analysis and testing required under any food legislation or other enactment; and,
b) Issue reports or certificates regarding food analysis and testing under a).

At the sector level, SROS is one of the key implementing agencies under the following sector plans:

1. Agriculture Sector Plan (ASP) 2016-2020 for targeted research on value adding on primary agricultural resources, and is one of the implementing agencies for training, and research and development for three of the four sub-sectors (namely crops, livestock and fisheries) of the ASP. SROS will contribute mainly towards the achievement of eight of the Sector's strategic priority activities, namely:
   - Introduce practical tools and systems to reduce food safety risk and postharvest losses among smallholder farmers (and fishers) in domestic food marketing chains;
   - Provide training in small scale fruit production, processing and preservation (preserves, pickles, jams, chutneys/fruit drying) etc. together with business management and marketing support;
   - Through a participatory approach with key stakeholders, together with consideration of market demand and opportunity and economic, social and environmental cost benefit, identify agriculture and fisheries value chains which will receive priority attention under the ASP;

- Establish industry-led, and where necessary government regulated and compliance checked, quality standards for key export markets;
- Strengthen postharvest management, farm processing (e.g., fermenting/drying etc.) storage, product transportation;
- Through a participatory approach with key stakeholders develop a broadly owned adaptive research strategy with M&E framework to address assessed needs in priority value chains;
- Conduct regular M&E for all research programmes; and,
- Strengthen the linkages between Farmer/Fisher Organisations and Research Organisations.

2. National Environment Sector Plan (NESP) 2017–2021 for targeted research on renewable energy initiatives and/or alternatives in particular, and scientific environmental assessments. SROS will contribute mainly towards the achievement of the Environment Sector's four strategic priority areas as follows:
   - Protection, conservation and sustainable management and development of Samoa's environmental and natural resources;
   - Sustainable and resilient built environment;
   - Climate Change and Disaster Risk Management mainstreamed across the entire national development agenda; and,
   - Strong sectoral and cross sectoral governance and orientation.

   SROS is currently a member of the National Environment Sector Steering Committee (NESSC) which is the apex body for the Environment Sector. The NESSC is tasked with overseeing planning, implementation, monitoring, review and evaluation of the sector-wide programme.

3. Trade, Commerce and Manufacturing Sector Plan (TCMSP) 2012-2016 (new TCMSP yet to be finalised) for targeted value adding efforts, and in collaboration with other relevant Ministries and private sector entities, SROS will contribute mainly towards the achievement of four of the Sector's strategic priority activities as follows:
   - Strengthen and provide more resources (tax incentives) to the SROS for research on value added potential for local produce and agro-processed products;
   - Provide incentives to encourage the private sector to invest in the expansion and commercialization of research results from SROS and other research institutions to form the basis for agriculture trade and export in future;
   - Set up a training and mentoring programme to educate private sector men and women producers on potential value addition, including challenges and remedies, in their respective industries and businesses; and,
   - Identify value addition activities at the primary production level and establish support programmes to encourage men and women farmers and growers to perform value adding activities.

4. Energy Sector Plan (ESP) 2012-2016 (new ESP yet to be finalized) for targeted research on renewable energy alternatives, and is the leading implementing agency towards the achievement of two of the Sector's strategic priority areas namely:
    - Promote the use of indigenous energy resources in renewable energy technologies; and,
    - Improve SROS's capacity to undertake renewable energy research and development.

The Board of Directors of SROS will play a significant role during the four-year lifespan of this Corporate Plan to ensure that SROS:

- Achieves objectives and strategies in this Corporate Plan;
- Ensures this Corporate Plan's Statement of Corporate Objectives and Reports (Quarterly and Annual) are prepared on time and in accordance with the guidelines set by the Ministry for Public Enterprises (MPE);
- Achieves a surplus and reduces reliance on Government's annual budget; and,
- Complies with all policies and instructions directed by Cabinet.

5.1. Objectives, strategies, activities and performance measures

Corporate objective 1: To promote the national economy of Samoa based on research and development.		
Strategy	Activity	Performance measure
1.1: Develop postharvest technologies for at least 5 crops to facilitate the revival of agricultural produce and products (e.g., taro, breadfruit, cocoa, coffee, coconut, vanilla, pineapple or lemon), and facilitate the access of these products to domestic and export markets.	1.1.1: Convene 1 consultation of relevant stakeholders annually to ascertain national postharvest requirements.	• 1x report on outcomes of consultation produced and distributed to stakeholders annually.
	1.1.2: Secure start-up funding (where needed) and acquire necessary equipment and supplies.	• Start-up funding secured by June 2017. • Necessary equipment and supplies acquired by September 2017.
	1.1.3: Provide progress reports to key stakeholders.	• 1x progress report distributed to key stakeholders annually starting in 2017.
	1.1.4: In partnership with MAF and relevant stakeholders, develop fresh and frozen breadfruit and extend shelf life for export markets.	• 1x technical report on export market pathway/extended shelf life for frozen breadfruit produced and disseminated by March 2017. • 1x technical report on export market pathway/extended shelf life for fresh breadfruit produced and disseminated by March 2019.
	1.1.5: Produce at least 1 scientific publication from postharvest research findings.	• At least 1x scientific manuscripts published by December 2019.
1.2: Expand/Improve current production processes to increase use of sustainable energy.	1.2.1: In partnership with MNRE and key stakeholders, evaluate performance of various feedstocks for biogas production.	• 1x technical report on performance results of at least 10 feedstocks produced and shared with MNRE and key stakeholders annually.

	1.2.2: In partnership with MNRE and key stakeholders, refine process options for biogas production.	• 1x technical report on refined process options produced and shared with MNRE and key stakeholders by December 2017.
	1.2.3: In partnership with MNRE and STEC, measure the heat content of feedstocks (including invasive species) for biomass gasification.	• 1x technical report on heat content results of at least 5 feedstocks produced and shared with MNRE and STEC annually.
	1.2.4: In partnership with MNRE and relevant stakeholders, develop an efficient biodiesel production technology using potentially locally produced enzymes and alcohol.	• 1x technical report on an efficient biodiesel production technology produced and shared with MNRE and key stakeholders by December 2019.
	1.2.5: Produce at least 1 scientific publication from research findings.	• At least 1x scientific manuscript published by December 2019.
1.3: Review SROS Act to accommodate emerging research and development interests and needs of stakeholders.	1.3.1: Consult relevant stakeholders.	• 1x report on outcomes from stakeholders consultation produced by March 2017.
	1.3.2: In partnership with AGO, complete draft of amendments.	• Draft of amendments produced by June 2017.
	1.3.3: Submit amendments in the SROS Act to Parliament for legislation considerations.	• Amendments in the SROS Act 2008 enacted by Parliament by December 2017.
1.4: Encourage primary production of feedstocks relevant to processing needs.	1.4.1: In partnership with MAF, import avocado seedlings of the desired Hass and/or Fuerte varieties, for nursing and distribution to relevant stakeholders, to bulk up sufficient supply of the fruit long term for avocado oil processing	• At least 1000 avocado seedlings of the Hass and/or Fuerte varieties imported by December 2017.

	and margarine making.	
	1.4.2: In partnership with relevant private (SFA, FFI, WIBDI) and public sector (MAF) entities, distribute avocado planting materials to farmers annually.	• At least 1000 avocado planting materials distributed to farmers annually by December 2020.
	1.4.3: In partnership with MAF and MNRE, import seedlings/plantlets of popular orchids for propagation purposes.	• At least 1000 seedlings/plantlets of at least 2 popular orchids for propagation purposes imported by June 2017.
	1.4.4: In partnership with MAF, propagate/multiply *in vitro* and *in vivo* local and imported orchids annually.	• *In vitro* and *in vivo* propagation of at least 2000 local and imported orchids completed annually by December 2020.
	1.4.5: In partnerships with relevant private (e.g., orchid growers, National Beautification Committee) and public sector (e.g., MWCSD, STA) entities, distribute ready orchid plants annually.	• At least 1000 ready orchid plants distributed annually by December 2020.
1.5: Support livestock sub-sector of Agriculture sector on research into animal feed formulation using locally available resources.	1.5.1: In partnership with MAF and relevant stakeholders, develop test methods for analysis of essential nutritional values of locally sourced potential ingredients for animal feed formulations.	• Test methods for analysis of at least 3 additional essential nutritional values developed by December 2017.
S1.6: Support fisheries sub-sector of Agriculture sector on establishment of a small scale fish processing facility.	1.6.1: In partnership with MAF, develop a concept on the technical viability of establishing a small scale fish processing facility.	• Concept on small scale fish processing facility developed by March 2017.
S1.7: Assist stakeholders in the development and testing of new products.	1.7.1: Formalise partnership MOUs with interested stakeholders for new	• MOUs formalised for all developed new products.

	product development. 1.7.2: Compile and maintain market information for every research project in support of discussions with stakeholders.	• Market information is compiled and maintained as required.
Corporate objective 2: To undertake scientific and technical research with the primary aim of adding value to local resources and services.		
Strategy	Activity	Performance measure
2.1: Continue development of technologies and processes utilising locally available resources (products and services).	2.1.1: Develop a process for the purification of coconut oil.	• 1x technical report on an efficient process for the purification of coconut oil produced by March 2017.
	2.1.2: Develop a process for the extraction of vanilla.	• 1x technical report on an efficient process for the extraction of vanilla produced by March 2017.
	2.1.3: Develop a process for fruit spirit production.	• 1x technical report on an efficient process for fruit spirit production developed by March 2017.
	2.1.4: In partnership with MAF, MCIL and 2 pre-selected cocoa farmers, develop processes for fermenting and drying of cocoa beans.	• 1x technical report on an efficient process for fermenting and drying of cocoa beans produced by March 2017.
	2.1.5: In partnership with WIBDI, develop different cocoa products for business opportunities.	• 1x technical report on efficient processing of at least 1 cocoa product produced by December 2017. • Developed cocoa product(s) adopted by at least 1 business entity by June 2018.
	2.1.6: In partnership with MAF, MCIL and 2 pre-selected cocoa farmers, identify export market requirements for dried	• Export market requirements for dried fermented cocoa identified and documented by December 2017.

	fermented cocoa, and develop allied suitable standards. 2.1.7: Conduct an external review of the developed standards for dried fermented cocoa beans. 2.1.8: In partnership with MAF and producer organisations, disseminate research findings on dried fermented cocoa beans.	• Allied suitable standards developed by June 2018. • 1x report on external review produced and disseminated to relevant stakeholders by December 2018. • 1x technical report on research findings produced and disseminated by June 2017.
2.2: Develop new products from terrestrial plants or marine organisms for medicinal or cosmetic benefits.	2.2.1: Identify compounds with potential health benefits. 2.2.2: Develop extraction process(es) for essential oils using locally available fragrant plants.	• At least 5 compounds identified and documented by December 2020. • 1x technical report on extraction process(es) for at least 3 essential oils produced by March 2017.
2.3: Develop opportunities for by-products and waste from coconut oil and cream production.	2.3.1: In partnership with MCIL, existing coconut oil producers and other relevant stakeholders, develop economic uses for by-products (e.g., dried coconut meal, coconut water, shells or husks) from coconut oil and cream production for business adoption.	• 1x technical report on economic uses for at least 2 by-products produced by June 2018. • Economic uses for by-products adopted by at least 2 business entities by December 2018.
2.4: Design and construct a new laboratory.	2.4.1: Secure funding for the design and construction of a laboratory.	• Funding for laboratory design and construction secured by June 2017. • A new laboratory built by December 2017.
Corporate objective 3: To develop functional prototypes of products and processes based on scientific and technical research for the local or overseas markets.		
Strategy	Activity	Performance measure
3.1: Develop margarine product utilising local	3.1.1: Develop a margarine prototype product	• 1x technical report on at least 1 margarine

produce. 3.2: Develop dehydration methods for food processing (e.g., breadfruit, taro or cocoa).	containing avocado and/or coconut oils. 3.2.1: In partnership with relevant stakeholders, fabricate and test a solar drier design for drying breadfruit, taro or cocoa.	prototype product produced by February 2017. • 1x technical report on drying performance of at least 1 low cost solar drier design produced by June 2017.
Corporate objective 4: To establish partnership with the private sector and commercial interests to support the Organisation's activities.		
Strategy	Activity	Performance measure
4.1: Upscale and commercialise research outcomes.	4.1.1: Establish commercial partnership for avocado oil producing plant. 4.1.2: Establish partnerships with commercial entities and/or communities for breadfruit flour production. 4.1.3: Establish partnerships with small business entities for essential oil processing. 4.1.4: Technology transfer of frozen breadfruit pathway to relevant stakeholders. 4.1.5: Technology transfer of fresh breadfruit pathway to relevant stakeholders. 4.1.6: In partnership with MNRE, YWAM and STA, technology transfer of biogas production to communities and tourist accommodation providers. 4.1.7: Technology transfer of purified coconut oil production process to communities.	• MOU for private-public partnership established by March 2017. • MOUs for private-public partnerships with at least 1 commercial entity and/or at least 2 communities established by June 2017. • MOUs for private-public partnerships with at least 3 small business entities established by June 2017. • An efficient frozen breadfruit technology adopted by at least 1 stakeholder by June 2017. • An efficient fresh breadfruit technology is adopted by at least 1 stakeholder by June 2019. • An efficient biogas technology is adopted by at least 2 communities and 1 tourist accommodation provider by March 2018. • An efficient purified coconut oil production technology is adopted by at least 2

		communities by June 2017.
	4.1.8: Establish partnership for vanilla extraction.	• MOU for private-public partnership with at least 1 small business entity established by December 2017.
	4.1.9: Establish commercial partnership for fruit spirit production.	• MOU for private-public partnership with at least 1 alcohol product producer established by December 2017.
4.2: Operate as the national laboratory for the certification of imports and exports, and for the provision of other essential testing services, and meeting the testing requirements of stakeholders.	4.2.1: Train scientists on ISO17025 biological and chemical tests.	• At least 2 scientists are trained on ISO17025 biological and chemical tests every 3 years.
	4.2.2: In partnership with NPO and MOP, develop accreditation status for narcotics analysis (*Cannabis* and methamphetamine).	• Accreditation of narcotics analysis (*Cannabis* and methamphetamine) established by December 2018.
	4.2.3: In partnership with MJCA and NPO, develop test methods for analysis of alcohol and drug levels in biological samples (e.g., urine).	• Test methods for analysis of alcohol and drug levels in biological samples developed by March 2018.
	4.2.4: Develop new test methods (especially for quality and safety parameters for cocoa, coffee, and coconut) to be added on to the list of accredited methods.	• New test methods accepted by IANZ and added on to the list of accredited methods as required.
	4.2.5: In partnership with NPO and MOP, develop test methods for analysis of forensic samples from crime cases.	• Test methods for analysis of forensic samples developed as required.
	4.2.6: Ongoing partnership with key	• Monitoring and verification of food

	stakeholders to monitor and verify food product compliance to standards (e.g., CODEX, SNDWS, etc.).	product compliance to standards as required.
	4.2.7: In partnership with MAF and MNRE, develop test methods to analyse for selected pollutants from pesticides in water and crop produce.	• Testing capabilities to analyse selected pollutants established by June 2017.
Corporate objective 5: To ensure effective training for researchers and technical research.		
Strategy	Activity	Performance measure
5.1: Established educational partnership with universities.	5.1.1: Establish educational partnership with universities.	• At least 2 universities are consulted by December 2020 to establish partnership opportunities on training and research.
	5.1.2: Review and strengthen partnership arrangements with VUW (NZ) and UH (Hawaii) as required for relevance to SROS mandates in terms of training and research.	• Existing partnership arrangements with VUW (NZ) and UH (Hawaii) reviewed and strengthened as required.
	5.1.3: As part of HR capacity development activities, enroll scientists in tertiary institutions.	• At least 1 scientist is enrolled in a tertiary institution every 2 years.
5.2: Maintain networks with national and international colleagues and distinguished honorary fellows in technical fields.	5.2.1: Establish new collaborative project or activity involving national and international colleagues as honorary research fellows.	• At least 1 new collaborative project or activity established every 2 years.
	5.2.2: Have each scientist participate in scientific/technical conference, workshop, forum or outreach activity.	• Participation of every SROS scientist in at least 1 scientific/technical conference, workshop, forum or outreach activity recorded in quarterly and annual reports every year.

5.3: Increase public awareness and education of the work of SROS.	5.3.1: Provide science students with practical experience training in research and development work undertaken by SROS.	• At least 3 science students provided with practical experience training every year.
	5.3.2: In partnership with MESC, support the promotion of science related activities up to secondary level education.	• At least 2 science related activities supported annually.
	5.3.3: Hold awareness raising activities to promote the functions of SROS to in the first instance users and partners, and to public at large.	• At least 1 public awareness forum is held every year.
	5.3.4: Assess the level of public awareness of the work of SROS.	• 1x customer survey report produced and disseminated to relevant stakeholders by October every year.
Corporate objective 6: Augment and effectively manage financial and human resources of the Organisation.		
Strategy	Activity	Performance measure
6.1: Enable informed budgetary control by effective use of a budgetary monitoring system.	6.1.1: Prepare divisional budget.	• Each divisional budget is submitted to CEO by February every year.
	6.1.2: Maintain SROS's facilities and asset register and implement necessary repairs.	• SROS's facilities and asset register maintained, and necessary repairs completed according to set schedules.
	6.1.3: Prepare quarterly and annual reports.	• Quarterly and annual reports completed on schedule.
	6.1.4: Update financial position for monthly review.	• Copies of monthly updates reviewed by the Senior Management Group.
	6.1.5: Implement stringent financial controls to ensure year-end variance is within	• Year-end variance is within budget.

	budget.	
6.2: Ensure SROS has the manpower capacity to fulfil its mandate.	6.2.1: Provide performance feedback to individual staff.	• Staff performance appraisal process implemented and cash bonuses rewarded annually.
	6.2.2: Provide each staff member with a development opportunity.	• Each staff member is provided a development opportunity and recorded in quarterly and annual reports every year.
6.3: Increase the external (non-core) income and earning capacity of SROS.	6.3.1: Establish partnerships with businesses, agencies or other stakeholders for the provision of research and technical services.	• At least 1 MOU established with businesses, agencies or other stakeholders every 2 years.
	6.3.2: Efficiently provide contracted services to stakeholders.	• Contracted services provided on time with the agreed level of reporting, and recorded in quarterly and annual reports every year.
	6.3.3: Secure consultancy service contracts to generate revenue for SROS.	• At least 1 consultancy service contract is secured and recorded in quarterly and annual reports every year.

5.2. Scientific Research Programs

The SROS's research and development programs are aimed to add value to local resources by developing prototypes of products intended for export, import replacement and renewable and sustainable sources of energy. They will target the processing of natural resources, such as plant food materials, animal food materials, fishery products and sources of alternative energy, and SROS is uniquely placed to explore the interrelated challenges faced by the agriculture, food manufacturing and energy sectors.

5.3. Targets and Performance Indicators

The SROS aims to remain the national flag carrier for scientific research in the areas of its research activities. This requires that the research undertaken should strive to be of the highest international standard and is specific to Samoa's needs for applied research. The quality and number of publications in scientific journals, the impact of the research and the international reputation of research staff and Divisions are used to judge scientific success. On the other hand, successful uptake of research outcomes by business and industry stakeholders, individuals and communities is used to judge commercialisation success. This requires aligning research activities with industry needs throughout the supply chain and establishing appropriate partnerships, to ensure that customer demands and perception of value are met by the quality, availability and price of supplies. As listed in Section 5.1, targets for both scientific and commercial achievements are integral parts of this Corporate Plan.

5.4. Collaborative Links

Collaborations with groups in universities and other research organizations (both local and international) as well as the public and private sectors, have been promoted and encouraged to harness the benefits derived from multidisciplinary research efforts. International collaborations are an important part of SROS's work, reflecting the global nature and merits of scientific endeavours. Locally, interactions with the private sector, civil societies and rural communities will be strengthened through technical services and consultancies as well as through discussion of research outcomes and the associated investment and commercialisation opportunities. Investment profiles have also been prepared to attract international investors into business partnerships (e.g., for breadfruit flour and avocado oil).

5.5. Increased Awareness of Organisation's Research

There are several mechanisms through which the work and activities of SROS is disseminated:

- Presentation of papers at national and international seminars/conferences;
- Presentation and discussion of work with:
  - Policy making bodies (SROS Board of Directors);
  - Industry, sector and trade organisations (e.g., SAME, SFA, SCCI, WIBDI, etc.);

  - Government ministries and committees (e.g., MAF, MNRE, MCIL, NUS, MOH, MOP, AGO, NPO, CDC, etc.); and,
  - Key stakeholders in the community (e.g., farmers, end-users, etc.).
- Conferences, workshops and seminars organized by the SROS Management;
- Annual reports of the SROS's work;
- The SROS website: www.sros.org.ws;
- Promotional literature generated by SROS, and advertisement campaigns;
- Visits by overseas officials, government ministers, representatives of commercial companies and fellow scientists;
- Publication of peer-reviewed research papers in scientific journals;
- Publication of scientific and popular review articles; and,
- Attendance to trade shows and expos to help promote SROS's products and services.

5.6. Strengthen the Organisation's Research Program

5.6.1. Review of Research Program

The research strategy developed for SROS is aimed at addressing some of the current economic problems facing Samoa's development, and maintaining SROS as the national scientific research organization. Research activities are organized into three main research programs, namely Plant and Postharvest Technologies, Environment and Renewable Energy, and Food Science and Technology. Within each of these three research programs, a number of research projects are designed to tackle specific research problem(s) in each research discipline.

The broad content of the research programs are developed in consultations with the relevant stakeholders, and then screened by SROS's Senior Management Group before submission to the Board of Directors for endorsement. The goals of the research programs must agree with the SROS mandate, align closely with the Government's SDS 2017-2020 and other relevant sector plans aforementioned, and be responsive to the emerging research interests of key stakeholders. The research strategies continue to be developed and refined through a series of reviews and discussions with stakeholders, in order to adjust focus and directions and set funding targets.

To ensure SROS maintains relevance, strategic focus and international competitiveness of its research, several mechanisms are in place to monitor the research programs, which is undertaken at three different levels:

- Weekly reviews of the research and targets set in discussion with the SROS's Senior Management Group;
- Reviews of research progress by the Board of Directors through quarterly and annual reports, final reports of projects and discussion via stakeholders consultation meetings; and,
- Triennial review of research progress by an independent panel instituted by the Board of Directors under clause 9A (Advisory Committees) of the SROS Act 2008.

This system of review ensures an appropriate balance between science and commercial exploitation for the benefit of Samoa. It also identifies where new requirements for capital or operational investments, such as the expansion of existing laboratories, revision of existing or establishment of new Divisions. In addition, it assesses productivity and value-for-money of the research carried out within SROS for Samoa.

6. FINANCIAL STATEMENTS

Surpluses of $45,232 and $170,237 were recorded in 2013-2014FY and 2014-2015FY, respectively. The Government grant received at the end of 2014-2015FY was a 4% decrease from the previous year. For 2015-2016FY, the budget from Government grant for SROS activities saw a slight increase in terms of salary funding while its operating funds remain relatively the same. The total revenue budget approved for 2015-2016FY was $3.33M from Government grant funding and $149k from other income, yielding a projected operational surplus of $46k.

The budget going forward is expected to include some proposed Capital items to ensure SROS is able to provide its essential services according to its mandate. The tar resealing of the SROS road has now been completed in the 2014-2015FY. Other capital items proposed include the proposal for a new laboratory building in 2017-2018FY, and the construction of a security fence around the SROS compound in 2018-2019FY. SROS is also trying to acquire a new motor vehicle via partial funding from donor (about 60%) and utilizing savings by SROS during the 2015-2016FY.

There are projected increments in other income not only to compensate for rising costs but also for SROS to slowly reduce Government grant per annum. These projections are summarised in tables 3 and 4 and were made with the following assumptions:

- Income: Level of Government grants is relatively maintained and forecasted to be reduced to enable essential technical services (including export certification, water safety and narcotics) and the improvement of infrastructure, to maintain the level of staff, whilst SROS aims to increase its earning capacity gradually each year through its technical services and by securing increased external funding for research projects;

- Expenditure: Key expense items such as administrative, occupancy and other costs will fluctuate in the range of 1 to 2% annually, while depreciation will slightly increase in 2016-2017FY to 2017-2018FY, anticipating capital injection via new capital projects proposed, and then forecasted to decrease in 2019-2020FY. These are all based on anticipated expansion in SROS operations associated with increased technical services and research activities undertaken, annual activities such as IANZ accreditation audit and laboratory equipment maintenance to international standards, and other capital investments;

- Directors fees budget provisions comprise annual fees for eligible members as per Cabinet endorsement of changes in 2015 ($22.5k for Chairman and $18k for members); and,

- Continued efforts will be made to establish commercial links with the private sector and other relevant stakeholders, and strategic links with international research organisations in order to develop additional funding partnerships and revenue streams.

Table 3: Statement of Income and Expenditure and Cashflow for the Scientific Research Organisation of Samoa for the period 2013-2014FY to 2019-2020FY.

FOR THE PERIOD 2013/2014 TO 2019/2020	ACTUALS		BUDGET	BUDGET	BUDGET	BUDGET	BUDGET
	FY2013/2014	FY2014/2015	FY2015/2016	FY2016/2017	FY2017/2018	FY2018/2019	FY2019/2020
Income	(Audited Accounts)	(Audited Accounts)	(Budget Forecast)	(Budget Forecast)	(Budget Forecast)	(Budget Forecast)	(Budget Forecast)
Government Grant	3,432,584	3,300,902	3,334,495	3,450,789	3,459,262	3,380,537	3,380,537
Other Income	561,981	347,609	148,988	151,294	166,423	183,066	201,372
Total Income	**3,994,564**	**3,648,512**	**3,483,483**	**3,602,083**	**3,625,685**	**3,563,603**	**3,581,909**
Expenditure							
Audit fees	8,004	9,550	10,304	10,304	10,304	10,304	10,304
Directors fees & board expenses	50,765	40,456	62,235	86,940	94,500	94,500	94,500
Depreciation	860,480	226,993	261,143	274,200	301,620	286,539	272,212
Personnel costs	1,559,289	1,742,435	1,887,452	1,906,327	1,925,390	1,829,120	1,847,411
Occupancy costs	158,821	255,282	252,835	257,892	263,050	268,311	273,677
Administrative costs	651,942	513,356	422,133	430,576	439,187	447,971	456,930
Other costs	660,031	690,203	541,671	552,504	563,555	574,826	586,322
Total Expenditure	**3,949,332**	**3,478,275**	**3,437,773**	**3,518,742**	**3,597,605**	**3,511,570**	**3,541,357**
Surplus/Deficit of Income over Expenditure	**45,232**	**170,237**	**45,710**	**83,341**	**28,080**	**52,032**	**40,552**
Cash Flow From/To Operating Activities							
Cash received from Government of Samoa	3,256,626	3,031,445	3,334,495	3,450,789	3,459,262	3,380,537	3,380,537
Cash received from - Technical Services	93,612	128,981	148,988	151,294	166,423	183,066	201,372
Cash received from the Republic of Turkey Ethanol	100,732	10,703	12,957	12,957	12,957	12,957	-
Cash received from the Republic of Turkey Breadfruit	94,177	17,450	2,784	2,784	-	-	-
Cash received from the Republic of Korea Fruit Wine	3,282	18,319	35,451	141,803	35,451	35,451	35,451
Cash received from SPC	-	-	47,624	31,749	15,875	15,875	15,875
Cash received from - Avocado Margarine	-	-	24,529	171,705	-	-	-
Cash received from - Coconut Oil Refinement	1,390	-	34,285	239,998	-	-	-
Cash received from - IUCN	9,409	64,158	5,821	14,552	2,910	-	-
Cash received from - Biodiesel	10,816	48,150	-	-	-	-	-
Consultancy services	8,345	9,000	10,800	11,880	13,068	14,375	15,812
PHAMA Projects	40,736	21,786	6,464	-	-	-	-
TCM Project Tier 2	-	-	81,037	121,556	67,531	-	-
FAO Projects	-	-	13,600	12,920	12,274	-	-
Other Income	2,697	10,135	10,642	11,174	11,733	12,319	12,935
Total Cash Flow From/To Operating Activities	**3,621,822**	**3,360,126**	**3,769,477**	**4,375,160**	**3,797,484**	**3,654,579**	**3,661,982**
Cash Paid for Expenses	(2,944,180)	(2,960,510)	(2,941,504)	(3,412,145)	(2,968,566)	(2,849,823)	(2,844,124)
Net Cash Flow by Operating Activities	**$ 677,641**	**$ 399,616**	**$ 827,973**	**$ 963,015**	**$ 828,918**	**$ 804,756**	**$ 817,859**
Net Cash Flow from/to Investing Activities							
Purchase of Property, Plant & Equipment	(419,501)	(396,535)	(315,176)	(456,782)	(1,456,782)	(739,251)	(389,251)
Net Increase/Decrease in Cash and Cash Equivalent	**258,140**	**3,081**	**512,797**	**506,233**	**(627,864)**	**65,505**	**428,608**
Cash and cash equivalent at the beginning	$ 1,122,336	$ 1,380,476	$ 1,383,557	$ 1,896,353	$ 2,402,587	$ 1,774,723	$ 1,840,228
Cash and Cash Equivalent at END	**$ 1,380,476**	**$ 1,383,557**	**$ 1,896,353**	**$ 2,402,587**	**$ 1,774,723**	**$ 1,840,228**	**$ 2,268,835**

Table 4: Balance Sheet for the Scientific Research Organisation of Samoa for the period 2013-2014FY to 2019-2020FY.

FOR THE PERIOD 2013/2014 TO 2019/2020	ACTUALS		BUDGET	BUDGET	BUDGET	BUDGET	BUDGET
	FY2013/2014	FY2014/2015	FY2015/2016	FY2016/2017	FY2017/2018	FY2018/2019	FY2019/2020
	(Audited Accounts)	(Audited Accounts)	(Budget Forecast)	(Budget Forecast)	(Budget Forecast)	(Budget Forecast)	(Budget Forecast)
Opening Balance	3,188,227	3,233,460	3,403,696	3,449,406	3,532,747	3,560,827	3,612,859
Add: Surplus/(Deficit)	45,232	170,237	45,710	83,341	28,080	52,032	40,552
Closing Balance	**3,233,460**	**3,403,696**	**3,449,406**	**3,532,747**	**3,560,827**	**3,612,859**	**3,653,412**
Current Assets							
Cash & Cash Equivalents	1,380,476	1,383,557	1,896,353	2,402,587	1,774,723	1,840,228	2,268,835
Other Receivables and Prepayments	299,873	368,651	97,067	87,360	78,624	70,762	63,686
Other Project Funds	-	-	-	-	-	-	-
Stock on Hand	214,940	150,912	209,672	209,672	209,672	209,672	209,672
Total Current Assets	**1,895,289**	**1,903,120**	**2,203,092**	**2,699,619**	**2,063,019**	**2,120,662**	**2,542,193**
Current Liabilities							
Other Payables and Accruals	90,964	57,419	45,935	36,748	29,399	23,519	18,815
Allowance for Staff Benefits	68,472	57,771	63,094	63,094	63,094	63,094	63,094
Deferred Income	655,271	706,654	781,444	625,156	500,124	400,100	320,080
Total Current Liabilities	**814,707**	**821,844**	**890,474**	**724,998**	**592,617**	**486,713**	**401,989**
Working Capital	**1,080,582**	**1,081,276**	**1,312,618**	**1,974,621**	**1,470,402**	**1,633,949**	**2,140,204**
Non-Current Assets							
Property, Plant & Equipment	2,152,878	2,322,420	2,136,788	1,558,126	2,090,426	1,978,911	1,513,208
Net Assets	**3,233,460**	**3,403,696**	**3,449,406**	**3,532,747**	**3,560,828**	**3,612,859**	**3,653,412**

7. SPECIFIC PROJECTS

7.1. New Projects Proposed for 2017–2020

7.1.1 Enhanced food production and postharvest handling systems for Samoa

Project objective: To increase the efficiency of fruit value chains through improved productivity and postharvest handling practices for fresh breadfruit and pineapple.

The horticultural sector supports the livelihoods of the majority of the Samoan population. However, increasing food imports, declining contribution to overall GDP, and reduced household participation in the sector, highlights systemic challenges. In seeking to revitalise the horticultural industry, the Samoan Government launched the *Fruit & Vegetables Development Strategy for Samoa* in 2009. While this strategy does not identify commodity-specific priorities, it does provide an extensive action plan (based on industry structure reform, R&D to improve productivity, capacity building, supply chain coordination, and provision of technical services), focused on achieving import substitution and supporting niche export market opportunities.

This four-year project will aim to achieve the following objectives:

(a) Improve the commercial viability of sea-freight exports in Samoa by developing postharvest protocols for small breadfruit consignment shipments to New Zealand and Australia;
(b) Evaluate the existing postharvest handling constraints along domestic pineapple value chains in Samoa, and provide appropriate remediation; and,
(c) Undertake concurrent postharvest optimisation of sea freight storage protocols for Samoan pineapple in support of a future Samoa pineapple export industry.

Planned milestones	Time frame	Estimated cost	Status
1. Develop fresh breadfruit pathway and extend shelf life for export markets.	by Mar 2019	AUD$311k	ACIAR funding
2. Develop fresh pineapple pathway and extend shelf life for export markets.	by Dec 2020	As in 1 above	-
3. Provide progress reports to key stakeholders.	Starting 2017	-	-
4. Produce at least one scientific and/or technical publication from research findings.	by Dec 2019	-	-

7.2. Currently Active Projects

7.2.1 Cocoa value adding

Project objective: To determine the optimum fermentation and drying processes and potential value added products for the different cocoa varieties locally available.

Cocoa intended for different markets or products can have distinct fermentation and drying requirements. This study aims to characterise the local varieties when fermented and dried, and thus identify the optimum fermentation and drying processes for the different varieties available, and evaluate potential value added products for the desired varieties.

Planned milestones	Time frame	Estimated cost	Status
1. Secure funding to conduct the study.	by Mar 2015	AUD$10k USD$56k	PHAMA TCMS EIF Tier 2

2. Identify the optimum fermentation and drying processes for the different varieties available locally.	by Mar 2017	AUD$10k from PHAMA	In progress
3. Evaluate potential value adding on the desired cocoa varieties.	by Dec 2017	USD$56k from TCMS EIF Tier 2	In progress
4. Identify export market requirements for dried fermented cocoa beans.	By Dec 2017	-	Internal funding
5. Develop suitable standards for dried fermented cocoa beans.	by Jun 2018	USD$10k	TCMS EIF Tier 2
6. Conduct external review of developed standards.	by Dec 2018	USD$1k	TCMS EIF Tier 2
7. Produce at least one scientific and/or technical publication from research findings.	by Jun 2017	-	Internal funding

7.2.2 Orchid propagation & essential oil extraction

Project objective: To improve the economic and social wellbeing of Samoan communities through the advancement of a natural resources industry.

The project is designed to directly benefit the grassroots level as well as contribute to the socio-economic development of Samoa by using cost effective biotechnologies on plants which are abundant, well grown and economically viable. It entails the use of plant biotechnology to exploit the resources abundantly available at different locations spread across the islands of Savaii and Upolu. The project will specifically be directed at the propagation of various beautiful orchids and the extraction of aromas from fragrant plants.

Planned milestones	**Time frame**	**Estimated cost**	**Status**
1. Secure funding to conduct the study.	by Mar 2015	USD$95k	Funded by Japanese Embassy Samoa
2. Procure necessary equipment for the project.	by Oct 2015	USD$80k from Japanese Embassy Samoa	Completed
3. Establish quarantine nursery and irrigation/fertigation system for orchid seedlings.	by Oct 2015	USD$15k from Japanese Embassy Samoa	In progress
4. Establish extraction process(es) for essential oils.	by Mar 2017	SAT$10k	Internal funding
5. Establish business partnership(s) for essential oils.	by Jun 2017	-	Internal funding
6. Import desired orchid seedlings from Japan.	by Jun 2017	SAT$10k	Internal funding
7. Propagate at least 2000 seedlings annually for distribution purposes.	by Dec 2020	-	Internal funding
Major milestone(s) achieved to date	**Date**	**Revenue**	**Funding agency**
1. Developed essential oil prototypes showcased at Tokyo COSME Expo 2016, Japan.	Jan 2016	SAT$2k	Internal funding

7.2.3 Renewable energy using locally available bioresources

Project objective: To achieve commercial production of an alternative renewable energy using the bioresources of Samoa

The central objective of the project is to reduce the nation's reliance on foreign sources of fossil fuels so that economic growth can be sustained. Biodiesel and bioethanol can significantly contribute to the infrastructure priorities outlined in the new SDS 2017-2020 that seek sustainable energy supply for the country.

	Planned milestone(s)	**Time frame**	**Estimated cost**	**Status**
1.	Additional agencies or businesses successfully running vehicles and motors with biodiesel supplemented fuel.	Annually starting in 2013	Cost recovery from users	Completed
2.	Provide progress reports to key stakeholders.	Starting in 2014	-	Internal funding
3.	Refine process options for biogas production.	By Dec 2017	-	Funding sought
4.	Refine process options for biodiesel production.	By Dec 2019	-	Funding sought
5.	Scientific publication from research findings.	By Dec 2019	-	Internal funding
6.	Evaluate performance of at least 10 various feedstocks for biogas production annually.	By Dec 2020	-	Funding sought Internal funding
7.	Measure heat content of at least five feedstocks for biomass gasification annually.	By Dec 2020	-	
	Major milestone(s) achieved to date	**Date**	**Revenue**	**Funding agency**
1.	A pilot plant was installed on-site for the production of biodiesel from coconut oil at 200 L of biodiesel per batch.	Nov 2009	SAT$600k	IUCN-Italy-Austria
2.	Laboratory equipment was set up on-site for the production of bioethanol from cassava and breadfruit.	Dec 2008	SAT$582k	Turkey
3.	Two vehicles operated by SROS have subsequently been successfully fuelled with 100% biodiesel [B100].	2010 to 2012	-	Internal funding
4.	Environmental Impact Assessment (EIA) was carried out by Landcare Research (NZ) on the cultivation of *Jatropha curcas*, as a non-food feedstock for biodiesel production to supply EPC's new power station site at Fiaga.	April 2011	-	IUCN-Italy-Austria
5.	Feasibility study and report was prepared for a biodiesel plant in Savaii by the New Zealand consulting firm Fairbain Consult and David Wright with our assistance.	Dec 2011	-	NZAID
6.	Car fleet of SPREP successfully supplied with B10 biodiesel since August 2012, as well as select vehicles of STEC and MNRE.	Aug 2012 to date	-	Cost recovery
7.	Business financial model completed for the generation of electricity from biodiesel in conjunction with biomass gasification, which was used to prepare an investment profile, an expression of interest to EPC and a pre-proposal to IRENA.	Jan 2013	-	Internal funding
8.	Published 2 papers on SROS biodiesel production processes and engine performances characteristics.	March 2013	-	External funding
9.	Complete the set-up of coconut oil and Jatropha oil expellers at STEC Land (Mulifanua).	August 2013	SAT$334k	IUCN-Italy-Austria

7.2.4 Avocado and coconut margarines

Project Objective: to utilize locally extracted avocado and coconut oils to produce an avocado and coconut margarines. Avocado oil was successfully extracted and launched in 2012. The full utilisation of the extracted oil has seen the need to add more value to this new local oil, by producing an avocado margarine which can contribute to lessening the import of margarine and butter into the country and also be an export product for overseas niche market. The same approach will be applied to coconut oil to produce a coconut margarine.

Planned milestone(s)	Time frame	Estimated cost	Status
1. Develop at least two margarine formulations utilising avocado and coconut oils.	By Feb 2017	SAT$394k	GoS funding
2. Complete development of at least two margarine product prototypes containing avocado and coconut oils.	By Feb 2017		GoS funding

Major milestone(s) achieved to date	Date	Revenue	Funding agency
1. Commissioning of a commercial-scale processing plant for avocado oil on the Organisation's campus was completed.	Feb 2012	Refer 7.2.5	GoS
2. Sale of avocado oil prototype in local supermarket from May 2012 to March 2013.	May 2013	SAT18k	Cost Recovery
3. New research strategy developed with the assistance of Honorary Research Fellow, Dr Ron Bowrey.	Apr 2015	SAT$5k	GoS

7.2.5 Avocado oil

Project objective: To establish a commercial avocado oil processing operation in Samoa.

Adding value to local agricultural produce to serve both the domestic and export markets is a big incentive for farmers to continually grow the raw material and business owner to invest in processing. The achievement of this project's main objective would be a great benefit to the development of rural areas to improve the economic outlook of the country.

Planned milestone(s)	Time frame	Estimated cost	Status
1. Establish commercial partnership(s) for avocado oil producing plant by completing the Expression of Interest re-advertised in May 2016.	By Mar 2017	-	Internal funding
2. Complete process optimisation and training of manufacturing personnel for business partner.	By Jun 2017	-	Funding sought
3. Import at least 1000 avocado seedlings of the desired Hass and Fuerte varieties for propagation.	Dec 2017	-	Internal funding
4. Assist business partner to launch new or existing product to local markets.	By Dec 2017	-	Funding sought
5. Distribute 1000 avocado planting material to farmers annually.	By Dec 2020	-	Funding sought

Major milestone(s) achieved to date	Date	Revenue	Funding agency
1. A technical study to establish testing methods and evaluate the avocado resource in Samoa was completed.	May 2010	SAT$254k	AusAid
2. Commissioning of a commercial-scale processing plant for avocado oil on the Organisation's campus was completed.	Mar 2012	SAT$735k	GoS
3. Sale of avocado oil prototype in local supermarket from May 2012 to March 2013.	May 2012	SAT$12k	Cost recovery

4.	Business financial model that has been used to develop an investment profile.	Sep 2012	-	Internal funding
5.	Provisional acceptance for registration of the "Samoa Pure" trade mark.	Feb 2013	-	Internal funding
6.	Avocado oil successfully utilised to make avocado margarine prototypes.	Oct 2015	SAT$394k	GoS

7.2.6 Breadfruit flour

Project objective: To establish breadfruit flour processing operation in Samoa.

To demonstrate the economic potential of processing flour for Samoan breadfruit to local industries and business, and communities.

Planned milestone(s)		**Time frame**	**Estimated cost**	**Status**
1.	Establish partnerships with a commercial entity and/or communities for breadfruit flour processing.	By Jun 2017	-	Funding sought
2.	Develop a low cost and efficient dehydration method for drying breadfruit (and cocoa).	By Jun 2017	USD$20k	TCMS EIF Tier 2
Major milestone(s) achieved to date		**Date**	**Revenue**	**Funding agency**
1.	Prototype flour products from breadfruit and cassava were launched with sample pastries prepared with these gluten-free flours.	Feb 2012	–	Internal funding
2.	Business plan and financial model completed for the establishment of a flour processing centre in Apia, which was used as reference in discussions with potential investors and with relevant participants of the Two Samoas Ulu Summit.	Dec 2012	–	Internal funding
3.	Establishment of local interest for breadfruit flour – used as a malt substitute for beer brewing by Samoa Breweries Ltd.	Oct 2013	SAT$2,343	Cost Recovery
4.	Natural Foods International formalised a supply contract with Samoa Breweries Ltd for the breadfruit flour.	Dec 2014	-	-
5.	Revised version of business plan for discussion with interested investors.	May 2015	-	Internal funding

7.2.7 Coconut oil refinement

Project objective: To refine the quality of coconut cooking oil by using new means of filtration and local resources.

The aim is to help improve the eating or cooking quality of the oil while exploiting advantages in regards to its high cooking temperature.

Planned milestones		**Time frame**	**Estimated cost**	**Status**
1.	Develop a process for the purification of coconut oil.	by Mar 2017	SAT$400k	GoS
2.	Establish partnership with individuals and/or communities for purified coconut oil processing.	by Jun 2017	–	Internal Funding
Major milestone(s) achieved to date		**Date**	**Revenue**	**Funding agency**
1.	Start-up funding secured for acquiring necessary equipment and supplies.	Jul 2012	As in 1 above	GoS
2.	New research strategy developed with the assistance of Honorary Research Fellow, Dr Ron Bowrey.	Sep 2013	As in 1 above	GoS

7.2.8 Novel Processing of Fruit Spirit

Project objective: To develop an efficient process for fruit spirit production from local fruits.

Samoa is blessed with abundance of tropical fruits that are often under-utilised while in season. There has been some interest from local businesses in the development of alcoholic spirit using locally grown fruits. This project aims to develop a technically and commercially efficient process for the processing of fruit spirits using locally grown fruits for local consumption and export.

Planned milestones	Time frame	Estimated cost	Status
1. Develop an efficient process for fruit spirit production.	By Mar 2017	USD$140k	South Korea funding; in progress
2. Develop a business case for a fruit spirit production operation.	By Mar 2017	As in 1 above	In progress
3. Establish commercial partnership for a fruit spirit production operation.	By Dec 2017	-	-

Major milestone(s) achieved to date	Date	Revenue	Funding agency
1. Sensory evaluation of fruit spirit prototypes with SAME and SHA.	March 2015	SAT$10k	South Korea

7.2.9 Postharvest Technologies

Project objective: Develop postharvest technologies to facilitate the revival of agricultural produce and products in Samoa.

A key outcome in the new SDS 2017-2020 is revitalized agriculture, which could be greatly facilitated by the introduction of value-added processing through postharvest technologies. In addition to existing projects in food processing, SROS seeks to identify a new project through consultation with relevant stakeholders in the farming, processing and logistics industries. SROS aims to develop a postharvest technology that will be taken up by local industries and individuals to increase exports of Samoa's agricultural products.

Planned milestones	Time frame	Estimated cost	Status
1. Complete consultation with relevant stakeholders to ascertain national postharvest requirements.	By Dec 2015	–	Internal funding
2. Secure start-up funding and acquire necessary equipment and supplies.	By Jun 2016	SAT$100k	Funding sought
3. Provide annual progress reports to key stakeholders.	Starting in 2017	–	Internal funding
4. Establish at least one marketable product using postharvest technology, for example:			
a. Vanillin extraction; and,	by Mar 2017	-	Internal funding
b. Frozen breadfruit.	by Mar 2017	-	Funding sought
5. Produce at least one scientific and/or technical publication from postharvest research findings.	by Dec 2019	–	Internal funding

Major Milestones achieved to date			
1. Secured funding for frozen taro activities from PHAMA (acquired blast freezer).	October 2013	AUD$22k	PHAMA
2. Secured funding to build staff and laboratory capacity for molecular level research to study pathogens affecting fresh breadfruit.	August 2013	USD$50k	Turkey

3.	Promotion of frozen taro product at SAME Buy Samoa Made Products Tradeshow, Sydney, Australia.	March 2015	SAT$5k	PHAMA

7.2.10 Medicinal and cosmetic application of select organisms available in Samoa

Project objective: To evaluate medicinal and cosmetic application of select organisms (terrestrial and marine) that are abundantly available in Samoa.

Samoa is blessed with abundance of terrestrial and marine resources that have potential to inhibit various enzymes responsible for high sugar levels in blood causing diabetes and other non-communicable diseases. This project aims to screen selected terrestrial flora and marine fauna for their effectiveness in inhibiting the activity of the α-glucosidase enzyme which is responsible for high sugar levels in blood.

Planned milestones	**Time frame**	**Estimated cost**	**Status**
1. Identify at least five compounds with potential health benefits.	By Dec 2020	USD$5k	US Embassy Samoa Office; in progress

Major milestone(s) achieved to date	**Date**	**Revenue**	**Funding agency**
1. Four plant species and two marine species showed promising effectiveness in inhibiting the activity of the α-glucosidase enzyme.	October 2015	-	Internal funding

7.2.11 Essential Testing Services and International Accreditation

Project objective: To provide technical analyses to support the private sector and exporters in their efforts to expand primary food production, manufacturing/processing and the service industries.

SROS has been working to achieve international accreditation of different testing services to help the private sector within the framework "Strategies under accreditation that will make the private sector an intervention sector that would drive economic growth and job creation". The portfolio of testing services established continues to be expanded to meet the needs of our customers and stakeholders.

Planned milestone(s)	**Time frame**	**Estimated cost**	**Status**
1. Train at least two scientists on ISO17025 biological and chemical tests.	Triennial	-	Funding sought
2. Develop test methods to analyse for selected pollutants from pesticides in water and crop produce.	By Jun 2017	SAT$90k USD$21.5k	GoS FAO
3. Implement identified methods and complete successful runs in ILCPs by November of each year.	Annually	-	Internal funding
4. Develop new test methods for quality and safety parameters for cocoa, coffee and coconut.	As required	USD$30k	TCMS EIF Tier 2

Major milestone(s) achieved to date	**Date**	**Revenue**	**Funding agency**
1. Successful audit of IANZ accreditation.	Dec 2014	-	Internal funding
2. Successful audit of IANZ accreditation.	Dec 2015	-	Internal funding
3. Extension of accredited scope of tests to analyse histamine and mercury in fish and fish products, *Vibrio* in undercooked seafood, and energy in food and food products.	Dec 2014	USD$20k	US Embassy Samoa Office

7.2.12 Narcotics Laboratory			
Project objective: To upgrade the technical capacity of SROS to enable testing of hard drugs and precursors.			
Planned milestone(s)	**Time frame**	**Estimated cost**	**Status**
1. Develop accreditation status for narcotics analysis.	By Dec 2018	-	Funding sought
2. Develop test methods for analysis of alcohol and drug levels in biological samples (e.g., urine).	By Mar 2018	-	Funding sought
3. Develop test methods for analysis of forensic samples from crime cases.	As required	-	Funding sought
Major milestone(s) achieved to date	**Date**	**Revenue**	**Funding agency**
1. Complete set up of the narcotics laboratory.	Jul 2013	SAT$57k	Samoa Law and Justice Sector funding
2. Successfully trained three analysts for *Cannabis* analysis.	Oct 2013	NZD$45k	NZAid &Samoa Law and Justice Sector funding
3. Procure GC/MS for methamphetamine and other hard drugs.	April 2014	SAT$140k	GoS
4. Successfully trained two analysts for methamphetamine and other hard drugs.	Oct 2014	-	NZAID
5. Revised narcotics service contract formalised with MOP.	July 2015	-	Internal funding

7.3. Capital Projects

7.3.1 Building a security fence around the compound
Status: Funding sought **Estimated cost:** SAT$350k **Timeframe:** 2018-2019FY
7.3.2 Acquiring a new motor vehicle for technical & research work
Status: Partially funded by ACIAR (AUD$30k); remaining funding sought **Estimated cost:** SAT$105k **Timeframe:** 2015-2016FY
7.3.3 SROS Laboratory Building
Funding of SAT$1M was granted to build a new laboratory to house all food processing and product development facilities. Cabinet approval as per FK (11) 26 however was obtained to divert funds to procure the avocado processing plant for avocado oil processing. A new laboratory building is now needed to house and centralize the Technical Services Division, analysis equipment and instruments, and offices for its staff. **Status:** Funding sought **Estimated cost:** SAT$1.5M **Timeframe:**2017-2018FY

7.4. Completed/Closed Projects

Project	Completed	Budget	Funding
7.4.1 Promotion of Gluten Free Breadfruit Flour Project.	Feb 2015	NZD$10k	NZ Tindall Foundation/VSA
7.4.2 Assessment of the acceptability (sensory & nutritional evaluations) of selected varieties of taro for food security and export.	Jun 2015	AUD$35k	PARDI
7.4.3 Analysis of microbiological risks for selected leafy green vegetables chains in Samoa.	Jul 2015	USD$18k	FAO
7.4.4 Ready-to-cook frozen taro for Samoa Export Market.	Sep 2015	AUD$20k	PHAMA

8. SUPPORT FOR GOVERNMENT POLICIES

In the new SDS 2017-2020, Government is declaring its commitment to the provision of certain services including scientific research as means of improving the output from resources used in agriculture and industry and increasing the use of sustainable energy sources.

The SROS was specifically set up with a key goal being to improve the national economy through value adding to local resources and services. The results of research activities are expected to lead to the development of prototype products and services for uptake by individuals, communities, businesses and industry to supply both the local and overseas markets. SROS also works closely with the private sector to resolve industry specific challenges requiring research.

Another key area of focus of SROS is renewable energy as it is one of the implementing agencies for achieving the key outcome of sustainable energy supplies in the new SDS 2017-2020. SROS will continue research on biogas, biomass and locally available feedstock for renewable energy.

The provision of IANZ certified technical services and other essential testing services (including narcotics analysis) by SROS have wide applications and important implications on various sectors of national development. These analytical services are able to assist in the following areas:

- Quality of various crops and crop varieties;
- Quality management to ensure compliance to Food Standards and the National Export Strategy;
- Consultancy services to improve various operations and products of the private sector;
- Influence and impact of manmade actions on the environment;
- Quality of water and soils in Samoa; and,
- Drug testing services under Narcotics Act 1967.

9. ASSUMPTIONS AND RISKS

Strategic issues (factors, trends and obstacles) that have the potential to affect the shape and performance of SROS long term are as follows:

1. Funding sustainability and commercialization of developed products and technologies continue to be ongoing challenges for SROS given its dependence on Government and external funding for its operations and research mandate. With increasing competing funding requests made to Government and with the Government's strategy to reduce the national debt by promoting self-sustainability of SOEs and tightening annual budget provisions, the challenges for SROS are to:
   - continue to strengthen its earning capacity via increased engagement in commercial activities/opportunities (technical and consultancy services) to achieve its mandated objectives;
   - continue to scope long term research and business investment partners to pursue meaningful research activities that are industry driven and will benefit partners and the Samoan economy as a whole; and,
   - develop Intellectual Property (IP) ownership to SROS scientific research outcomes which could potentially lead to an outright sale of the research results and/or some form of commercial partnership with another party to achieve financial gain.

   To address the abovementioned challenges, SROS intends to reform its Food Science and Technology Division to operate as a commercial arm of SROS, to commercialize its scientific research outcomes (products and processes) for trading purposes either on its own or via public-private partnership (PPP) arrangements with interested business entities. This direction may require some amendments to the SROS Act 2008 and is planned to be completed and enacted by Parliament by the end of 2017.

2. SROS's evolving and expanding scientific research mandate also puts pressure on available resources (human, financial & infrastructure) to successfully deliver expected outcomes within specific timeframes. Having said this, SROS is committed to effectively and efficiently utilize its limited resources to achieve the best possible outcomes.

3. Climate change and allied natural disruptive events, principally cyclones and secondarily floods and droughts, can negatively impact on crop yields, especially on those crops needed to supply raw materials to realise the commercial potentials of SROS's research findings and product development efforts. As mentioned in an earlier section, the realignment of SROS with MAF will promote and support the establishment of supply of the preferred plant varieties (especially climate ready varieties) needed as raw materials, to ensure long-term stable supply of the desired quantities for large scale/commercial processing of some of the developed products. MAF is mandated and better equipped to implement the multiplication and distribution of the desired climate ready crop varieties, and the merge between MAF and SROS should expedite this important supply component of the value chain.

10. CONCLUSION

The priority objectives, strategies and performance measures defined in SROS's Corporate Plan 2017-2020 have been identified and developed following thorough consultations with its stakeholders. These will guide future scientific and technical research and alignment with broad national development strategies to develop new technologies and products to benefit Samoa's local manufacturing industry, energy sector and in turn the national economy.

Given that the majority of the activities highlighted in the Plan will be completed by December 2018, SROS will hold another stakeholders consultation in September 2018, to target specific ideas for new projects, partnership options and feedback from stakeholders. This is to ensure that the strategies and allied new activities for the remaining two years of the Plan (2019 & 2020), will continue to be relevant and responsive to technical and research development interests and needs of SROS's stakeholders in the public and private sectors, and civil societies.