

COUNTRY REPORT ON THE STATE OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

SAMOA



THE STATUS OF PLANT GENETIC RESOURCES

**COUNTRY REPORT
SAMOA**

Prepared by: Philip Tuivavalagi

Note by FAO

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EXECUTIVE SUMMARY

Since gaining independence 30 years ago, Samoa has been proactive in returning control of government, land and resources to traditional owners. The most recent challenges have been in the areas of biodiversity conservation and the creation of sustainable livelihoods. Samoa has taken a progressive approach by recognising the unique value improved agricultural methods that have developed over generations.

Samoa's agricultural production base is narrow being confined to a few root crops, vegetables and fruits. However, with various developments projects, the production base is being diversified with the introduction of exotic fruit trees as well as the development of economically viable crops in the ecologically suitable and sustainable farming systems for production by farming communities. These projects was a success at first, however, once the funding ceased, the operation generally slowed recently.

This report illustrates the survey findings on the status of conservation and sustainable utilization of plant genetic resources for food and agriculture in Samoa as outlined in the Global Plan of Action. The survey was conducted in the two main islands of Upolu and Savaii as the other small islands is considered not relevant to the aim of the survey.

INTRODUCTION



Samoa is an independent small island developing state (SIDS) in the central South Pacific, lying about latitude 14 degrees south and longitude 170 degrees west and not far from the international dateline. The country is located 2 600 miles north west of Hawaii, and north east of New Zealand 1 800 miles and 2 700 from Sydney, Australia. The total land area is about 2 930 km². Of the two main islands, Savaii is the largest at about 1 700 km². The islands are of volcanic origin clearly visible in the form of several dormant volcanoes and lava fields. Beyond the narrow coastal plains, mountain ranges rise steeply to a maximum of 1 860 metre (m) on Savaii and 1 100 m on Upolu intersected by fertile valleys. The greatest part of the country was covered by lush vegetation and rain forest.

The country's 362 villages are divided into 43 districts. The climate is tropical with abundant rainfall. Humidity is high averaging about 80 percent (%). The average monthly temperature averages about 27°C with little seasonal variation. There are two main seasons with the rainier season from November through April when cyclones may occur, and the drier season from May through October, the latter with more regular south east trade winds. The mean annual rainfall is about 2 900 mm although there is great variation with latitude and location.

The country's farming systems are characterised by closely independent production activities that cut across the crops, livestock, fisheries and forestry sub-sectors. The food crops sector is dominated by the production of root crops such as taros (giant *Alocasia macrorrhiza*, *Colocasia esculenta*, American *Xanthosoma* sp.), yams, manioc/cassava, etc., and bananas and plantains. *Colocasia* sp. taro, the main staple and export, was devastated by *Phytophthora colocasiae* taro leaf blight (TLB) in 1993 and has largely been replaced by giant taro, bananas and plantains.

The majority of those engaged in farming in one way or another in Samoa falls under the category of subsistence farming with a smaller portion of commercial farming. This indicated that the people primarily grow crops for family food and excess yields may be sold for income.

Employment within the crop sector is considered less favourable even for school dropouts. There has been an increasing trend of internal migration of rural to urban areas in search of employment in other sectors such as industrial and the tourism industry.

Crop and crop products play significant roles in terms of food security and income generation in both local and export market. The crop sector includes farmers, processors, exporters, wholesalers, retailers, government ministries, non-government organizations, government corporations, regional and international corporations and cooperatives.

The population of Samoa experiences growth every year. In the last 45 years, the population growth was relatively minimal when compared to the growth in other countries. The highest population growth was reflected in the 1960s with 3 percent per annum. In the 1970s to the early 1990s, the population growth started to decline from 2 percent to 0.1 percent per annum. Three major events can control population in any country: births, deaths and migration.

Since independence in 1962, the overflow of overseas migration plays a major role in reducing the population growth in the country. Despite the large number of about 5 000 newborns every year, the volume of emigration mainly to New Zealand, Australia, United States, American Samoa and other countries cancelled the addition of newborns and immigrants to the population.

Over the last decade, mainly between the 1991 census and 2001 census, an interesting trend in the population growth emerged from 161 298 to 176 710 respectively. Instead of a declining population growth as it was between the census years 1966 (131 377) to 1986 (157 408), an increasing trend in the population growth rate began to surface from 0.5 percent in 1991 to 1.0 percent in 2001 per annum. The most recent population in 2006 recorded a total population of 180 741.

The human population trends in Samoa greatly affect the demand for agricultural production. Its effect has increase significantly throughout the years.

The distribution pattern of people between rural and urban areas has changed.

There has been an increasing number internal migration of people moving towards the urban areas, as well as external migration to overseas countries. It is usually the working middle class that migrate leaving the young and the very old population in the rural areas. As a result, the remaining people in the rural areas are less capable of working the land for food security and rural development declined. In other words, rural poverty increases.

Poverty is not a problem in Samoa as there is always food, however, it is the lack of interest and laziness that causes food shortages in families and homes. The land is always available for farming developments. At the current situation,

Samoa has achieved food security.

Food shortages may be possible in periods of natural disasters such as frequent cyclones throughout a single year. Another reason may be due to an invasion of various pests and diseases with high cost control measures.

Over the past 10 years, overall crop production shows a positively increasing trend especially in staple crops. Vegetable production indicated a fairly unstable trend due to climate change and infestation of many pests and diseases. Fruit tree production shows a promising growth recently due to improved development programmes.

THE STATE OF DIVERSITY



1.1 The main values of plant genetic resources

Staple food crops contribute largely to the majority of crops grown in Samoa. Taro (*Colocasia esculenta*) continues to be the most important staple crop. However, since the devastating invasion of the taro leaf blight (TLB) in 1993, the taro industry is slowly recovering with improved varieties that could tolerate the leaf blight. Giant taro, yam, banana and breadfruit are other important staple food crops available throughout the year. Due to recent changes in climate, breadfruit trees have been bearing fruits all year round instead of its seasonal fruiting pattern. Despite the slight drop in numbers of staple crop growers as indicated in the 2005 Agricultural survey, plus increasing market prices, the overall quantity available to satisfy the local demand is fairly enough for food security purposes.

The export market for various agricultural crops and crop products has dropped dramatically since the last decade due to the invasion of diverse pests and diseases, cyclones, quarantine restrictions and the increasing numbers of competitive suppliers of the same produce from other Pacific Island countries and especially Asian countries. The major export commodities namely taro, cocoa and coconut for Samoa currently has about less than 1 percent of the total market share in the major trading markets of New Zealand and Australia. Efforts have been steered towards reviving these major industries in the country with the aim of retaining its stance in the export market, however, it is believed that this will be a long shot for success. Papaya and breadfruit have currently been exported overseas through the aid of Heat Treatment Forced Air (HTFA) and quality quarantine proceedings. Apart from that, some of the crops have high medicinal value such as the coconut.

1.2 Diversity within and between crops

Coconut breeding programs have been a success with the rapid multiplication of improved planting materials. However, it is the farmers' preference of growing more coconuts that is declining. The diversity of cocoa in Samoa is slightly decreasing due to the drop in market demand. Major staples such as taro, breadfruit, bananas, yam and giant taro has increased in range. The improved varieties of taro from several breeding programs have contributed to the increase numbers and variety of taro. Recent percentage of major fruit trees grown is mostly on a smaller scale. The acceptance of papaya in the New Zealand markets has encouraged farmers to grow papaya.

Minor crops and underutilized species of staples such as cassava, sweet potato and swamp taro (*Cytosperma chamissonis*) are either grown wildly or are cultivated on a much smaller scale due to the peoples dietary preference. The same applied to some fruit trees.

The actual state of diversity of wild plants for food production is unknown. No proper inventories and surveys were conducted with the aim of identifying specific wild plants for food production.

There has been a concern over the threat of genetic vulnerability on the local Samoan taro since the invasion of the taro leaf blight in 1993. Despite the many improved varieties that have been widely grown by farmers, it is believed that not many farmers are interested in growing the local Samoan taro variety again due to the leaf blight. For this reason, the diversity of modern varieties of taro continues to increase. The marketable nature of the two varieties of papaya namely sunrise and sunset have also increased its diversity.

1.3 Factors influencing the state of plant genetic diversity

The recent world food crisis has driven the prices of substitute staple foods such as rice and flour to increase dramatically. This has put greater demands for local staples to satisfy the usual Samoan dietary preference.

Genetic erosion of plant genetic resources occur in Samoa but is not well surveyed and documented. There have been numerous effects of genetic erosion. The replacement of certain varieties especially with improved ones with higher resistance to pests and diseases can surely wipe out the existing variety. Varieties of crops with high market values can alter the farmer's preference to opt for that particular variety instead of the less marketable one. There has been an increasing rate of urbanization in Apia leading to an overcrowding urban areas and suburbs. In turn, less people are left to work the land in rural areas.

1.4 Future needs and priorities

High priorities have been set to conduct a thorough survey and inventory of the state of diversity of plant genetic resources for food production in Samoa. Since this has not been carried out before, assistance from other countries within the region will be sought. This will ensure that a much better understanding is found on the roles and values of the diversity of plant genetic resources.

Since the monitoring of genetic erosion and response to observed erosion is not a primary concern and due to the lack of skilled workers and the lack of financial support. It has been prioritized that trainings with the assistance from experienced countries is encouraged.

THE STATE OF *IN SITU* MANAGEMENT



2.1 Inventories and surveys - Assessments and priorities

The greatest constraints to improving inventories and surveys for plant genetic resources for food production are the insufficient financial support, insufficient number of staff, and existing staff do not have sufficient skills.

High priorities for future inventories and surveys of plant genetic resources for food production have been identified. Staple food crops and fruit trees have had the highest priorities.

There is a greater need for the existing staff involved in inventorying and surveying plant genetic resources to be well trained. Resources required for surveys and inventory are also needed.

2.2 On-farm management and improvement of PGRFA

On-farm management of PGRFA is addressed in Samoa on a medium scale. This is because it is not of a high priority area.

The government through the Ministry of Agriculture and Fisheries (MAF) provides extension services to support farmers, seed production and distribution services and supportive research. All these incentives are either offered free of charge or at a very low price to farmers. A few national policies are in place to motivate on-farm management of PGRFA.

The South Pacific Commission in Fiji have has provided a lot of technical assistance with the local farmers involved in on-farm conservation. Breeding programmes and activities have been locally supported by MAF and the University of the South Pacific at Alafua campus. Demonstration plots and nurseries for seed production are operated by MAF to support local farmers.

2.3 Restoring agricultural systems after disasters

There are two tissue culture laboratories at the USP and MAF plus four genebanks also located at different MAF stations that are in place holding numerous plant genetic resources for food and agriculture. These plant genetic resources can replace PGRFA following disasters.

However, constraints are often encountered in establishing effective plant genetic resources disaster response mechanisms. The most common problems are:

- PGRFA were not collected and inventories before the disaster
- Inadequate number of staff
- Insufficient training and skills of staff
- Insufficient germplasm materials available for multiplication and restoration
- Insufficient financial support

Therefore, greater need is required to combat the constraints that hinder effective disaster response mechanisms. Local priorities have recently steered towards the improvement of plant genetic resources in response to disasters.

Regional and international collaboration is strengthened with the exchange of views and ideas not only to create stronger relationship with these organizations but to further improve the target of disaster response.

2.4 *In situ* conservation of wild crop relatives and wild plants for food production

National policies are in place to support *in situ* conservation of plant genetic resources, crop-associated biodiversity and wild plants for food production. However, less emphasis is assigned to strengthen the set policies. Therefore, no activities have begun in order to support *in situ* conservation of plant genetic resources.

THE STATE OF *EX SITU* CONSERVATION



3.1 Sustaining and expanding *ex situ* collections

The government through MAF has been strengthening the maintenance of the tissue culture laboratory and genebanks. Funds have been allocated each year by the local budget to finance equipments and resources required to the improvements and operation of plant genetic resources collections.

However, there were limitations to sustaining *ex situ* plant genetic resources collections. Despite the government support for plant genetic resources collections, the need for more financial support increases. The tissue culture laboratory requires heavy machinery and high cost chemicals in order to operate. Insufficient staff and lack of training is another major constraint for many years. The outbreak of pests and diseases such as the black sigatoka, taro leaf blight, giant African snail, rhinoceros beetle and taro weevil has tremendously destroyed collections of *ex situ* plant genetic resources.

Botanical gardens and reserve areas as emphasized by the Ministry of Natural Resources and Environments for many years do not involve the conservation of plant genetic resources for food and agriculture.

There is a greater need for Samoa to expand plant genetic resources *ex situ* collections for the next decade, however, the lack of financial stability is a major concern plus the lack of experienced staff and limited resources. Therefore, the available resources and manpower at hand is managed and used to its full potential.

Regional assistance is sought in order to provide the best technical advise as well as financial assistance to fund the most required resources to sustain and expand *ex situ* plant genetic resources collections.

MAF has prioritized continuous safety duplications for unique accessions. Accession numbers for taro continues to increase as well as coconuts and a few fruit trees. These are well stored at the main tissue culture laboratory at MAF. Database systems are in place for the documentation of *ex situ* plant genetic resources collections.

The capacity for research to expand and improve *ex situ* plant genetic resources conservation is limited to the existing staff with little to no knowledge and experience. But, the need for research to expand and improve is higher than expected. With the technical assistance from the SPC in Fiji, networks have been arranged for support in *ex situ* conservation of PGRFA.

The capability level of management practices to prevent genetic erosion in collection during regeneration is limited to on-going backlog. The trend ranges from a stable regeneration to a decreasing one.

High priorities are set upon strengthening the capacity level of staff in performing tasks and duties necessary for all regeneration programs to prevent genetic erosion in existing plant genetic resources collections. Other priorities are set on seeking assistance from regional and international cooperation in maintaining viability and preventive measures to genetic erosion of *ex situ* collections.

3.2 Planned and targeted collecting

Collection of staple food crops, different varieties of coconuts and several fruit tree crops have been undertaken to improve *ex situ* plant genetic resources. This was done for many years now, but more collections have been stressed recently due to the uproaring world food crisis.

There were gaps identified throughout the collection processes. The most common gaps are:

- Missing known local cultivars/landraces
- Incomplete coverage of targeted taxa
- Incomplete geographical coverage
- Missing historical cultivars

The greatest constraints to undertaking collecting missions involve the lack of experienced staff and inappropriate resources used for collection. Another major constraint is that the majority of the ones collected are major crops only.

Priorities and needs for collecting plant genetic resources focuses on the major crops for food security and income generation purposes. Less focus is put upon wild plants for food production and wild relatives. Also, the need for well trained researchers and staff is prioritized in order to enhance collecting of plant genetic resources for food and agriculture.

3.3 Assessment of major *ex situ* needs

Priority needs and measures vary from country to country. With Samoa, rationalizing collections through regional and international collaboration and sharing facilities is one area of priority needs. Other needs include sharing the burden of the cost of conservation, improved germplasm management, filling gaps in collections, low cost conservation technologies, complete safety duplication and the development of pathogen-tested collections.

THE STATE OF USE



4.1 Distribution of plant genetic resources

Since breeding programmes in Samoa are much smaller in size and in juvenile stages samples of conserved plant genetic resources are distributed to farmers instead of other breeding programmes.

4.2 Utilization and enhancing the use of plant genetic resources

The most recent improvement in crop production through the use of certain varieties demonstrating the contribution of plant genetic resources is the success in the taro industry. More than a hundred accessions are recorded for taro in order to find the best variety for consumption and for sale. The same applies to coconut production which is also a success in the provision of the best variety that bears more fruits with convenience in fruit collection.

Constraints often encounter with the use of improved plant genetic resources. The many improved introduced and crosses of taro varieties that can tolerate the leaf blight lacks the core collections or access to samples from them. It also lacks characterization and evaluation and most importantly the lack of documentation. Limited financial support, unqualified personnel and facilities are always common constraints.

Several activities have been undertaken to enhance the use of plant genetic resources. Local professionals are used to lead and provide trainings for those staff involved in plant breeding activities. MAF also conduct workshops and demonstrations for local farmers on plant breeding techniques. For instance, the on-farm technique of breeding taro from a method called “corm to stolon technique” was demonstrated to farmers as this has been an effective method to breed taro planting materials fast.

Effective collaboration among researchers, breeders, genebank managers and farmers has been established to better integrate conservation and use of plant genetic resources. Collaboration with the USP – tissue culture unit and the SPC in Fiji has also been created to share views and ideas regarding the conservation and use of plant genetic resources. Strengthening capacities and improved training in plant breeding is currently a priority in Samoa due to the need for more planting materials.

Germplasm collections are already in place, however, proper characterization and evaluation are not done to most of the collection gathered. Databases and IPGRI descriptors are being used to characterize germplasm.

There has been a limit in utilization of the resources due to characterization and evaluation. Therefore, staff training is emphasized plus seeking financial assistance is appropriate to overcome the problem.

The level of capacity of plant breeding in Samoa is quite low. Currently, there is no qualified plant breeder apart from the great assistance provided by the SPC in Fiji and other international plant breeders who were hired in to do short term consultancy work in plant breeding programs.

Priorities are high in terms of technical research in order to enhance the use of plant genetic resources for food and agriculture.

The main constraints in diversifying crop production and broadening diversity in crops are marketing/commercial obstacles and that breeding programs recommended improved cultivars only.

4.3 Seed supply systems and the role of markets

Seed production and distribution are carried out by both public and private sector. The public sector often offers this service free of charge or at a very low price. The production and distribution of seed is conducted on a smaller scale. About one percent of seed production is conducted by the private sector. The bulk of seed available in Samoa is exported from overseas. The importation of seeds may be cost effective than producing them here which required a lot of resources as well as qualified staff.

Priorities are placed upon encouraging the public sector to continually produce and distribute seed that can be done locally. The private sector needs to be trained on seed production and distribution.

Seeds of new varieties of vegetables, fruit trees, coconuts and some staple crops are less favourable in the market place due to several reasons. Listed below are the common constraints:

- Varieties poorly adapted to local conditions
- Insufficient availability of foundation/basic seed
- Insufficient availability of registered/certified seed
- Insufficient availability of commercial seed
- Poor seed storage facilities
- Seed price too high as compared to commodity price
- Inadequate seed production systems

Market location has affected the use of plant genetic resources in Samoa. Freight costs incurred are much higher than expected, especially with recent fuel prices. These have driven the prices sky high which in turn would discourage the farmers to grow more. The local market is not big enough to satisfy the suppliers.

The government has supported the development of new markets for local varieties and diversity rich products. Subsidies have been offered to either the reduction of chemical costs or cutting freight costs to about a half or a quarter of the total shipping costs.

The main constraint Samoa faces in attempting to increase markets for local varieties and diversity rich products are:

- Development/establishment of markets for local varieties is not a national priority
- Lack of financial support
- Lack of trained personnel
- Industrial processing limitations
- Disincentives in the country
- Lack of consumer demand

The government through MAF played a vital role in linking small scale producers with local and export markets. MAF does all the negotiations on quarantine arrangements and requirements as well as advertising local produce to overseas buyers through the internet and leaflets. For instance, small scale papaya growers have had their produce sold in New Zealand markets.

4.4 Crop improvement programmes and food security

The status of crop improvement programmes in Samoa is basically in place with moderate germplasm identification and evaluation processes. Staple crops and fruit trees are primarily involved in these programmes. Staple crops are: taro, banana, yam, cassava, taamu, taro palagi, sweet potato and breadfruit. Fruit trees are lemon, lime and Tahitian lime. Coconut is also included in these programmes.

The crop improvement programme has contributed to the increasing varieties of taro to cater for the local consumption. It has also produced numerous varieties that can tolerate the leaf blight. Demonstrations in rural farms on the eradication of rhinoceros beetles have greatly improved coconut yields in farms.

Significant changes are projected in the future in the use of plant genetic resources for food and agriculture. This is due to efforts aimed at crop improvement programmes have been emphasized for all farmers.

THE STATE OF NATIONAL PROGRAMMES, TRAINING NEEDS AND LEGISLATION



5.1 National programmes

Samoa established a national programme for plant genetic resources targeting food security as its primary concern. MAF is responsible for the implementation of this programme and farmers plus other relevant stakeholders all play a part for this programme. The plan of action was drafted by MAF with a legal framework and was circulated to stakeholders for comments before finalization. The national programme is now in progress and is gradually moving forward.

The major problem encountered is the limiting financial support since it is locally funded. Necessary equipments with high operating and maintenance costs are expensive to obtain. The staff involved in the national programme has limited ability to perform the required tasks due to inexperience.

5.2 Networks

National networks for plant genetic resources coordinated by MAF were developed for many years. The participants involved are farmers (subsistence and commercial), exporters, middlemen, wholesalers, retailers, processors and other government departments and corporations. All these participants partake in sharing views and ideas for further improvements as well as discussing possible solutions to problems.

5.3 Education and training

There is higher needs and priorities for education and training to support the sustainable use, development and conservation of plant genetic resources. Areas that require trainings are:

- Genetic resources conservation
- PGRFA documentation, characterization, fingerprinting and molecular markers
- Monitoring genetic erosion
- PGRFA conservation and utilization

Obstacles to providing required education and training in Samoa are: the lack of trained personnel in the country to provide training, lack of financial resources, lack of awareness of the training needs within the Samoa and the paucity of human resources to provide quality training.

The SPC in Fiji already has trainings available for regional members, however, the lack of finance has been a major constraint. Universities in New Zealand and Australia also offer detailed courses on plant genetic resources, but finance is always the problem.

5.4 National legislation

The amended quarantine Biosecurity Act 2006 has emphasized sanitary and phytosanitary measures to be undertaken.

5.5 Information systems

Computerised information systems are in place to manage and support efforts to sustainably use, develop and conserve plant genetic resources. The computer programmes used are the Microsoft access and excel. However, not all stations have access to computers due to limited budget and staff having no knowledge of computers. A standardized system is needed to be in place at all MAF stations with internet for the ease of information exchange.

5.6 Public awareness

The level of awareness of the roles and values of plant genetic resources in Samoa is limited. This is due to public awareness programmes having limited complementary and coordinated activities. Constraints to developing public awareness programmes for plant genetic resources is the high costs of materials used and a much higher cost in the media employed.

THE STATE OF REGIONAL AND INTERNATIONAL COLLABORATION



6.1 International networks

Plant genetic resources networks with regional institution such as the SPC in Fiji and other crop-based system have had numerous benefits involved such as the transfer of technology, back up safety duplication of germplasm, exchange of germplasm, access to financial resources through participation, sharing of responsibilities for network activities, exchange of technical expertise, training for nation programme scientists, exchange of information, access to advanced research results, increased awareness of PGRFA and avoid duplication of efforts.

6.2 International programmes

Needs and priorities for future international collaboration is highly required in the areas relating to understanding the state of diversity, enhancing both *in situ* and *ex situ* management, enhancing training needs and legislation as well as information management and early warning system of plant genetic resources. Finally, enhancing public awareness.

6.3 International agreements

Samoa has subscribed to the International Treaty for Plant Genetic Resources for Food and Agriculture for some time now. This is appropriate to the sustainable use, development and conservation of plant genetic resources.

ACCESS TO PLANT GENETIC RESOURCES AND SHARING OF BENEFITS DERIVED FROM THEIR USE, AND FARMERS' RIGHTS

7.1 Access to plant genetic resources

Samoa has subscribed to the International Treaty for Plant Genetic Resources for Food and Agriculture. Management action was undertaken to maintain and enhance access to plant genetic resources not found in Samoa. A formal request was lodged to the SPC in Fiji for improved germplasm of taro to be brought to Samoa, and therefore an agreement was made. From then, gaining access to plant genetic resources has improved over the years. This access to outside plant genetic resources is adequate in supporting agriculture food security and development goals.

Obstacles identified through accessing plant genetic resources outside Samoa is the shipment costs and the improper handling of shipped germplasm. Therefore proper packing of shipped materials should be encouraged with fragile labels around the packages.

7.2 Fair and equitable sharing of the benefits of the use of plant genetic resources

There are several benefits arising from the use of plant genetic resources in Samoa. These involve the mass multiplication of planting materials, obtaining of traditional varieties and all others when natural disasters appear, food security, income generation and other countless benefits. The country as a whole will benefit from the use of plant genetic resources.

Public awareness through radio programmes, television advertisement, newspaper notices plus other means of media releases in order to share the benefits to the public regarding the use of plant genetic resources.

The fair and equitable sharing of the benefits of the use of genetic resources is hindered by the gap between the wealthier and the poor, and the illiterate and the well educated people. Therefore, methods or ways to equate these problems should be looked at all avenues for all to have a fair share of the benefits.

CHAPTER 8

THE CONTRIBUTION OF PGRFA MANAGEMENT TO FOOD SECURITY AND SUSTAINABLE DEVELOPMENT

The contribution of PGRFA management to agricultural sustainability is tremendous due to the fact that proper *ex situ* conservation are in place and improved plant breeding programmes to maintain the continuous existence of plant genetic resources for food and agriculture.

With the sustainability of plant genetic resources for food and agriculture, it will in turn satisfy the need to meet food security. The people of Samoa are ensured that their normal dietary needs for local foods are met with the availability of agricultural foodstuff.

Income generation from the agricultural sector is increasing with the proper management of plant genetic resources for food and agriculture. Excess production may be sold to the local market or to exporters and processors for more income.



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