

SIGNIFICANCE OF CLIMATE SMART AGRICULTURE AND MECHANISATION IN FIJI ISLANDS

Presentation by

Name Penaia Mua

Title Senior Research Officer

Agency Ministry of Agriculture Fiji Islands



CSAM



I. Introduction

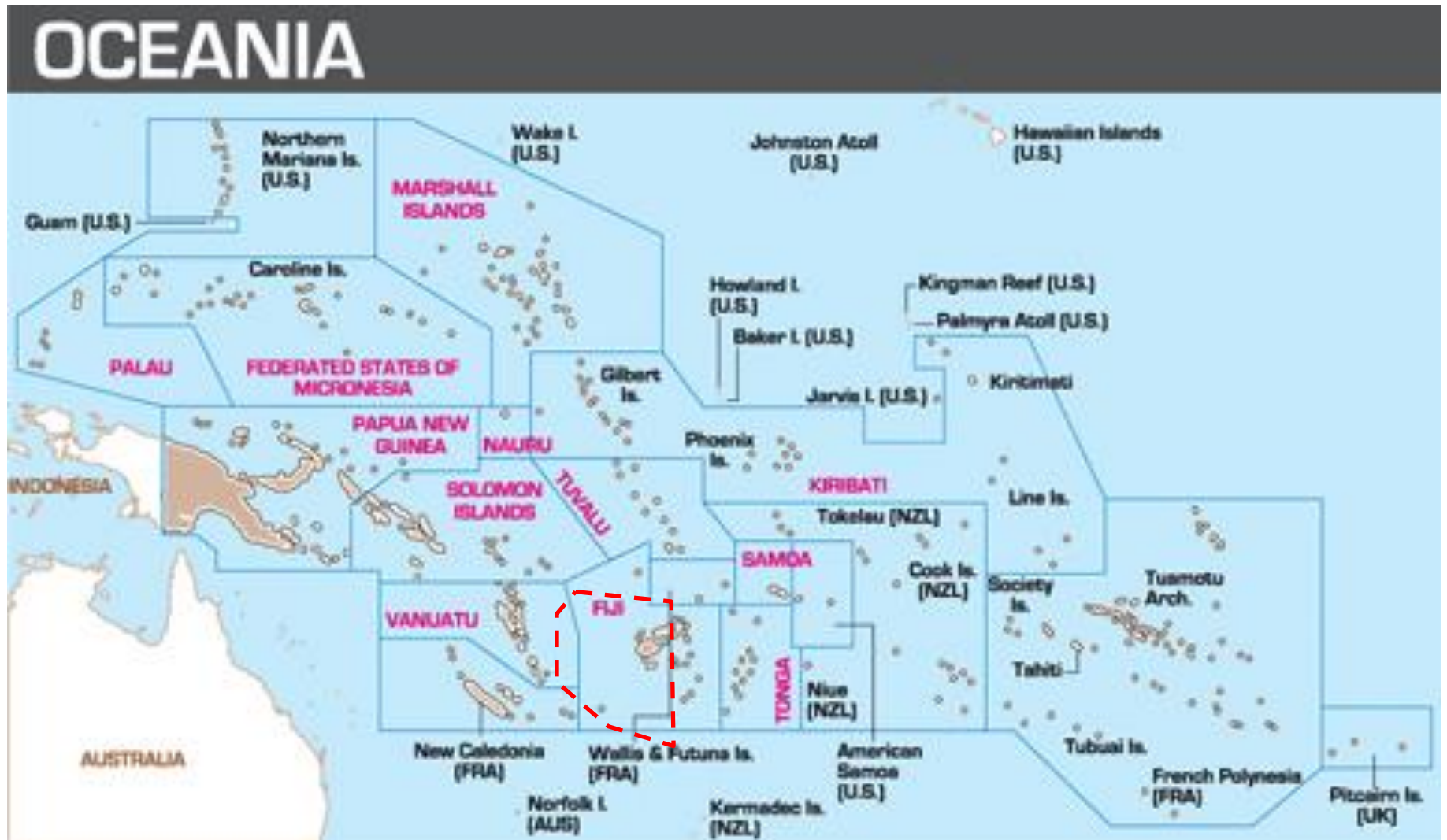
Fiji, a country in the South Pacific, is an archipelago consists of 332 islands (of which 106 are inhabited) and 522 smaller islets.

The country is divided into four (4) geographical divisions/regions:

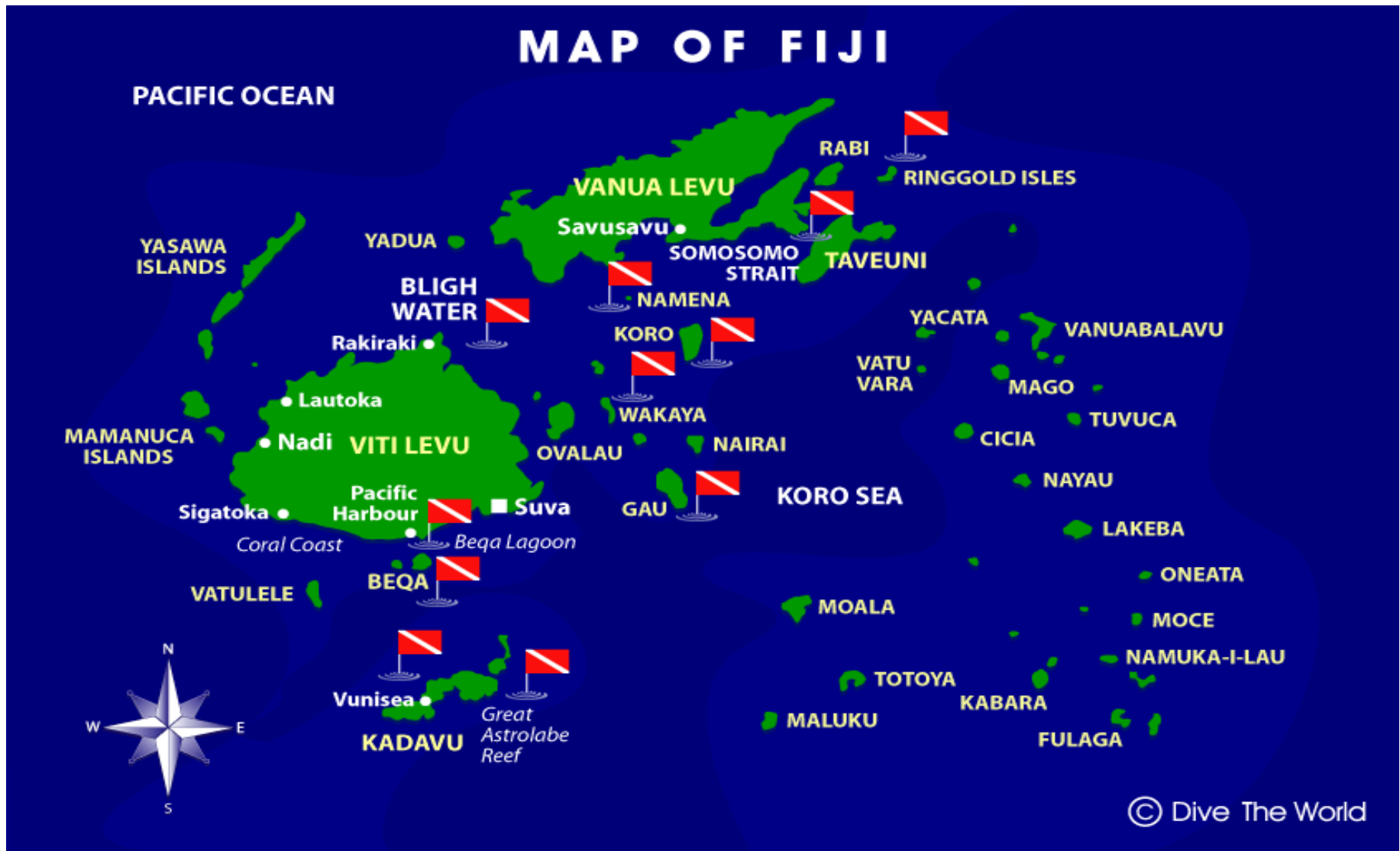
1. Central Division
2. Western Division
3. Northern Division
4. Eastern Division

The two most important islands are Viti Levu and Vanua Levu, which account for about three-quarters of the total land area of the country

Fiji Islands, Country in Oceania



Country profile of Fiji



Country profile of Fiji (Cont.)

Agriculture is the single largest sector in the economy Fiji:

- Contributing some 43% of Fiji's foreign exchange earnings,
- Employing half the population and accounting for nearly 20% of GDP.
- Sugar cane is the most important crop,
- Two major industries - sugar and tourism.

Country profile of Fiji (Cont.)

Climate

- Fiji enjoys two seasonal climate conditions: hot wet and cool dry
- Average annual rainfall - 1,500 mm to 4,000 mm
 - The topographic effect means that much of the rainfall is within the windward side of the islands.
 - Up to 80% of the rainfall is recorded in the wet season and 20% in the dry season.

Statistical information:

- ❖ Capital: Suva
- ❖ Area: 18,270 sq km
- ❖ Population: 844,330 (2001 est.)
- ❖ Population growth: 1.41% (2001 est.)
- ❖ Languages: English (official), Fijian, Hindustani
- ❖ Labour force: subsistence agriculture 67%, wage earners 18%, salary earners 15%
- ❖ GDP: US\$5.9 billion(2000 est.)
- ❖ GDP per capita: US\$7,300 (1999 est.)
- ❖ GDP composition by sector: agriculture 16%, industry 30%, services 54%

Fiji's religious composition:

- 52 percent are Christian (including 37 percent Methodist and 9 percent Roman Catholic)
- 38 percent Hindu
- 8 percent Muslim

II. Agricultural Development in Fiji

- Agriculture has been the backbone for Fiji's economy over the past decade.
- However, its contribution to the national GDP has declined from 20% to around 16% recently. This has been mainly due to shifting of labour force from farming to other sectors such as tourism, manufacturing and the garment industries.
- Food security had become an increasingly important agenda especially with the climate change in the island countries in the South Pacific.
- Modernizing the agriculture industry requires infusion of the needed agricultural infrastructures, development of agricultural enterprises and mechanization in the countryside.

II. Agricultural Development in Fiji (Cont.)

- As in the experience of other advanced countries, agricultural mechanization played a key role in raising production and market efficiencies.
- However, the modern agricultural technologies introduced, mechanization is probably one of the most controversial.
- Mechanization is usually blamed for escalating rural unemployment.
- The trend however, that most of the younger generations is now more inclined to “urbanization” will make mechanization a very important agenda to help attain food security.
- Due to the tedious nature of work involved in the agricultural sector, agricultural mechanization plays a pivotal role in sustaining this industry.

National level of the farm mechanization in Fiji as of 2009

Type Farm Machinery & Equipment	National Level (Total No. of Farm - 9341)	
	Equipment owned	% Level
Level Hand Tractor/Power tiller	293	3
Four Wheel Tractor	4289	46
Wheel Tractor Driven Plow	2667	29
Animal Driven Plow	7647	82
Hand Thresher	64	1
Rice/Corn Husker	51	1
Motorized Thresher	42	0
Hand Water Pump	340	4
Motorized Water Pump	413	4
Motorized Chemical Pump	110	1
Chainsaw	2628	28

Source: Fiji National Agricultural Census 2009

II. Status of Agricultural Mechanization in Fiji (Cont.)

Present status of farm mechanization in Fiji

1. Mechanized farming where animal and machine powers were extensively used was mainly focused in sugarcane belts and some commercial farms of Western parts of Viti Levu and Vanua Levu islands of the country.
2. Introduction of large four-wheel drive tractors and associated machineries and equipment in the sugar industry was a major challenge for the benefit of the industry. Use of these machines was concentrated in the sugar industry, which enjoyed assured export market in the United Kingdom
3. In other areas of the two main islands and outer islands, farmers were just reliant on farm hand tools and animal power.

The potential of the farm mechanization to increase agricultural productivity can only be realized should the Government pursue total support to the program in the coming years.



Problem in achieving sustainable food security self-sufficiency

- Changes in policies in attaining the desired agriculture development objectives in the country.
- Land ownership
- Pre-dominance of subsistence agriculture
- Over dependence on sugar industry
- Lack of organizational capacity of government institutions that are responsible to lead agriculture development.
- **Climate change**

Climate Change Impact

- Summer are becoming hotter (High temperature)
- Intrusion of sea water into the land(rise in sea level)
- Increased river flow and inundation during monsoon
- Heavy rainfall over short period causing water logging
-
- Increased frequency, intensity and recurrence of flood

Climate change agenda for Fiji focuses on using conservation and environmentally sound agriculture technologies for the best use of land and water resources and prepare for possible climate changes

Reduction of Disaster Risks and Strengthen Disaster Preparedness

1.4.1 Promote and strengthen food security programmes to enhance community-based disaster risk reduction

Conserve economic crop germplasm

2) No. of PGR conserved in field collections:
Root crops
 -Dalo – 114, Cassava – 32,
 Yams – 60, Kumala – 44,
 , Ginger – 8, Turmeric – 1

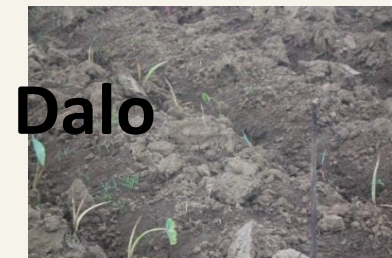
Quantity: 10



Cassava

DRS PGR Collections

KRS PGR Collection



Dalo



Kumala



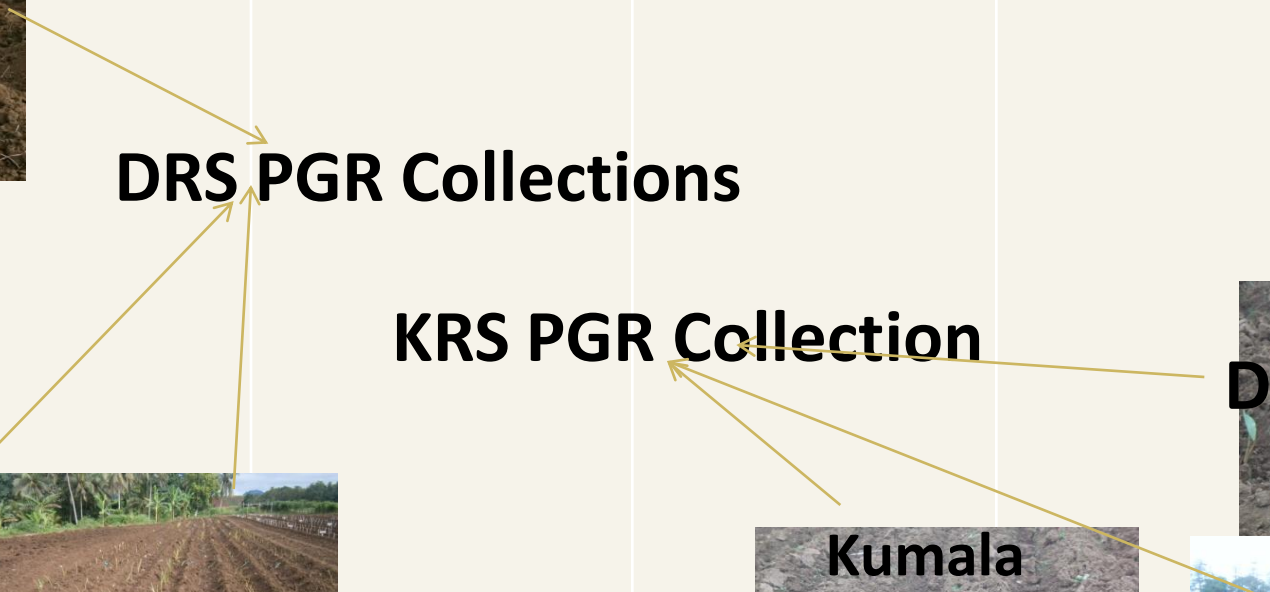
Dalo



Kumala



Cassava



Root crops:
2 Kumala

2 varieties
looks
promising



Ba Demo Plot – Sarava, Ba

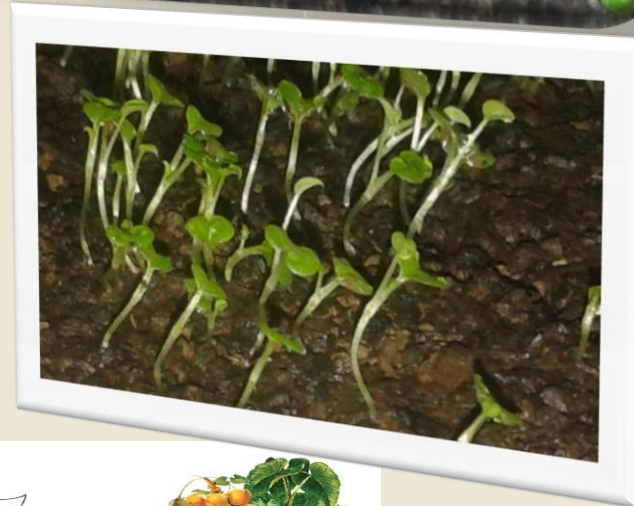
Nakovacake Total Farm, Nare



Root Crops (4):
Taro breeding for Taro
Leaf Blight (TLB)

Quantity: 28

- 7 Samoan X 10 Local Varieties
- 39 cross pollination for Local Varieties (mother) and pollen from Samoan lines
- 27 cross pollination done Samoan (mother)
- 16 mature berries harvested
- seeds of 14 crosses sown
- All the above crosses are germinating and awaiting Mr. Tolo for transplanting.
- Daily observation & watering has been carried out.



Root Crops (4):
) Evaluate TLB
line with local &
improved varieties

Qu...



E545



AGRONOMY
PROMOTING CROP DIVERSITY



Soil and water conservation

- a) Development of the Peri-urban agricultural Engineering models (Organic Container Gardening System- Horizontal & Vertical garden system)) using recycled containers for the organic container farming technology

Horizontal Container Gardening system



Vertical Container gardening system



RICE

- Introduced in 2007 from International Rice Research Institute, Philippines, National Agricultural Research Institute, Papua New Guinea and Directorate of Rice Research, India.
- Sixty one aerobic varieties/line IRRI
- Forty one rainfed(IRRI) and four National Agricultural Research Institute from PNG
- Seven drought, eight saline and four aromatic rice varieties IRRI
- Seven rice varieties introduced from Rice Research in India

Imports of agricultural machinery will be increasing the coming year that includes four-wheel and 2-wheel tractors with farm implements, engines, rice threshers and reapers.

- This can be attributed to the priority program of the Ministry of Agriculture in the country to revive the local rice production and increase the agricultural productivity.
- This importation trend is expected to continue due to the relaxation of import duties on agricultural tractors and engines pursuant under the program of the government.

VI. Foreign Assistance program in Farm mechanization of the country

1. The Government of the Republic of Indonesia donated 10 hand tractors (2-wheel tractors) to the Ministry of Agriculture to assist in enhancing Fiji's food security and boost crop production.
 - The hand tractors, total valued at around FJD\$60,000, were officially handed over to the Ministry of Agriculture's permanent secretary Mr. Ropate Ligairi by the Indonesian Advisor to the Ministry of Agriculture, Mukti Sardjono at the Koronivia Research Station.
 - The 10 hand tractors were distributed 4 Extension Divisions and Research Stations of the ministry



nal Forum



chanizati



- The Rice project that has duration of 2 years was developed as a result of the Memorandum of Understanding that was signed between Fiji and China entrusted by the Government of the People's Republic of China.
- The China Shandong International Economic & Technical Cooperation Group Ltd negotiated with the Ministry of Agriculture of Fiji to implement rice development project in Dreketi and Koronivia in Fiji.
- There are three components of this project: technical cooperation, material supply and training.

- The technical cooperation component includes the technology transfer. Under this aid project, there are plans to bring a total of 11 styles of 36 varieties (336 sets) of rice machines from China.
- These mechanical equipment's will be used as a process to transfer rice technology into productivity, train farmers not only to cultivate with new technology and skill, increase unit area yield of rice, improve the production enthusiasm but also to extend the rice cultivating area gradually.
- The aim of technology transfer is to promote mechanized rice production; reduce labor intensity, costs, as well as to improve efficiency to increase profits. The increase use of machines will also arouse farmers' enthusiasm to plant rice; promote the development and expansion of large-scale growers, effectively suppress the downward trend in the rice planting area, restore nationwide rice production and rapid increase grain production throughout the country.
- As a result, there will be an increase in Fiji's rice production to become self-sufficient, reduction in rice imports, and improvement in food security.

Rice Machinery Brought to Fiji from China

No.	Function	Name	Unit	Quantity
	Field Level	Mini excavator	Set	4
	Field Level	Crawler excavator	Set	2
	Field Level	Crawler bulldozer	Set	1
	Field Level	Tractor	Set	19
	Field Level	Laser grader	Set	4
	Field Level	Double disc Trencher	Set	8
	Field Level	Ridge Maker	Set	8
	Field Level Implement	Rotary Tiller	Set	18
	Field Level Implement	Paddy field machine	Set	12
	Field Level Implement	harrow	Set	4
	Field Level Implement	plow	Set	8
	Field Level Implement	disc plow	Set	4
	Bed Soil Prepare	Cylindrical screening machine	Set	2
	Tray Sowing	Automatic rice seedling planting line	Set	2
	Direct Sowing	Hill-drop	Set	5
	Transplanting	Walker Transplanter	Set	5
	Transplanting	Riding Transplanter	Set	5

	Harvesting	Harvester	Set	11
	Plant Protection	Sprayer	Set	4
	Plant Protection	Air blast spayer	Set	4
	Plant Protection	Spray powder machine	Set	23
	Plant Protection	Solar insecticidal light	Set	100
	Post-harvest Treatment	Motor Tractor	Set	1
	Post-harvest Treatment	Forklift	Set	3
	Post-harvest Treatment	Grain Dryer	Set	1
	Post-harvest Treatment	Seeds winnowing machine	Set	4
	Post-harvest Treatment	Straw chopper and returning machine	Set	12
	Post-harvest Treatment	Mill machine	Set	5
	Irrigation	Mobile diesel engine water pump	Set	12
	Power Supply	Diesel Generating Set	Set	5
	Power Supply & Electro-welding	Diesel generation and welding machine	Set	8
	Field Survey	Measuring acres	Set	16
	Laboratory Test	Vacuum counter beds instrument	Set	4
	Laboratory Test	Fast computer moisture meter	Set	4
	Laboratory Test	Seed purity table	Set	4
	Laboratory Test	Seed germination boxes	Set	4

VI. Issues and constraints in the adoption of agricultural mechanization

The current status and trends of agricultural mechanization in Fiji can be attributed to the following:

1. High cost of machines
2. Lack of promotion - lack of farmers' awareness of new mechanization technologies and the unfavorable attitudes and orientation of farmers caused by risks in adapting locally manufactured equipment.
3. Poor quality of locally fabricated machines due to low capability of the local manufacturing industry
4. Lack of access to formal credit facilities
5. Low income of farmers/small farm sizes - Landholding distribution in the country also affects the pace of farm mechanization.

III. Need for Mechanization

Farm mechanization continues to play pivotal role as part of the agronomical practices to ensure economic viability of the agriculture sector.

- Fiji farmers had been struggling for ages to transform agricultural farming practices from traditional method of production to modern farming technologies.
- The mechanization technologies are very efficient and thus yields higher farm returns in terms of export earnings and as food security.
- The importance of using the appropriate tools and machines in farm operations cannot be overemphasized, as mechanization increases labor efficiency, eases-up the drudgery of farm work, saves time and promotes technical accuracy.
- Moreover, the level of mechanization technology increases as the source of power shifts from human to animal to mechanical power.

Thank you.

Name: Penaia Mua

Email: pvosawai@yahoo.com

Website:



CSAM

