



FIJI ISLANDS





SUSTAINABLE AGRICULTURAL DEVELOPMENT VIA ENGINEERING TECHNOLOGIES IN FIJI





INTRODUCTION

- Fiji Island – situated in the South Western Pacific Ocean
- Comprise of over 300 island, of which only 109 islands are inhabited.
- Two main islands – Viti Levu & Vanua Levu supporting majority of the population.
- Islands are predominantly volcanic and rise to an elevation of around 1,000m above sea-level
- Windward side predominantly covered with rainforest while the leeward side extensively cultivated with sugarcane
- Total land area is 18,272km² dispersed in the territorial waters of around 141,800km²
- Fiji has two marked seasonal climatic conditions (hot-wet & cool-dry)
- Average rainfall ranges from 1,500mm to 4,000mm annually
- 80% rainfall recorded in the windward side, while leeward side receives 20% of the rainfall.





AGRICULTURAL SECTOR

- Backbone of Fiji's economy over the last two years,
- Tourism has now become the lead revenue earner,
- Agriculture's contribution to the nation's GDP declined from 20% to 16% recently,
- **This has mainly been due to shift of labor force from farming to other sectors ie tourism, manufacturing and garment industries, etc**
- Subsistence farming and sugarcane production dominate the Fijian agricultural sector.



SUGARCANE CROP

- Fiji enjoyed EU preferential market till recently on sugar,
- In line with Cotonou Agreement, the price of sugar is falling,
- By 2008, the price will be all time low to about \$F37.00/ t of sugarcane,
- Cost of production for sugarcane in Fiji is around \$30 per tonne,
- Will need to compete in open market with other sugarcane growing countries ,
- Therefore diversification in other crops is a necessity now.



IMPORTS vs EXPORTS

- Fiji's agricultural imports(\$0.44billion) account for just over 14% of the total import(\$3.1billion),
- Its agricultural exports(\$0.53billion) accounts for around 44% of the country's total export(\$1.2billion),
- There is potential to increase exports.



ECONOMIC RECOVERY

- **Import Substitution**

- Deregulation on agricultural commodities (rice, vegetables beef, poultry etc),
- Licensing and import quotas removed,
- Tariff raised on imported goods,
- Support and protect private sector,

- **Constraints**

- High cost of production,
- Lack of appropriate machinery,
- Little duty concessions on agro machinery,

..... continued



•continued

- **New strategies to develop import substitution**

- Build capacity of farmers,
- Strengthen applied research,
- Collaborate with hotels,
- Strengthen business advisory units ,





- **EXPORT PROMOTIONS**

- Traditional exports,
- Niche market crops,
- Significant potential in neighboring countries,

- **Constraints**

- Marketing structure,
- Lack of proper infrastructures,
- Lack of Quarantine protocols,
- lack of appropriate machineries and technologies,

.....continued



.....continued

- **Strategies to promote exports**

- Improve market via bilateral Quarantine agreements,
- Formation of commodity industry councils,
- Undertake supply chain studies on potential export commodities,
- Develop appropriate infrastructure,
- Strengthen trade facilitation efforts,
- Agro processing and value adding,
- Increase investment in agriculture,



FOOD & INCOME SECURITY

- Fiji is not self sufficient in any food commodity except for chicken and eggs,
- With over half the population in urban areas, dietary habits have changed from traditional foods to imported and junk foods,
- Traditional food have remained expensive with escalating cost of production,

•

-----continued





.....continued

- Develop cost effective technology for production of traditional food
- Value adding to traditional crops
- Expand rural infrastructure and broaden market access
- Empower woman and rural community via education and communication
-





NEED FOR MECHANIZATION IN AGRICULTURE

- Farm Mechanization continues to play pivotal role as part of agronomical practices to ensure economic viability of the Sector,
- Can link up well with land use policy to address soil loss problems,
- Soil loses range from 30 to 89tonnes per hectare per year,
- Improve productivity,
- Substitute manpower,
- Reduce drudgery,
- Improve returns,
- Maintain soil texture and fertility,





CURRENT STATUS

- Mechanized farming limited to sugarcane growing areas only with large machines,
- Adoption of mechanization in other areas very is slow, thus most farm still using draught animals,
- Various types of small machines tried for small holder farmers, but have not been viable due to various reasons,
- Only 10% of small holders use some form mechanization,
- Professional expertise in Agricultural Engineering and machinery profession to assist in the adaptation of modernization and mechanization within the agricultural sector is limited.



MECHANIZATION THE WAY FORWARD

Mechanization in Fiji can make a difference because,

- Heavy and difficult soils prepared satisfactory without depending on weather,
- Timely operations meeting optimum planting dates,
- Better weed and pest control measures,
- Multiple cropping becomes more feasible through crop diversification / inter-cropping to optimize production and sustainable utilization of scarce land and water resources,
- Avoid harvesting and post-harvesting losses such as threshing, handling, drying, storage and processing,
- Increase economic returns to farmers,
- Reduce drudgery and hard work,
- Substitutes for farm labor low profit returns by traditional method of crop production.



LEVEL OF MECHANIZATION NEEDED

SHORT-TERM

- Government Machinery Pool.
- Setting up of Machinery Contractors.
- Strengthening Mechanization Unit.

LONG -TERM

- Establishment of Farmer Organization.
- Research & Development.
- Policy formulation



INADEQUACIES / CONSTRAINTS / LIMITATIONS IN THE PRESENT SYSTEM

- Lack of appropriate machines & equipments,
- Lack of funding assistance,
- Rough terrain,
- Lack of knowledge & skill in agricultural mechanization,
- Land tenure security,
- Small-scale holdings,
- Credit availability,
- Recovery of hire chargers,
- Lack of spare-part sales & after sales service,
- Lack of Research & Development programs,
- Lack of Human Resource Development,





INFRASTRUCTURE DEVELOPMENT

- Most of Pacific island nation are atolls with productive land just over 1meter above the mean sea level,
- Fiji has made efforts to reclaim vast low lying land for agriculture,
- This has been possible with the construction of sea defence works, floodgates and intensive drainage networks,
- The seawalls are 2.1m above mean sea level,
- The drainage networks are designed to discharge 100mm of rainfall in a 24 hour period,





EFFECTS OF CLIMATE CHANGE

- The weather pattern have become unpredictable,
- The rainfall intensity is increasing and have become irregular,
- Droughts are frequenting and prolonged,
- The sea level rise is now taking its toll,
- The seawalls already constructed are about to collapse,
- Most of the productive agricultural land will again be subject to salt water intrusion.





Action Time

- To sustain the current level of living of the poor community action is required not only at nation level, but at global level too,
- Pacific Adaptation for Climate Change (PACC) has moved in small island nations in the Pacific to set up pilot projects to address some of the problems,
- Fiji has been selected for the pilot project and the program will target sea level rise,
- Fiji Government has taken initiative to embark major environmental issues affecting different watersheds
 - Mangrove management on the coastlines
 - Reforestation in the hinterlands
 - Water harvesting
 - Flood controls



FUTURE DIRECTION

- Fiji needs to review its agricultural engineering programs to suit local condition,
- Eradicating poverty among the rural farming communities through improved farming systems and use of appropriate farming machineries and equipment for sustainable livelihood,
- Refocus on Agricultural Engineering and Mechanization for sustainable agricultural development,
- We therefore, would like to request external assistance from the member countries such as APCEAM (and also including other donor agencies) to assist Fiji in the following area:
 - Technical Assistant
 - Policy formulation for agricultural mechanization,
 - Asses impacts of infrastructure to sustain agricultural development



Thank You

