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.
• 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.
Fiji’s agricultural imports ($0.44 billion) account for just over 14% of the total import ($3.1 billion),

Its agricultural exports ($0.53 billion) accounts for around 44% of the country’s total export ($1.2 billion),

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,

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• 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,
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• 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,
• 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,
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• 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 89 tonnes 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 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 1 meter 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 2.1 m above mean sea level,
- The drainage networks are designed to discharge 100 mm of rainfall in a 24 hour period,
EEFECTS 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,
    • Assess impacts of infrastructure to sustain agricultural development
Thank You