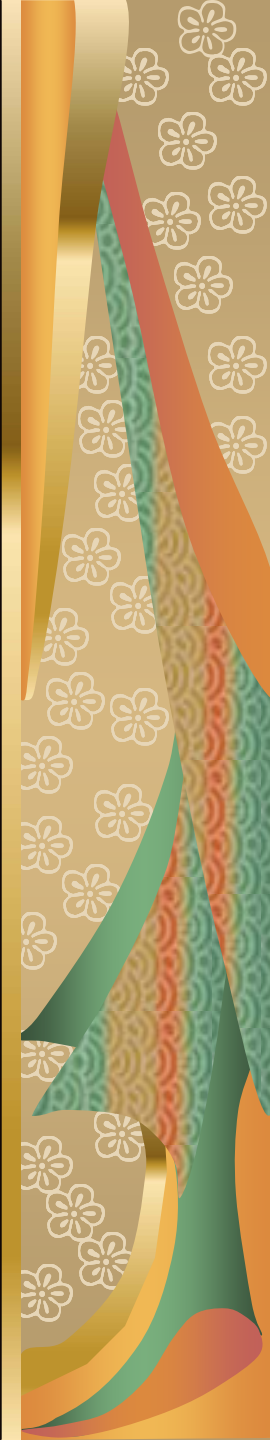


ESD-E7/UNEP RURAL ELECTRIFICATION NAIROBI
WORKSHOP: 1st to 3rd MARCH, 2006

“MIRREIA WORK IN TANZANIA”

By: CYRIL J. BATALIA



PROFILE OF TANZANIA

❑ GEOGRAPHIC SIZE:	945KM ²
❑ POPULATION:	35 MIL.
❑ RURAL POPULATION:	75%
❑ GDP GROWTH (CURRENT)	6%
❑ TOTAL NO. OF VILLAGES:	>8000
❑ PER CAPITAL INCOME:	US \$ 330
❑ TOTAL INSTALLED GRID ELECTRICITY:	890 MW
❑ MAXIMUM DEMAND:	450 MW

COMMON ENERGY PROJECTS-RENEWABLES

- SOLAR-PV PANELS
- BIOMASS
- WATER- MICRO AND MACRO HYDRO
- WIND - IN SOME AREAS BEING STUDIED

UNDEVELOPED WITH POTENTIAL:
GEOHERMAL, NUCLEAR, TIDAL WAVE

SUMMARY OF ENERGY RESOURCES POTENTIAL AND CURRENT LEVEL OF EXPLOTATION; 2004

RESOURCE	PROVEN POTENTIAL	CURRENT EXPLOITATION
<input type="checkbox"/> Hydro Power - Large - Mini-Micro	4,700 MW 314 MW	561 Mw 4.7 Mw
<input type="checkbox"/> Natural Gas	15.697 x 109m ³	Songosongo Gas Project 112MW Electr.
<input type="checkbox"/> Coal	304 x 106 tons	Generation > 150,000 t/a
<input type="checkbox"/> Biomass Wood	1.8 bil. M ³ Avg. Annual yield 24.3m m ³	Annual Consumption 40 m m ³
<input type="checkbox"/> Biomass Residues	15m Ton/a – Crop 14m Ton/a – Cattle 11m Ton/a – Goats/Sheep	- >2000 biodigestors units of 50m ³ capacity - 22.75 MW Electr. And Steam at Sugar Plants - 3.525 MW forest residues
<input type="checkbox"/> Wind	0.9 – 4.8 M 5 ¹ at some locations. Some 12m 5 ¹	> 129 wind mills for water pumping. > 8.5 KW installed at 4 sites
<input type="checkbox"/> Solar	> 187 W m ² (Est. 215 W M ²)	Insignificant and limited to Telecoms lighting & water Heaters, PV 1.2MWp

MIRREIA:PROJECTS INVOLVEMENT

- BIOMASS
 - MAFIA COCONUT PROJECT: K.J.STANLEY&SONS LTD DEVELOPERS USING OLD COCONUT PALM TREES FOR BIOFUEL TO GENERATE ELECTRICITY
 - MTIBWA AND TPC SUGAR FACTORIES: EXPANSION FOR GENERATION OF ELECTRICITY FROM BARGASS
- MINI-HYDROS
 - MUFINDI TEA ESTATE: MWANGA RIVER MINI-HYDRO
 - NJOMBE KILOCHA SEMINARY RUHUDJI RIVER MINI-HYDRO
 - KILOMBERO MNGETA RIVER MINI-HYDRO PROJECT
 - KIGOMA MALAGARASI RIVER MINI-HYDRO PROJECT

FUNDING FOR RENEWABLES

- ❑ GOVERNMENT THRU MEM to TANESCO- IN FUTURE THROUGH REA/REF
 - ❑ DONOR SUPPORT-REA/REF
 - ❑ NGO/PRIVATE SECTOR
 - ❑ MICRO-FINANCING GAINING MOMENTUM
 - ❑ COMMERCIAL BANKS-LIMITED INVOLVEMENT
-

MAFIA ISLAND(INITIAL PROPOSAL)

- ❑ OWNERSHIP: 3000HA. OLD COCONUT PLANTATION
 - ❑ TECHNOLOGY:GENERATE 2MW FROM GASIFICATION POWER PLANT, TRANSMISSION 60KM AT 11KV
 - ❑ INVESTMENT: US\$8MIL
 - ❑ SUBSIDY:REA/REF AT US\$ 1MIL OR 3-4 MIL/ IPP OR UTILITY
 - ❑ DEVELOPER: H.J.STANLEY&SONS LTD
 - ❑ TARIFF:US\$.15/kWh
 - ❑ BENEFITS:EXPAND GENERATION,INREASE ACCESS(2 TO 4 VILLAGES),UTILISE BIOMASS WASTES,EMPLOY NEW TECHNOLOGY
-

MAFIA ISLAND(NEW PROPOSAL)

- ❑ DEVELOPER: H.J.STANLEY&SONS LTD AS AN IPP
 - ❑ OWNERSHIP: 3000HA. OLD COCONUT PLANTATION
 - ❑ TECHNOLOGY:200KV,ANKUR BIOMASS GASIFIER WBG 500 FROM INDIA, CRRENT TRANSMISSION 11KV, 15KM GRID
 - ❑ INVESTMENT: IN 4 PHASES. PROPOSED PHASE I WILL COST US\$ 508,000. PHASE II WILL DEPEND ON SUCCESS OF PHASE I.
 - ❑ SUBSIDY:PHASE I AFREPREN/UNEP AT 50 TO 50 CONTR. LATER PHASES REA/REF SUBSIDY
 - ❑ TARIFF:US\$.20/kWh WITHOUT SUBSIDY
 - ❑ BENEFITS:STABILIOSE CURRENT TANESCO GENERATION,IMPROVE DOMESTIC AND PART COMMERCIAL LOAD,UTILISE BIOMASS WASTES,EMPLOY RENEWABLE TECHNOLOGY
-

TPC AND MTIBWA SUGAR

- ❑ DEVELOPER:FACTORY OWNERS
 - ❑ KEY OBJECTIVES:EXPAND CO-GENERATION FOR OWN CONSUMPTION AND SALE TO TANESCO/INCREASE RURAL ACCESS
 - ❑ OWNERSHIP:TPC-EXPAND TO 1064 HA. PRODUCTION FROM 62,500 TO 144,000 TONS, MTIBWA-5000HA. AND 5000HA OUT GROWERS EXPAND BY 30,000HA, production from 48,000-138,000TONS
 - ❑ TECHNOLOGY:BOTH UPWARDS OF 15MW FROM GASIFICATION POWER PLANT, TRANSMISSION 60KM AT 11KV
 - ❑ INVESTMENT:TPC- US\$8MIL, MTIBWA-UNDECIDED
 - ❑ SUBSIDY:TPC-REA/REF AT US\$ 1MIL OR 3-4 MIL/ IPP OR UTILITY
 - ❑ TARIFF:US\$.15/kWh
 - ❑ BENEFITS:EXPAND GENERATION,INCREASE ACCESS(2 TO 4 VILLAGES),UTILISE BIOMASS WASTES,EMPLOY NEW TECHNOLOGY
-

MUFINDI MINI-HYDRO POWER

- ❑ **DEVELOPER: MAIN PIONEER-MUFINDI TEA COMPANY**
 - ❑ **KEY OBJECTIVE: DEV. HYDRO-POWER TO COMPLEMENT OVERSTRECHED TANESCO SUPPLY AND DEPENDANCE ON DIESEL GENSETS**
 - ❑ **OWNERSHIP: OPERATE TEA ESTATE AND FACTORY**
 - ❑ **TECHNOLOGY: 3 MW HYDRO-POWER TURBINES AT MWENGA RIVER**
 - ❑ **INVESTMENT: US\$ 4.5 MIL TO COVER GEN. AND DISTR.**
 - ❑ **SUBSIDY: PROJECT VIABLE WITHOUT SUBSIDY-NEED US\$350,000 FO ELECTRIFICATION AND 150-175 FOR CONNCTION SUBSIDY**
 - ❑ **TARIFF: US\$CENT3.4/Kwh EXCLUD. DISTRIBUTION**
 - ❑ **BENEFITS: 3000 NEW CONNECTION BY 2015, 23,000GWh/yr SUPPORT GROWTH OF AGRIC., REPLACE DIESEL IRRIG. PUMPS WITH ELECTR. OPERATED, IMPROVE RELIABILITY, INCREASE ACCESS INCLUDING VILLAGES**
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NJOMBE-KILOCHA MINI-HYDRO

- ❑ **DEVELOPER: KILOCHA CATHOLIC MISSION OF NJOMBE DIOCES**
 - ❑ **KEY OBJECTIVE: DEVELOP HYDRO-POWER AND IN FUTURE SELL EXTRA POWER TO TANESCO**
 - ❑ **OWNERSHIP: OPERATE A SECONDARY SCHOOL SEMINARY AND DEV. A TEA ESTATE-NEED IRRIGATION**
 - ❑ **TECHNOLOGY: 4.6MW HYDRO-POWER TURBINES AND DISTRIBUTION TO LOAD CENTRES**
 - ❑ **INVESTMENT: US\$ 11. MIL TO COVER GEN. AND DISTR.**

 - ❑ **SUBSIDY: US\$7.0 MIL IN GENERATION AND 1.7MIL IN CASE OF TANESCO GRID EXTENSION**

 - ❑ **TARIFF: US\$CENT18/Kwh EXCLUD. DISTRIBUTION**

 - ❑ **BENEFITS: 3000 NEW CONNECTION BY 2015, 23,000GWh/yr SUPPORT GROWTH OF AGRIC., REPLACE DIESEL IRRIG. PUMPS WITH ELECTR. OPERATED, IMPROVE RELIABILITY, INCREASE ACCESS INCLUDING VILLAGES**
-

SUMMARY OF PROJECT RISKS

- ❑ MINI-HYDRO PROJECT LOCATION POORLY ACCESSABLE-HIGH INVEST. COSTS
 - ❑ HIGH COST OF CONNECTION AND ALSO TARIFFS IF UNSUBSIDISED
 - ❑ COCONUT BIOFUEL UNTESTED AS WELL AS ITS TECHNOLOGY
 - ❑ WEAK ECONOMIC BASES IN RURAL AREAS-COMMERCIAL/INST.
 - ❑ POOR RURAL CUSTOMERS- ENERGY UNAFFORDABILITY
 - ❑ UNCLEAR POLICY ARRANGEMENTS ON PPF AGREEMENTS/TANESCO
 - ❑ WATER DEFICITS FOR MINI-HYDRO IN UNPREDICTABLE CLIMATIC CONDITIONS
 - ❑ LACK OF EXPERIENCE IN ELECTR. DISTR.-NON-CORE ACTIVITY
 - ❑ UNCERTAIN ON SUBSIDY-GRANTS AND OTHER FUNDING SOURCES
 - ❑ LIMITED JOINT VENTURE PARTNERS BOTH PUBLIC AND PRIVATE-RISK SHARING
-

DEVELOPER ASSISTANCE BEING RENDERED

- ❑ SUPPORT IN PREPARATION OF APPRAISAL DOCUMENT/BUSINESS PLAN, ERT SUPPORT-PPF
 - ❑ DISCUSSIONS WITH MEM AND OTHER STAKEHOLDERS FOR PROJECT RECOGNITION AND APPROVAL AS AN IPP
 - ❑ ESTABLISH AND CONFIRM ON ENVIRONMENTAL IMPACT STATUS
 - ❑ REGISTRATION AND TIC APPROVAL WHEN NECESSARY
 - ❑ SUPPORT IN PPA AGREEMENT WITH TANESCO
 - ❑ PROJECT FINANCING-SUBSIDY QUALIFICATION UNDER REA/REF
 - ❑ PROCUREMENT AND INSTALLATION
 - ❑ MONITORING AND EVALUATION
-

END

ASANTENI-THANK YOU
