

African Utility Week

Designing a sustainable renewable energy hybrid system for rural Africa

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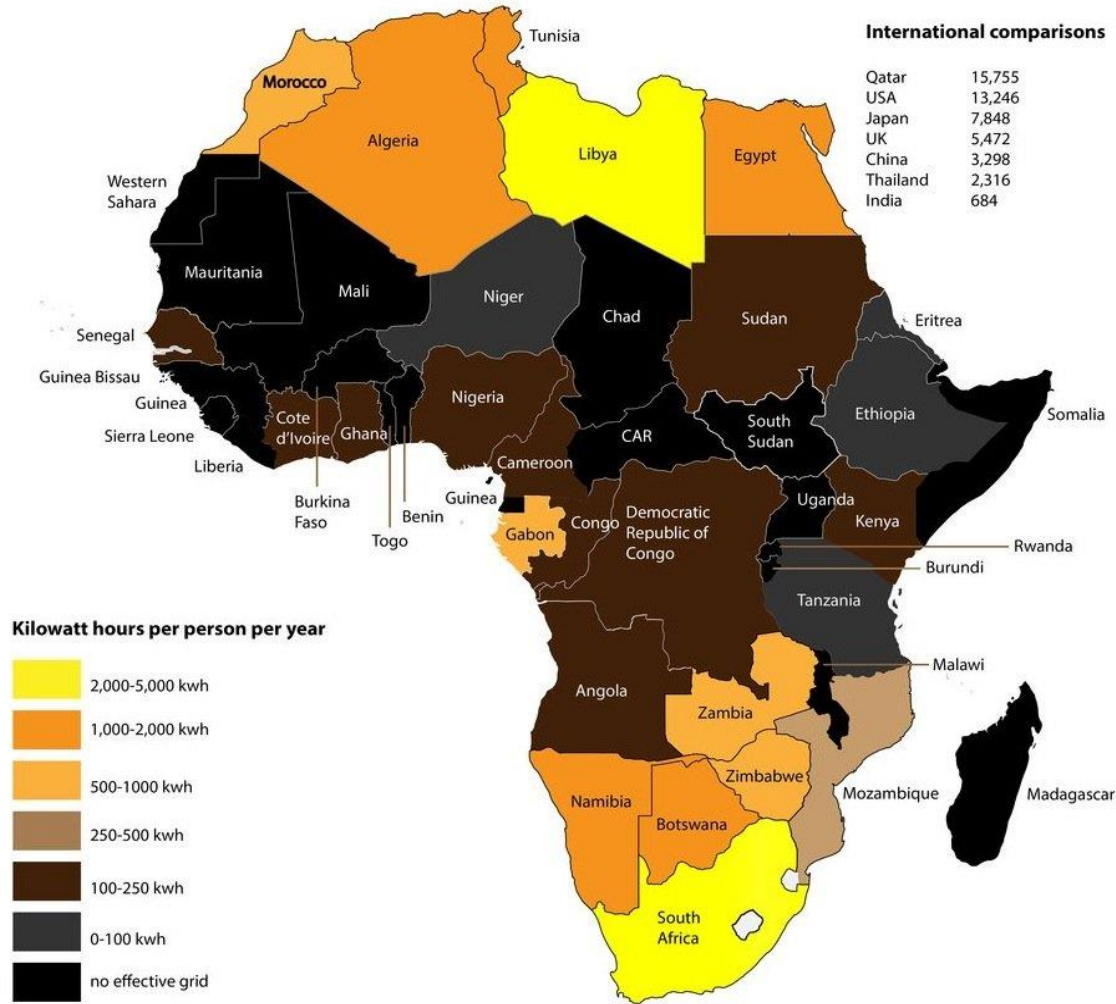
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AFRICA



Africa 2013

The Dark Continent



Source: World Bank; CIA Factbook

FACTS ABOUT RURAL AFRICA

- ABOVE 60% DO NOT HAVE ACCESS TO ELECTRICITY
- HIGH UNEMPLOYMENT RATE
- HIGH RATE OF POVERTY
- LACK OF SKILLS
- LACK OF ACCESS TO INFORMATION
- LACK OF ACCESS TO CLEAN RUNNING WATER
- POOR OR NON EXISTENT HEALTH CARE

WHAT DO ALL OF THESE LEAD TO?

CHALLENGES THAT ARISE

- POOR OR NO SERVICE DELIVERY
- POOR GOVERNANCE & CONTROL
- OPPORTUNITIES FOR CONFLICT BOTH INTERNALLY & EXTERNALLY (OUTSIDE INTERFERENCE)
- DE-FORESTATION
- EASILY SPREAD DISEASES

BASICALLY – A POOR QUALITY OF LIFE

AVAILABLE IN THE RURAL AFRICA

- LAND FOR AGRICULTURE & DEVELOPMENT
- VALUE SYSTEM ENTRENCHED IN THE TRIBAL SYSTEM
- REDUCED “CRIME”
- RESOURCES IN ABUNDANCE
- “CURRENT” INABILITY TO PAY FOR SERVICES – MAJOR DETRACTION TO INVESTORS

COMPARISON TO OTHER DEVELOPING COUNTRIES

- OVER **600m** DO NOT HAVE ACCESS TO ELECTRICITY IN AFRICA WITH MOST BEING IN SUB-SAHARAN AFRICA
- LATIN AMERICA HAS LESS THAN **2%** A DROP FROM **5%** IN 2011
- MIDDLE EAST HAS LESS THAN **5%** A DROP FROM **9%** IN 2011
- INDIA HAS LESS THAN **4%** A DROP FROM **25%** IN 2011 (340m TO 5.5m)

THE MAIN CONTRIBUTING FACTOR TO THE ABOVE - THE EASE OF REACHING THE RURAL AREAS THROUGH RENEWABLES AND THE ACTIVE ROLE OF RENEWABLES IN THE COUNTRIES & REGIONS THAT SHOWED LARGE IMPROVEMENTS

SOME EFFORTS IN AFRICA

- THE ESTABLISHMENT OF THE “RURAL ENERGY TRUST” – TANZANIA
- IN SA
 - BEE (BASIC ELECTRIC ENERGY) PROGRAM
 - 50 W SOLAR HOME SYSTEMS
 - TRIALS WITH MINI HOME BIODIGESTERS
- PROPOSAL OF AN “ELECTRICITY AFRICA ACT”
- THERE HAS BEEN VARIOUS RESEARCH WORK DONE REGARDING RENEWABLES SUCH AS:
 - STUDY BY CSIR & DR DAVID ROGERS OVER 10 YEARS AGO WHERE THEY CONCLUDED THAT IS WAS TOO EXPENSIVE (R7.76/KWH)
 - STUDY: COMMUNITY ELECTRICITY IN RURAL SA: RENEWABLE MINI GRID ASSESSMEN

RENEWABLE ENERGY RESOURCES AVAILABLE

- SUN – AREAS WITH GOOD IRRADIATION FACTORS AND CONSTANT
- WIND
- OPPORTUNITY OF WASTE TO ENERGY
- GEOTHERMAL ACTIVITY
- HYDRO

THE RURAL ENERGY SOLUTION

- DESIGN AND INSTALL A HYBRID SYSTEM
- MINI-GRID / OFF-GRID SYSTEM
- WITH ENERGY STORAGE / BACK UP
- USING BIOGAS IN SUPPORT OF BASE LOAD DEMAND
- BIOGAS TO BOTTLE GAS – FOR COOKING, HENCE REDUCED DEMAND ON ELECTRICITY

“DEFINITELY NOT ROCKET SCIENCE”

REVISITING THE EARLIER STUDIES & FINDINGS

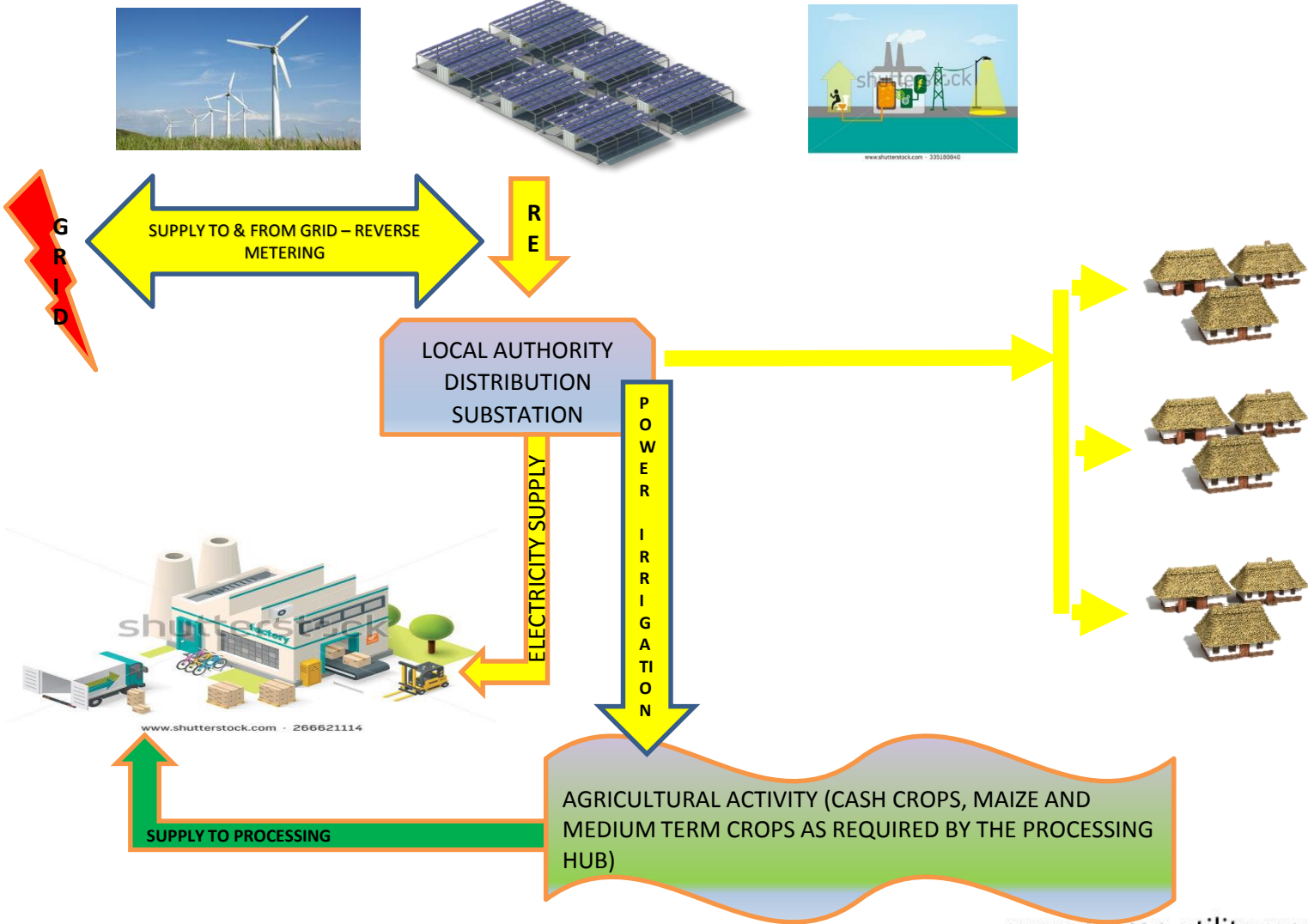
- TOO EXPENSIVE
- LARGE OPPORTUNITY FOR RENEWABLES TO SOLVE THE ENERGY CRISIS IN RURAL AFRICA
- LACK OF AFFORDABILITY TO PAY FOR ELECTRICITY

WHAT WAS NOT LOOKED AT: “HOW TO ENSURE SUSTAINABILITY”

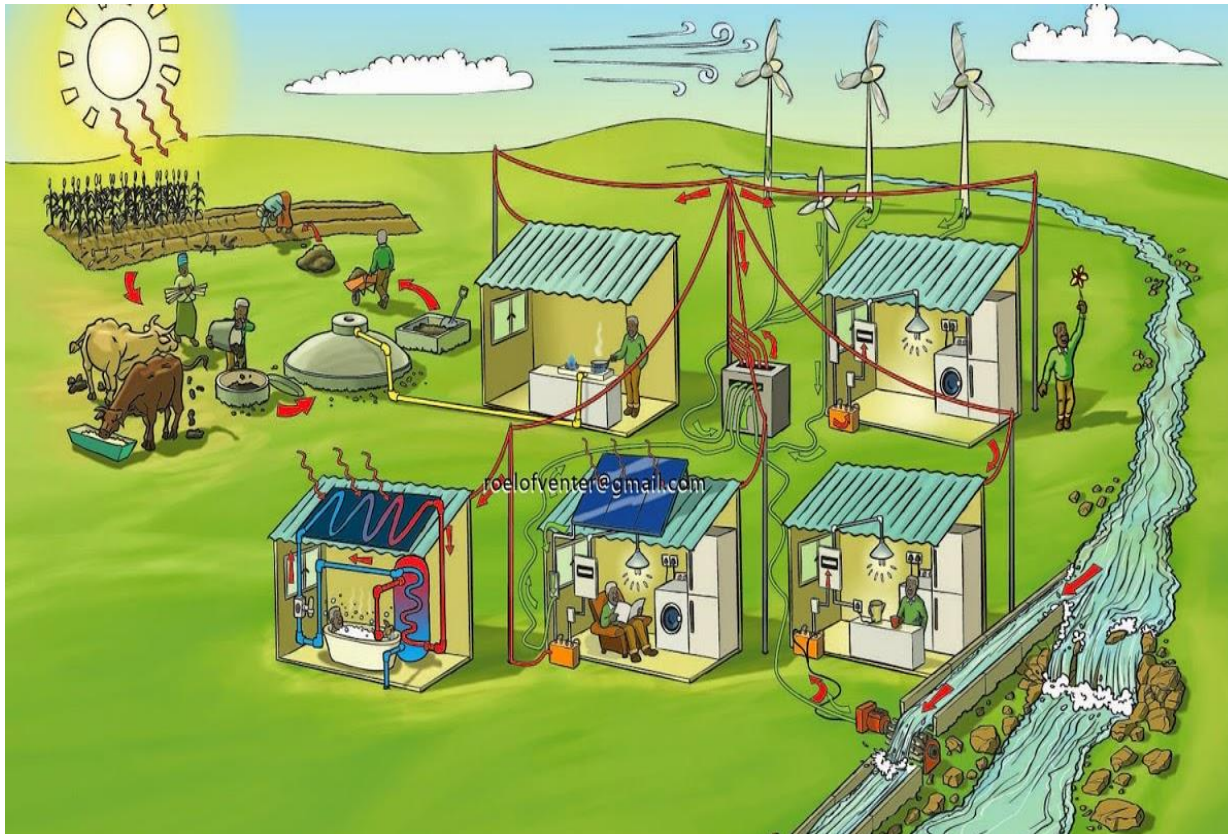
FACTORS TO CONSIDER TO ENSURE SUSTAINABILITY

- ACCESS TO ELECTRICITY - CREATE EMPLOYMENT - ABILITY TO PAY FOR ELECTRICITY
- ACCESS TO ELECTRICITY MEANS NO MORE NEED FOR CANDLES, PARRAFIN AND OTHER FUELS USED AND HENCE A SOURCE OF FUNDS TO PAY FOR ELECTRICITY
- ACCESS TO ELECTRICITY MEANS NO MORE COLLECTING OF WOOD AND HENCE MORE PRODUCTIVE TIME LEADING TO MORE EARNING OPPORTUNITIES
- NO COLLECTING OF WATER – MORE TIME TO STUDY

A PROPOSED SUSTAINABLE MODEL



POSSIBLE PICTURE



ECONOMIC ACTIVITIES

- MAIZE MILLING & PACKAGING
- FRUIT PLANTING & DEHYDRATION
- CASH CROPS TO PICKLED FOODS AND FROZEN FOODS
- MAINTENANCE & SUPPORT FOR THE PROCESSING FACTORIES
- MAINTENANCE CENTRES FOR THE RENEWABLE ENERGY PLANTS
- COLLECTION AND SUPPLY OF WASTE AND DUNG FOR BIOMASS PLANTS

OPPORTUNITIES FOR PRIVATE SECTOR

- INVESTMENT BY DEVELOPERS IN RE THROUGH SOCIAL INVESTMENT PROGRAMS
- DEVELOPERS AND CORPORATIONS TO ACCESS CO-FUNDING AND HENCE LEAD THE PROCESS
- FORM PARTNERSHIP WITH STATE / LOCAL AUTHORITIES
- RETAIL CORPORATES – ACCESS TO MARKET

OPPORTUNITIES FOR GOVERNMENTS

- ENFORCE THE PRE-CONDITIONS THROUGH DEVELOPMENT OPPORTUNITIES (REIPPP)
- ESTABLISH AND DRIVE “RURAL ENERGY ACT” AND THE RELEVANT POLICIES
- ESTABLISHMENT OF A FUND FOR RURAL DEVELOPMENT – APPLY SUCH FUNDS APPROPRIATELY

DELIVERY OF ELECTRICITY TO THE “DON’T HAVES” IS NOT A POLITICAL DEBATE – IT IS NOW A BASIC RIGHT THAT WILL LEAD TO MAJOR CHANGES IN THEIR LIVES

SOME ANOMALIES IN INVESTMENT

- SEZ / IDZ – LEADING TO MIGRANT LABOUR – INFORMAL SETTLEMENT
- WHY NOT DEVELOP WITHIN THE AREA?
- INVESTMENT AND EFFORT IN EV'S, SPACE TRAVEL, ETC – ENERGY TO RURAL AREAS IS CHILD PLAY?? IS THERE A LACK OF WILL OR THE FACT THAT THE SHORT TERM ECONOMIC BENEFIT IS NOT THERE
- PACKAGED SOLUTIONS – WHY NOT WORKING?
- MISPLACED GRANT FUNDING

AFRICA WITH ELECTRICITY

- ACCESS TO DECENT EDUCATION
- IMPROVED EMPLOYMENT OPPORTUNITIES
- ACCESS TO INFORMATION
- ACCESS TO RUNNING CLEAN WATER
- LOCAL ECONOMIC DEVELOPMENT
- FINANCIAL EMPOWERMENT
- SKILLS IMPROVEMENT
- MORE STABLE COMMUNITIES
- IMPROVED INFRASTRUCTURE

THE PEOPLE ARE TRYING



LET US WORK WITH THEM