

19. ENERGY

1. a) - Saudi Arabia ✓
 - Iraq ✓
 - Iran ✓
 - Kuwait ✓
 - United Arab Emirates/ Abu Dhabi/ Bahrain/ Bahrain Island ✓
 - Qatar ✓
- b) - Earning foreign exchange ✓
 - Improvement of hospitals and schools ✓
 - Development of manufacturing industries e.g. petrol chemicals ✓
 - Creates employment ✓
 - Development of towns and cities ✓
 - Incomes/ profits have made the countries have high per capita income ✓
 - Revenues and royalties earned from oil have enabled those countries to invest abroad thus increasing their wealth ✓
2. a) - A multi purpose project is a project that serves more than one purpose e.g. HEP, irrigation, fishing ✓
- b) - Seven forks project ✓
 - Kariba project ✓
 - Aswam high dam project ✓
 - Akosombo dam project ✓
 - Cobra Basa project ✓
3. a) i) The sun, wind, water, wood, waves and tides, geothermal steam, biomass and animal
 - ii) - It is always available as long as it is blowing
 - It is cheap source as we do not pay for it
 - It is clean source which does not pollute environment
 - It can be produced on small scale for local consumers
 - The land occupied by windmills can also be simultaneously used for cultivation of crops
- b) i) Geothermal power is electricity which is generated from the earth's internal heat that reaches the surface through geysers and hot springs
 - ii) - It is relatively cheap to produce
 - Generation of electricity is continuous because steam is continuously being produced naturally
 - The cost of operating of geothermal plant is relatively low
 - Geothermal steam is renewable source
 - It is a clean source of energy which does not pollute the environment
 - it helps reduce over-dependence on exhaustible sources such as fossil fuels
- .c) - Government bureaucracy and political interference
 - Inadequate capital for investment
 - Lack of skilled labour
 - Inadequate technology
- d) - People are being encouraged to use energy-saving devices such as the energy-saving Stoves
 - the government is encouraging the use of alternative sources of energy such as wind, the sun and biomass.
 - there is development of wood fuel programme through a forestation and reforestation involving planting of quick-growing trees.
 - The government uses consumer prices to discourage unnecessary uses of oil as fuel
 - People are being encouraged to switch off electricity gadgets when they are not being used

- People are also encouraged to have proper maintenance of motor vehicles to reduce the amount of fuel consumed
- 4. a i) - Refers to the chain of negative reactions emanative from a acute shortage of essential energy
- ii) - Over reliance on one source of energy (oil)
 - High increase in oil prices by oil producing countries
 - Hoarding of oil to create artificial shortage leading to skyrocketing of prices
 - Depletion of fossil fuels
 - War which hinder mining and supply of oil to the world market
- b i) – Coal
 - Uranium
 - Petroleum
- ii) - Turkwel power project
 - Sondu Miriri project
- iii) - Steep gradient that allowed fast flow of water (water falls) to turn tubing to produce Electricity
 - Permanent source of water from RTana which provided plenty and regular supply of water to turn turbines and provide electricity throughout the year
 - Sparse population in the region which reduced the cost of resettlement
 - Impermeable soils in the region which reduce water loss from the reservoir through see page
 - Presence of hard basement rock which provided firm foundation for construction of dams
- 5. a) - Inexhaustible
 - Versatile- many uses
 - Reduces dependence on oil
 - Cheap/ free access everywhere
 - Minimum maintenance cost
 - Environment friendly
 - Can be stored
- . b) P- Masinga
Q – Kamburu
R – R. Kindaruma
- . c) - Industrial growth – creation of employment/ goods
 - Transport – employment/ enables trade
 - Agriculture e.g. tractors e.t.c. – food production
 - Water supply – industrial use
 - Health e.g. X- rays – healthy work force
- . d i) - Reduced industrial production – shortages/ lose of employment
 - Increased prices/ fares – limits purchase/ travel
 - Domestic problems e.g. darkness/ cooking e.t.c. reduced standards of living
- . ii) - Put off gadgets not in use
 - Keep gadgets in good working condition
 - Use of public transport
 - Increase capacity of public vehicles
 - Better roads – avoid traffic jams e.t.c.
 - Use fewer lighting bulbs
 - Minimise outdoor advertising i.e. bill boards
 - Energy saving jikos/ stoves
 - Use low capacity cars
- 6 . a) - Renewable sources of energy are those sources that are continually being replaced or regenerated.
 - They are considered inexhaustible

- b i) - Presence of steep gradient of where there is a waterfall through out the year to make the operations economical
 - Hard basement rock to provide a firm foundation for the construction of a dam and accommodate weight of the reservoir
 - Presence of a deep valley-where there is a deep valley or river gorge, it provides space for the reservoir therefore saves on the costs of constructing a dam.
 - Presence of non-porous rocks to prevent seepage of water from the reservoir
 - ii) - Adequate capital to develop more plants in Olkaria and other potential areas
 - Low level of technology in exploitation of geothermal
 - Economical imbalance between the cost of setting up a station and the subsequent power outlay hence need for more stations.
 - Potential areas are scattered and located in remote sparsely populated areas which are not potential markets for electricity produced
 - High transmission costs of the potential markets
 - c i) - It leads to an increase in prices of imports and other locally manufactured goods.
 - Third world countries spend huge sums of money on importation of crude oil
 - Affects balance of trade since earnings from exports will be lower than imports.
 - Results into inflation since the government passes the costs to consumers
 - Oil crisis lowers GDP of third world countries since there will be more expenditure than investments
 - It causes recession making an economy unable to create more jobs
 - Causes a rise in living standards of people
 - Increase production costs in other industries
 - c .ii) - Reducing the consumption rate of energy by encouraging people to put off electricity when not in use
 - Rationing of power by the distributing company
 - Encouraging the use of public vehicles, proper maintenance of vehicles to cut down on the amount of petroleum used/consumed
 - Encouraging the use of alternative sources of energy like biogas and solar energy that can be renewed hence saving on non-renewable energy sources.
 - Ensuring the development of energy saving devices e.g. jikos which use wood/charcoal
 - Development of industrial machines which can use coal that is cheaper as an alternative form of energy
 - Reduction of taxes on gas and solar panels to cut down on the use of wood fuel
7. (a) - Leads to increase in prices of imports which result in material shortage lowering of the gross domestic products (GDP) and creates a recession hence economy cannot be able to create more jobs
- Leads to inflation i.e. the rise of prices of various commodities leading to reduced consumption of goods and services hence drop in profits
 - Increase in price of other forms of energy due to higher transport and production cost
 - Decline in agricultural production due to decrease in and under maize and wheat and reduced tourist activities due to the hike in oil prices that result in higher transport costs. air fares rise steeping making it expensive for tourists to travel
 - Depletion of foreign exchange reserves due to the increase in the oil import bill, the country spends a lot of its revenue on purchase of unrefined oil
 - Environmental degradation due to search for alternative sources of energy hence demand for harcoal and wood fuel causing deforestation and soil erosion
- b) - To conserve energy means the efficient utilization of energy to avoid wastage
- Encouraging he use of solar for heating and lighting
 - Encouraging Kenyans to put off electricity gadgets when they are not being used
 - Proper maintenance of motor vehicles
 - Encouraging the use of public transport instead of personal cars
 - Encourage the use of energy saving jikos /stores to reduce wood fuel used

8.
 - a) Is usually portrayed as a question of price and supply uncertainties and the rapid depletion of fossil fuels
 - b) - Destruction of forest as alternatives source of energy
 - Promote erosion due to deforestation
 - Destabilize ecological balance
 - Facilitate desertification due to deforestation
9.
 - a)
 - Oils.
 - Natural gas.
 - Coal.
 - b) - Kenya would save foreign exchange it used to spend on oil inputs and channel the funds to projects.
 - More industries would be established because industrial fuel would be cheaper/increase in investments. .
 - More job opportunities would be created in the oil sector and other related industries thereby improving standards of living of Kenyans. .
 - Transport costs would reduce leading to cheaper commodities in the market. .
 - Kenya would earn more foreign exchange through oil exports and these earnings used to develop other sectors of the economy. .
 - Infrastructure of social amenities improved leading to better standards of living.
 - c) - The government is encouraging the use of alternative sources of energy such as , Geothermal biomass, wind & sun.
 - The government is developing modified programmes through afforestation, reafforestation & planting of fast-growing trees.
 - Controlling importation of vehicles with high engine capacity.
 - People are encouraged to use energy saving jikos.
 - A lot of emphasize is being put on protecting the existing forest by resettling people]who have settled on forest land.
 - Encouraging the use of public transport by improving it so as to reduce the number of private cars on the roads.
10.
 - i) - Conducting reconnaissance
 - Preparing relevant tools & equipment.
 - Preparing working schedule.
 - Forming groups.
 - Content analysis/doing more research.
 - ii) - Direct observation.
 - Interviewing.
 - Administering Questionnaire.
 - Photographing/filming.
 - iii) - Lighting.
 - Heating.
 - Powering machines.
11.
 - a i) - Coal
 - Natural gas
 - Uranium
 - Petroleum products/oil
 - ii) - a large and constant volume of water harvested from large river with large volume of water through out the year
 - a deep narrow valley/gorge to minimize the construction cost.
 - Sparse population in order to minimize relocation/resettlement cost
 - A fall water /water fall-water falling from a high point to supply force required to rotate the tribunes

- A hard basement to reduce the amount of water that will seep into the ground and provide storing foundation for the dam
 - Adequate capital for dam construction, transmission of power and compensation displaced people
 - b i) Energy crisis is the price and supply uncertainties that are usually accompanied by the rapid depletion of fossil fuels
 - ii) - overdependence on oil and its products
 - depletion of wood fuel
 - exhaustion and deepening of coal mines
 - artificial shortages cause when some countries decide to conserve their resources
 - wastage and misuse of energy
 - wars/disagreements within oil producing countries
 - iii) - every crisis has led to petroleum price adjustment causing a general inflation and the prices of various commodities.
 - Some industries in the economy are affected to a points where they lay off some of their staff
 - The price increase usually leads reduced consumption of goods and services leading to a drop in profits
- 12.
- a) - Petroleum
 - Gas
 - b) - Fishing
 - Irrigation
 - Industrial/ domestic use
 - Water ways
 - Tourism
 - Regulate river flow
 - Water storage
 - c) - There could have been bumper harvest of maize locally.
 - There might have been sufficient food for all.
 - The country may not have experienced famine to necessitate emergency importation.
 - d i) - Rift Valley
 - Western
 - Central
 - Coast.
 - d ii) - Maize stalk is used as cattle feeds.
 - Cobs /stalk is used as fuel.
 - Grain is used as human food.
 - Industrial material – oil.
- 13.
- a) E – Owen falls Dam in Uganda
F – Akosombo Dam in Ghana
G – Kariba dam in Zambia/ Zimbabwe
 - b) Renewable sources of energy are those that have the capacity to be regenerated/ reused e.g. sun, wind, water while non-renewable sources of energy are those that can be exhausted if not well managed such as coal, petroleum and natural gas
 - c) - Availability of large volume of water from the River Nile
 - Presence of a natural water fall, the Owen falls; to turn the turbines
 - Presence of a hard basement rock to support the weight of the reservoir
 - Availability of a ready market for the power from the surrounding high population
 - d) - High seasonal fluctuations in the flows of the river regime especially in times of drought
 - Inadequate capital since H.E.P require high capital outlay which many African countries lack and they rely heavily on foreign aid

- Poor maintenance of machinery at power production stations caused by inadequate capital to buy spare parts for the machines
- Siltation of reservoirs caused by poor farming methods upstream and lack of machinery to remove the silt from the reservoirs
- Small markets for HEP hinder production due to high poverty level of the population found in the counties
- The big rivers such as Niger, Nile, Volta, Zambezi and Orange have their waters reduced by
- evaporation because they pass across dry regions