Paper 2 Section B Knowledge Booster

The Challenge of Resource Management ANSWERS

Explain how food, water and energy are fundamental to human development (6)	• *Food – poor diet = illness and diseases, well fed = productive, obesity = cost and shorter life expectancy* • *Water – essential for drinking, vital for crops, produce energy.* • *Energy – light, heat and power, fuel for transport*
Describe and explain the global inequalities in the supply and consumption of energy or water (6)	• *Water – variations due to climate = affect rainfall supply. Capture storage and extraction is expensive. Many LICs have water shortages, LIC/NEEs use most water for agriculture, HICs use most water in industry.* • *Energy – richer countries consume more energy than poorer countries. Middle East – major oil supplier. As NEEs industrialise the demand for energy increases.*

An overview of resources in relation to the UK

Give 2 examples of high value food exports from low income countries (2)	• *Prawns - Thailand* • *Bananas - Dominican Republic*
Define organic produce (1)	• *Food produced without the use of pesticide and fertilisers* • *Riverford Organic Farms, Devon (reduces food miles and provides local employment)* • *Food which is produced using environmentally and animal friendly farming methods on organic farms. Artificial fertilisers are banned and farmers develop fertile soil by rotating crops and using compost, manure and clover. It must be free of synthetic additives like pesticides and dyes*
Give one environmental disadvantage of purchasing high value food export countries of LICS such as Brazil. (2)	• *Increased carbon footprint = more CO_2*
Give 2 features of an agribusiness farm (2)	• *Lynford House Farm* • *Land intensively farmed to maximise the amount of food produced.* • *Pesticides and fertilisers widely used.* • *Machinery costs high but increase efficiency* • *Small number of workers employed.*
Describe how the demand for water has changed over time in the UK (4 marks)	• *Increased due to population growth, more houses, increase in water intensive domestic appliances e.g. Dishwashers.* • *50% of UK water supply used domestically* • *Est to rise by 5% between 2015 – 2020.*
What is the difference between water quality and water quantity (2 marks)	• *Quantity – how much water available* • *Quality - can be measured in terms of the chemical, physical, and biological content of water i.e. how clean the eater is due to damage caused by industrial discharge, fertilisers, leaching from underground mines.*
Explain 2 ways water quality can be increased through pollution management (4 marks)	• *Environment Agency manages by: filtering water to remove sediment, purifying water by adding chlorine, imposing strict regulations.*
Describe areas of water deficit and surplus in the UK (6 marks)	• *South and East water deficit* • *North water surplus* • *Water stress (demand exceeds supply) experienced in more than half of England.* • *North, Scotland, Wales, Devon, Cornwall heavy to very heavy rainfall.* • *London and South higher population density*
Assess the effectiveness of water transfer schemes to maintain supplies and meet both supply and demand (6)	• *Water transfer schemes to meet demand. Opposition because; the effect on land and wildlife, high cost, GHGs released by pumping water over long distances.*

Describe the energy mix in the UK (4)	• *1990 – 3/4s of UK energy came from coal and oil – fossil fuels – non-renewable.* • *2007 – equal mix of coal, gas and nuclear all non-renewable* • *2014 renewable sources e.g. wind and solar become more important.* • *Energy consumption has fallen due to decline of heavy industry and energy conservation and the concerns about GHGs.* • *75% of UKs know oil and natural gas reserves have been used up.* • *2020 UK aims to meet 15% of its energy from renewable sources*
Explain why domestic supplies fossil fuels have decreased (6)	• *Technology – hydrogen cars, biofuels* • *Education – turn appliances off at the plug, smart meters.* • *Energy efficient technology at work and houses e.g. cavity wall insulation, double glazing* • *Renewable fuel use e.g. solar, HEP.*
Identify economic issued associated with the exploitation of energy sources (2)	• *Nuclear – nuclear power plants expensive to build, decommissioning them is expensive, new plants provide job opportunities* • *Wind – high construction costs, local homeowners can have lower energy bills*
Identify environmental issued associated with the exploitation of energy sources (2)	• *Nuclear – problem of safe processing and storage of radioactive waste. Warm water can harm local ecosystems.* • *Wind – Visual impact on the landscape. Reduce carbon footprint, noise from wind turbines.*

Energy

Define the term the term energy security (1)	• *Uninterrupted availability of energy sources at an affordable price.*
Define the term the term energy insecurity (1)	• *If a county's demand exceeds production it has an energy deficit.*
Describe the global distribution of energy consumption and supply (6 marks)	• *Consumption is highest in N. America and parts of the Middle East.* • *Consumption is lowest across most of Africa and parts of SE Asia.* • *North America has large coal reserves* • *Russia has large reserves of natural gas and oil* • *Sub-Saharan Africa depends on overseas TNCs to exploit reserves.*
Explain how economic development leads to increasing energy consumption (2)	• *Demand for energy supplies rises* • *Living standards increases leading to demand for more technology e.g. dishwashers, air conditioning*
Assess the factors affecting energy supply (6)	• *Technology – makes energy sources in difficult environments exploitable e.g. Arctic oil* • *Political – UK govt. has cut subsidies for renewable energy, political instability in Middle East means countries seek alternative energy* • *Cost of exploitation – HIC vs LICs e.g. nuclear* • *Physical factors – Geology for fossil fuels, Geothermal energy* • *Climate – amount of wind, sun, HEP and mountainous regions*
Energy insecurity causes conflict. Discuss (6)	• *Shortage of energy, Middle East produced 40% of world's gas and 56% world's oil, Gulf and Iraq wars in the 1900s and 2000s were influenced by the West's fear of global oil shortage and rising prices.*
Assess the impacts of energy insecurity (4)	• *Impacts on food production* • *Impacts on industry* • *Potential for conflict*
Explain how energy insecurity effects food production and industrial output (6)	• *Impacts on food production – maize and sugar cane for energy led to increase food prices, biofuels grown on land previously used for growing food, LICs collecting wood for fuel decreases time spent on food production.* • *Impacts on industry – shortfalls in energy production, closure of 500 companies in industrial region of Pakistan*

Using an example assess how the extraction of a fossil fuel has both advantages and disadvantages (6 marks)	• *Natural Gas, Shale Gas (Fracking)* *+ve emits 45% lower CO_2 emissions than other fossil fuels. Lower risk of environmental accidents than oil, transported easily via pipelines or tankers. Provided employment* *-ve some gas reserves are in politically unstable countries. Wastewater and chemicals from fracking can contaminate groundwater. Contributes to global warming by producing CO_2 and methane emissions. Deforestation* • *60% of known natural gas reserves are in Russia, Iran and Qatar expected to last 54 years.* *Arctic Oil: difficult and sensitive areas.* *Economic –ve exploitation is difficult and expensive, people demand higher wages to work there, long distances and limited transportation increase transport costs.* *Environmental –ve oil spill would be catastrophic or the fragile Arctic ecosystem, strict environmental controls needed, drilling equipment may sink during the summer thaw when permafrost melts slightly.*
Give 4 examples of renewable energy (4)	• *Solar* • *Tidal* • *Wind* • *HEP* • *Wave* • *Biomass* • *Geothermal*
Give 4 examples of none renewable energy (4)	• *Coal* • *Oil* • *Gas* • *Nuclear*
Explain how the UK can move towards a sustainable future. Consider homes, workplaces and transport. (6)	• *Homes and workplaces – Energy efficient appliances, double-glazing, energy efficient lighting, cavity wall land loft insulation, solar panels. BedZeds* • *Transport – buses run on biogas and fuel, Boris Bikes super highway, improve public transport Crossrail and HS2.*
Describe how technology can increase efficiency in the use of fossil fuels (2)	• *Vehicle manufacturers are using technology to design more fuel-efficient cars. Development of electric and hybrid cars, development of biofuel technology (however, growing biofuels rather than food crops is a controversial issue)*
Explain how demand reduction can increase energy supply in the UK (4)	• *Financial incentives* • *Raising awareness of the need to use energy efficiently* • *Greater use of off-peak energy* • *Using less hot water for domestic appliances*
Using an example of a local renewable energy scheme in a LIC or a NEE. Examine the extent to which it provides sustainable supplies of energy (6)	*Biogas India* • *Needed so women no longer need to collect firewood and can now get a job. Also to reduced the rate of deforestation due to pop. growth.* • *What is the scheme? Bottom up strategy Cow dung ferments to produce methane = used to run gas stoves/ lights or to make electricity in a generator.* • *Benefits to the community: No breathing problem as no smoke from fires / 80% of families use extra time to increase their income / school / destroys micro-organisms which cause disease / 200,000 permanent jobs / slurry = fertilizer / 277 tonnes of carbon dioxide emissions per year have been stopped. –VE :conflict / start up fund / 30°C* *Chambamontera, PERU HEP Mico-hydro* • *Is an isolated community in the Andes of Peru. It introduced a micro-hydro to exploit water power as an energy source.* • *½ the pop. live on <$2 a day. Steep slopes and rough roads make it isolated, low population so uneconomic to build an electricity grid to the area.* • *What is the scheme? Bottom Up Strategy. High rainfall / steep slopes / fast flowing rivers = micro hydro electric scheme. Cost*

	$51,000. Japan govt. invested and loan to the local community to pay for the rest. • *Benefits to the community: Provides renewable energy / Low maintenance & running costs / Has little environmental impacts / Using local labour and materials / Businesses are developing / Less wood is needed to be burnt / Reduced rural-urban migration / Recued flooding / less deforestation as no need to burn wood.*