**LESSON NOTE 4**

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| **PEST AND DISEASES OF AGRICULTURAL IMPORTANCE**    Definition   * **Pests** are organisms that feed on and damage crops or livestock. * **Diseases** are abnormal conditions in plants or animals caused by pathogens like bacteria, viruses, or fungi.   **Types of Pests**   **Crop Pests**:   * *Insects*: grasshoppers, weevils, aphids * *Rodents*: rats, squirrels * *Birds*: quelea birds   Animal Pests:   * *Parasites*: ticks, lice, mites   **Types of Diseases**     * **Crop Diseases**:   + *Cassava Mosaic Virus*: causes yellow patches and stunted growth   + *Maize Rust*: fungal infection, reduces yield   + *Rice Blast*: weakens plant stems * **Animal Diseases**:   + *Foot and Mouth Disease*: blisters and fever in livestock   + *Newcastle Disease*: affects poultry, causes paralysis and death   **Effects on Agriculture**   * Destruction of crops and livestock * Decreased yield and farm income * Poor quality agricultural produce * Food scarcity and price increase   **Control Methods**     * **Cultural Control**:   + Crop rotation, clean farm practices * **Biological Control**:   + Using predators like ladybirds to eat aphids * **Chemical Control**:   + Application of pesticides and fungicides * **Quarantine and Sanitation**:   + Isolating infected plants or animals and maintaining cleanliness |

**LESSON NOTE 5**

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| **FOOD PRODUCTION AND STORAGE**    Food Production can be defined as the process of growing crops and rearing animals to provide food for consumption.  Food Storage is the preservation of food products after harvest to prevent spoilage and ensure availability.  **Factors Affecting Food Production**   * Environmental Factors: rainfall, soil quality, pests, diseases, climate * Technological Factors: availability of tools and machines, improved seeds * Economic/Social Factors: access to land, capital, government policies, education of farmers   **Methods of Food Production**   * **Traditional Methods**: subsistence farming, use of hoes and cutlasses, local irrigation * **Modern Methods**:   + Mechanized farming (tractors, harvesters)   + Use of fertilizers and pesticides   + Improved seed varieties   + Irrigation systems (sprinklers, drip irrigation)   + Greenhouse farming and hydroponics   **Methods of Food Storage**     * **Traditional**: drying, smoking, salting, storing in barns, pots or cribs * **Modern**:   + Refrigeration/freezing   + Use of silos and cold rooms   + Canning, bottling, and vacuum sealing   **Ways of Improving Crop Yield**   * Use of high-yielding and disease-resistant seed varieties * Application of fertilizers and compost * Effective irrigation systems * Mechanization of farming processes * Pest and disease control   **Role of Food in Agricultural Production**   * Food is essential for:   + Sustaining farmers and laborers to continue production   + Economic development through export and trade   + Reducing hunger and improving health in communities   + Promoting national food security and self-sufficiency |

**LESSON NOTE 6**

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| **POPULATION GROWTH AND FOOD SUPPLY**  Meaning of Population growth: Increase in the number of people due to high birth rates, reduced death rates, and immigration. This can be caused by;   * High birth rates due to lack of family planning * Improved medical care reducing death rates * Immigration into urban and fertile rural areas. Etc.  ****Effects of Food Shortage****  * Hunger and malnutrition * High food prices * Poor health, especially among children and the elderly * Social problems: theft, conflict, migration * Low economic productivity due to unhealthy workers  ****Government Efforts to Increase Food Production****  * Distribution of improved seeds and fertilizers * Support for mechanized farming * Provision of loans and subsidies to farmers * Establishment of agricultural research institutes * Youth empowerment programs like NAPEP, YOUWIN, and NALDA   **Relationship between availability of food and human population.**    The relationship between the availability of food and human population is complex and multifaceted. Adequate food availability is essential to sustain a growing population. Factors such as agricultural productivity, distribution systems, economic conditions, and technological advancements influence food availability. Conversely, population growth can strain food resources, leading to challenges in ensuring everyone has access to nutritious food. Sustainable agriculture practices, food distribution mechanisms, and population management strategies play crucial roles in balancing this relationship.  HOME FUN   1. Highlight 4 effects of population growth on food supply. |

**LESSON NOTE 7**

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| **MICROORGANISMS AROUND US**    Microorganisms are tiny living organisms that can only be seen with a microscope. They are also called microbes. They are found everywhere, in the air, water, soil, in food, on living and inside the bodies of living things. ****Classification of Microorganisms**** Microorganisms are classified into five major groups:   1. **Bacteria** – Single-celled prokaryotic cell without a true nucleus. (e.g., E. coli, Streptococcus)   **Types of bacteria**: they can be grouped based on the following   * Oxygen requirement; aerobic, obligate anaerobes and facultative anaerobes. * Based on shape: cocci, bacilli, spirillae, vibrios, flagellated spirpchaetes * Based on Gram’s staining technique: gram-positive retains (purple/violet stain in its cell) and gram – negative bacteria ( lose purple stain in the cells)  1. **Fungi** – Non- green simple plants that feed saprophtically or parasitically. Includes molds and yeast (e.g., Saccharomyces, molds on bread) animal disease caused by fungi is ringworm, athlete’s foot, mouth thrush etc. 2. **Viruses** – unicellular, non-living outside the host; cause diseases (e.g., HIV, COVID-19 virus) 3. **Protozoa** – Animal-like microorganisms found in damp soil or water. Some could be parasitic like trypanosome and plasmodium, while non-parasitic ones are amoeba, paramecium etc. 4. **Algae** – Plant-like microorganisms with chlorophyll to several other pigments giving rise to green algae, blue/green algae (e.g., Chlamydomonas, Spirogyra)  ****Carriers and Vectors of Microorganisms****  * **Carriers** are organisms or objects that transport microorganisms without being affected. * **Vectors** are living agents (mostly insects) that transmit disease-causing microorganisms to humans and animals.   **Examples:**   * **Mosquito** – vector of Plasmodium (malaria) * **Housefly** – spreads bacteria by moving from waste to food * **Cockroach** – spreads pathogens in dirty environments * **Dirty hands or utensils** – carry microorganisms to food and drinks  ****Economic Importance of Microorganisms**** **Beneficial Effects:**   * **Food Production:** Yeast in bread and alcohol, bacteria in yogurt and cheese * **Medicine:** Production of antibiotics (e.g., penicillin), vaccines * **Agriculture:** Nitrogen-fixing bacteria improve soil fertility * **Waste Management:** Decompose dead plants and animals   **Harmful Effects:**   * **Disease:** Cause illnesses like malaria, tuberculosis, cholera * **Food Spoilage:** Cause perishable foods to rot quickly * **Material Damage:** Destroy leather, books, and clothes * **Crop/Animal Infection:** Affect agricultural productivit  ****Growth of Microorganisms**** Conditions that support the growth of microorganisms:   * **Warmth:** Thrive at temperatures similar to body heat (around 37°C) * **Moisture:** Need water to survive and multiply * **Nutrients:** Use organic matter as food * **Oxygen (or lack of it):** Some require it (aerobes), some grow without it (anaerobes)   **Example:** Bread mold growing in a warm, damp kitchen ****Control and Prevention of Harmful Microorganisms**** **Methods of Control:**   * **Personal hygiene:** Frequent hand washing, clean clothes * **Food hygiene:** Proper cooking, refrigeration, covering food * **Use of disinfectants/antiseptics:** Cleaning surfaces and wounds * **Medical measures:** Vaccination and use of antibiotics * **Environmental control:** Disposal of waste, use of mosquito nets and insecticides   HOME FUN  Draw and label a bacterium. |