Student 's Assignment 3 (Module three)

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Questions

1. Define the following terms:
(a) Policy
(b) Food balance sheet
2. Discuss four limitations of food aid
3. Use of genetically modified foods (GMOs) has been a controversial issue. Discuss the role of GMOs on food and nutrition security.
4. Discuss the common coping strategies adopted by household in your community when there is crop failure.
5. Explore the technological trends that can increase individuals' vulnerability to food insecurity.

1. Define the following terms

(a) Policy

Policy is defined as a guideline that helps in attaining the aims of the objectives of an organization. In food security and nutrition scope, policy is a document containing projected program of food and nutrition goals, values and their consistent practice over a considerable long period of time and it is periodically reviewed.

Characteristics of a policy;

Should be Flexible. It must have the character of adaptability and required changes should not disturb the organization too much. Neither the changes should be such which may require rethinking so far as the aims and objectives of the organization are concerned. It should not be static. It must be flexible only to the extent to which it makes sense with the objectives, plans and requirements of the organization.

It should prove an effective instrument for the execution of the plans of the organization.

The code prescribed should state procedure which is to be followed in a given situation.

Normal procedure should be clearly defined and should usually follow the conventional and establish course since they have withstood the time and have now been accepted by the organization. The change, if required, may be incorporated if it is going to help the working. But such a change should be adequately tested before it is given effect to.

A particular policy may be good in one set of circumstances, but it may not prove useful in another set of circumstances. Since circumstances may not remain the same all the time. It is therefore, necessary that the policy should be reviewed periodically. A periodical review of the policy makes the policy more adaptable and acceptable.

(b) Food balance sheet

A food balance sheet is a comprehensive compilation of a selected country's food supply during a specific time period. Food balance sheet also presents a comprehensive picture of the pattern of a country's food supply during a specified reference period. The food balance sheet shows for each food item for example each primary commodity and a number of processed commodities potentially available for human consumption - the sources of supply and its utilization.

The total quantity of foodstuffs produced in a country added to the total quantity imported and adjusted to any change in stocks that may have occurred since the beginning of the reference period gives the supply available during that period.

On the utilizatio*n* side a distinction is made between the quantities exported, fed to livestock, used for seed, processed for food use and non-food uses, lost during storage and transportation, and food supplies available for human consumption at the retail level, for instance as the food leaves the retail shop or otherwise enters the household.

Annual food balance sheets tabulated regularly over a period of years will show the trends in the overall national food supply, disclose changes that may have taken place in the types of food consumed for example, the pattern of the diet, and reveal the extent to which the food supply of the country as a whole is adequate in relation to nutritional requirements.

There are problems especially when it comes to time-reference period to be used in preparing food balance sheets. Several twelve-month periods, such as July/June, October/September, April/March, have been proposed and were indeed also applied. However, none of these periods satisfactorily and uniformly covered the production of all agricultural commodities, their trade and domestic utilization. It can be assumed that there is no single twelve-month period which is fully suitable for recording supply and utilization for all products. It was therefore felt that, although the calendar year time-reference period (January-December) might not be a completely satisfactory solution, its advantage would appear to outweigh its disadvantages. The application of a calendar year time-reference period during which the bulk of the harvest takes place also helps in linking the agricultural statistics with those of the industrial and other sectors of the economy.

Nevertheless, food balance sheets, while often far from satisfactory in the proper statistical sense, do provide an approximate picture of the overall food situation in a country and can be useful for economic and nutritional studies, for preparing development plans and for formulating related projects.

2. Discuss four limitations of food aid

Food aid is a humanitarian heart of assisting the most vulnerable as result of shock among the population. It means providing food and other related assistance to tackle hunger especially in emergency situations to improve food security. Food aid may also be in terms of cash to

purchase food or in support of food assistance programs. It can also be described as any intervention done by an organization or government to address hunger and undernutrition.

It is a donor-driven system - Food aid from developed countries such as the US, China and South Korea increases the dependence of people from the recipient country on it. This makes local markets disrupted and make it harder for people to recover from the crisis.

It promotes domestic interests of donor countries - Food aid systems also put the interests of donor countries above the needs of the hungry people, the food aid produced in developed countries are also less expensive because famers who grow them receive subsidies, so they are able to produce it at a lower price. So, here again the local market is disrupted.

It is a foreign policy tool - Food aid can also have a knock-on effect when only one food price falls, then people might only buy that product causing farmers from other industries to suffer.

International institutions are driven by exporters - Food aid also can sometimes arrive late, causing disruption to the next round of harvests, resulting in the slow recovering of local farmers. Transport of food aid can be very expensive, especially if oil prices increase. It is said to be 50% cheaper to buy food locally.

Development is not necessarily the objective - The donor country will benefit from food aid because they will be donating any of their food that is in surplus. Food experts say that it is better to give local people the buying power from their local markets as food aid is only successful in short-term during times such as disasters.

Countries such as Switzerland are moving towards this as they think that giving people cash or vouchers will help improve the local markets.

3. Use of genetically modified foods (GMOs) has been a controversial issue. Discuss the role of GMOs on food and nutrition security.

The role of genetically modified crops for food security is the subject of public controversy. GMOs have both positive and negative impacts on people food and nutrition security. GMO crops alone will not solve the hunger problem, but they can be an important component in a broader food security strategy. Agricultural plants are one of the most frequently cited examples of genetically modified organisms (GMOs). Some benefits of genetic engineering in agriculture are increased crop yields, reduced costs for food or drug production, reduced need for pesticides, enhanced nutrient composition and food quality, resistance to pests and disease, greater food security, and medical benefits to the world's growing population. Advances have also been made in developing crops that mature faster and tolerate aluminum, boron, salt,

drought, frost, and other environmental stressors, allowing plants to grow in conditions where they might not otherwise flourish. Other applications include the production of nonprotein (bioplastic) or nonindustrial (ornamental plant) products. A number of animals have also been genetically engineered to increase yield and decrease susceptibility to disease. For example, salmon have been engineered to grow larger and mature faster, and cattle have been enhanced to exhibit resistance to mad cow disease (United States Department of Energy, 2007).

This is in accordance to research of Theresa Phillips, Ph.D. on Genetically modified organisms, (Nature Education, 2008).

Examples of GMOs Resulting from Agricultural Biotechnology

Genetically conferred Trait	Example Organism	Genetic Change
Approved commercial products		
Herbicide tolerance	Soybean	Glyphosate herbicide (Roundup) tolerance conferred by expression of a glyphosate-tolerant form of the plant enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) isolated from the soil bacterium *Agrobacterium tumefaciens*, strain CP4
Insect resistance	Corn	Resistance to insect pests, specifically the European corn borer, through expression of the insecticidal protein Cry1Ab from *Bacillus thuringiensis*
Altered fatty acid composition	Canola	High laurate levels achieved by inserting the gene for ACP thioesterase from the California bay tree *Umbellularia California*
Virus resistance	Plum	Resistance to plum pox virus conferred by insertion of a coat protein (CP) gene from the virus
Products still in development		
Vitamin enrichment	Rice	Three genes for the manufacture of beta-carotene, a precursor to vitamin A, in the endosperm of the rice prevent its removal (from husks) during milling
Vaccines	Tobacco	Hepatitis B virus surface antigen (HBsAg) produced in transgenic tobacco induces immune response when injected into mice
Oral vaccines	Maize	Fusion protein (F) from Newcastle disease virus (NDV) expressed in corn seeds induces an immune response when fed to chickens
Faster maturation	Coho salmon	A type 1 growth hormone gene injected into fertilized fish eggs results in 6.2% retention of the vector at one year of age, as well as significantly increased growth rates

Source: *Nature Education, 2008*

The pharmaceutical industry is another frontier for the use of GMOs. In 1986, human growth hormone was the first protein pharmaceutical made in plants (Barta *et al*., 1986), and in 1989, the first antibody was produced (Hiatt *et al*., 1989). Both research groups used tobacco, which

has since dominated the industry as the most intensively studied and utilized plant species for the expression of foreign genes (Ma *et al*., 2003). As of 2003, several types of antibodies produced in plants had made it to clinical trials. The use of genetically modified animals has also been indispensable in medical research. Transgenic animals are routinely bred to carry human genes, or mutations in specific genes, thus allowing the study of the progression and genetic determinants of various diseases.

Positive impacts include the following

There are three possible pathways how GM crops could impact food security.

First, GMO crops could contribute to food production increases and thus improve the availability of food at global and local levels.

Second, GMO crops could affect food safety and food quality. GMO technology can help to breed food crops with higher contents of micronutrients; a case in point is Golden Rice with provitamin A in the grain.

Third, GMO crops could influence the economic and social situation of farmers, thus improving or worsening their economic access to food. This latter aspect is of particular importance given that an estimated fifty percent of all undernourished people worldwide are small-scale farmers in developing countries. Half of the global GM crop area is located in developing countries, but much of this refers to large farms in countries of South America. One notable exception is Bacillus thuringiensis (Bt) cotton, which is grown by around 15 million smallholders in India, China, Pakistan, and a few other developing countries. Bt cotton provides resistance to important insect pests, especially cotton bollworms. Several studies have shown that Bt cotton adoption reduces chemical pesticide use and increases yields in farmers' fields. There are also a few studies that have shown that these benefits are associated with increases in farm household income and living standard. Higher incomes are generally expected to cause increases in food consumption in poor farm households.

Negative impacts of GMOs

Even though the genes being transferred occur naturally in other species, there are unknown consequences to altering the natural state of an organism through foreign gene expression. After all, such alterations can change the organism's metabolism, growth rate, and response to external environmental factors. These consequences influence not only the GMO itself, but also the natural environment in which that organism is allowed to proliferate. Potential health risks to humans include the possibility of exposure to new allergens in genetically modified foods, as well as the transfer of antibiotic-resistant genes to gut flora.

Horizontal gene transfer of pesticide, herbicide, or antibiotic resistance to other organisms would not only put humans at risk, but it would also cause ecological imbalances, allowing previously innocuous plants to grow uncontrolled, thus promoting the spread of disease among both plants and animals. Although the possibility of horizontal gene transfer between GMOs and other organisms cannot be denied, in reality, this risk is considered to be quite low. Horizontal gene transfer occurs naturally at a very low rate and, in most cases, cannot be simulated in an optimized laboratory environment without active modification of the target genome to increase susceptibility (Ma *et al*., 2003).

In contrast, the alarming consequences of vertical gene transfer between GMOs and their wild-type counterparts have been highlighted by studying transgenic fish released into wild populations of the same species *(Muir & Howard, 1999).* The enhanced mating advantages of the genetically modified fish led to a reduction in the viability of their offspring. Thus, when a new transgene is introduced into a wild fish population, it propagates and may eventually threaten the viability of both the wild-type and the genetically modified organisms.

4. Discuss the common coping strategies adopted by household in your community when there is crop failure.

Long periods natural (flood, drought, pest and disease) or man-made (conflict, political instability, government policy, social and cultural approach) disasters can devastate families who are dependent on agriculture for their food as well as their income.

As climate change makes weather patterns or other artificial disasters less predictable, it is the poorest who suffer the worst.

Practical action has been working with agricultural communities around the world to cope with drought, flood, pests and other manmade disasters by helping to develop flexible (fast maturity) resistant crops, protection of livestock and ways of conserving precious water.

With a better understanding of the risks they foresee, and with a range of skills to draw on, communities are able to prepare themselves to be able to cope in times of need.

In South Sudan, population when face lack of food security they employ the following coping strategies;

When drought or flood attack, the communities do migrate to flood free areas such as islands and high grounds respectively with their cattle and shoats plus other household items like cooking pots, spare food and etc.

Those with cattle or shoats end up sell some for cash or in kind (barter)to cater the missing food and other items. Excess sale of cattle shows the severity of the shocks on the household or community. Usually, pastoralist or agro-pastoralist do not easily sell livestock more than 10% of the herd in a month.

Some households with skilled labor/member(s) get employed for income to the members at home. Technical skills such computer, blacksmithing, farming, teaching and etc. do get a little employment among other careers. Women in South Sudan are the most favored when it comes to junior positions hire.

Petty trade – this involves selling charcoal & firewood, grass as hay for cattle, kitchen garden and sales of vegetable and green leaves. Both from own production or wild gathering. Fetching of water for sell to restaurants and hotels.

Wild foods and greens collection - this is almost practiced by every community in South Sudan. Sometimes is done even at food security time, but in minimal scale. When there is food insecurity, the practice is widespread.

Fishing and hunting wild animals – some families are exposed to practice of fishing or hunting wild animals as mean of survival. Fishing is regular activity in the country along the River Nile but only to few members of the households that have it as a job. But it sometimes strange to those force to do due to crisis.

Begging and sharing is continuously increasing in the country since the current conflict and political instability, 2013 and until time of this writing, 2019. Sharing has been usual practice while begging is unusual practice.

Searching for relief aid from international and national humanitarian organizations. Most of the communities are becoming increasing dependence and addicted to aid. Most people run to internal displaced persons and refugee camps in hunt for free assistance.

5. Explore the technological trends that can increase individuals' vulnerability to food insecurity.

Depraved increase use of modern war techniques and suffocated weapons - violent conflicts are increasing resulting to massive displacement and in poverty-creations; these and other variables are uprooting farmers everywhere. While people have always left their homes in search of safety or opportunity, there is a high record number of people currently are on the move ending up to internally displaced persons or refugees' camps.

Epidemic diseases such as HIV/AIDS that spread due to fastest access and mobility of human races making the world a global village. Those people with the sickness can spread it in short time possible because of technology like planes, vehicles and etc. Human health shocks like HIV/AIDS have been one of the biggest shocks on household food security. The burden can lead to sale of assets to offset hospital bills. This is especially if the infected member is the household bread winner. Due to HIV/AIDs households use lot of money in treatment and in medical expenses at the expense of food. People are also becoming unproductive and are unable to engage in income generating activities due to the sick condition.

Population increase in some regions within the country, this is due to rural – urban migration in search of employment, medical services, education and other improved social services. This leads to competition over few resources in the towns thus increasing vulnerability.

All these trends are negatively affecting traditional social structures that communities depend on for survival, and insufficient attention is being paid to these structures' role in ensuring food security. If global hunger is to be eradicated, the underpinnings of rural resilience must be supported, expanded, and diversified, CGIAR Research Program on Climate Change, Agriculture, and Food Security (2017).

References

Devos, Y., *et al*. Ethics in the societal debate on genetically modified organisms: A request for sense and sensibility. *Journal of Agricultural and Environmental Ethics* **21**, 29–61 (2007) doi:10.1007/s10806-007-9057-6

Hoban, T. Public attitudes towards agricultural biotechnology. ESA working papers nos. 4-9. Agricultural and Development Economics Division, Food and Agricultural Organization of the United Nations (2004)

Jesse, H., & Obrycki, J. Field deposition of Bt transgenic corn pollen: Lethal effects on the monarch butterfly. *Oecologia* **125**, 241–248 (2000) United States Department of Energy, Office of Biological and Environmental Research, Human Genome Program. Human Genome Project information: Genetically modified foods and organisms, (2007)