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The way of Reducing the Losses of Agricultural Products in Harvesting

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Annotation: All types of natural products that which grown on agricultural are considered to be beneficial for human health. At the same time, regardless of how important it is for the human organism, agricultural products grown for the production of all kinds of fruits, vegetables, spices and processed consumer goods are food. We are known that there are also two types of agricultural food products, such as agriculture and livestock, but the importance of fruits and vegetables for human health is higher. According to nutritionists that fruits and vegetables are plenty in all the minerals necessary for human health and play an important role in boosting immunity. Accordingly, it is recommended that a healthy person consume an average of 80-100 grams of fruits and 360 grams of vegetables per day.

Keywords: Agricultural, Agricultural Products, humanity.

Introduction.

In the face of global climate change, humanity faces many natural disasters, but they also needs to address issues such as food security and reducing crop losses. In fact, natural disasters are directly impact to reducing agricultural harvest and livestock sector is damaged by this disasters. Climate change is impacts with several ways on food safety system, on the one hand, reduces crop yields in agriculture, and on the other hand, increases storage losses because of the proliferation of various biological pests in the storage of agricultural products. A few size reduction in the loss of agricultural products will not only increase the volume of food, but also reduce the impact of human resources on nature by reducing the consumption of resources in production.

Methods. Over the past decade, reducing food waste and waste reduction has become a problem not only governments but it also for the private sectors. Currently, many private companies have tried to extra services for their consumptions when their products after utilizations because of them also tried to reducing waste. The loss of agricultural produce is divided into several parts: in the first period, the loss at harvest time. If the crop harvested in a timely, losses would be few. According to research, if the losses of agricultural products in the Republic are expressed in terms of value, on average, 20-25% of the value of the product is formed due to losses[1]. This indicate might be bigger in the countryside areas because they are not providing modern technical. As well as, the order of the Minister of Agriculture and Water Resources of the Republic of Uzbekistan dated 24.08.2016 No 24 "On approval of norms of natural losses in storage, transportation and sale of fresh fruits, vegetables, potatoes, melons and grapes"[2]. According to this norm of natural losses of food products grown in the country has been approved, and we can see that it contains up to 0.5-3% of natural losses, depending on the type of fruit and vegetables.

According to a research by FAO, food waste searching and scientific studies have shown that it is advisable to study the amount of food lost and the consequences of losses as an integral chain. Because, we are able to solve this problem by this method. Therefore, high-level losses producing food not only increase waste, but also add value to the cost of food consumed. However, FAO research does not account for the harvest process, but for the losses from harvested to

[1] B.Djurayev. Ways to improve the organizational and economic framework for the use of marketing systems in agriculture. Thesis (PhD) Dissertation.

[2] To the order of the Minister of Agriculture and Water Resources of the Republic of Uzbekistan from August 24, 2016 of No. 28

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retail, as well as for food purchased by consumers and lost without consumption do not take into account the products. At the same time, FAO studied showed that the big part of the food is lost in the process of retail and consumption. However, the more part of food losses on the harvest time because all agricultural crop ripe on the time but we do not have technical and labor force to harvesting in a short time. We believe that reducing the cost of natural food losses is relatively not costly, but it is possible to achieve food security by reducing the human related aspects[3]. In recent years, as the effects of global climate change has become more pronounced. This fact directly impact to research has begun to address food security and reduce crop losses. It is seemed that more producing is required more resources and they causes much waste in environment. At the same time, there is a growing international focus on the disadvantages of losing food without consuming it.

Lipinski and his team do research on these global issues[4] initially conducted research, but later a great deal of attention was paid to this area, and the International Food Loss Index SDG 12.3.1 was developed. According to the index, the largest food losses are in Central Asia and South Africa. That is, about one-fifth of the produce grown in these countries is lost without consumption, compared to the world average of 13.8 percent, but the lowest indicate were in two countries, which are Australia and New Zealand at 5.8 percent. It is obvious that in Central Asian countries the basic focus is on reducing the volume of losses equalization to the average indicate, rather than increasing production, as well as stabilizing food prices by reducing the consumption of resources in production expedient. In general, much of the research work to reduce food losses has been focused on after 2010. Although, this problem was huge in the world but it has ignored by many researches. When Hue and his team studied showed[5] that food loss researches in the globally, most studies have focused on increasing economic efficiency, acknowledging that only in the last 10 years has scientific research been conducted on food loss.

Results. In our opinion, the loss of food does not mean on the production process period, but it account after the harvest season (or after slaughter) and on the period after this stage. That is, it is impossible to recycle food lost at the process. Therefore, we have to try to reducing food losses only after harvesting. Accordingly, in the calculation of losses that it is advisable to fully take into account the losses during storage, transportation, processing, sales and consumption. It is also advisable to take into account non-consumable parts of the goods in determining the amount of losses.

The following factors are taken into account in determining the index of losses in the production and consumption of food:

- development of loss rates for all stages of the farm, from the time of harvest to the time of retail sale of goods;
- harmonization of the internationally approved food loss index with the country's conditions. It w well known that the natural climatic conditions and resources of all countries, as well as recycling technologies, are different;
- development of pre-harvest loss rates, including determination of loss rates for each type of crop (in including livestock sector), as well as for each type of food determine the rate of consumption of products. According to research, food losses are vary in each countries, accordingly, calculated average food losses index for World. The overall average index is also calculated by dividing food losses into several stages.

[3] Prediction of prices for agricultural products through Markova chain model Umurzakov, U., Djuraev, B. International Journal of Psychosocial Rehabilitation this link is disabled, 2020, 24(3), pp. 293–303

[4] Lipinski, B., Hanson, C., Lomax, J., Kitinoja, L., Waite, R., Searchinger, T., 2013. Reducing food loss and waste. World Resources Institute Working Paper 1, 1–40.

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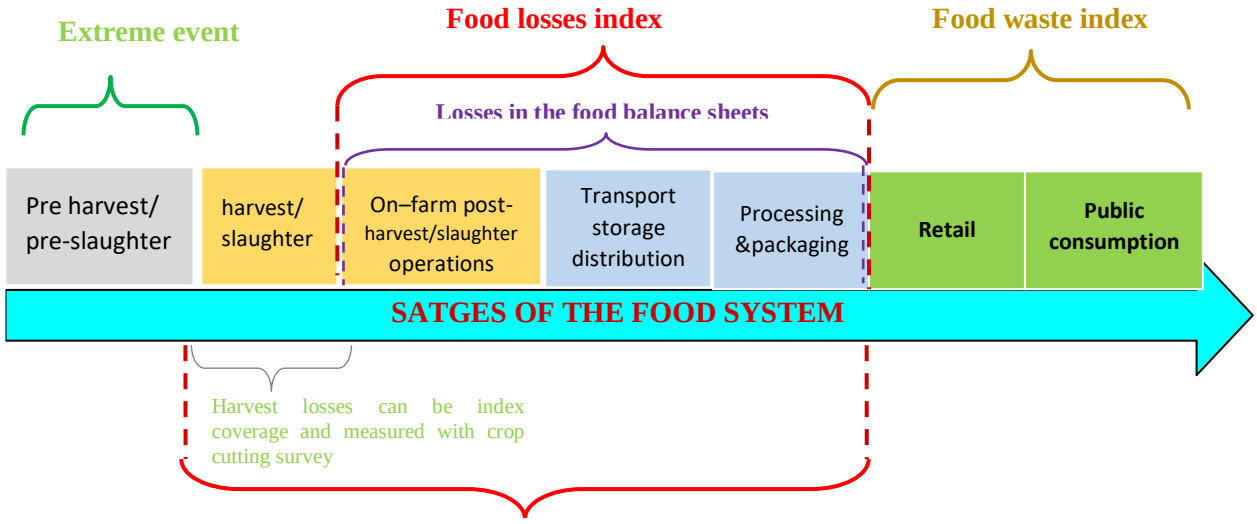

Figure 1. Stages of food loss.

As can be seen from Figure 1, the loss of agricultural food is especially observed in seven processes, but they are analyzed in three main parts. There is also more to the harvest (and slaughter in animal husbandry) than the calculation of the food loss index, which is calculated at the stages of initial storage, transportation and storage and processing and packaging after the harvest taking into account the alloys, an index of local losses is developed.

Determine the index of food losses we have to account some methods such as the Food Loss Index SDG (Sustainable Development Goals) 12.3.1 is based on the following considerations:

- changes in the amount of waste in the quantitative loss of food:
- the loss of food includes the period from ripening to the retail stage. It is important to remember that in animal husbandry (meat production) the period of maturity must be clearly defined because the exact age of the livestock (fishes, poultry) raised for meat in animal husbandry has not been unmarked;
- the index of loss of crops not harvested during the harvest season for certain reasons is not taken into account:
- the amount of losses added to the value of the products produced also means that production costs can be affected by reducing the amount of losses. In addition, in most countries, when calculating the loss index, at least 10 types of products must be selected based on the specialization of the manufacturer;
- it is expedient to rely on version 2.1 developed by the International Institute of Food Cycle Analysis on calculating the local food loss index. Because the results of the index obtained through it are important in the analysis of the average results worldwide. According to the study, a clear conclusion on the index of losses calculated at the regional and national levels does not give the expected results. Therefore, it is necessary to use the methods of the Institute for the analysis of the international food cycle[6].

The SDG 12.3 index for calculating the food loss index for each country is determined by the following formula:

[6] Note on "FAO Approach for Monitoring SDG12.3: Measuring & Estimating Losses for Compiling the Global Food Loss Index", Office of the Chief Statistician and Statistics Division, FAO, Rome

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$$FLI_{it} = \frac{FLP_{it}}{FLP_{i0}} = \frac{\sum_j l_{ijt} * q_{ij0} * p_{j0}}{\sum_j l_{ij0} * q_{ij0} * p_{j0}} * 100$$

In there:

- FLP_{it} - Average percentage of food losses in the country this year:

- FLP_{io} - The average percentage of food lost nationwide in the base year:

- *i* – country:

- *j* – products, includes 10 different products in five main categories:

t – Years, 0 – basis year:

l_{ijt} – i s the percentage of loss of type j goods in country t over time t.

q_{ij0} –change in the volume of Commodity production in the country relative to the basis year:

p_{j0} – International average prices of goods in 2018-2020 (international currency in US dollars).

The index provides an accurate forecast of how much food is wasted in the country each year, as well as the amount of excess money spent as a result. It is well known that recycling food waste or decontaminating the environment requires a large amount of additional resources.

Many developed countries focus on agricultural development and modernization in their long-term sustainable development strategies to provide food security. At the same time, they are paying close attention to the natural loss of agricultural products. According to the developed sustainable development strategy, by 2030, how much of the agricultural output will reach retail or not will change compared to today. It should be noted that the loss of food in recent years has begun to be considered as an object of study.

Actually, per capita consumption of vegetables in the Republic of Uzbekistan in 1992 averaged 153.17 kg, while in 2017 it was 274.15 kg per person. We can see from this indicated that the country consumes an average of 9316 thousand tons of vegetables per year. If we consider the average annual loss of 16%, approximately 1490.6 thousand tons of vegetables could be lost per year. Accordingly, large amounts of resources can be saved by reducing the average probability of fruit and vegetable losses, albeit by a small percentage.

Conclusion.

We believe that the reduction of natural losses of fruits and vegetables can be achieved mainly by modernizing storage processes and increasing the number of refrigerated warehouses. It is also possible to reduce losses at the retail stage by forecasting the volume of supply by developing a transport logistics system and accurately assessing the needs of consumer markets.

In summary, in determining the average annual food loss index, it is advisable to collect the data based on sample surveys. This is because the loss rate is not the same for every farm that grows agricultural products. However, in order to ensure a high degree of accuracy of the loss index, the data can be obtained not only through surveys, but also experimentally or through other types of mathematical models. However, official government sources can also be used.

In our opinion, it is advisable to use the methods developed by international research institutes and the FAO to study the rate of loss of food products grown in our country.

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