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# Waste reduction strategy for food security crops

Amir Hossein Pirmoradi<sup>1\*</sup>, Somaye Latifi<sup>2</sup> and Samire Sey Mohammadi<sup>1</sup>

1- Phd student in Agricultural Development, Faculty of Agriculture, Razi University, Kermanshah, Iran

2- Phd student in Agricultural Development, Faculty of Agriculture, Tabriz University, Tabriz, Iran

**Corresponding Author:** Amir Hossein Pirmoradi

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### ABSTRACT

Today food security in developing countries faces threat, so the fast increasing of population makes us to provide more food. Thus, in order to increase the produce crops and meet the people's needs, there are some strategies such as increased acreage, higher yields per unit area, achieving superior numeric, field operations management, including extermination and diseases elimination, irrigation, feeding, pruning, etc. However, there is a strategy that has been overlooked: the reduction of agricultural waste products. High rate of agricultural waste products is one of the problems which has always been an obstacle to agricultural strategic self-sufficiency and food security in Iran. So that by eliminating or minimizing the agricultural waste products, we can achieve self-sufficiency faster. Food security and self-sufficiency in crops strategic production in the current world which is considered as a weapon and leverage in the hands of power sources are of the most important factors. However, considering food products import process including wheat makes us worry about future's food security of nearly 70 million people in our country. Therefore, it is clear that reducing waste is directly related to food security which is one of the macro-policies systems of the development plans. This paper, which has been conducted through documentary approach, in order to gain food security through analyzing concepts such as food security, agricultural waste products, the importance of agricultural waste products reduction, seeks to discuss it. And finally presents a strategy to reduce agricultural waste products.

**Keywords:** Food security, Agricultural waste, Waste reduction.

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### INTRODUCTION

With population growth of the world, a food demand is increasing day after day. World Food Organization has announced that by 2030 the world population will reach more than 8 billion which providing food for this population needs a lot of efforts in agriculture and related sciences. Considering improvements in the last three decades of annual food consumption has only increased about 20 percent. Based current estimations, the amount of 2030 food production in developing countries must be 70 percent more than its current production so that could keep the pace with the growth population. (3) However, assuming the importance of agriculture and food security, especially wheat, in the country, every year a huge amount of crops and orchard products in various stages, especially after harvesting loss qualitatively, so that due to some reasons such as lack of attention to principles of agricultural processed maintaining, lack of scientific warehousing methods, and the damage of storing extermination, in third world countries the amount of wastes are more than industrialized countries. If damages to agricultural products in farms and gardens added to these problems, it would lead to a great amount of agricultural waste products. So based on existing statistics, on average, 35 percent of agricultural products in Iran, in various stages, will be wasted which feeds 15 to 20 million people in the country. In order to provide food security in the country, it is necessary to adopt strategies to reduce agricultural waste products, so that through waste reductions, without higher yields per unit area, we could provide an increase in crops productions and finally leads to food security in the country.

#### *Description and discussion thread*

##### *The concept of food security*

Intellectual origin discuss of food security has been one of the components of national security to be on the world food crisis in early 1970. Presented based on different definitions, the concept of food security and access to all the people all the time and all times to enough food for a healthy life and a dynamic (Ghassemi, 1994). There are several formal definitions for

food security represents the evolution of attitudes to this issue. United Nations in 1975 defined food security as: "Food security is a continuous supply of basic food commodities in order to constantly improve the level of food consumption and neutralize the adverse effects of fluctuations in food production and prices" (15). Formulated a theory to food security and nutrition for the first time at international conferences in 1992 and was raised as one of the important strategies in dealing with hunger and malnutrition, household food security and emphasized, and eventually was adopted 1996 World Food Summit defined food security following the latest announcement: "Food security means that all people in all time to enough food, physical and economic access to safe and nutritious food are available and needs a feeding regime is consistent with their preferences for an active and healthy life, to provide "(15). Food security can also be defined as a situation in which all the families of physical and economic access to enough food for all members and also not in danger of losing their access level (17).

### ***The lesions***

Several definitions of the lesions is presented in the following description of some of them are paid. Food and Agriculture Organization of the view United Nations Environment Programmed and any changes resulting in non-food quality and safety of the product is inaccessible and, as a result, the non-agricultural products for human consumption must be considered waste (6). Gilman and Taylor (1979), argue that the decreasing quality and quantity of food waste (1). Some of the researchers from planting to consumption of products considered as waste and others believe that the removal of waste products and processing steps to be taken to the stage of the evaluation will be (7). Others believe that the lesions are related to the process of harvesting and postharvest phases of the product for any reason, unused or waste is considered to be unsuitable for sale (1). Tergal (2005) also believes that food wastes including food waste at different stages of production at household level (including injuries in various stages of storage, transportation, etc.) are.

### ***Causes losses of agricultural products***

#### ***The primary causes of lesions:***

Biological products consumed by rodents, birds, and other large animals that are directly caused the disappearance of the weight loss product. And in some cases, the amount of pollution caused by excrement, hair and feathers of animals and birds for human consumption so that virtually no mass product. Insects can also damage the quality and quantity of agricultural products (6).

***Microbiological:*** fungi, bacteria and microorganisms in general, damage to stored products are imported. Traces of these products are taking the lead in terms of product quality is not optimal for humans. Toxins produced by molds that mycobacteria of toxins the non-consumable products are being called.

***Chemical*** group of chemicals in agricultural products automatically react with the product and cause loss of color, taste and smell, are tissue and their nutritional value. Contaminated products such as pesticides and chemicals that are harmful to humans or oil varnishes are among the categories of waste.

***Biochemical reactions:*** the number of active reactions by enzymes can be done on the products in the warehouse and the loss of flavor, color and softness to them. A sample of the waste occurs in the frozen vegetables before freezing them is necessary, these enzymes are inactivated using the methods.

***Mechanical*** wounding bite and garden products to the store over the size of the pile and separate the waste is causing the lesions.

***Physical:*** insufficient or excessive heat or cold can damage the crop. Improper storage of waste will cause this type of atmosphere.

***Physiological:*** After harvesting the crop was still alive and continues his activities as a vital relationship with the land and add to its food plant organs with no chlorophyll, so photosynthesis occurs in the process and product photos of the nutrients that feed your and generates heat. This caused a drop in the value of the food product, to investigate the possibility of mechanical damage and also increases the growth of microorganisms.

***Secondary causes lesions:*** incorrect feeding habits and buy more than needed to cause lesions.

- Inadequate skills, harvesting, packaging and administration;
- Lack of adequate container for shipping and handling putrescible products;
- Its inadequate storage facilities;
- Inadequate transport facilities to transport products to market before decay;
- Inadequate cold storage;
- Inadequate drying equipment (6).

### ***Injuries due to social and economic factors***

1 - Policies: the political situation in which there is not enough or for a technological solution to the problems facing its implementation. For example, poor planning and lack of information about human resources management, economic and scientific issues, including which foods are causing injuries.

2 - Sources: lack of human resources, economic and technology needed to develop programs to prevent or reduce post-harvest food losses.

3 - Education: not enough information from the scientific principles related to the storage, processing, packaging, transportation and distribution of food products.

3- 4 - Services: inefficiently public or private organizations and commercial entities for marketing products (14).

#### ***Waste products of agriculture and food security***

Human society and the provision of basic needs including food and nutrition, food security lies in its category. A widely accepted definition, food security and secure access to the position that people healthy and nutritious food for growth and development and have an active and healthy life (16). Food security is a cornerstone of community development and physical and mental health is the main element, every day in developing countries is threatened. The threat, which is deeper when we know constitute the children and youth the majority of these communities and with the threat to their health, a major part of GDP would be at risk (8). Food security is one of the challenges facing the Islamic Republic of Iran. Food security has always been one of the main objectives of agricultural and rural development programs in Iran and among the strategic objectives and priorities of programs are long-term future (12). So that the prospect of Iran in 1404 AH enjoyment of health, welfare and food security. So to achieve this important first step in a five-year development in 1404, legislators in Article 18 of the bill said the program required the government has approved the development plan within 6 months of the centrality of agriculture and natural resources self-sufficiency in basic agricultural production, food security, economic development to production and export of agricultural products, promoting agricultural value added growth rate of at least 5 / 6 percent, and preparing to run. These measures include a 50 percent reduction in agricultural waste, which is never given the available evidence has not been achieved (7). Currently, food waste from the point of challenging the country's economic policy is such that it tends to undermine food security, social and economic prosperity in the world. The importance of agriculture in providing food for 85 percent and 90 percent of the raw material for food industries, special attention should be directed to (5). Looking at the trend of food imports, including wheat, a disturbing picture of the food security of nearly 70 million population are already present. It is clear that food security and reducing waste as well as directly with the relevant policies of the development program. Among many of factors involved in increase or decrease the amount of waste (9). The only solution to the old tactic of maintaining food security and agricultural production stability does not matter. Population growth on one hand and the growing constraints of resources and agricultural production such as land, water and.... On the other hand, the fact is haunted. It brought out a significant portion of agricultural wastes from the production cycle of agricultural produce to be consumed, so that statistics based on an average 35 percent of agricultural products in Iran and in various stages of their food waste that is 15 to 20 million of the country's population (3). So that the potential increase in yield losses of crops and horticultural crops in food security, is important. According to the Food Agricultural Organization, the production of 15 crops and horticultural crops in the first place to tenth, 25th and diversification of production is allocated to third place (2). However the control of annual crops such as wheat and rice imports could be because of various reasons including lack of processing industries, packaging, storage and adequate, integrated and non-mechanized agricultural land and the construction industry in the production of poles agricultural products or agro industrial complexes, large quantities of these products, horticultural products, especially in transport and storage of waste will be long and awkward, and disappears. So that the of agriculture waste products one of challenges for food security in the agricultural sector.

#### ***Role in reducing the waste processing industry***

One sector that has a fundamental role in achieving food security and complementary agricultural processing industries and the importance and role of small and medium industries, both in industrialized and developing countries on food security is growing. The main roles of conventional and complementary agricultural industries contribute to sustainable development and agriculture to achieve food security, and reduce the effects of lesions in a variety of crops, orchards, livestock and fisheries (1). In fact, the conventional and complementary agricultural industries by processing agricultural products, particularly horticultural products can play an important role in reducing losses after crops are harvested. Experts believe the food industry in the country, about 25 percent of oil revenue, a year in lost agricultural waste products so that conventional and complementary industries has led to the neglect of food equivalent to 15 million people each year on agricultural waste of this while in developed countries and advanced 70 to 80 percent of production is processed in our country and this figure is below 40% (7). Crops in the least time are prone to corruption, therefore, even if the production of agricultural products with the best and highest quality product with the processing of waste that must be avoided. Agricultural waste is currently about 30 percent of the volume of waste, the figure is estimated at \$ 5 billion a year. Processing and agriculture industries to develop the most effective complementary option are to reduce the size of the lesions (13).

## CONCLUSIONS

In fact, food security is the foundation of a developed country and is considered as major element of mental, psychological, and physical health. However, based on World Food Organization emphases on adopted national food security policies by governments through adjusting to national standards have been placed. Food safety, in Iran, has a close relationship with wheat production because as it was mentioned wheat has a special place in food basket among Iranians. For example, Iranians consume 2.5 times more than the other countries. So if we want to classify agricultural products in terms of food security, wheat would have the most important place. However, assuming the importance of agriculture and food security, especially wheat, in the country, every year a huge amount of crops and orchard products in various stages, especially after harvesting, loss qualitatively so that due to some reasons such as lack of attention to principles of agricultural processed maintaining, lack of scientific warehousing methods, and the damage of storing extermination, in third world countries the amount of wastes are more than industrialized countries. If damages to agricultural products in farms and gardens added to these problems, it would lead to a great amount of agricultural waste products. So based on existing statistics, on average, 35 percent of agricultural products in Iran, in various stages, will be wasted which feeds 15 to 20 million people in the country. In order to provide food security in the country, it is necessary to adopt strategies to reduce agricultural waste products, so that through waste reductions, without higher yields per unit area, we could provide an increase in crops productions and finally leads to food security in the country.

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