Food and Agriculture
United Nations

National platform
of the Kyrgyz Republic for DRR

METHODOLOGICAL GUIDLINE

for damage and loss assessment related with disasters /emergencies in agriculture, forestry and fisheries

CONTENTS

Chapter 1:
RELEVANCE OF DAMAGE AND LOSS ASSESSMENT IN AGRICULTURE, FORESTRY AND FISHERIES - THE KEY SECTOR OF THE ECONOMY OF THE KYRGYZ REPUBLIC

Kyrgyzstan is a mountainous agrarian country. Agriculture, a key sector of the economy of the Kyrgyz Republic, is of great economic and social importance. "In this Guidance, agriculture means a branch of the economy aimed at providing the population with food and obtaining raw materials for industry, and includes economic activities in the field of crop production, animal husbandry, forestry, fisheries, beekeeping, etc."

As of 01.01.2021 there were over 468 thousand operating economic entities registered on the territory of the republic engaged in agriculture, forestry and fisheries.

The share of agriculture, forestry and fishing has significantly decreased from 37% to 16%[1] In the total gross domestic product of the country over the past 20 years, at the same time the gross output of agriculture, forestry and fisheries in 2022 was more than 324 billion soms[3] and compared to 1991 has almost doubled.

There are 4,357.4 million people or about 65% of the total population of the Kyrgyz Republic living in rural areas and 34.0% or 14% of the total population of the country is employed in agriculture, forestry and fisheries[6]*(in developed countries this indicator is 1-3%).*

In 2020, there were 1 million 678 thousand people living below the poverty line, 73.7% of whom lived in rural areas[8]. The agriculture, forestry and fisheries sector employ 446,600 people *(252,700 men and 194,000 women)*, representing 18.3% of the country's total population engaged in economic activity[9].

The agriculture, forestry, and fisheries sector have been slow to modernize, and the growth rate is insufficient for sustainable progressive development, poverty reduction, and food security in rural areas.

Earthquakes, mudflows, high water, floods, landslides, avalanches, waterlogging, hurricane winds, desertification, dust storms, continuous and heavy rainfall, hail, snowfalls and blizzards, droughts, frosts, extreme temperatures, epidemics, mass infectious diseases of people and animals, diseases, weeds and pests, soil degradation and other disasters, significantly aggravated by climate change, lead to devastating consequences, have an extremely negative impact on the development of agriculture, forestry and fisheries.

At the microeconomic level, disasters often lead to reduced employment in agriculture, forestry and fisheries, reduced wages for producers, and reduced income due to loss of arable land, decreased productivity and yields. Negative processes in the sector of agriculture, forestry and fishery lead to social insecurity of agricultural producers, force Kyrgyz farmers to seek other activities, migrate in search of work.

According to the National Statistical Committee of the Kyrgyz Republic at the beginning of 2022, the area of unused arable land due to salinization and swamping, lack of irrigation, due to failure of irrigation network, exposure to natural disasters *(landslides, mudflows)* amounted to 49,640 ha[11]

[1] http://www.stat.kg/ru/news/v-yanvare-noyabre-2021-goda-otmechaetsya-rost-valovogo-vnutrennego-produkta/
[3] http://www.stat.kg/ru/publications/sbornik-selskoe-hozyajstvo-kyrgyzskoj-respubliki/
[6]http://www.stat.kg/media/publicationarchive/c2680694-07a1-4728-9921-131cb00e6c46.pdf
[8] http://www.stat.kg/media/publicationarchive/aff32455-587b-478f-b293-07087a033cb6.pdf
[9] http://www.stat.kg/media/publicationarchive/c2680694-07a1-4728-9921-131cb00e6c46.pdf
[11] [11] http://www.stat.kg/ru/publications/sbornik-okruzhayushaya-sreda-v-kyrgyzskoj-respublike/

In addition, the lack of effective water resources management under market conditions, poor technical condition of irrigation infrastructure due to worn-out structures, lack of funds for repair and maintenance, as well as construction of new facilities, hinder the increase in agricultural, forestry and fishery production.

Today, a key characteristic of the country's agriculture, forestry and fisheries sector is low productivity and small-scale production. Kyrgyzstan is focusing and working to improve its capacity to prevent, mitigate and respond to disasters in the face of climate change, but without adequate coverage of the agriculture, forestry and fisheries sector.

The agriculture, forestry and fisheries sector is largely overlooked in disaster risk reduction (DRR), preparation for emergencies (ES) and adequate response because the main authorized state bodies in DRR and ES have little experience in the sector and, on the other hand, authorized state bodies as well as economic entities involved in agriculture, forestry and fisheries have very limited capacity in DRR and adaptation to change

The Decree of the Government of the Kyrgyz Republic № 597 dated 11.11.2019 approved the *"Procedure for assessing damage from emergencies"*[13] . This Procedure of damage assessment from emergencies establishes uniform norms of organization and conduct of damage assessment from emergencies for commissions on civil protection, central executive authorities, local state administrations, local self-government bodies, organizations and enterprises, regardless of ownership forms.

However, with regard to agriculture, forestry and fisheries, the established procedure for assessment does not fully reflect the specifics and characteristics of the sector in assessing damage and economic losses from the impact of natural disasters / emergencies.

The Food and Agriculture Organization of the United Nations *(FAO)* has developed a methodology for damage and loss assessment in agriculture, forestry and fisheries[14] , which provides a framework for the identification, analysis and assessment of the impact of natural disasters / emergencies on the agricultural sector.

Seeking to standardize the assessment of the impact of disasters in agriculture, forestry and fisheries, the FAO's Methodology for Damage and Loss Assessment is consistent with universal norms, commitments and collective action at the global level, while remaining flexible enough to be applied at national and local levels.

The FAO's methodology serves as a tool for damage and loss assessment for both national policy and planning needs, as well as for international resilience programs up to 2030, including the Sustainable Development Goals, the Sendai Framework for DRR, the Paris Agreement on the UN Framework Convention on Climate Change, while remaining flexible enough to apply to both large-scale disasters and local and site-specific emergencies.

In 2020, the MES KR asked FAO for assistance in institutionalizing the methodology for damage and loss assessment for the agriculture, forestry and fisheries sector of the Kyrgyz Republic, by adapting the FAO's methodology for damage and loss assessment in agriculture, forestry and fisheries at national, local and site level.

FAO, with its international experience, has directed its efforts to assist Kyrgyzstan in disaster risk management at the policy and technical level, offering its best practices from around the world in applying a context-specific approach to capacity development, particularly in institutionalizing a methodology for assessing direct losses associated with disasters in agriculture, forestry and fisheries.

This **METHODOLOGICAL GUIDELINE FOR DAMAGE AND LOSS ASSESSMENT RELATED WITH DISASTERS /EMERGENCIES IN AGRICULTURE, FORESTRY AND FISHERIES OF THE KYRGYZ REPUBLIC** *(hereinafter the Methodological Guideline)* presents the FAO's Methodology for Damage and

[13] http://cbd.minjust.gov.kg/act/view/ru-ru/157244?cl=ru-ru
[14] https://www.fao.org/3/ca6990en/CA6990EN.pdf

Loss Assessment as a basis for identification, analysis and assessment of the impact of disasters/emergency situations on agriculture, forestry and fisheries.

THIS METHODOLOGICAL GUIDELINE:

DEVELOPED BY:

- Interagency working group of the National Platform of the Kyrgyz Republic on disaster risk reduction, with the support of international consultants and experts of FAO, national specialists and experts, in the framework of the FAO project "Institutionalization of the methodology of damage and loss assessment in agriculture *(crop and livestock)*, forestry and fisheries in Kyrgyzstan";
- Based on adaptation of *the FAO' Methodologies for Damage and Loss Assessment in Agriculture, Forestry and Fisheries, 2020 edition*[15] , which provides a framework for identifying, analyzing and evaluating the impacts of disasters on crops, livestock, aquaculture, fisheries and forestry and is included by the UN for data collection and monitoring of progress towards the global sustainability goals, especially on the Sendai Framework for DRR indicator C2 *(Direct agricultural losses attributed to disasters* [16]), indicator 1.5.2. SDGs *(direct economic losses from disasters as a percentage of global gross domestic product (GDP))*, and Chapter G of the Biennial Transparency Report (BTR*) (information related to averting, minimizing and addressing losses and damages associated with climate change impacts) under* the Paris Agreement Transparency Framework *(ETF).*

INTENDED:

- For practical application in assessing damage and losses from the impact of disasters / emergencies in agriculture, forestry and fisheries of the Kyrgyz Republic.

RECOMMENDED:

- To be used by interdepartmental, departmental, territorial, object and special commissions on civil protection[17] , specialists - experts of ministries, departments, local state administrations and local authorities, organizations and institutions, representatives of economic entities involved in agriculture, forestry and fishing, as a Methodological Guideline to assess damage and losses from disasters / emergencies;
- For practical application, not only to assess damage and losses after disasters / emergencies, *but also, very importantly*, to predict the expected damages and losses from possible disasters / emergencies in order to use the data as a basis for planning and implementing measures for disaster risk reduction, prevention of emergencies.

Chapter 2:
KEY CONCEPTS USED FOR DAMAGE AND LOSS ASSESSMENT FROM THE IMPACT OF DISASTERS/EMERGENCIES IN AGRICULTURE, FORESTRY AND FISHERIES

This Methodological Guideline is recommended for use in assessing damage and losses from the impact of disasters/emergency situations in agriculture, forestry and fisheries of the Kyrgyz Republic, including the following main sectors of economic activity: *crop production, livestock, forestry and fisheries.*

[15] https://www.fao.org/3/ca6990en/CA6990EN.pdf

[16] Agriculture refers to crops, livestock, fisheries, beekeeping, aquaculture and forestry, as well as related facilities and infrastructure (https://www.preventionweb.net/files/54970_techguidancenotesrus.pdf).

[17] http://cbd.minjust.gov.kg/act/view/ru-ru/157244?cl=ru-ru

AGRICULTURE, based on the Law of the Kyrgyz Republic of 26.05.2009 № 166 (new edition of 6.04.2021) *"On the development of agriculture of the Kyrgyz Republic"*[18] , **is the basis of the agro-food sector of the economy of the Kyrgyz Republic.**

Agro-food sector of the economy of the Kyrgyz Republic is a set of economic activities of legal entities and individuals, as well as citizens, leading private subsidiary plots, for the production *(cultivation)* and processing of **agriculture** *(crop, livestock, fur farming, poultry, beekeeping),* **fishery and *forestry*** products.

DISASTER: a serious disruption of the functioning of a community or a society due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental loss and impacts[19] .

Disasters that may disrupt agricultural operations and jeopardize livelihoods can be one of three general types: natural (e.g. hydrometeorological, geophysical or biological), technological or complex (disasters that go well beyond natural hazards and involve conflicts, famine, climate change induced disasters, etc.)[20] .

Disasters can be *small-scale*, affecting a limited geographic area with localized effects, or *large-scale*, affecting a large area. The impact of disasters may severely challenge the local community or society and exceed their ability to cope on their own, and therefore may require assistance from external sources, which may include neighboring states or institutions at the national or international level.

Hazard: A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption, or environmental degradation[21] . While hazards may be natural, anthropogenic or socio-natural in origin, this Methodological Guideline refers to hazards of natural origin only, predominantly related to natural processes and phenomena.

EMERGENCY SITUATION: a situation on a certain territory of the Kyrgyz Republic as a result of a dangerous natural or man-made phenomenon, accident, catastrophe, natural or other threat, the impact of modern means of destruction, which may cause or have caused victims, damage to human health or the environment, significant material losses and infringement of living conditions *(Law of the KR "On Civil Protection of the KR).*[22]

Note: *The concepts* ***of "Disaster"*** *and* ***"Emergency"*** *are generally similar, complementary and interchangeable with each other, in this regard both concepts will be used in this Methodological Guideline, since in practice not every disaster resulting in material, economic and environmental losses and impacts can be recognized as an emergency situation.*

Based on the "Classification of emergencies and criteria for their assessment in the Kyrgyz Republic[23] *" approved by the Government of the Kyrgyz Republic: the situation in a particular territory may be recognized as an emergency situation only on the basis of a decision of the Civil Protection Commission at the appropriate level.*

DAMAGE: is the total or partial destruction of assets and stored products of agriculture, forestry and fisheries as a result of a disaster/emergency. According to the *FAO's methodology for damage and loss assessment in agriculture* (intended by FAO as crops, livestock, aquaculture, fisheries and forestry) damage is the total or partial destruction of physical assets and infrastructure in disaster-

[18] http://cbd.minjust.gov.kg/act/view/ru-ru/202555

[19] https://www.undrr.org/publication/report-open-ended-intergovernmental-expert-working-group-indicators-and-terminology

[20] https://www.fao.org/3/ca6990en/CA6990EN.pdf

[21] https://www.preventionweb.net/files/50683_oiewgreportrussia.pdf

[22] http://cbd.minjust.gov.kg/act/view/ru-ru/111787?

[23] http://cbd.minjust.gov.kg/act/view/ru-ru/12747?cl=ru-ru#:~:text=-%20ordinary%20technogenic%20crash%3B,-%20conflict%20emergency%20situations.

affected areas, expressed as replacement and/or repair costs.[24] *(damage to assets), as well as* the loss of stored products and inputs of agriculture, forestry and fisheries.

The quantitative value of damage is measured in physical quantities *(units)* of assets, products and resources of agriculture, forestry and fisheries *(tons, kg, ha, pieces, heads, and so on).*

The monetary value of damage is determined by the replacement costs at the time of the disaster/ES of the affected assets, products and resources of agriculture, forestry and fisheries *(in millions or thousands of KGS).*

Replacement costs is the value of the costs required to reproduce an exact copy / analogue of fully or partially destroyed, demolished assets *(resources)* and production *(products)* of agriculture at average market prices in force at the time of the disaster / disaster.

LOSSES: These are the negative changes in the production activities of economic entities resulting from the complete or partial destruction, demolition of assets *(resources)* and production *(products)* of agriculture caused by a disaster/ES. *A*ccording to the FAO's methodology for damage and loss assessment in agriculture loss means changes in economic flows occuring as a result of a disaster. In agriculture, loss may include decline in crop production, decline in income from livestock products, increased input prices, reduced overall agricultural revenues, higher operational costs and increased unexpected expenditures to meet immediate needs in the aftermath of a disaster [25] .

The monetary value of losses is expressed as the difference between the expected value before the disaster/ES and the actually received average market value of partially or completely destroyed, destroyed production *(products), as well as* the actual cost of short-term maintenance after the disaster: *(the cost of temporary maintenance of the production process immediately after the disaster/ES).*

Chapter 3:
BASICS OF DAMAGE AND LOSS ASSESSMENT FROM THE IMPACT OF DISASTERS/EMERGENCIES IN AGRICULTURE, FORESTRY AND FISHERIES

In assessing the impact of disasters/emergencies **AGRICULTURE, FORESTRY and FISHERIES** are divided into two main components: **ASSETS and PRODUCTION**.

The division into **assets** and **production** components makes it possible to calculate the extent and amount of damage and loss for all components in each sector of agriculture, forestry and fisheries and to develop a standardized method for assessing the impact.

To identify the direct impact that disasters/ emergencies have on agriculture, forestry, and fisheries, it is important to consider both **the damage** and the **losses to** production and assets.

ASSETS COMPONENT: measures the impact of disasters/emergencies on structures, equipment, tools and key infrastructure involved in the process of agriculture, forestry and fisheries production. The "**assets**" component **assesses** only the **damage** caused by the disaster/ES. Monetary value (fully or partially) of damaged assets is calculated by using the replacement costs or repair/reconstruction and in accounting is reflected only in the form of damage.

PRODUCTION COMPONENT: The "**production**" component **assesses damage and losses** caused by the disaster/ES to resources and agriculture, livestock, forestry and fisheries production.

[24] https://www.fao.org/3/ca6990en/CA6990EN.pdf

[25] https://www.fao.org/3/ca6990en/CA6990EN.pdf

"DAMAGE TO PRODUCTION" - reflects the value of stored resources *(e.g., seeds, fertilizer, fry, perennial trees, seedlings, etc.)* and products *(e.g., stored crops, livestock, fish catch, tree logs, etc.)* that are fully or partially, destroyed, demolished by the disaster/ES.

"PRODUCTION LOSSES" reflect agricultural production as a result of the disaster/ES, in monetary value.

The methodology for assessing the impact of disasters/emergencies provides for the use of a standardized method of calculation to assess the direct damage and losses arising in agriculture, forestry and fisheries for each individual disaster/ES, regardless of its scale, nature of manifestation and severity, and then cumulatively, with mandatory consideration of the specifics and characteristics of each sector: *agriculture, forestry and fisheries.*

Consistent application of this Methodological Guideline will eventually allow to determine / summarize / systematize damage and losses of any single disaster/ES, as well as in the totality of all disasters / emergencies that occurred in a particular area, for individual economic entities, *agriculture, forestry and fishery* sectors, total for agriculture, forestry and fishery in general, in different time periods *(days, months, quarters, half-years, years, and so on).*

Damage and losses for each facility, sector affected by the disaster/ES are determined in monetary value separately and then the data obtained are summarized.

Formula for determining the total damage and losses from the effects of disaster/ES in agriculture, forestry and fisheries:

TDLCLFOFI = TDLC +TDLL + TDLFO + TDLFO, where:

TDLCLFOFI: Aggregate damage and losses in agriculture, forestry, and fisheries *(in monetary value)* will consist of aggregate *(in monetary value)* data:

1. **TDLC:** damage + losses in crops.
2. **TDLL:** damage + losses in livestock.
3. **TDLFO:** damage + losses in forestry.
4. **TDLFI:** damage + losses in fishery.

Chapter 4:
METHODOLOGY FOR DAMAGE AND LOSS ASSESSMENT FROM THE IMPACT OF DISASTERS/EMERGENCIES IN CROPS

The necessary basic and detailed data on assets, production and economic activity in crop production are available and accessible at the existing economic entities operating in the crop production sector, *as well as* at the structural units of the National Statistical Committee of the Kyrgyz Republic, relevant authorized state bodies, local state administrations and local self-government bodies.

DAMAGE IN THE CROP SECTOR is the total or partial destruction, demolition of assets used in crop production *(damage to assets)* and the loss of stored crop products and resources used in crop production *(damage to production) as a result of* a disaster/ES.

In the crop sector, damage to assets is considered in relation to agricultural machinery and equipment, buildings, irrigation systems and other infrastructure used in crop production, and damage to production - in relation to the stored finished products of annual and perennial crops, as well as stocks of materials resources *(pesticides, herbicides, seeds, etc.).*

The quantitative value of damage in the crop production sector is measured in physical values of assets *(units of machinery, equipment, and so on)* and *products and inputs in tons, centners, liters and kilograms of crop production, stocks of seeds, fertilizers, pesticides, herbicides, etc.).*

The monetary value of damage in the crop sector is determined in the replacement costs of the affected assets *(resources)* and products and inputs, in millions or thousands of soms.

Replacement costs is the cost required to reproduce an exact copy / analogue of fully or partially destroyed, demolished as a result of the disaster/ES assets and crop production and inputs at pre-disaster/ES average market prices.

LOSSES IN THE CROP SECTOR are negative changes in the economic flows of economic entities operating in the crop sector, resulting from the impact of the disaster/ES.

The monetary value of the loss is the sum of:

- *The difference between the expected pre-disaster/ES value and the actual average market value of crop production on the partially damaged harvesting areas;*
- *The expected average market value of completely lost (perished) on the root crop production on completely damaged harvesting areas;*
- *The actual cost of short-term post-disaster maintenance: (the cost of temporary maintenance of the production process immediately after the disaster/ES).*

Typical damages and losses in the crop sector as a result of a disaster/ES include:

<table>
<tr><th colspan="2">Damage</th><th rowspan="2">Production losses
negative changes in the production activities of economic entities operating in the crop sector</th></tr>
<tr><th>Assets
complete or partial destruction, demolition, breaking down</th><th>Products
complete or partial destruction</th></tr>
<tr><td>Agricultural machinery: tractors, combines, seeders, engines, spare parts, etc.</td><td rowspan="3">Stored cereals (wheat, rye, barley, millet); leguminous crops (peas, lentils, chickpeas); industrial crops (sunflower, soybeans); sugar-bearing crops (sugar beets); root crops (potatoes, carrots, horseradish);
Oil crops (sunflower, rape); fodder crops (grasses, silage crops, melons), etc.</td><td>Reduction / reduction or total destruction of crops</td></tr>
<tr><td>Irrigation infrastructure (canals, ditches, wells, pumps, etc.)</td><td>Costs associated with the liquidation of the consequences of emergencies and the early recovery of production</td></tr>
<tr><td>Production facilities: machine and tractor sheds, elevators, outbuildings, etc.</td><td></td></tr>
<tr><td>Equipment for finished products: refrigeration units, storage facilities, containers, warehouses, etc.</td><td>Materials used in crop production: herbicides, pesticides, mineral and organic fertilizers, medicinal preparations, etc.</td><td></td></tr>
<tr><td>Infrastructural facilities: farm buildings, warehouses, seed laboratories, markets, etc.</td><td>Seed material, breeding material, seedlings, etc.</td><td></td></tr>
</table>

The following formula should be used in determining the total damage and losses from disasters/emergencies in the crop production sector (TDLC):

TDLC = DCA + DCP + LCP, where:

1. DCA – assets damage in crops.

2. DCP – crop production damage.

3. LCP – crop production loss.

The DCA is calculated by summing the replacement costss for each destroyed/damaged asset/infrastructure item used in crop production. *The replacement costs* is the cost needed to repair the damaged asset/infrastructure and to reproduce an exact copy of the completely destroyed asset/infrastructure at pre-disaster/ disaster average market prices

The DCP is calculated by summing the replacement costss for each type of stored finished crop products and stored inputs destroyed by the disaster/ES. *The replacement costs* is the value of stored finished products and inputs destroyed at pre-disaster/ES average market prices and is calculated by multiplying the quantity value by the pre-disaster average market price *(in the case of crop products, this should be the "field price"). In the case of* perennial crops, the replacement costs of destroyed trees and shrubs is also added, calculated by multiplying the number of destroyed units by the monetary value *(pre-disaster/post-disaster) of the* replacement per unit. Income from the sale of destroyed trees is deducted from the estimated replacement costs of the destroyed units.

The LCP is calculated by summing, for each type of damaged crop, the differences between the values of expected and actual production. The difference is calculated by multiplying the damaged area, the difference between the expected average yield under normal conditions and the actual yield *(in the case of completely destroyed areas, the actual yield will be zero)* and the average market price "off the field" before the disaster/ES. To this are added the short-term costs associated with disaster response and restoration of production.

Data needed to assess damage and losses in crop production:

Data	Unit of measure	Source of information	Document Reference
Size of crop areas fully/partially affected by the disaster	hectares (to the nearest thousandth), when counting hectares	Act of the CPC	Availability of the act in the LSG body
Average crop yields for the last 5 years	cwt/ha	Forms NO. 29-CX, NO. 7-CX	National Statistical Committee, Ministry of Agriculture
Average yields under normal conditions	cwt/ha	Forms NO. 29-CX, NO. 7-CX	National Statistical Committee, Ministry of Agriculture
Volume of destroyed stored crop products by crops	tons to the nearest hundredth	Act of CPC	Availability of the act in the LSG body
Volume of stored inputs destroyed (stocks of seeds, fertilizers, pesticides, herbicides, etc.)	tons to the nearest hundredth	Act of CPC	Availability of the act in the LSG body
Number of completely destroyed trees/shrubs of perennial crops	pieces	Act of CPC	Availability of the act in the LSG body
Average price of pre-disaster crop production by type of crops	KGS/kg	Average market value / or average producer price by form No. 2-Price	National Statistical Committee
Average market price before disaster of stored inputs	KGS/kg		National Statistical Committee
Actual crop yields by crop	tons to the nearest hundredth	Form NO. 29-CX	National Statistical Committee, Ministry of Agriculture
The value of destroyed, demolished infrastructure, destroyed machinery, equipment and facilities, and other assets	thousand soms	Act of CPC, prices are determined by the market value of repair/rehabilitation	Availability of the act in the LSG body

EXAMPLE #1
assessment of damage and losses resulting from the disaster/ES

by crop sector *(annual crops)*

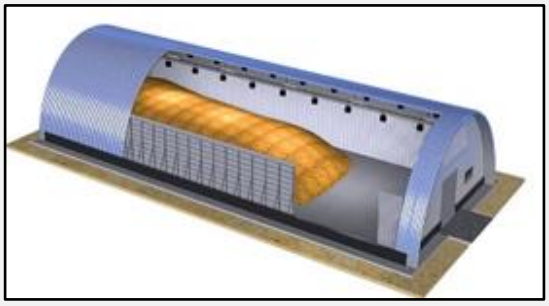
Initial data: farm "Kelechek" this year sowed wheat seeds on 100 hectares of agricultural field and it was planned *(at average annual static yield)* to get income of 2,3 tons *(23 centners)* of grain from 1 hectare, total - 230 tons of grain worth 5 million 520 thousand KGS. *(at average wholesale price per kg of grain 24 soms, 230,000 kg * 24 soms).*

From the secondary production of 10 000 bales of straw worth 600 thousand soms, based on the average annual static yield in the area from 1 hectare is expected 2 tons of wheat straw, the average weight of one bale of 20 kg *(100 ha * 2 tons / 20 kg = 10 000 bales of straw)* and the average market wholesale price for 1 bale of straw 60 KGS *(10 000 * 60 KGS).*

In total, it is planned to receive income in the amount of **6 million 120.0 thousand soms**. *(5,520+600)*

The disaster *(heavy rain with hail, followed by mudslides) had the* **following consequences**:

On assets: as a result of a powerful mudflow was completely destroyed 1 tractor MTZ-82 and a warehouse area of 800 m2.



In production (*products*): 20 hectares of standing crops were completely destroyed *(washed away by a mudflow)*, a storage room with 500 liters of herbicides, 1 ton of mineral fertilizer and 10 tons of wheat grain were destroyed and rendered unusable. At the same time, the remaining 80 hectares of sown area were badly beaten by hail.

Assessment of the total damage to the assets of the peasant farm "Kelechek" *(crop sector)* **in quantitative and monetary value:**

- Tractor MTZ-82: 1 unit, material / monetary value is expressed in replacement costs at average market prices in force at the time of the disaster - 1 million 400 thousand soms;
- Warehouse (800 m2): 1 unit, material / monetary value is expressed in replacement costs at average market prices in force at the time of the disaster: 2 million soms.

The total damage to the assets *(resources)* **of the peasant farm "Kelechek" in value terms amounted to: 3 million 400 thousand soms.** *(1,4+2,0)*

Assessment of the total damage to the production of the peasant farm "Kelechek" in quantitative and monetary value:

- Herbicides: 500 liters, material / monetary value is expressed in replacement costs at average market prices in force at the time of the disaster - 250 thousand soms *(1 liter at 500.0 soms);*
- Mineral fertilizers: 1 ton, material / monetary value is expressed in replacement costs at average market prices in force at the time of disaster - 30 thousand soms *(1 kg at 30.0 soms);*
- Finished products of wheat grain in storage: 10 tons, material / monetary value is expressed in replacement costs at average market prices in force at the time of the disaster - 240 thousand soms *(1 kg at 24.0 soms).*

The total damage to production of the peasant farm "Kelechek" in value terms was: 520 thousand soms *(250+30+240).*



Estimation of total production losses*:*

After disasters the farm "Kelechek" actually harvested from the remaining 80 hectares of sown field 144 tons of grain, from 1 hectare 1.8 tons (18 centners), an income of 3 million 456 thousand soms *(at average market price per kg of grain 24 soms, 144 000 kg * 24 soms).*

From the secondary production of 6,400 bales of straw worth 384 thousand soms, from 1 ha received 1.6 tons of wheat straw, the average weight of one bale 20 kg *(80 ha * 1.6 tons/20 kg = 6,400 bales of straw)* and at an average market price for 1 bale of straw 60 soms *(6 400 * 60 soms).*

In total, the actual total income of the peasant farm "Kelechek" amounted to 3 million 840 thousand soms.

Calculation:

To determine the losses of the peasant farm "Kelechek" from the consequences of the past disaster:

- Expected total income before disasters from 80 hectares of sown area - 4 million 896 thousand soms *(with 100 hectares of sown area planned income in money terms was 6 million 120 thousand soms, per 1 ha income - 61.2 thousand soms, 80 ha * 61.2 thousand soms).*

  The actual total income after the disaster - 3 million 840 thousand soms.

  The difference is 1 million 56 thousand soms (4,896 - 3,840);

- Completely destroyed sown area as a result of the disaster - 20 hectares at the amount of 1 million 224 thousand soms. *(with 100 ha of sown area planned income in monetary value was 6 million 120 thousand soms, per 1 ha income - 61.2 thousand soms, 20 ha * 61.2 thousand soms);*

- Payment for clearing of irrigation system and sowing areas from debris and mud, filled as a result of mudflow - 160 thousand soms. Total costs - 160 thousand soms.

As a result of the disaster *(heavy rain, hail, mudflow consequences)* **the farm "Kelechek" suffered losses of 2 million 440 thousand soms** *(1,056+1,224+0,160)*

The total damage and losses from disasters in the peasant farm "Kelechek" *(in the crop sector)* **in value** *(money)* **amounted to: 6 million 360 thousand soms:**

Where:

1. **DCA** - assets damage in crops: 3 million 400 thousand soms.
2. **DCP** - crop production damage: 520 thousand soms.
3. **LPA** - crop production loss: 2 million 440 thousand soms.

EXAMPLE #2
Assessment of damage and losses caused by the disaster/ES in the crop sector *(perennial crops)*

Initial data: Peasant farm "Cholpon" specialized in selling raspberries and had a raspberry plantation of 3 hectares, which was planted three years ago and annually yielded on average 30,000 kg *(10 tons per hectare, first harvest in June-July, second harvest from August to first frosts).* With average wholesale value annual income was - 5 million 400 thousand soms (wholesale average market price per 1 kg is 180 soms).


This disaster *(drought) has had* **the following consequences:**

On assets: as a result of the abnormal heat and because of overcapacity, the diesel autonomous water supply station *(a system for pumping water, consisting of a set of equipment)* has fallen into disrepair;

In terms of *production*: 1.3 hectares of raspberry bushes plantation died completely on the root *(dried up). At the same time,* the yield of the remaining 1.7 hectares of the plantation decreased significantly.



Assessment of the total damage to the assets of the crop sector *(perennial crops)* in quantitative and cost terms:

- Diesel autonomous water supply station: 1 set, material / monetary value is expressed in replacement costs at average market prices in force at the time of the disaster/ES - 300 thousand soms.

Assessment of the total losses of crop production, perennial crops *(negative changes in the production activities of the farm, resulting from the complete or partial destruction, demolition of assets and loss or destruction of crop production (products):*

- This year after disasters, the peasant farm "Cholpon" actually harvested berries from the remaining 1.7 hectares of the plantation was 13,600 kg *(from 1 hectare to 8 tons)* and sold for 2 million 448 thousand soms. *(at the wholesale average market price per 1 kg of 180 soms).*

In total, the actual total income of the farm "Cholpon" amounted to 2 million 448 thousand soms.

Calculation:

On determining the losses of the farm "Cholpon" of the consequences of the last disaster:

- Expected total revenue for the current year to the disaster of 3 hectares of plantations - *5 mln.400 thousand soms, per 1 hectare income- 1 mln.800 thousand soms, 1.7 ha * 1 mln.800 thousand soms).*

  The actual total income after the disaster - 2 million 448 thousand soms.

  The difference is 2 million 952 thousand soms; (5,400-2,448);

- Completely died on the root *(dried up because of drought)* 1.3 hectares of raspberry bushes, losses in the cost of raspberry bushes amounted to 364 thousand KGS; (*raspberry seedlings "polka" need for 1.3 ha- 10 400 pcs * 35 KGS)*
- According to the contract for the provision of services, payment for transportation of water for artificial irrigation of the plantation - 160 thousand soms;

Total costs - 160 thousand soms.

As a result of the disaster *(drought)* **the farm "Cholpon" suffered losses of 3 million 476 thousand KGS** *(2.952+0.364+0.160).*

Total damage and losses from disasters in the crop sector *(perennial crops) (peasant farm "Cholpon") in* **monetary value amounted to 3 million 776 thousand soms:**

Where:

- **DCA** - assets damage in crops (perennial crops): 300 thousand soms;
- **LPC** - losses of production activity of plant growing on perennial crops: 3 million 476 thousand soms.

Chapter 5:
METHODOLOGY FOR DAMAGE AND LOSS ASSESSMENT FROM THE IMPACT OF DISASTERS/EMERGENCIES IN LIVESTOCK

The necessary basic and detailed data on assets, products and economic activities in the livestock sector are available and accessible to existing economic entities operating in the livestock sector, *as well as* structural units of the NSC KR, the relevant authorized state bodies, local state administrations and local governments.

DAMAGE IN THE LIVESTOCK SECTOR is the total or partial destruction, demolition of assets used in livestock production *(damage to assets) and the* loss of stored livestock products and resources used in livestock production *(damage to production) as a result of* a disaster/ES.

The quantitative value of damage in the livestock sector is measured in physical values of assets *(in units of machinery, equipment, heads of livestock, poultry),* products *(tons of meat, wool, honey, liters of milk, thousands of eggs and others)* and inputs *(tons/ kg of feed reserves (grain, crushed grain, silage and dry hay, for use as animal feed and forage), vitamins, drugs and medicines and others).*

The monetary value of damage in the livestock sector is expressed in the replacement costs of affected assets, products and inputs *(in millions or thousands of soms).*

Replacement costs is the cost required to reproduce an exact replica/similar of the assets, livestock products and inputs completely or partially destroyed, demolished, as a result of the disaster/ES, at pre-disaster/ES, average market prices.

LOSSES IN THE LIVESTOCK SECTOR are negative changes in the economic flows of economic entities operating in the livestock sector resulting from a disaster/ES.

The monetary value of the loss is the sum of:

- The difference between the expected pre-disaster/ES and the actual received average market value of livestock products;
- Short-term post-disaster/ES maintenance costs: *(costs of temporary maintenance of the production process immediately after a disaster/ES).*

Typical damages and losses in the livestock sector as a result of a disaster/ES include:

<table>
<tr><th colspan="2">Damage</th><th rowspan="2">Losses
negative changes in the production activities of economic entities involved in livestock production</th></tr>
<tr><th>Assets

complete or partial destruction, demolition, breaking down</th><th>Products

total or partial destruction, death</th></tr>
<tr><td>Agricultural machinery and machines: tractors and trailers, milk trucks, feeders, fodder crushers, feeders, beehives, etc.</td><td rowspan="2">Livestock products: milk and dairy products, carcasses of slaughtered meat-cattle, poultry, eggs, honey, wool, etc.</td><td></td></tr>
<tr><td>Working capital used in animal husbandry: spare parts for repair of machinery and agricultural machinery, fuel and lubricants, water pumps, etc.</td><td>Decrease/decline in production and sales</td></tr>
</table>

Production facilities: machine and tractor boxes, feed stores, feed storage facilities, etc.		
Equipment for finished products: refrigeration units, freezers, containers, etc.	Materials, used in animal husbandry, vitamins, vaccines, dry (pelleted), juicy (silage, haylage, chewed) feed, grain forage, etc.	
		Costs associated with the liquidation of the consequences of emergencies and the early recovery of production
Infrastructural facilities: warehouses, incubators, research laboratories, etc.	Fresh and frozen seed material, juveniles, etc.	

In determining the total damage and losses from disasters/emergencies in the livestock sector, the following formula should be used:

TDLL = DLA + DLP+ LLP , where:

DLA - livestock assets damage;

DLP - livestock production damage;

LLP- livestock production loss.

The DLA is calculated by summing the replacement costs for each destroyed/damaged asset/infrastructure item used in livestock production. *The replacement costs* is the cost required to repair the damaged and reproduce an exact copy of the totally destroyed asset/infrastructure at pre-disaster/ES average market prices.

The DLP is calculated by summing the replacement costss for each type of stored finished primary livestock products and stored inputs destroyed by the disaster/ES. *The replacement costs* is the value of destroyed stored finished livestock products and inputs at pre-disaster/ disaster average market prices and is calculated by multiplying the quantitative value *(expressed in physical units - tons, centners, kilograms, grams, liters of livestock products, feed stocks, vaccines, drugs, etc.)* by the pre-disaster average market price (*for livestock products it should be the farmgate price).* This also includes the replacement costs of dead animals, calculated by multiplying the number of dead animals by the average market price *(pre-disaster/ES).*

The LPP is calculated by summing up, for each type of livestock production *(milk, eggs, wool, honey. etc.),* the differences in the values of expected and actual production. The difference is calculated by multiplying the number of damaged/lost animals, the difference between the average productivity expected under normal conditions and the actual productivity *(in the case of dead animals the actual productivity will be zero)* and the average market price *"at the farm gate"* before the disaster/ES. Added to this are the short-term costs associated with emergency response and production recovery.

Data needed to assess damage and losses in livestock production:

Data	Unit measurements	Source information	Link on file
Actual livestock productivity by species	kg/s head	Act of the Civil protection Commission (CPC)	Availability of the act in the LSG body
Livestock accounting and other livestock statistics	kg per head	Forms № 6 livestock accounting, NO. 24-CX, NO. 26-CX	National Statistical Committee, Ministry of Acriculture
Average livestock productivity by species under normal conditions	kg/head	Forms No. 24-CX, No. 26-CX, No. 2-prices	National Statistical Committee, Ministry of Acriculture
Volume of stored livestock products destroyed	kilo g	Act of CPC	Availability of the act in the LSG body
Average cost of livestock products by species before the disaster	KGS/kg	Average market value and/or average producer price by	National Statistical Committee

		type of products, form No. 2-prices	
Loss of livestock due to disaster/ES	heads	Act of CPC	Availability of the act in the LSG body
Cost of damaged/destroyed infrastructure, machinery, equipment and facilities and other assets	thousand soms	Act of CPC, prices are determined by the market value of repair/reconstruction	Availability of the act in the LSG body

EXAMPLE #3
Assessment of damage and losses caused by the disaster/ES in the livestock sector

Initial data: The farm "Arashan" specialized in milk production and had a farm with 80 head of cattle, including 30 milking cows, 20 pregnant cows and 30 calves.

The average annual productivity of milk was 160 tons, at the average market wholesale cost per kg. 35 soms, with an annual income of **5 million 600 thousand soms.**

The disaster *(heavy rain, hail, mudslides, and a breach of the debris protection dam) resulted* **in the following consequences:**

On assets: as a result of heavy mudflow, which formed due to a break above the mudflow protection dam damaged the dairy farm, came into disrepair refrigerator complex for storing liquid (milk) at 6 tons, 1 truck GAZ-53 (milk cart), 1 transformer substation and killed 5 dairy cows and 10 pregnant cows.



On production: washed away by mudflow 8 tons of milk, which is in the cooling complex, 1500 bales of hay, 5 tons of pelleted feed.

Assessment of the total damage to livestock assets of the farm "Arashan" in quantitative and cost terms:

- Overhaul of dairy farm: according to the design and estimate documentation - 780 thousand soms;
- Refrigerating complex: 1 piece, market value - 380 thousand soms;
- GAZ-53 "Molokovozovoz" car: market value - 364 thousand soms;
- Transformer substation: 1 kt, market value - 154 thousand soms;

Total damage to livestock assets in value terms:

1 million 678 thousand soms. *(780+380+364+154)*

Assessment of the total damage to livestock production of the farm "Arashan" in quantitative and cost terms, destroyed by the mudflow:

- milk: 8 tons, wholesale and market price per 1kg. 30 soms - 240 thousand soms;
- hay in bales: 1500 pieces, wholesale and market price for 1 bale at 180 soms - 270 thousand soms;
- pelleted fodder: 5 tons, wholesale and market price per 1kg of 40 KGS - 200 thousand KGS.
- Dairy cows: 5 head, wholesale and market price of 84 thousand soms, the total - 420 thousand soms;
- Pregnant cows, 10 heads, the market price of 90 thousand soms, a total of 900 thousand soms.

Total damage to livestock production in value terms: 2 million 30 thousand soms. *(240+270+200+420+900)*

Evaluation of total production losses of the farm "Arashan".

The material / monetary value of the loss consists of:

- The difference between the expected pre-disaster/ES and the actual average market wholesale value of production *(livestock products);*
- Short-term post-disaster maintenance costs *(costs of temporary maintenance of the production process immediately after the disaster).*

Calculation:

- The farm "Arashan" with 30 head of milk cows per year planned to produce 160 tons of products *(milk)* worth 5 million 600 thousand soms. *(35 KGS per kg of milk),* before the disaster/ES;

Actual volume of production *(milk)* after disaster/ES with 25 head of milking cows amounted to 134 tons worth 4 million 690 thousand KGS. *(35 KGS per kg of milk).*

The difference is 910 thousand soms.

- The farm "Arashan" attracted and paid for special engineering equipment to clear the territory of the farm from debris and mud filled as a result of the mudflow for - 110 thousand soms;

Total losses from the disaster of the farm "Arashan" in terms of value amounted to: 1 million 20 thousand soms (910+110).

TDLL - total damage and losses from disasters in livestock production in value terms: 4 million 728 thousand soms, where:

- **DLA** - livestock assets damage: 1 million 678 thousand soms;
- **DLP** - livestock production damage: 2 million 30 thousand soms;
- **LLP** - livestock production loss: 1 million 20 thousand soms.

Chapter 6:
METHODOLOGY FOR DAMAGE AND LOSSES ASSESSMENT FROM THE IMPACT OF DISASTERS / EMERGENCIES IN FORESTRY

In the Kyrgyz Republic, according to records of the forest fund, the total area of land of the state forest fund *(SFF),* specially protected natural areas and forests outside the SFF is about 4.1 million hectares, including land *(SFF)* of about 2.5 million hectares under the operational management of 41 state institutions – "leskhozes" (forestries), as well as lands of specially protected natural areas - about 1.2 million hectares.[26] . According to the National Forest Inventory *(2008-2010), the* area of forests of the Kyrgyz Republic is 1,116.56 thousand ha or 5.6% of the total area of the country[27] .

[26] Order "On Approval of Forest Inventory Results as of January 1, 2018" dated March 23, 2020 No. 67, https://forest.gov.kg/ru/forestries?

[27] The concept of development of the forest industry of the Kyrgyz Republic for the period up to 2040. http://cbd.minjust.gov.kg/act/view/ru-ru/14283#:~:text

Forestry in the Kyrgyz Republic is not a defining industry in the country's economy. Its contribution to the country's economy is insignificant; gross output from hunting and forestry is about 0.05% of GDP[28] .

The Concept of Development of the Forest Industry of the Kyrgyz Republic notes that *"the conservation role of the forests of the Kyrgyz Republic, the high altitude mountainous terrain, the sharply continental climate and the proximity of arid zones, which determine the slow regeneration of forests, determine the small volume of timber harvesting, making the republic more than 90% import-dependent on supplies of industrial wood and sawn wood"*.

At the same time, it was pointed out that apart from timber products, forestry in the Kyrgyz Republic has the potential to increase its contribution to the country's economy through forest management: the development of tourism in forest ecosystems and well-established marketing of non-timber forest products *(walnut, almond, pistachio, honey, medicinal herbs, etc.).*

It is also important to note the role of the forest in the social development of the country. More than 2 million rural population of 283 rural councils *(62.5%)* live near forests or directly within the State Forestry Fund, and their socio-economic development is highly dependent on forest resources[29] .

Taking into account the importance of the forest in the sustainable development of Kyrgyzstan, the Concept of development of the forestry sector identifies economic priorities and tasks, the solution of which requires the systematic introduction of a methodology and procedure for assessing forest damage and losses after disasters, the frequency and impact of which is constantly increasing due to climate change. This concerns not only fires, dangerous exogenous geological processes, but also the spread of various forest diseases.

When developing and implementing the methodology for assessing damage and losses in forestry, it is important to consider the following circumstances:

- A forest usually consists of two classes of productive assets: the forest and the land on which the forest grows. The first is a capital asset whose value can be increased by investments, forestry activities, and biological growth of wood. Alternatively, its value may be reduced by timber harvesting or natural disturbances. Land, on the other hand, tends to have a fixed supply, and its value can be altered by alternative uses and intensive management. Forest-related disasters, such as fires or pest infestations, damage only the forest, not the land, and only soil erosion can seriously damage land productivity.

  This methodology focuses only on damage to the forest (timber), *not the land on which the forest grows;*

- A forest often consists of multiple stands, each with different characteristics. A stand is a continuous group of trees, sufficiently homogeneous in age classes, composition and structure, and growing in an area of sufficiently homogeneous quality to be a distinguishable unit. The stands are divided into two groups: ***merchantable,*** consisting of mature timber stands which size, quality, and condition allow them to be sold under given economic conditions at a given time; and ***pre-merchantable,*** consisting of timber stands that are too immature to be profitably harvested and sold for the production of forest products[30]. Both merchantable and pre-merchantable stands can die in a disaster. In the case of loss of pre-merchantable timber, ***inflation-indexed prices*** for timber and non-timber products should be used in estimating the loss of forest production *(the calculations are presented in the examples below);*

[28] https://unece.org/fileadmin/DAM/timber/meetings/2019/20190528/2019-kyrg-forestcong-natper-kyr.pdf

[29] FAO. 2019. The concept of development of the forestry industry of the Kyrgyz Republic for the period up to 2040. Bishkek https://www.fao.org/3/ca6762ru/CA6762RU.pdf

[30] Conforti, P., Markova, G., & Tochkov, D. 2020. FAO's methodology for damage and loss assessment in agriculture. FAO Statistics Working Paper 19-17. Rome, p.20. https://doi.org/10.4060/ca6990en.

- Forest farms, in accordance with the current normative-legal acts, in coordination with the authorized state body in the sphere of antimonopoly policy**, can set prices for their products**[31] . **Thus, when assessing damage and losses in forestry, prices for forest products at *the "bottom warehouse"*, i.e. *"gate prices"*, are applied.**

- This methodology for assessing damage and losses in forestry is based on the current forestry legislation of the Kyrgyz Republic, *"regulating relations in the field of protection, conservation and reproduction, rational and sustainable use of forests*[32] *"*.Thus, taking into account the specifics of forestries of the Kyrgyz Republic, which is to perform environmental and reforestation functions, when calculating losses in production, coefficients are used to determine the capitalized costs of forestry for reforestation and the standard costs of reforestation per 1 hectare, approved by the KR Government Decree of August 13, 2013 № 458 *"The procedure for determining the valuation (standard price) of forest lands when compensating for losses of forestry production in cases of using forest plots, both included and not included in the state forest fund, as well as forest fund plots for purposes not related to forestry"*[34]. Based on the Decree of the KR Government of February 10, 2009 № 97 (As amended by the Decree of the KR Government of December 31, 2018 № 653) *"On Approval of the Rules of sale of timber stands in the forests of the Kyrgyz Republic, rates for timber of forest species sold, and standards for assessing the forested area of the Kyrgyz Republic*[35]*"* when calculating the losses of forest production, according to the proposed methodology, the approved rates for timber, standards for assessing the forested area by timber reserves and its value are used. However, given the fact that these NLAs indicate the prices of 2008, according to the methodology of DLA in forestry, *these prices should be indexed, taking into account inflation by "chain method"*, which is widely used by the Ministry of Economy of KR and the NSC KR *(further examples show how the NSC KR indexation tool - "Consumer price index as a percentage over the previous year "*[36]*) is used.*

DAMAGE IN FORESTRY is the total or partial destruction, demolition of forestry assets *(resources)* and production *(products) as a result of* a disaster/ES.

LOSSES IN FORESTRY are negative changes in the production activities of economic entities operating in the forestry sector resulting from the disaster/ES. Losses refer to changes in economic flows resulting from the disaster/ES.

In determining the total damage and losses from disasters/emergencies in forestry, it is recommended to use the following formula:

TDLFO = DFA + DFP + LFP, where:

DFA - forestry assets damage.

DFP - forestry production damage.

LFP - forestry production loss.

The DFA is calculated by summing the replacement costs for each destroyed/damaged asset/infrastructure item used in forestry *(e.g., skidder tractors, forest planters, uprooters, etc.).*

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[31] Procedure for Determining the Amount of Payment for the Provision of State and Municipal Services (Work). PPKR of October 26, 2000, No. 637. http://cbd.minjust.gov.kg/act/view/ru-ru/7735?cl=ru-ru;
On Approval of the Standards for Public Services Provided to Individuals and Legal Entities by Government Bodies, their Structural Divisions and Subordinate Institutions. PPKR No. 303 of June 3, 2014. http://cbd.minjust.gov.kg/act/view/ru-ru/159818?cl=ru-ru; Unified register (list) of public services provided by executive authorities, their structural subdivisions and subordinate institutions. http://cbd.minjust.gov.kg/act/view/ru-ru/93449/100?cl=ru-ru

[32] http://cbd.minjust.gov.kg/act/view/ru-ru/10?cl=ru-ru

[34] http://cbd.minjust.gov.kg/act/view/ru-ru/94658?cl=ru-ru

[35] http://cbd.minjust.gov.kg/act/view/ru-ru/70050/

[36]h ttp://www.stat.kg/ru/statistics/ceny-i-tarify/

Replacement costs is the value required to repair the damaged and reproduce an exact copy of the completely destroyed asset/infrastructure element at pre-disaster/ES average market prices.

The DFP is calculated by summing the replacement costs for each type of stored finished forest products and stored inputs destroyed by the disaster/ES.

Replacement costs of resources is the value of inputs (fertilizers, pesticides, seedlings and seedlings, etc.) at pre-disaster/ disaster average market prices and is calculated by multiplying the quantitative value *(expressed in physical values - cubic meters of biohumus, tons, kg. pesticides, biopreparations, thousand pieces of seedlings and seedlings, etc.)* by the average market price in effect before the disaster.

Replacement costs of products is the value of destroyed stored timber and non-timber products at prices established by forestries before the disaster, and is calculated by multiplying the quantitative value (expressed in physical values - cubic meters of business wood, firewood, thousand pieces of seedlings and saplings, kg of berries, mushrooms, etc.) by the price in effect before the disaster.

The LFP is calculated by summing the following three components:

1. For a merchantable timber stand, the loss is equal to the product of the volume of standing timber by the price per unit volume established by the **"Norms for the assessment of forested area of the Kyrgyz Republic**"[37] and indexed with the indexation. The volume of timber in the stand is determined by the taxation description, or according to the typology of the forest.

2. For pre-merchantable timber stand *(non-closed forest planting)* losses are calculated by multiplying the *"cost of reforestation per hectare"* indexed for inflation, by *the "coefficient for determining the capitalized costs of forestry reforestation"* and by the *"area"* of dead forest crops.

For example: A fire killed non-closed planting of walnut on an area of 10 hectares.

Losses in this case are calculated according to the formula:

*LFP = P/ indexed cost of reforestation/ * K / reforestation coefficient/ *S / area of dead crops/.*

The indexed value is determined by the *"chain"* - applied method, widely used by the NSC KR and the Ministry of Economy of the KR. To do this, it is necessary to multiply the "standard cost of reforestation" in 2008 by the inflation rate in 2009 and divide by 100%. The obtained figure is used to index the price for 2010. And so the price indexation for 2022 is carried out in a chain. It is recommended to use the table *"Consumer price index as % of previous year (9) Excel"*. If the cost of walnut recovery in 2008 was 14,204.77 soms, in 2022 it is 34,566.55 soms. The coefficient (K) on walnut reforestation at maturity of 110 years is equal to 1.5, then the loss of forestry production is equal:

34,566.55 KGS X 1.5 X 10 ha = 518,498.25 KGS

3. **For non-timber forest products, such** as fruits, berries, mushrooms, flowers, and recreational activities, whose income is not associated with a specific stand but with the entire forest, losses are calculated by multiplying *"the amount of average annual underproduction"* by *"the average market price at the time of the disaster"* and by *"the recovery period of the crop"*

For example: As a result of a fire, rosehip plantations on a forest plot of 10 hectares were completely lost, the harvest of rosehips was 200 kg from 1 hectare, the price of the forestry for rosehips is 150 soms per kg. It takes 3 years to fully restore the productivity of rosehips. The term of full recovery is established by expert way. Losses are:

200 kg X 10 ha X 150 soms X 3 years = 900,000 soms

[37] http://cbd.minjust.gov.kg/act/view/ru-ru/70050/

For the final calculation of forest production losses, the value of timber that was salvaged and sold after the disaster/ES should be subtracted from the sum of the above components.

Typical forestry losses due to a disaster/ES include:

<table>
<tr><th colspan="2">Damage</th><th rowspan="2">Losses
negative changes in the production activities of economic entities engaged in forestry activities</th></tr>
<tr><th>Assets

complete or partial destruction/ destruction</th><th>Production

complete or partial destruction</th></tr>
<tr><td>Tractors, engines, pumps, transformers, sawmills, etc.</td><td rowspan="5">Harvested wood (business, semi-business wood), harvested/harvested wild fruits (mushrooms, berries, medicinal plants, nuts, fruits, root crops), hay, commercial honey

Stored materials (resources) used in forestry: seeds, seedlings, seedlings; preparations used to protect forests from pests and diseases, fertilizers and herbicides, etc.</td><td>Complete or partial death of a stand (wood on the root)</td></tr>
<tr><td>Forestry machines, pruners, power saws, brush cutters, cultivators, tillers, etc.</td><td rowspan="2">Total or partial loss of non-timber forest resources</td></tr>
<tr><td>Forestry production facilities (nurseries, greenhouses and hothouses, apiary, etc.)</td></tr>
<tr><td>Equipment for finished products (cold stores, containers, warehouses, etc.)</td><td rowspan="2">Expenses associated with the liquidation of the consequences of emergencies and the restoration of production</td></tr>
<tr><td>Forestry infrastructure facilities (forestry and fire roads, forest warehouses, etc.)</td></tr>
</table>

Data required for forest damage and loss assessment:

Data	Unit of measure	Source of information	Document Reference
Size of completely/partially affected areas of the LF by stand	ha, *to the nearest hundredth*	Act of the CPC	Availability of a certificate from the Forest Service or MPRETN[38]
Volume of fully/partially destroyed standing timber with indication of the main species	м^3	Act of CPC, Taxation description of the allotment	Materials of the forest inventory of the leskhoz, Forest inventory database
Norms for assessing the forested area of the Kyrgyz Republic		RPC Decree № 97 of 10.02.2009.	http://cbd.minjust.gov.kg/act/view/ru-ru/#p2
The procedure for determining the value assessment (normative price) of forest land when compensating for losses and damages of forestry production in cases of using forest areas, both included and not included in the state forest fund, as well as forest areas for purposes not related to forestry management		RPC Decree № 458 of 13.08.2013.	http://cbd.minjust.gov.kg/act/view/ru-ru/94658?cl=ru-ru
Volume of timber damaged by the disaster, but suitable for sale	м^3	Act of CPC,	Availability of a certificate from the Forest Service or MPRETN
Age of stand	years	Taxation description of the allotment	Materials of the forest inventory of the leskhoz
Number of regularly harvested non-timber forest resources fully/partially destroyed by the disaster	kg	Act of CPC, Taxation description of the allotment	Materials of the forest inventory of the leskhoz, Forest inventory database
Quantity of destroyed stored LP	kg, l, m^3	Act of CPC	Forestry accounting data

[38] Ministry of Natural Resources, Environment and Technical Supervision

products by type			
Average value of destroyed LH products by type	KGS/kg, KGS/m^3	Forestry	Accounting
Value of damaged/destroyed infrastructure, machinery and equipment, structures and other assets	thousand soms	Act of CPC	Price list of economic entities, SNiP[39]
Consumer price index	%	Statistical data on tariffs and prices of the NSC KR	http://www.stat.kg/ru/statistics/ceny-i-tarify/

EXAMPLE NO. 4
assessment of damage and losses resulting from the impact of the disaster/ES in forestry:

Initial data: As a result of the fire, a forest area of 10 hectares, finished timber products and materials in temporary storage were destroyed.

The disaster/ES that occurred has had the following consequences:

By assets: 1 forest ranger's house was completely destroyed, 1.0 thousand seedlings and 850.0 thousand seedlings in the nursery were completely destroyed, a skidder tractor was partially damaged.



By production: completely lost harvested/collected forest (wood and non-wood products) and materials that were in temporary storage: 200 m3 of harvested business wood, 2500 kg of harvested walnut fruits and 3000 kg of rose hips, 500 kg of forest seeds and 500 liters of bio-preparation against forest insect pests.



Assessment of the total damage to the forestry assets in quantitative and cost terms:

- Destroyed and dilapidated cordon house: quantitative value: 1 unit, value in replacement costs at pre-disaster average market prices: 0.850 million soms;
- A skidder tractor: quantitative value: 1 unit, value in replacement costs at average market prices valid at the time of the disaster: 0.1 million soms;
- Planting material (seedlings and saplings) in the nursery: quantitative expression: 1.0 thousand seedlings and 850 thousand seedlings, cost value at pre-disaster leskhoz prices: 1.2 million KGS.

Total damage to forestry production assets in value terms: **2.15 million soms** *(0.85+0.1+1.2).*

Assessment of the total damage to forestry production in quantitative and monetary value:

- Destroyed harvested timber: quantitative expression: 200 cubic meters, cost value according to the prices of the forestry at the lower warehouse before the disaster: 0.8 million soms (1 m3 at 4000 soms);

[39] Building codes and regulations

- Destroyed walnut fruits: quantitative expression: 2500 kg, value according to the prices of the forestry before the disaster: 0.5 million soms (1 kg at 200 soms);
- Destroyed rose hips: quantitative expression: 3000 kg, value according to the prices of the forestry before the disaster: 0.45 million KGS (1 kg at 150 KGS);
- Destroyed seeds of tree and shrub species: quantitative value: 500 kg, value in replacement costs at pre-disaster average market prices: 0.1 million KGS (1 kg at 200 KGS);
- Destroyed biological preparation against insect pests: quantitative value: 500 liters, cost value in replacement costs at pre-disaster average market prices: 0.5 million KGS (1 liter at 1000 KGS).

Total damage to forestry production in value terms: **2.35 million soms** *(0.8+0.5+0.45+0.1+0.5)*

Assessment of total losses of forestry production (*negative changes in forestry production resulting from complete or partial destruction of merchantable, non-timber forest stands and non-timber forest products*):

- Lost walnut plantation: quantitative expression: 10 hectares with timber stock, according to the forest inventory data - 95 m3/hectare, the value of which according to the *"**Norms for the assessment of forested area of the Kyrgyz Republic**" and* the indexed value is: 189,324.1 soms. After indexation, this value at the moment of disaster/ES is 527,390 soms. Thus: 10 x 527,390 soms = 5,273,900 soms;
- Dead non-closed walnut forest crops/pre-merchantable walnut stand/: quantitative data: area of dead forest land 5 ha; indexed cost of reforestation costs per 1 ha - 34,566.55, coefficient on walnut reforestation at maturity 110 years equals 1.5.

  The value of losses is: 34,566.55 X 1.5 X 5 = 259,249.12 soms;
- Non-timber forest products not received by economic entities: walnut fruits - 1 000 kg, rosehip fruits - 500 kg, the value at prices of the leskhoz before the disaster (walnut - 200 KGS/kg, rosehip - 150 KGS/kg), according to expert data, the recovery period of walnut - 15 years, rosehip - 3 years: 1 000 kg X 200 som X 15 = 3 000 000 som; 500 kg X 150 som X 3 = 225 000 som. Total losses from the death of non-timber crops: 3,225,000 soms;
- Total costs of extinguishing forest fires in monetary value/ according to the act of the Commission on State Protection: 1 100 000 soms;
- Salvaged wood, suitable as firewood: quantitative expression: 300 m3, material / monetary value at the prices of the leskhoz before the disaster / CS 500 soms / cu m is 150,000 soms.

Total losses of forestry production in value terms: **13, 44 million soms** *(3,990,000* + 5,273,900 *+3 225,000+1100,000) - 150,000.*

TDLFO - total damage and losses/losses from disasters/emergencies to forestry in value terms: 17.94 million KGS: (2.15+2.35+13.44), where:

- **DFA** - forestry assets damage: 2.15 million soms;
- **DFP**- forestry production damage: 2.35 million soms;
- **LFP** - forestry production loss: 13.44 million soms.

The necessary basic and detailed data on assets, products and economic activities are available and accessible at the forestry, structural units of the Forest Service under the Ministry of Agriculture of the Kyrgyz Republic*, as well as* structural units of the NSC KR, relevant authorized state bodies, local state administrations and local self-government bodies.

Chapter 7:
METHODOLOGY FOR DAMAGE AND LOSS ASSESSMENT FROM THE IMPACT OF DISASTERS/EMERGENCIES IN FISHERIES

On the territory of the republic, as of 2022, about 240 operating economic entities are registered engaged in fishing activities*, including the* forms of ownership: state, collective, private and others.

The necessary basic and detailed data on assets, products and economic activities are available and accessible in the existing economic entities operating in the fisheries sector, *as well as in the* structural units of the NSC KR, the relevant authorized state bodies, local state administrations and local governments.

FISHERIES DAMAGE is the total or partial destruction, demolition of assets used in fisheries (damage to assets), and the *loss of stored fishery products and inputs used in fisheries (damage to production) resulting from* a disaster/ES.

The quantitative value of damage as a result of the disaster/ES in the fisheries sector is measured in physical values of assets *(hectares of ponds for fish breeding and fishing; pieces of containers, nets),* production *(tons of fish: whitefish, pelyad, carp, trout and other fish in fresh, chilled or frozen form, caviar)* and inputs *(tons/kg of fish stock, juveniles, brood stock, fry and others; tons/kg of stocks of feed, fertilizers, vitamins, drugs and medicines and others)*

The monetary value of damage in the fisheries sector is expressed in the replacement costs of affected assets, products and inputs in millions, thousands of soms.

Replacement costs is the cost required to reproduce an exact replica/similar of all or part of the assets, fishery products and inputs destroyed, demolished, lost as a result of the disaster/ES, at pre-disaster/ES average market prices.

LOSSES IN THE FISHERIES SECTOR are negative changes in the economic flows of economic entities operating in the fisheries sector resulting from the impact of the disaster/ES.

The monetary value of the loss is the sum of:

- The difference between the expected pre-disaster/ES and the actual received average market value of fishery products;
- Short-term post-disaster/ES maintenance costs: *(costs of temporary maintenance of the production process immediately after a disaster/ES).*

Typical damages and losses to the fishery as a result of a disaster/ES include:

<table>
<tr><th colspan="2">Damage</th><th rowspan="2">Losses
negative changes in the production activities of economic entities operating in the fisheries sector</th></tr>
<tr><th>Assets
complete or partial destruction, demolition, breaking down</th><th>Production (products)
total or partial destruction, loss</th></tr>
<tr><td>Fishing boats, engines, pumps, transformers, etc.</td><td rowspan="3">Pellet, whitefish, trout, carp, bighead carp, grass carp, rainbow trout, pikeperch, bream, chebak and other fish and fish products caught alive, frozen and chilled</td><td>Full or partial stoppage of production</td></tr>
<tr><td>Fishing gear, fishing tackle, nets, etc.</td><td>Decrease/decline in production volumes</td></tr>
<tr><td>Fishery production facilities (reservoirs, ponds, pools. cages, tanks, containers, etc.)</td><td></td></tr>
<tr><td>Hatcheries and hatcheries for juveniles, fish eggs, etc.</td><td rowspan="2">Materials used in fisheries, feed, medicinal preparations, feeding stuff, etc.</td><td></td></tr>
<tr><td>Equipment for finished products (refrigeration units, freezers, containers, warehouses, etc.)</td><td>Short-term expenses related to disaster response and recovery</td></tr>
<tr><td>Infrastructural fishery facilities (coastal infrastructure, outbuildings, etc.)</td><td>Juvenile fish, fingerlings, live roe, ready-made roe, fish oil, etc.</td><td></td></tr>
</table>

In determining the total damage and losses from disasters/emergencies in the fishery, it is recommended to use the following formula:

TDLFI = DFIA + DFIP + LFIP, where:

DFIA - fisheries assets damage;

DFIP – fisheries production damage;

LFIP - fisheries production loss.

The DFIA is calculated by summing the replacement costs for each destroyed/damaged asset/infrastructure element used in fisheries *(such as e.g. ponds, ponds, pools, cages, tanks, containers, etc.).*

Replacement costs is the cost required to repair the damaged and reproduce an exact copy of the completely destroyed asset/infrastructure element at pre-disaster/ES average market prices.

The DFIP is calculated by summing the replacement costs for each type of stored finished fishery product and stored inputs destroyed by the disaster/ES.

Replacement costs is the value of destroyed stored fish products (at pre-disaster/ES average market prices and is calculated by multiplying the quantitative value by the pre-disaster average market price *(in the case of fish products, this should be the farm gate price).* To this is added the pre-disaster/ES net value loss of the brood stock.

The LFIP is calculated by summing up the following components:

(a) The difference between the expected and actual value of fishery production in incompletely damaged fixtures for fish farming;

b) the pre-disaster value of lost fishery products in completely damaged fishery fixtures;

c) short-term costs associated with the liquidation of the consequences of emergencies and the restoration of production.

Data required for fisheries damage and loss assessment:

Data	Unit of measure	Source of information	Document Reference
Size of fully/partially affected fishery (water body)	hectare *(to the nearest hundredth)*	Act of the CPC	Availability of the act in the LSG body
Average level of fishery production by type of aquaculture (average volume of production of a given fishery per year)	kg	Form No. 28 fish	Department of Fisheries
Average level of fish catch under normal conditions	tons/year	Form No. 28 fish	Department of Fisheries
Number of destroyed stored fishery products by type of aquaculture	kg	Act of CPC	Availability of the act in the LSG body
Average cost of fishery products by species	KGS/kg	Form No. 28 fish or average market value / or price "at the gate	Department of Fisheries
Actual level of fish production by type of aquaculture	kg	Form No. 28 fish or internal fishery accounting documents	Department of Fisheries
Cost of destroyed infrastructure, destroyed machinery, equipment and facilities, ships, equipment and other assets	thousand soms	Act of CPC, prices are determined by the market value of repair/restoration	Availability of the act in the LSG body

EXAMPLE #5

assessment of damage and losses resulting from the disaster/ES

in fisheries

Initial data: "Marinka" cage farm grew rainbow trout in special 5 cages with a volume of 100 m^3 each, set on the river Karasuu, of 5 cages in 4 contained two-year old fish, reaching a marketable weight of 800 grams. One cage contained fry. This year, it was planned to sell fish (rainbow trout) that reached marketable weight.

The 4 cages contained a total of 10,000 rainbow trout with an average weight of 800 grams, a total of 8 tons at a wholesale price per kg. 420 soms.

Total planned income from the sale - 3 million 360 thousand soms.

The disaster that occurred *(heavy rain, hail, mudslides, a partial breakthrough of a high mountain lake)* **led to the following consequences:**

By assets: 1 cage with fish of commercial weight, 1 cage with fry, 5 containers for storing and transporting fish feed were completely destroyed, washed away and became unusable. 1 cage with fish of commercial weight was partially damaged.



By production: 1 commercial fish cage and 1 fry cage (12 thousand fry), 1 ton of fish food in 5 containers completely destroyed, as well as partially washed away commercial fish from the damaged cage were completely taken away by the water flow.

Assessment of the total damage to the assets of the "Marinka" cage farm in quantitative and cost terms:

- 2 cages, *tangible/ monetary value expressed in replacement costs at pre-disaster average market prices: 496 thousand soms (2ed * 248 thousand soms);*
- Containers for the storage and transportation of fish feed: *quantitative expression: 5 units, value / monetary value in the replacement costs at the average market prices in force at the time of the disaster/ES: 25 thousand soms (5 units * 5 thousand soms);*
- Repair of 1 cage: *quantitative expression: 1 unit, cost/monetary value in replacement costs at average market prices valid at the moment of disaster/ES: 60.0 thousand soms.*

Total damage to assets of the cage farm in value terms: 581 thousand soms *(496+25+60)*

Assessment of the total damage to the production of the "Marinka" cage farm in quantitative and cost terms:

- Lost (washed away) fry contained in a fully dilapidated cage: *quantitative expression: 12 thousand pcs., cost/monetary value in replacement costs at wholesale average market prices in force at the time of the disaster: 480 thousand soms (12000 pcs. * 40.0 soms);*
- Fish fodders, contained in 5 completely destroyed containers: *quantitative expression: 1 ton, cost / monetary value in the replacement costs at the time of the disaster/ES average market prices: 180.0 thousand soms (1000 kg * 180.0 soms).*

Damage to the production of the "Marinka" cage farm in value terms amounted to: 660 thousand soms *(480+180)*

Assessment of production losses of the "Marinka" cage farm (*negative changes in the production activity of the Marinka cage farm resulting from complete or partial destruction, demolition of assets and production (loss of products):*

Calculation to determine the losses of the "Marinka" cage farm the consequences of the past disaster/ES:

- Lost (washed away) fish of marketable weight, contained in 1 cage: quantitative expression: 2 tons (2500 pcs. of 800 grams), cost/money expression in replacement costs at pre-disaster/ES wholesale-market prices: 840,0 thousand soms (2000 kg * 420,0 soms);
- Expected planned income before disaster/ES *(with changes, reduction of the number of cage and fish marketable weight)*, 3 cages, 7.5 thousand rainbow trout with an average weight of 800 grams, a total of

6 tons at the wholesale and average market price per kg. 420 soms, planned income - 2 million 520 thousand soms.

The actual total income of the "Marinka" cage farm after the consequences of the disaster/ES was 2 million 352 thousand soms.

The difference is 168,000 soms. - consequences of a highland lake outburst;

- Payed 85 thousand soms for clearing straggling cages of debris and mud filled as a result of mudflow from a partial breakthrough of a mountain lake.

Losses of cage farm in value terms: 1 million 93 thousand soms *(840+168+85).*

TDLFI - total damage and losses from disasters/emergencies on the cage farm in value terms: 2 million 334 thousand soms: *(581+660+1093), where:*

1. **DFIA** - assets damage *of the cage farm*: 581 thousand soms;
2. **DFIP** – production damage *of the cage farm*: 660 thousand soms;
3. **LFIP** - production loss *of the cage farm*: 1 million 93 thousand soms.

Chapter 8:
ORGANIZATIONAL AND LEGAL FRAMEWORK FOR DAMAGE AND LOSSES ASSESSMENT FROM THE IMPACT OF DISASTERS/EMERGENCIES IN AGRICULTURE, FORESTRY AND FISHERIES

The assessment of damage and losses from the effects of disaster/ES in agriculture, forestry and fisheries is carried out for the purpose of[40] :

- Analysis of damage and losses and other negative socio-economic consequences, including an assessment of the possible impact on economic indicators, temporary reduction in employment, reduction in income and the level of material well-being of affected citizens and households;
- Determining the activities necessary for emergency response and short-, medium-, and long-term rehabilitation work;
- Determining the funding requirements needed to provide for the recovery of damages and losses;
- Determining the degree of impact of the disaster on the activities of business entities, peasant *(farm)* households, individual entrepreneurs engaged in agricultural production;
- Determining the degree of impact of the disaster as a whole on the social situation of rural residents, socio-economic development of rural councils, rural areas, regions, national economy, gross domestic product, export levels, imports, income, poverty, other micro and macroeconomic indicators;
- Initiating, by decision of the Government of the Kyrgyz Republic, the process of requesting and receiving necessary international assistance beyond the country's own capabilities.

The assessment of damage and losses from the impact of a disaster/ES in agriculture is initiated and managed directly by[41] :

- **at the object level** - heads of economic entities *(legal entities)* operating in the field of agriculture, forestry and fisheries with the mandatory participation of individual entrepreneurs and farmers *(individuals)* engaged in agricultural production;

[40] http://cbd.minjust.gov.kg/act/view/ru-ru/157244?cl=ru-ru

[41] http://cbd.minjust.gov.kg/act/view/ru-ru/157244?cl=ru-ru

- **at the local level** - heads – heads of Civil Protection of local self-government bodies *(heads of aiyl okmotu);*

- **at the district level** - heads of state administrations - heads of district civil protection *(district akims);*

- **at the regional level** - heads of state administrations - heads of regional civil protection *(plenipotentiary representatives of the President of the Kyrgyz Republic in the regions);*

- **at the sectoral level** - heads of state authorities - heads of Civil Protection of ministries and departments;

- **at the national level** - on the basis of decisions of the Cabinet of Ministers of the Kyrgyz Republic.

Assessment of damage and losses from the impact of a disaster/ES in each case, depending on the specifics of the disaster / emergency / sector / industry/ entity/ territory, **is carried out by the relevant CPC**[42], which includes or additionally appoints officials - experts with the knowledge and skills necessary to assess damage and losses in agriculture.

The working bodies of the CPCs are the territorial divisions of the state body authorized by the state body in the field of civil protection *(MES KR).*

If necessary, depending on the scale and specifics of the disaster/ES, assessment of damage and losses is carried out by special joint commissions/groups of specialists-experts, which are created by separate decisions of the heads of the relevant civil protection authorities or the Cabinet of Ministers of the Kyrgyz Republic.

***Note: A** typical list of expert experts required to assess damage and losses from the impact of disasters/emergencies in agriculture, forestry and fisheries is presented in Annex 1 to this Methodological Guideline.*

The official final document reflecting the situation in a particular territory, facility, sector, industry as a result of a disaster/ES, as well as the results of damage and loss assessment is the Act of the CPC.

Act of the Civil Protection Commission:

- is signed by all members of the commission and approved by the chairman of the commission;

- must contain basic information about the disaster/ES, data on damage and loss assessment, as well as relevant conclusions, findings and suggestions;

- It is supplemented with the necessary appendices - relevant documents, tabular, list, reference, photo, video and other materials confirming/explaining the basic information indicated in the Act.

The damage and loss assessment process is carried out by comparing the pre-disaster/ES situation with the post-disaster/ES situation and should be conducted for each disaster/ES that occurred, separately, with a sectoral distribution from the smallest/unique crop, livestock, forestry and fishery facilities, which can range from several units for small-scale disasters to tens of hundreds for large-scale/large-scale disasters/emergency situations.

The results of the assessment determine the aggregate data of damage and losses for each single disaster/ES, as well as from all disasters/event that occurred in a particular territory or in the country as a whole, with a distribution by individual sectors/sectors/sub-sectors/agencies/types of ownership, and so on, at different points in time *(months, quarters, half-years, years).*

[42] h ttp://cbd.minjust.gov.kg/act/view/ru-ru/12983?cl=ru-ru

In cases of a large-scale emergency with catastrophic consequences, in order to minimize the time for taking action, the assessment of damage and losses can be carried out for individual sectors/industry/subsectors, by aggregated indicators, groups of facilities in quantitative and cost/money terms.

Chapter 9:
STATISTICAL REPORTING ON DAMAGE AND LOSSES FROM THE IMPACT OF DISASTERS/EMERGENCIES IN AGRICULTURE, FORESTRY AND FISHERIES

The legal basis for the development, production and dissemination of official statistics, as well as the organization and functioning of the national statistical system is regulated by the Law of the Kyrgyz Republic "On Official Statistics"[43] .

In order to provide the state and society with statistical information the National Statistical Committee of the Kyrgyz Republic in cooperation with other producers of official statistics, suppliers of administrative data, users of official statistics and respondents develops annual statistical programs approved by the Resolutions of the Cabinet of Ministers of the Kyrgyz Republic.

Violation of the procedure and deadlines for submitting information, its distortion and failure to comply with confidentiality shall entail liability established by the legislation of the Kyrgyz Republic.

Mandatory state statistical reporting on damage from emergencies:

In the Kyrgyz Republic, since 2018, semi-annual and annual mandatory state statistical reporting on damage from emergencies was introduced according to Form No.1-ЧС [44] , approved by the Resolution of the National Statistical Committee of the Kyrgyz Republic No. 6 of 23.06.2021 *(according to the updated form, taking into account additions on indicators of achievement of the Sendai Framework for DRR for 2015-2030),* which is to submit by:

- enterprises and organizations, local governments, cities of district significance - to local state administrations and district departments of the Ministry of Emergency Situations and the Department of Emergency Situations in Osh - until the 20th day of July and January;
- district and city departments of the Ministry of Emergency Situations - to the regional and Bishkek city departments of the Ministry of Emergency Situations by the 25th day of July and January;
- The regional and Bishkek and Osh departments of the Ministry of Emergency Situations - to the MES KR by the 30th day of July and January;
- MES KR - in a consolidated form for the year to the National Statistical Committee of the Kyrgyz Republic until February 20 of the following year.

In the report on damage from emergencies in form No. 1-ЧС, in the part concerning statistical data on the impact of disasters / emergencies in agriculture, forestry and fisheries, the following information should be reflected:

Chapter III. Information about damage to infrastructure and material and technical base *(by the example of the information of the MES KR for 2021):*

Line code	Unit of measure	Fact	Name of Indicators
Б	В	1	А
30	hectare	27 767,2	Agriculture and forestry: total area of damaged agricultural land, of which:

[43] http://www.stat.kg/media/files/a73fcd31-b1da-4d74-9ff2-da7df70126a7.pdf

[44] http://www.stat.kg/media/files/ed991e64-c825-4e7f-97f7-44bcd1428f6d.pdf

Line code	Unit of measure	Fact	Name of Indicators
Б	В	1	А
30.1.1	- "-	22 039,8	*irrigated arable land*
30.1.2	- "-	5 697,7	*non-irrigated arable land*
30.1.3	- "-	-	*pastures*
30.1.4	- "-	1,7	*private subsidiary farming (gardens, vegetable gardens)*
30.1.5	- "-	28,0	*forest land*
30.1.6	thousand soms	106 058,0	Total damage to agricultural land
30.2.1.	hectare	27 767,6	Total area of dead crops, of which:
30.2.2	- "-	19 744,2	*cereals*
30.2.3	- "-	158,2	*Root vegetables*
30.2.4		4,0	*cotton*
30.2.5	- "-	1 863,4	*vegetables*
30.2.6	- "-	255,9	*beans and other legumes*
30.2.7	- "-	5 741,5	*perennial plants*
30.2.8	- "-	-	*private subsidiary farming (gardens, vegetable gardens)*
30.2.9	thousand soms	105 883,0	Total damage to crops
30.2.10		175,0	*Total damage to forestry*
30.3	Head	4043	Total number of fallen livestock, poultry, fish, of which:
30.3.1	- "-	186	*Large cattle*
30.3.2	- "-	403	*Small cattle*
30.3.3.	- "-	13	*horses*
30.3.4	- "-	3237	*poultry*
30.3.5	- "-	250	*fish, aquaculture*
30.3.6	thousand soms	24185,7	Total damage to livestock and poultry
30.3.7	thousand soms	*50,0*	*Total damage to the fishery*

Chapter IV. Information about the economic impact of emergencies:

Line code	Unit of measure	In fact	Name Indicators
Б	В	1	А
34	thousand soms	130293,7	The total amount of damage to agriculture, of which
34.1	- "-	24185,6	*livestock farming*
34.2	- "-	105882,9	*crop production*
34.3	- "-	175,0	*forestry*
34.4	- "-	50,0	*fishery*

The report on damage caused by emergencies is submitted by all economic entities operating in the field of agriculture, forestry and fisheries *(peasant (private) farms and individual entrepreneurs engaged in agricultural production),* regardless of ownership, local governments of a particular territory, the current situation in which is recognized as an emergency situation only on the basis of the decision of the Civil Protection Commission of local state administrations in coordination with the MES KR, as well as with the Interdepartmental Commission on Civil Protection of the Kyrgyz Republic. All data included in the statistical report must be reliable and fully comparable with the act of the Civil Protection Commission.

Reports must be signed by the heads of LSGs, operating economic entities engaged in agriculture, forestry and fisheries *(peasant (private) farms and individual entrepreneurs engaged in agricultural production)* who are responsible for the accuracy and completeness of the report and its timely submission in the prescribed time and address.

In this regard, in the acts of the commissions for civil protection, the results of damage and loss assessment in agriculture, forestry and fisheries, performed separately for each disaster/object/sector/industry are recommended to be reflected in the Summary tables of the results of damage and loss assessment, which are identical and basically correspond to form №1-ЧС and other relevant forms of mandatory state statistical reporting.

Developments and publications in the field of official statistics *(as they relate to damage and losses from the impact of disasters/emergencies):*

The National Statistical Committee of the Kyrgyz Republic on the basis of the received data on damage from emergencies in form No.1-ЧС and tables of indicators of the Sustainable Development Goals (SDGs) annually develops, publishes and posts on the NSC KR website the statistical collection "Environmental Protection"[45] , in which the following table data is presented under "Main socio-economic indicators":

- *Table 8.13: Number of emergencies by type;*
- *Table 8.14: Number of deaths as a result of emergencies by territory;*
- *Table 8.15: Amount of damage from emergencies.*

Monitoring the Sustainable Development Goal indicators *(as they relate to damage and losses from the impact of disasters/emergencies):*

The National Statistical Committee of the Kyrgyz Republic on the basis of the received data on damage from emergencies in form No. 1-ЧС annually develops, publishes and posts on the website of the NSC of the Kyrgyz Republic the statistical collection **"Statistics of Sustainable Development Goals in the Kyrgyz Republic**"[46] , in which the Chapter "Goal 1 End of poverty in all its forms everywhere" is presented in *Table 1.5.2 "Direct economic losses from disasters as a percentage of national gross domestic product (GDP)".*

[45] http://www.stat.kg/media/publicationarchive/c210d76d-91e9-4e8e-a597-e49217759846.pdf

[46]h ttp://www.stat.kg/media/publicationarchive/aff32455-587b-478f-b293-07087a033cb6.pdf

Appendix 1
to the Methodological Guideline for Damage and Losses Assessment
related with Disasters/Emergencies in Agriculture, Forestry and Fisheries

STANDARD LIST
of expert specialists required to assess damage and losses from the impact of disasters/emergencies in agriculture, forestry, and fisheries within the Civil Protection Commissions

1.	Civil Engineer
2.	Engineer - agronomist
3.	Animal husbandry engineer
4.	Forestry Engineer
5.	Fisheries Engineer
6.	Mechanical Engineer
7.	Plant Economist
8.	Livestock Economist
9.	Forest Economist
10.	Fishery Economist
11.	Veterinarian
12.	Zootechnician
13.	Social protection specialist
14.	Land management specialist
15.	Irrigation (water management) specialist
16.	Emergency response specialist
17.	Ecology Specialist
Extras:	
Officials - expert specialists with the knowledge and skills necessary to carry out damage and loss assessment in agriculture, forestry and fisheries.	
With direct involvement:	
Representatives of economic entities, peasant *(private) farms*, individual entrepreneurs engaged in agricultural production and activities in the field of agriculture, forestry and fisheries, affected by disasters / emergencies	
Note:	
The official final document reflecting the situation in a particular territory, facility, sector, industry as a result of a disaster/ES, as well as the results of damage and loss assessment is the Act of the CPC.	
Based on the acts of the CPC, semi-annual and annual mandatory state statistical reports on damage from emergencies are developed in form No.1- ЧС, which are submitted by all operating economic entities involved in agriculture, forestry and fisheries *(peasant (private) farms and individual entrepreneurs engaged in agricultural production),* regardless of ownership and LSGs	