Post-disaster needs assessment of damages and losses:
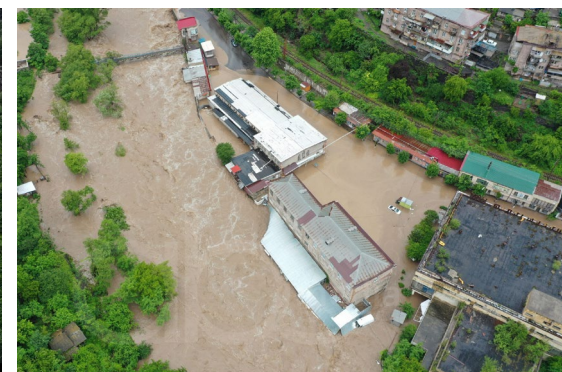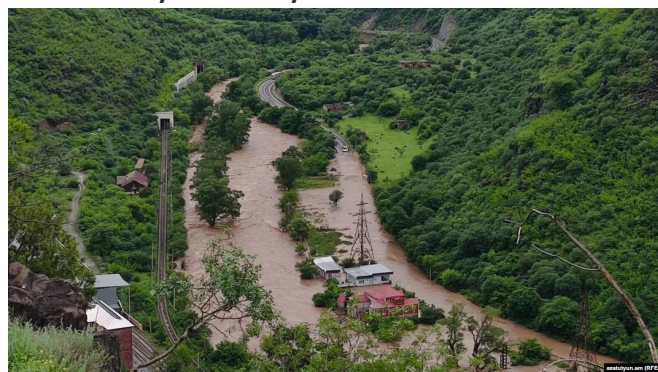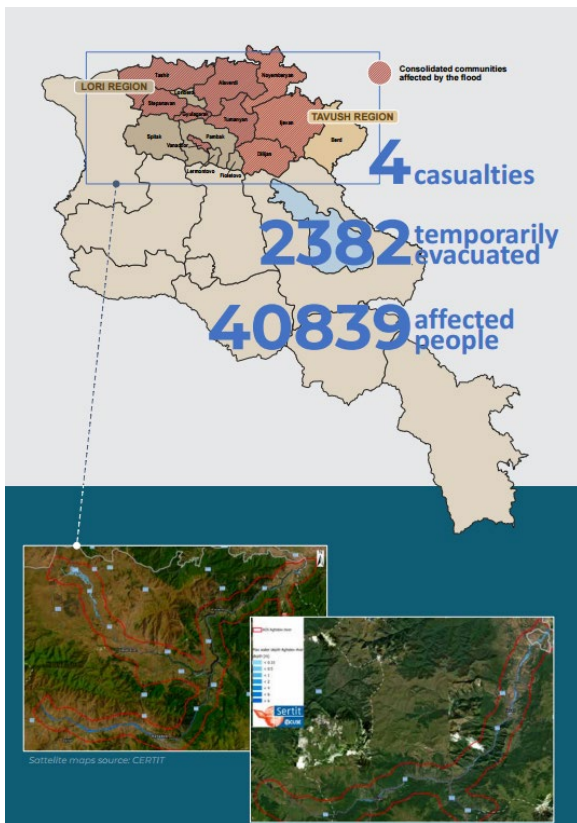# floods in the Lori and Tavush regions

Naira Mandalyan

Statistical Committee of Armenia

Lori and Tavush regions, RA - May 26, 2024

The severe flooding affected a total of 12 settlements across the two regions, including the communities of:

- Alaverdi,
- Gyulagarak,
- Pambak,
- Tashir,
- Tumanyan,
- Dilijan,
- Noyemberyan.

Three flood scenarios were observed:

■ Flash floods in Alaverdi and Karkop due to mountainous terrain, with water velocities estimated at 3-6 m/sec near Alaverdi and 4-10 m/sec near Akhtala and a significant amount of debris and mud transported by the Debed river. The water lingered for several days.

■ Riverine floods in Tashir, with water velocities of 1-3 m/sec3, where the floodwater receded quickly, allowing evacuees to return to their homes the next day.

■ Pluvial floods in Amrakits caused by excessive rainfall.

The Government of Armenia declared the affected areas as disaster zones and promptly sought assistance from international partners.

The Post Disaster Needs Assessment in Armenia (PDNA) was collaboratively prepared by the Government of Armenia, the UN and the EU.

Damages and Losses

Working groups were formed in order to carry out a post-disaster needs assessment (based on the PDNA methodology) in the declared disaster zones due to the floods that occurred on May 26, 2024 in the Lori and Tavush regions of the Republic of Armenia.
Representatives of Armstat are involved in the working groups of all sectors.

Sectors	Lead Ministry
Housing	Ministry of Territorial Administration and Infrastructure
Business (commerce, industry and tourism)	Ministry of Economy
Agriculture	Ministry of Economy
Transport	Ministry of Territorial Administration and Infrastructure
Community Infrastructure • Water, Energy	Ministry of Territorial Administration and Infrastructure
• Health	Ministry of Health
• Education	Ministry of Education, Science, Culture and Sport
Macroeconomics	Ministry of Finance
Human Impact and Livelihoods	Ministry of Labour and Social Affairs
Gender	Ministry of Labour and Social Affairs
Disaster Risk Reduction	Ministry of Internal Affairs
Environment (and waste management)	Ministry of Environment

PDNA Armenia
Sector Report Outline

1. Pre-disaster baseline information/ Sector Overview
2. Assessment (estimation of the value) of disaster effects
3. Assessment of disaster impact
4. The sector recovery strategy
   4.1 Sector Recovery Vision
   4.2 Reconstruction and Recovery Needs, including Build Back Better
   4.3 The Sector Recovery Plan
   4.4 The Sector Recovery Needs costing
   4.5. Implementation Arrangements

Total damage and loss by sector and sub-sector (in USD millions)

Sector	Damage	Loss
Social Sectors		
Housing	4.54	0.27
Productive Sectors		
Agriculture	12.11	7.03
Business	6.68	3.39
Infrastructure Sectors		
Transport	22.67	10.35
Community infrastructure	2.06	0.87
Communications	*0.19*	*0.23*
Energy	*0.93*	*0.25*
Water and Sanitation	*0.56*	*0.13*
Health	*0.19*	*0.25*
Education	*0.19*	*0.00*
Cross Cutting Sectors		
Environment	0.02	10.10
Disaster Risk Reduction	1.35	0.99
Total	**49.43**	**33.00**

Damage and loss by sector (in USD millions)

Damage

Sector	Value
Transport	22.67
Agricuture	12.11
Business	6.68
Housing	4.54
Community infrastructure	2.06
DRR	1.35
Environment	0.02

Loss

| Sector	Value
Transport	10.35
Environment	10.10
Agricuture	7.03
Business	3.39
DRR	0.99
Community infrastructure	0.87
Housing	0.27
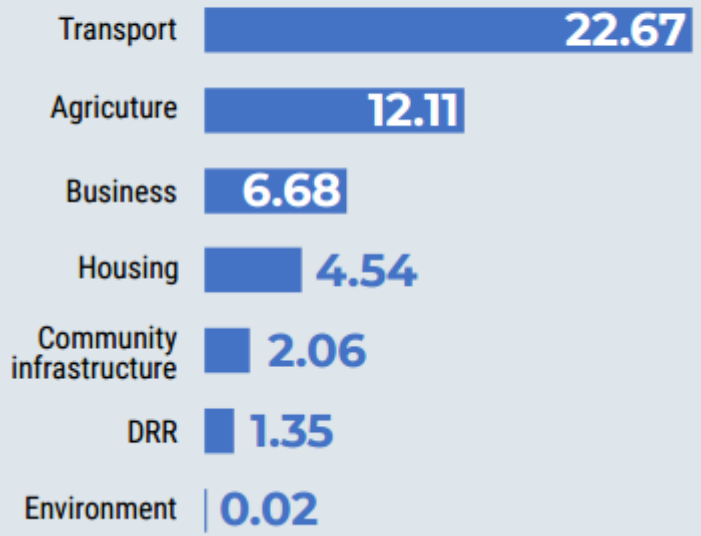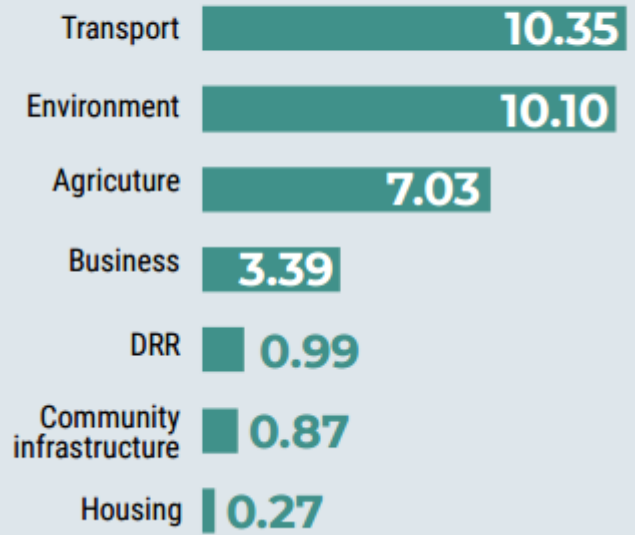
Total recovery needs by sector and sub-sector (in USD millions)

Sector	Short-term Needs	Medium-term Needs	Long-term Needs	Total Needs
Social Sectors				
Housing	5.19	1.65		6.84
Productive Sectors				
Agriculture	12.51	11.35		23.86
Business	7.35	4.68		12.03
Infrastructure Sectors				
Transport	3.82	17.38	23.05	44.25
Community infrastructure	2.27	2.26	0.01	4.54
Communications	*0.15*	*0.42*		*0.58*
Energy	*0.42*	*1.51*		*1.93*
Water and Sanitation	*1.17*	*0.12*	*0.01*	*1.30*
Health	*0.42*			*0.42*
Education	*0.11*	*0.21*		*0.31*
Cross Cutting Sectors				
Environment	10.11	0.40		10.51
Disaster Risk Reduction	3.27	7.27	4.37	14.91
Total	**44.53**	**44.98**	**27.43**	**116.94**

Total recovery needs by sub-sector
(in USD millions and percentage share)
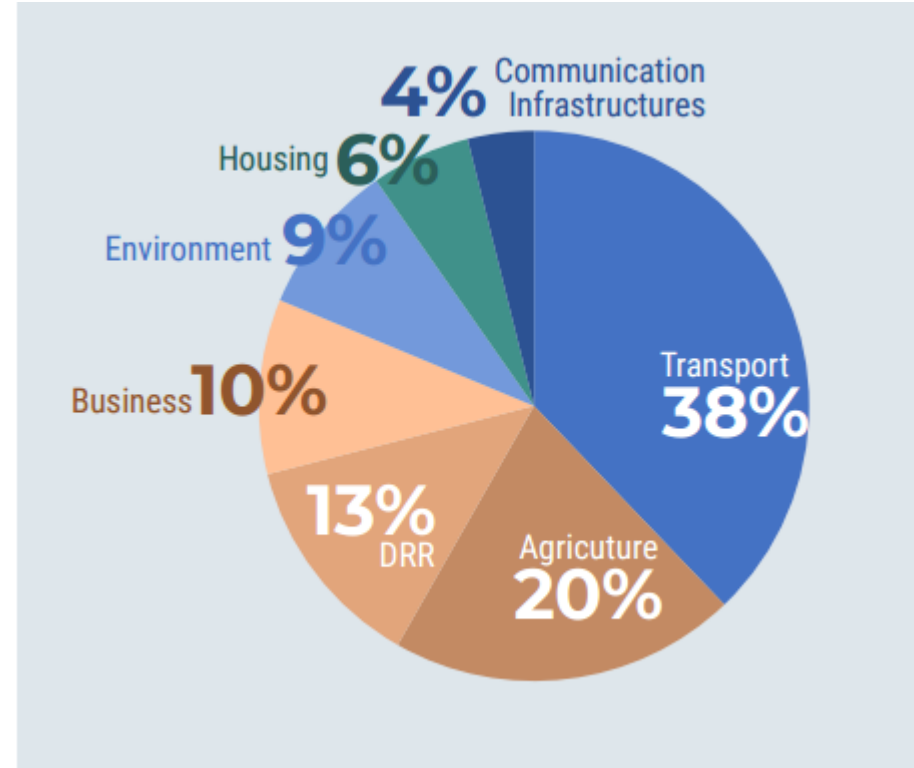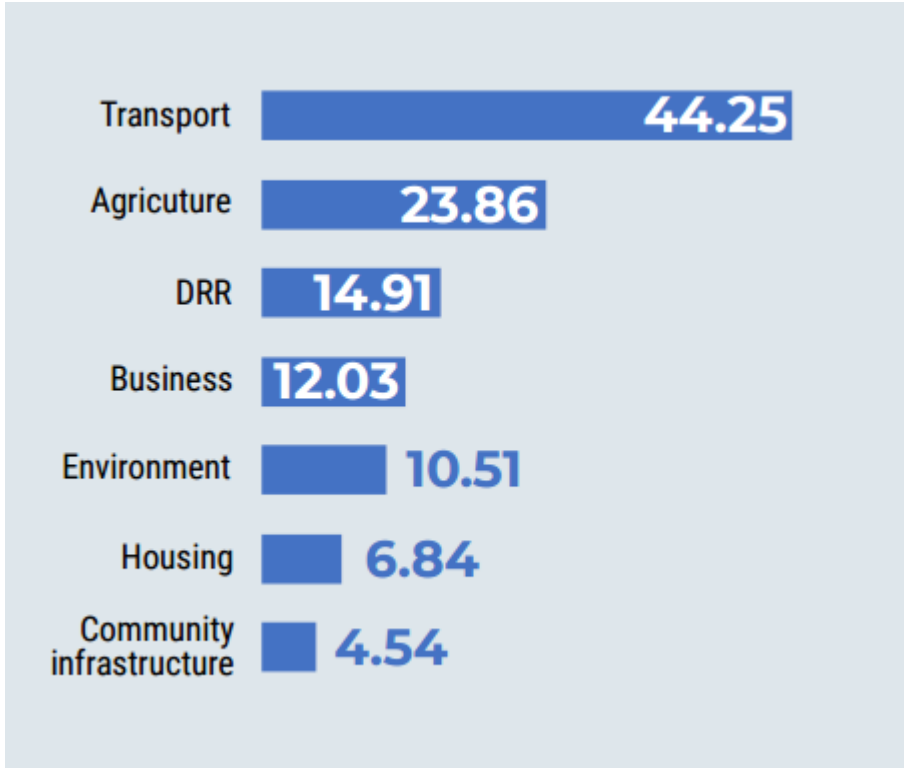
Business Sector

Armenia's economy has made significant progress in recent years, with an 8.7% economic growth recorded in 2023. The GDP per capita reached 8,168 USD, while foreign trade increased by 46%, amounting to 20.7 billion USD. The business sector, spread across services, industry, and agriculture, plays a pivotal role in this growth, with Lori and Tavush regions contributing to national development through key industries (Armstat)

UNDP contacted 35% of the listed businesses via email and follow-up phone calls to gather comprehensive and reliable data on the types of enterprises and the extent of the damages. Based on the available data and necessary assumptions made, the damages caused by the May 25-26 flood in 9 communities of Lori and Tavush regions of Armenia to business property, equipment and merchandise were estimated at 6.3 million USD. The damage and loss were estimated at 3.4 million USD and the recovery needs were estimated at 11.2 million USD.

Building stock and population in Alaverdi, Tashir and Noyemberyan urban areas (source: Armstat)

	Total		Multi-family buildings		Single-family homes		Population
	Number of apart.	Total floor area, m²	Number of apart.	Total floor area m²	Number of apart.	Total floor area m²	
Alaverdi	7,183	490,741	5,563	306,936	1,620	183,805	15,300
Tashir	3,312	521,625	1,114	55,205	2,198	466,420	7,600
Noyemberyan	1,715	307,369	578	33,034	1,137	274,335	6,400

	SFHs		MABs		Cabins		Total	
	Number	Floor area, m²	Number	Floor area, m²	Number	Floor area, m²	Number	Floor area, m²
Alaverdi	29	2,097	102	6,796	6	196	137	9,089
Dilijan	4	380					4	380
Gyulagarak	1	60					1	60
Noyemberyan	14	1,001			1	120	15	1,121
Pambak	1	37					1	37
Tashir	106	11,096	2	123			108	11,220
Tumanyan					3	152	3	152
Total	155	14,671	104	6,919	10	468	269	22,058

Affected dwellings (number and flooded or damaged floor area) per building type

Housing sector: Reconstruction and Recovery Needs

Key recovery needs include:

■ Temporary accommodations, debris removal, and replacement of essential household goods.

■ Securing funds for reconstruction, developing a post-event damage assessment methodology, implementing an Early Warning system, improving land use planning, managing illegal buildings, and raising community awareness on flood risk.

■ Preparing flood hazard maps integrated with landslide and seismic risk assessments.

These needs align with Armenia's Disaster Risk Reduction strategy.

Disaster Risk Reduction Sector: Reconstruction and Recovery Needs

- Enhancement of early warning systems,
- Automatic weather stations,
- Hydrological observation stations,
- Water current meter set,
- Radio-location systems,
- Retaining walls.

- Development of GIS-based Risk Index,
- Multi-hazard risk modeling,
- Strengthening Regional and National Crisis Management Centers,
- Promoting risk mitigation and evidence based decision-making,
- Strengthening hydrological forecasting, seasonal forecasts based on remote-sensing data, and snow modeling.
- Improving weather forecasting, and numerical weather prediction system,
- DRM planning for health facilities and implementing Hospital Safety indexing,
- Developing a unified PDNA baseline data and providing related training.

THANK YOU