

EARLY ACTION PROTOCOL SUMMARY

Ecuador | Volcanic Ash

26 September 2023

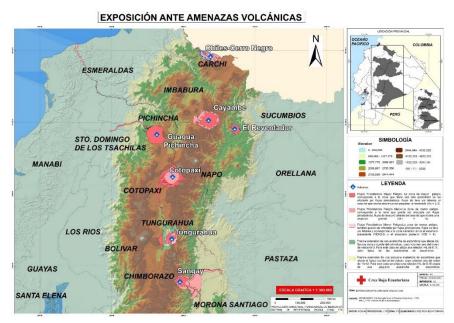


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EAP №: EAP2023EC03	Early action lead time: 5 Days	Operation №: MDREC024
EAP approved: 29/09/2023	EAP timeframe: 5 Years	Operational timeframe: 2 Months

Budget: 460,521 CHF To assist: 10,000 people

SUMMARY OF THE EARLY ACTION PROTOCOL



The **IFRC** Disaster Response Emergency Fund (DREF) has approved a total of CHF 454,166 for the implementation of the Ecuador Dispersion and Fall of Volcanic Ash EAP. The approved consists of an allocation of CHF 313,586 for readiness and prepositioning and CHF 140,580 allocated to implement early actions once the defined triggers are met.

Allocations are made from the Anticipatory Pillar of the IFRC-DREF, under the IFRC-DREF appeal code

MDR00001. Unearmarked contributions to the DREF are encouraged to guarantee sufficient funding is available for the Early Action Protocols being developed.

Summary

Ecuador is a country that is under the influence of several natural threats, the most frequent events in the territory are floods, earthquakes, and volcanic activity. The latest threat leaves the highest numbers of people affected for the period 2010 to 2022, affecting 764,799 people, while floods and earthquakes affect 528,296 and 52,211 respectively.

This big impact of volcanic activity on the at-risk population is due to the high density of volcanoes in the country. There are 84 volcanic centers according to the latest catalog (Bernard and Andrade, 2011), of which 24 are potentially active, meaning they have had an eruptive activity in the last 11,700 years.

This Early Action Protocol (EAP) focuses on 6 volcanoes: 3 volcanoes are classified as 'Very High Threat' (Tungurahua, Cotopaxi, Guagua Pichincha), and 3 classified as 'High Threat' (Reventador, Cayambe, Sangay). This prioritization was done based on the document Technical Criteria for the Construction of the Early Action Protocol for Ashfall (Bernard et al., 2018), which established a qualification for each of the 24 potentially active volcanoes in Ecuador.

The protocol was designed by CRE, CRA, RCCC, and IGEPN and will be implemented by several organizations (Secretariat of Risk Management, IGEPN, INAMHI, local GAD). Everyone involved has a key role during the readiness and activation of early actions in the areas of influence of the Tungurahua, Cotopaxi, Guagua Pichincha, Sangay, Cayambe, and Reventador, Chiles, and Cerro Negro volcanoes.

The EAP does not work in isolation. It is linked to the existing Disaster and Contingency Risk Management and Reduction Plans. This ensures that early actions intended to be implemented in the time window between the time the forecast is issued, and the potential disaster event are carried out in a timely and successful manner.

Target population

The target population for this EAP is 2,000 families (10,000 people) with health actions, protection of livelihoods, and protection and supply of safe water. From these families, 500 (2,500 people) will be prioritized for cash distribution. The possible high-risk areas where the EAP could be activated are the provinces, cantons, parishes, and communities near the volcanoes, where the ash deposit ranges between 2 mm to 300 mm, predominantly in agricultural and livestock areas.

Impacts

With the historical background of the impacts produced by ash fall during the eruptive processes of the Tungurahua, Cotopaxi, Guagua Pichincha, Reventador, Chiles-Cerro Negro, and Sangay volcanoes in the last 20 years and according to the risk elements identified, the impacts prioritized in this EAP are:

- **Health:** Affected population faces serious respiratory, eye, skin, and digestive problems (due to the exposure to volcanic material as it is abrasive and small in size).
- **Livelihoods**: The effects on agriculture were significant for the communities in previous volcanic events. The residents had to sell their animals at prices up to 70% below the national market average to recover or safeguard their investments or assets in some way.
- Water sources: Volcanic activity is an important source of water pollution since the solid particles can affect water quality. This limits the supply of drinking water for humans and its availability for animals.

OPERATIONAL STRATEGY

1. Who will implement the EAP - The National Society

The Ecuadorian Red Cross has a presence in 24 provinces of Ecuador, represented by 24 Provincial Boards and 214 Cantonal Boards. Its structure allows coordination at the national level of the Provincial Boards, given their organic and financial autonomy.

The National Rapid Response Teams managed by the National Presidency for activation and mobilization, focus on 2 areas:

- 1. Operations, developing activities on the ground for the benefit of the community.
- 2. Support, those who support and guarantee the actions of the mobilized teams.

The Ecuadorian Red Cross also works on different lines of action considered in this EAP. The Disaster Risk Management program coordinates efforts to strengthen the capacities of communities and their livelihoods. This is done through permanent risk analysis to reduce the risk of disasters, promote preparedness in the face of dangerous events, whether of natural or anthropogenic origin, deploy specialized community and institutional teams for the immediate response to such events, support recovery processes and strengthen resilience to promote the dignity and capacity of community action. The Health and Community Development team works on the lines of health promotion and disease prevention, health care, mental health, and psychosocial support. The area of Fundamental Principles and Values of the Movement work on the rights and protection doctrine, Restoration of Family Links, human mobility, protection, gender and inclusion, youth, community connection and environmental care and social innovation, and culture of peace.

In addition, the National Society has Strategic Partners:

- Movement Partners
- International cooperation agencies
- National public entities
- National private entities

The Ecuadorian Red Cross also has supplies prepositioned by internal procedure in the strategic warehouses at the national level that can be used when an activation of the EAP is triggered, in addition, it has an emergency fund of USD 20,000 that would allow an advance of funds if necessary.

EAP Ash Fall Activation Experience 2020

On September 20, 2020, the geophysical institute reported a significant increase in the level of eruptive activity, indicating that the potentially most affected provinces would be Chimborazo and Bolívar, with ash accumulations in a range of >3 millimeters and >1 millimeter respectively, which would be enough to affect agriculture. The implementation and activation mechanism included three moments established in the EAP:

- 1. Implementation of the Awareness Plan by the Provincial Board, an activity that was carried out during the month of June in communities of the Cebadas Parish of the Guamote canton. These activities were funded by the Ecuadorian Red Cross Headquarters.
- 2. Distribution of kits (livelihood protection, Health) and implementation of monetary transfer program based on Special Report C activating the EAP. These activities were funded by the Dispersion and Ash Fall as planned.
- 3. Monitoring and evaluation of the activation of the protocols and execution of early actions. Lessons learned from this activation were analyzed and included in the updated EAP Ash fall.

As part of the awareness processes from June 22 to July 12, 2020, Ecuadorian Red Cross headquarters in coordination with the Provincial Board of Chimborazo developed and implemented the Community Awareness Plan, considering self-protection measures in case of fall and dispersion of ash and COVID-19, through practical tools and methodologies. Community activities and training actions were carried out from June to September 2020.

The health and livelihood protection kits were prepositioned in strategic warehouses in the provinces of Tungurahua (Ambato) and Pichincha (Quito), which facilitated the transportation of the kits to the Provincial Board of Chimborazo, which reduced attention time to the affected communities.

After the eruption happened in the early morning of September 20, 2020, the Ecuadorian Red Cross in coordination with the Geophysical Institute of The National Polytechnic analyzed the possible scenarios and levels of impact, so the International Federation of Red Cross was requested to activate the Early Action Protocol for Ash Fall, the following actions were conducted:

- Preparation and socialization of the intervention map, and updates of the intervention map.
- Coordination for the execution of actions between Headquarters and the Provincial Board of Chimborazo
- Management for the distribution of Health Kits and Livelihood Protection Kits prepositioned in strategic warehouses (Quito, Tungurahua).
- Distribution of a 'health protection kit' consisting of: 5 N95 masks, 5 protective glasses
- Distribution of 'livelihood protection kit', which consists of 1 plastic tarp or tarpaulin and tools (shelter kit).
- Distribution and delivery of Cash and Voucher Assistance (or Monetary Transfer (PTM).

During the months of November and December, the monitoring, evaluation, and reporting processes were conducted, as well as the systematization and socialization of lessons learned.

2. How the EAP will be activated – The Trigger

Declaration of Activation

Trigger 1: The EAP will activate actions of the Ecuadorian Red Cross in terms of awareness in high-risk areas with a spatial report A, indicating significant changes in the internal activity of a volcano. This type of report is issued when a significant change, increase in this case, in the internal activity of the volcano (seismicity, gas, deformation, etc.) is observed.

Trigger 2: The EAP will activate the request for funds with a special report B (Increase of parameters of internal activity of the volcano) and/or with a spatial report C, which indicates an eruptive event with an explosive index (VEI 3) with possible impact on the communities. The ASH3D Ash Fall and Dispersion Model of the IGEPN should indicate at least that the 2 mm ash fall in the communities is exceeded.

- **Special Report A** Significant changes in the internal activity of a volcano. This type of report is issued when a significant change, increase in this case, in the internal activity of the volcano (seismicity, gas, deformation, etc.) is observed. The IGEPN uses information from the monitoring of each of the volcanoes to issue this report.
- **Special Report B** Increase in parameters of internal activity. This report details the internal activity of the volcano (increase-decrease) based on the permanent monitoring of the IGEPN. Special Report B, an update of seismic activity, for purposes of the EAP will also be used as a stop-mechanism since it is issued to report the level of activity of the volcano when no greater variation is observed or when the activity decreases.
- **Special Report C** Eruptive event with an explosive index (VEI 3) with possible impact on communities. The IGEPN ASH3D Ash Fall and Dispersion Model must indicate at least that the 2 mm ash fall is exceeded for the EAP to be activated.

The table details the impact or damage to people, crops, and livestock due to ash falls, from which the criteria to define the impact thresholds were obtained.

Descri	ption	No Harm	Harvest Interruption	Minor reduction in productivity: less than 50%	Major productivity reduction: More than 50% remeasurement required	Total crop loss Remediation required
Tuma	Crops	0 mm	1 mm	5 mm	50 mm	100 mm
Type Agriculture	Grazing	0 mm	3 mm	25 mm	60 mm	100 mm
Lives	tock	No Harm	Contaminated water sources/limited forage	Lack of feeding, tooth wear and affectation to water supplies	Dehydration/ may cause intestinal obstructions	Serious damage or death of livestock
		0 mm	>1mm	>10 mm	>100 mm	>300 mm

Humans	No Harm	Mild involvement of eyes and airways	Eye and airway irritation/pain	Eye pain and discharge, increased airway involvement	Difficulty breathing and corneal abrasion, skin irritation
	0 mm	>1 mm	>10 mm	>100 mm	>300 mm

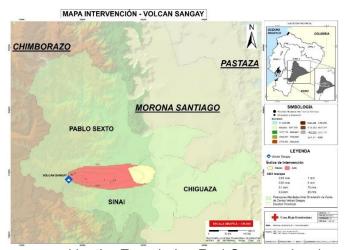
Source: These productivity risk loss ratios are based on expert judgment and very little empirical and experimental data. (Jenkins et al., 2015), (Encalada, 2015), (Caselli et al., 2011).

Based on the EAP for Ash Fall and after the analysis of the previous table, we proceeded to define the impact levels by standardizing the values for both crops and animals and humans. In this way, 3 levels of impact are found, defined, and useful for early actions.

Selected thresholds:

- From 2 to 5mm
- 5 to 10mm
- From 10 to 300mm

Based on the forecast created using ASH3D, the area where the fall and dispersion of volcanic ash is expected is obtained, this information is crossed with the information of vulnerability and lack of capacity and based on this analysis the parishes that must be intervened are prioritized based on the risk index. Below is an example intervention map for Sangay Volcano:



Source: Map prepared by the Ecuadorian Red Cross, volcanic activity 2022.

Description of early actions

Activator 1		Actions		
Special Report A	Significant changes in the internal activity of a volcano This type of report is issued when a significant change, increase in this case, in the internal activity of the volcano (seismicity, gas, deformation, etc.) is observed.	Training for volunteers in: Volcanic ash formation. Evolution of ash. Ash monitoring. Volcanic ash dispersion: height and extent of clouds. Volcanic ash deposit.		

		Deployment of volunteers from Provincial Boards (JP) who were trained in ris management (volcanic activity) to execute the Awareness Plan in communitie that are exposed to ashfall, and inform about the threat and self-protectio measures. Delivery of dissemination/awareness-raising material on self-protectio measures. Registration of people who may be affected by ashfall, very general informatio on the early actions of the LAP will be shared with community leaders or representatives.				
		Prepositioning				
		Elaboration of requirements for the purchase and acquisition of kit implements and protection of water sources. Prepositioning of: • Health Protection Kits • Livelihood Protection Kits • Implements for protection of water supply sources Preposition inputs are: • Tungurahua (main) • Pichincha – Headquarters (back up 1) • Imbabura (back up 2) It is considered to have back-up wineries given the possibility of isolation of provinces, due to collateral threats to a volcanic eruption (lahars). Similarly, the physical material for the dissemination of information will be in each of the Provincial Boards to be delivered at the time of the deployment of volunteers in the awareness phase.				
	Activator 2	Actions				
Special Report B (activity increase)	Increase of parameters of internal activity of the volcano based on the permanent monitoring of the IGEPN. Likewise, the ASH3D (IGEPN) and FALL3D (IGEPN – INAMHI), update of eruptive activity.	At this stage it is expected to keep the National Society on alert both administratively, operationally, with volunteers and technical equipment, so that in case of an ash fall the deployment is immediate. In case the internal activity of the volcano decreases, this report will serve as a				
	Activator 2	Actions				
•	Activator 2	Activation				
Report B	Eruptive event with possible impact on the community.	Distribution of volcanic ash fall protection kit, consisting of: 5 N95 masks (2 adults) and 3 for boy/girl). 5 eye protection glasses (2 for adults and 3 for boy/girl), and 3 for boy/girl), Development of awareness-raising actions on the use of the material delivered and self-protection measures.				
		Development of awareness-raising actions on the use of the material delivered				

Protection of water sources (supply)
Distribution of 2 jerrycans (10 liters each, for each family)
Distribution of 4 plastic tarps (plastic sheets), with measures of 4×6 m. for the community.
Development of awareness actions on the use of the material delivered and
consumption of safe water.

Source: PNGRED- CRE 2022 team.

Stop Mechanism

The stop mechanism is defined with the issuance of Special Report B, which indicates the update of the internal activity of the volcano. When this report indicates that the internal activity of the volcano (seismicity, degassing, and deformation) has decreased and has stabilized, the intervention in the communities with possible impact will be lifted.

Special Report B can be generated at any time after the issuance of Reports A (volcanic disturbances) or C (possible impact on the population).

3. How the EAP will reduce the impact on the population – The Early Actions

The early actions for this EAP were selected based on the historical background of the impact generated at the community level due to the fall and dispersion of ash, by the eruptive processes of Tungurahua, Cotopaxi, Guagua Pichincha, Reventador, and Sangay in recent years.

The analysis and identification of risks carried out during the implementation of the Forecast-Based financing project in 2019, as well as during the activation of the Early Action Plan in 2020 informed the selection of activities for this EAP. The readiness activities have been prioritized in the areas that have the greatest affectation on the population near the volcanoes with high and very high threats. The decision to work in accordance with the lines of intervention of the Ecuadorian Red Cross in the areas of:

- Risk Reduction (Community Awareness)
- Event or Response management (delivery of humanitarian assistance kits)
- Safe Water
- Livelihoods (Protection of livelihoods and CVA deliveries)

Based on the theory of change and the objective of the EAP, the general purpose is to "reduce future impacts in the context due to the impact of the fall and dispersion of volcanic ash in the areas of greatest influence of high and very high threat volcanoes, to through interventions in:

- Community awareness
- Distribution of Health protection kits (eye and respiratory) against the fall of volcanic ash

- Distribution of livelihood protection kits (agricultural and livestock)
- Distribution of Multipurpose Cash Transfer to 500 families with greater impact and vulnerability
- Protection of sources and water supply

Ash deposit threshold (mm)	Expected impact according to the EAP	Early action proposed in the EAP	Affectation in September 2020	Early action implemented in September	Outcome of early action
	Crops: Interruption of harvest		More than 90% of respondents said crops were affected.		More than 98% of respondents said they used the livelihood kit to build animal shelters or crops
	Water and livestock: Contaminated water sources	Distribution of livelihood protection kits	More than 90% of respondents said the grass was affected. More than 80% of respondents indicated that water sources were affected (change of taste and sediment) More than 80% noted that small, medium and large animals were affected by ashfall (even illness and death were noted)	Distribution of livelihood kids	Between 78% and 79% of respondents used the economic benefit (PTM) to purchase food for their animals. More than 98% of respondents said they used the livelihood kit to build animal shelters or crops
2 - 5 mm	People: Mild involvement of eyes and respiratory tract	Health kit distribution	More than 86% of people surveyed indicated an impact on their health and that of their family. Involvement of the airways, eyes, presence of cough, pain of head, among others.	Health kit distribution	More than 98% of respondents said that the health kit, and especially masks, was useful to protect against ash and COVID-19
	Limited fodder and interruption of crops and harvests	CVA	More than 90% of respondents said crops were affected. More than 90% of respondents said the grass was affected. More than 80% noted that small, medium and large animals were affected by the fall	Distribution of CVA	Between 62% and 68% of respondents used the economic benefit (CVA) to purchase seeds and fertilizer. Between 78% and 79% of respondents used the economic benefit (CVA) to purchase feed for their animals

Source: Elaboration of the consulting team, evaluation of PAT Ceniza 2020 activation.

PLANNED OPERATIONS

	Livelihoods	Female:	6000	135,598 CHF
(5) (7)		Male:	4000	AP Code: 007
Indicator:			ove been provided with porary shelters to pro	•

	# of families have temporary shelters for their crops, food, and animals
Readiness Activities	 Strengthening the capacities of the NS (training for volunteers on issues related to Livelihoods) Development of awareness and community preparedness actions in livelihoods.
Prepositioning Activities	 Acquisition of 2000 Livelihoods protection kits (1 plastic tarpaulin with measures of 4 x 6 m, 1 tool kit). Pre-positioning of implements of the Livelihood protection kits (1 plastic tarpaulin with measures of 4 x 6 m, 1 tool kit) in the strategic warehouses. Acquisition and preparation in the Provincial Boards of sensitization material on the proper use of the livelihood protection kit Coordination, logistics and transport of Livelihoods protection kits
Priority Early Actions:	 Coordination, logistics and transport of Livelihoods protection kits to the intervened communities Distribution of Livelihoods protection kits in intervened communities

	Multi-purpose	Female:	1000	128,439 CHF
	Cash	Male:	1500	AP Code: 081
		# of people receiving	cash assistance to cov	er their basic needs
Indicator:		# Households that have received help have improved their income.		
Prepositioni	ng Activities:	 Strengthening the capacities of the NS (training for voluntee on CVA issues). Coordination with banking institutions (Multipurpose Ca (MPC) by bank codes). Development of community awareness and preparationactions in MPC. 		
Priority Earl	y Actions:	 Deployment of MPC equipment to intervened sectors training of families benefiting from MPC. Registration and distribution of MPC to more vulner families. Around 500 families will receive 200 CHF each. amount is based on the standard basket's case (final am will be defined after the activation of the EAP). Evaluation of the intervention (MPC). 		to more vulnerable e 200 CHF each. The t's case (final amount

Health & Care	Female:	6000	44,517 CHF
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	Male:	4000	AP Code: 109	
Indicator:	· ·	oy community health a ate in awareness activ s.		
Readiness activities	 Strengthening the capacities of the NS (training for volunteers on topics related to risk management (volcanic activity)). Development of community awareness and preparation actions regarding health due to ash impact. Development of awareness tools on the proper use of the health protection kit 			
Prepositioning Activities:	 Acquisition of 2,000 health protection kits (5 N95 masks (2 for adults and 3 for boys/girls, 5 eye protection glasses (2 for adults and 3 for boys/girls). Prepositioning of health protection kit implements (5 N95 masks (2 for adults and 3 for boys/girls, 5 eye protection glasses (2 for adults and 3 for boys/girls), in strategic warehouses. Acquisition and prepositioning in the Provincial Boards of awareness Development of awareness actions on the use of the delivered material and self-protection measures material on the proper use of the health protection kit. Development of awareness actions on the use of the delivered material and self-protection measures. 			
Priority Early Actions:	intervention area.2. Review and valid intervention area.3. Coordination, logis kits to the intervention	olunteers and technic lation of beneficiary stics and transportation ed communities. realth protection kits	information in the	

·元	Water, Sanitation and Hygiene	Female:	6000	27,924 CHF
		Male:	4000	AP Code: 110
Indicator:		# of people reached with WASH interventions before a threat		
Readiness Activities:		 Strengthening the capacities of the SN (training for volunteers and technical personnel on topics related to safe water supply). Development of Safe Water awareness tools. 		
Prepositioning Activities:		 Acquisition of implements to protect water supply sources (1 plastic tarpaulin (tarpaulin) measuring 4 x 6 m, 1 tool kit). Acquisition of 10 liter jerrycans each for each family (safe water supply). 		

	3. Prepositioning of implements and supplies acquired in strategic warehouses
Priority Early Actions:	 Coordination, logistics and transportation of implements for protection and water supply. Deployment of WASH equipment to the intervened sectors. Distribution of implements for protection and water supply.

	Risk Reduction, climate adaptation and recovery	Female:	6000	2,130 CHF
		Male:	4000	AP Code: 101
Indictor:		# of people reached with risk reduction and/or climate adaptation interventions before a threat		or climate adaptation
Readiness Activities:		1. Update, design, and printing of preparation material (information banners, brochures, posters, among others) for the community.		
Prepositioning Activities:		1 . Distribution of awareness material to the strategic warehouses of the National Society.		
Priority Early Actions:		1. Distribution of the material to the community as part of awareness-raising actions.		

Enabling approaches

	Secretariat Services		37,071 CHF
			AP Code: 122
Readiness A	ctivities:	 DM CCD Salary Monitoring Visits Communications Office Costs Translations Bank charges 	

	National Society Strengthening		78,487 CHF	
F.C			AP Code: 124, 125	
Readiness Activities:		 Workshop on risk management (on volcanic activity). Strengthening the Volcanic Observer Network Annual socialization meeting with presidents and volunteers (starting in 2023) Annual Pre-Activation technical meetings (workshop with branch CRE presidents, volunteers, ERR and Technicians from year 2). Expert in GIS Monitoring Room for one year. 		

	6. PAT Coordinator (starting in 2024 for one year)7. Accounting staff (5 MONTHS, YEAR2)8. Office costs, bank charges, Courier.
Priority Early Actions:	 Mobilization of volunteers (monitoring and evaluation). Insurance for volunteers Lessons learned workshop (to be implemented after the PAT activation phase)

Budget



Early Action Protocol Summary

EAP2023CREC01 - Cruz Roja Ecuatoriana Dispersión y Caida de Ceniza Volcánica

Operating Budget	Readiness	Pre-Pos Stock	Early Action	TOTAL
Planned Operations	35.443	172.916	144.095	352.453
Shelter and Basic Household Items	0	0	0	0
Livelihoods	5.410	128.058	2.130	135.598
Multi-purpose Cash	8.627	0	130.463	139.089
Health	12.035	28.223	5.325	45.582
Water, Sanitation & Hygiene	7.242	16.635	6.177	30.054
Protection, Gender and Inclusion	0	0	0	0
Education	0	0	0	0
Migration	0	0	0	0
Risk Red., Climate Adapt. and Recovery	2.130	0	0	2.130
Community Engagement and Accountability	0	0	0	0
Environmental Sustainability	0	0	0	0
Enabling Approaches	83.573	4.473	20.022	108.068
Coordination and Partnerships	0	0	0	0
Secretariat Services	20.954	0	7.029	27.983
National Society Strengthening	62.619	4.473	12.993	80.085
TOTAL BUDGET	119.016	177.389	164.117	460.521
all amounts in Swiss Francs (CHF)				

Contact information.

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