General Information

Fund	MPTF_00249: Complex Risk Analytics Fund (CRAF'd)					
FMP Record	MPTF_00249_00007: VIEWS-PIN: People in Need					
MPTFO Project Id						
Start Date						
End Date						
Applicants	**Status**	**Contact Type**	**Name**	**e-mail**	**Position**	**Telephone**
	Active: 18-Feb-2023 3:03:00 AM	Project Manager	Håvard Hegre	hhegre@prio.org		
Signatories	**Signature Process**	**Role**	**Name of Organization**	**Name**	**User Email**	
	Manual	Signatory	PRIO: PRIO	Lars Even Andersen	larsea@prio.org	
Contacts	**Contact Type**	**Name**	**e-mail**	**Position**	**Additional e-mail**	**Telephone**
	Focal Point	Paola Vesco	paoves@prio.org	Senior Researcher		
	Project Manager		larsea@prio.org			
	Project Manager		ilzgeh@prio.org			

Description

The **Violence and Impact Early Warning System -- People in Need (VIEWS-PIN)** is an academic-based research project providing an **early warning system of need of humanitarian assistance** for all months up to **3 years** into the future, and for all **Low and Middle Income Countries** (LMICs). Forecasts of humanitarian need are made publicly available to decision-makers and stakeholders through an **interactive dashboard and a website**, contributing to allocate resources where they are mostly needed, and improving the relevance, timeliness, and cost-efficiency of forward-looking policies aimed at minimising human sufferings. The project will produce at least 2 **policy reports** on the expected trends and patterns of humanitarian need, **3 academic publications** shedding light on the drivers of need, hundreds of **analytics and visual tools** to enhance the understanding of the results, and new **evaluation metrics** to comprehensively assess the predictive performance of the forecasting models.

The project defines need as adverse changes in average **income, access to water, healthcare, education, and food**, and provide forecasts for all these dimensions, as well as the aggregate number of people in need. The coverage is global in scope, with a focus on Low and Middle Income Countries, and forecasts are released at both the country level and for sub-national locations of around 55x55 kilometers.

VIEWS-PIN utilizes a combination of **machine-learning techniques**, **advanced statistical tools and big data** management and curation. The forecasts are grounded in a thorough assessment of the drivers of humanitarian need, with particular attention to armed conflict and climate extremes, as well as their compound effects. VIEWS-PIN delves into analyses of the drivers of humanitarian need, mapping, and visualization, and publishing regular reports on key trends in humanitarian need at the country and sub-national levels.

Over 200 million people are in need of humanitarian assistance worldwide, mostly driven by the adverse consequences of climate extremes and violence. Timely, targeted anticipatory action and cost-effective humanitarian assistance are needed to **prevent crises and minimise human sufferings**. The success of these policies, in turn, need to rely on accurate and timely foresight of the magnitude of humanitarian crises and the expected adverse changes induced in the affected populations. VIEWS-PIN fulfils this need. The project contributes to more impactful crisis action, informs earlier and more targeted allocation of resources for increased preparedness, and facilitates anticipatory action and investments where and when they are mostly needed. Decision makers and practitioners around the world can rely on VIEWS-PIN towards **preventing and minimizing shocks, and improving human life and wellbeing in the face of humanitarian crises.**

The project is conducted at the Peace Research Institute Oslo, in partnership with the Department of Peace and Conflict Research at Uppsala University, leading academic institutions for the study of peace and conflict. VIEWS-PIN is part of **VIEWS**, an 'umbrella' research project that studies and provides forecasts for the risk of political violence and its societal impacts in each country and sub-national unit, and for every month up to 3 years into the future. VIEWS also publishes forecasts of the number of fatalities related to three types of violence: *state-based violence* where the use of armed force involves at least one governmental actor; *one-sided* violence which encompasses violent attacks against civilians, and *non-state* violence where two non-governmental groups fight each other. In addition, VIEWS sets out to study and provide forecasts for the impacts of political violence on a range of societal dimension: macro- and micro-economic outcomes, health and psychological wellbeing, access to water, migration and displacement, and political institutions. More information on the project can be found at *viewsforecasting.org.*

Universal Markers	**Gender Equality Marker**	**Risk**
	• GEM2 - GEWE is a significant objective of the Key Activity's overall intent	• Low Risk
Optional Markers	**Fragile Context**	• Yes
Fund Specific Markers	**Funding Window / Direct Cost**	**Funding Windows** • Window B: Analytics that drive critical insights for crisis anticipation, prevention, and response.
	Call for Proposals / Round	**2022** • Second Call for Proposals 2022 (Analytics and AI on Climate Fragility Risks)

Geographical Scope	**Geographical Scope**	**Name of the Region**	**Region(s)**	**Country**
	• Global/Interregional	• Low and Middle Income Countries (LMICs)	• Oceania • Americas • Africa • Asia • Europe	

Participating Organizations and their Implementing Partners	**Participating Organizations**	**Government/ Multilateral/ NGO/ Other**	**New Entities**	**Implementing Partners**
			• PRIO - PRIO	PRIO, Uppsala University

Programme and Project Cost	**Participating Organization**	**Amount (in USD)**	**Comments**	
	Budget Requested			
	PRIO	$700,000.00	Tranche 1: January 2024 -- start date of the project; Tranche 2: January 2025 -- Delivery of Outcome 1	
	Total Budget Requested	**$700,000.00**		
	Tranches			
	Tranche 1 (%)		Tranche 2 (%)	
	Total:	$350,000.00	Total:	$350,000.00
	Other Sources (Parallel Funding)			
		$250,000.00	In-kind funding from Societies at Risk, RJ grant M21-0002	
		$250,000.00	In-kind funding from ANTICIPATE, ERC-Advanced grant n. 101055176	
	Total	**$1,200,000.00**		
Thematic Keywords				
Programme Duration	**Anticipated Start Date**	01-Jan-2024		
	Duration (In months)	24		
	Anticipated End Date	01-Jan-2026		

Narratives

Title	Text

Executive Summary	UN OCHA estimates that over **200 million people are in need of humanitarian assistance worldwide**, mostly driven by the adverse consequences of climate-related extremes and violence (OCHA, 2021). Timely, targeted anticipatory action and cost-effective humanitarian assistance are needed to prevent crises and minimise human sufferings. The success of these policies, in turn, depend on empirically driven, accurate and timely foresight of the magnitude of humanitarian crises and the expected need of assistance. **Climate hazards and armed conflicts often compound** each other, precipitating affected societies in a spiral of violence, vulnerability, and harmful climate-related impacts. Deepening our understanding of how societies respond to compound shocks is critical to provide international support in fragile settings, and to minimise the risk that crises turn into humanitarian disasters. VIEWS-PIN addresses these gaps by providing an **early warning system of need of humanitarian assistance** for all months up to 3 years into the future, and for all Low and Middle Income Countries (LMICs) as defined by the World Bank. We define need as adverse changes in the affected populations' average income, access to water, healthcare, education, and food. The project estimates the impact of armed conflict and climate hazards on all these five dimensions of need and provides monthly forecasts for each of this dimension. Wherever feasible, we also provide aggregate estimates of the number of people in need by aggregating the count of people adversely affected by a change in at least one of the dimensions of need. VIEWS-PIN utilizes a combination of **machine-learning techniques, advanced statistical tools and big data** to provide solid estimates of the need of humanitarian assistance. The forecasting models of need are trained, calibrated, and tested on historical data that are openly available for all LMICs for at least 10 years in the past. The forecasts are grounded in a thorough assessment of the drivers of humanitarian need, with particular attention to armed conflict and climate hazards, as well as their compound effects. Specifically, building on and expanding the infrastructure provided by VIEWS (viewsforecasting.org), the project i) estimates the impact of armed conflict and climate hazards on five major dimensions of humanitarian need: **GDP per capita, access to water, healthcare, education, and food** (OCHA, 2021); ii) produces analyses of the main drivers of humanitarian need and how they interact; iii) based on these estimates, provides both sub-national and country-level forecasts of need, defined as the relative change in affected populations' income, access to water, healthcare, education, and food, and as the number of people in need of assistance; iv) provides mapping, trend lines, visualizations, and policy reports on key trends and patterns in humanitarian need at the country and sub-national levels for every month up to three years into the future, and for all LMICs. Committing to maximal transparency and accessibility, VIEWS-PIN provides open access to data, codebase, and all outputs and outcomes. By offering an improved understanding of societal responses to compound shocks, as well as timely, geographically disaggregated forecasts of need, the project contributes to **more impactful crisis action, informs earlier and more targeted allocation of resources for increased preparedness**, and facilitates anticipatory action and investments where and when they are mostly needed. Decision makers and relevant stakeholders could rely on the results of VIEWS-PIN for scientifically sound, publicly available estimates of need of humanitarian assistance. In turn, improved anticipatory actions and better preparedness may help to prevent and minimize shocks, mitigate the most detrimental consequences of armed conflict and climate hazards, and overall improve human life and wellbeing in the face of humanitarian crises.

Background and General Relevance	In 2022, over 200 million people were in need of humanitarian assistance and protection (OCHA, 2021). Climate-related hazards and armed conflicts are among the main drivers of humanitarian need: not only do they kill and injure people, they also increase the risk of disease outbreaks, poverty, and malnutrition, reduce government effectiveness, encourage authoritarian transitions, slow economic growth and investments, and worsen educational attainments. Some of the most urgent humanitarian emergencies are found in locations exposed to both climate extremes and violence, such as the hunger crises in conflict-ridden South Sudan and Northern Nigeria. This is not surprising, as **armed conflict and climate hazards mutually reinforce** and multiply in a way that make their combined impact greater than the sum of its individual components. On the one hand, the adverse impacts of climate hazards can increase the risk of armed conflicts, especially in regions characterized by low level of development, slow economic growth, a divided society, and unstable political institutions (Nel and Righarts, 2008). The impacts of climate hazards in conflict-affected areas may also intensify or prolong the fighting, whereby they weaken state capacity and reduce available resources for peace efforts (Eastin, 2016). On the other hand, the devastation induced by violence can contribute to turn climate hazards into disasters (Peters, 2022), as conflict-affected societies lack the resources, capacity, and political will to respond to and mitigate the effects of climate impacts. Armed conflicts have devastating effects on various dimensions of societal vulnerability: they destruct capital and infrastructure, lower educational attainment, reduce access to food and water, increase infant mortality and child malnutrition, deteriorate physical and mental health, increase poverty, inhibit economic growth and deteriorate material and immaterial resources. As a result, conflict-affected societies are less and less able to cope with other negative shocks, including those from epidemics, or climate hazards. Armed conflict and climate hazards may therefore give rise to a **cascade of spatially and temporally dependent risks** that lead to a vicious cycle of increased likelihood of conflict and amplified vulnerability to climate shocks (Buhaug and Von Uexkull, 2021). Women are especially affected by both climate extremes and armed conflicts (Augsten et al., 2022). Climate-related natural disasters, especially in agricultural dependent communities, disproportionately expose women to forced migration, discrimination, land and income loss, and food insecurity (Chandra et al., 2017). On average, women are more affected by natural and human disasters due to their weakened capacity to recover (Chandra and Gaganis, 2016), impaired access to land rights, financial resources and social protection mechanisms (Molyneux and Razavi, 2002; Shah et al., 2013), as well as cultural and societal barriers to disaster adaptation and response (Zake and Hauser, 2014). Understanding and anticipating how the exposure to conflict and climate hazards or their combination ('compound shocks' henceforth) affect societies can prevent a crisis to turn into a humanitarian disaster, facilitate earlier, more targeted anticipatory actions, and encourage a cost-efficient allocation of resources. By relying on transparent, scientifically sound information on the main drivers of humanitarian need, and on a solid understanding of the main **hotspots of need** in the future months and years, policymakers can allocate resources for better preparedness and response, help increase the resilience of affected societies, and minimise the impacts of armed conflict and climate shocks. VIEWS-PIN addresses this need, and provides **monthly forecasts of five major dimensions of need** (GDP per capita, access to water, healthcare, food, and education), as well as an aggregate estimate of the number of people in need of humanitarian assistance, at both the **country and the 'PRIO-GRID' level** (a sub-national area of around 55x55km at the equator; Tollefsen et al., 2012). We empirically relate the forecasts to the exposure to conflict and climate extremes, to provide an improved understanding of the causal mechanisms linking compound shocks to humanitarian crises. The project curates and updates spatially and temporally disaggregated data on armed conflict for **all LMICs** from the Uppsala Conflict Data Program (Pettersson et al., 2021), weather data from Copernicus ERA5, and socio-economic indicators from various sources including the Institute for Health Metrics and Evaluation (IHME, 2020). As some sectors of society may be particularly vulnerable to both human and natural-induced shocks, the project uses data sources and provides quantitative forecasts disaggregated by age and gender group.

Theory of Change	IF VIEWS-PIN provides (1) an improved understanding of how and under what circumstances armed conflict, climate hazards, and their combination are major drivers of humanitarian need and (2) solid, granular, reliable forecasts of the need of humanitarian assistance due to conflict and climate hazard, **THROUGH** A systematic review of the literature on the drivers of need, **AND** mapping and quantification of people exposed to armed conflict and climate hazards THROUGH the expansion to global coverage of the VIEWS database on conflict, weather, and humanitarian data at country and sub-national level **AND** an expansion of the ViEWS pilot system to provide forecasts of armed conflict globally AND to forecast need in LMICs at country and sub-national level for every month up to 3 years ahead **THROUGH** a systematic assessment of data to estimate measurement error, minimise bias, and improve forecasting performance AND the training, calibration, testing, and validation of statistical and machine-learning models models to estimate the effect of armed conflict, climate hazards, and the combination thereof on need **AND** a systematic analysis of the uncertainty of the forecasts developed **AND** the development of interpretative tools, visualisations and analytics to illustrate the forecasts **THEN** VIEWS-PIN can inform decisions regarding early and/or anticipatory action **THROUGH** dissemination of results and insights, and reliable, timely, granular forecasts of need in formats that are tailored to the user groups **AND** co-produced policy reports to highlight hotspots of humanitarian need in the future **AND** a realistic assessment of the uncertainties of the provided forecasts **THROUGH** the commonly accepted knowledge that reliable, early, and cost-effective anticipatory actions can mitigate the impacts of shocks and minimise suffering **AND** that reliable, early, and cost-effective anticipatory actions depends on solid, granular, reliable forecasts of the need of humanitarian assistance, as well as on an improved understanding of the drivers of need. **IF** Relevant decision-makers act on the insights and forecasts provided by VIEWS-PIN **THEN** The humanitarian impact of armed conflict and climate hazards will be less severe, since earlier, dignified anticipatory action for crisis response will be possible and the anticipatory action will be better informed. Overall, the project has a broad range of societal, economic, scientific, and environmental impacts that overall enable improved preparedness in response to crises. From a socio-political standpoint, forecasts of need will foster efficient, early, and targeted anticipatory action, better preparedness, and improved strategies for crisis prevention. Economically, forecasts of need can increase the cost-efficiency of prevention strategies, minimising adverse impacts of compound shocks. Scientifically, the project advances understanding of key drivers of humanitarian need and provides knowledge analytics and tools to assess compound risks. Environmentally, VIEWS-PIN develops theoretical and empirical insight of how needs are shaped by compound risks and how violence exacerbates the impacts of climate hazards, to inform policies aimed at increasing adaptive capacity and resilience.

Methodology	VIEWS-PIN defines need as adverse changes in average income, access to water, healthcare, education, and food. We rely on three main steps to predict need, detailed as follows. 1) **Empirical estimation of the impact of natural disasters and armed conflicts on need.** This step requires the collection of data on input (disasters and conflict) and output (need) variables. Data on climate hazards and natural disasters are drawn from Copernicus ERA5 and EM-DAT respectively. Data on violence are drawn from the Uppsala Conflict Data Program. Accordingly, we distinguish three types of violence: state-based conflict involves the use of armed force from one or more governmental actors leading to at least 25 fatalities in a country-year; non-state violence involves two organised non-governmental groups; one-sided violence refers to attacks against civilians. These data sources provide geographically precise data on the local magnitude of the hazard. We also collect geographically disaggregated, time-variant data on need indicators for all LMICs: GDP data from Tollefsen et al. (2012), Kummu et al. (2018) and Murakami and Yamagata (2019); data on food access from Local Burden of Disease (LBD, 2020), complemented by data on food security by Fewsnet; data on access to water and sanitation from LBD WaSH (2020); data on access to healthcare and education from IHME and GHDx (Weiss et al., 2020; LBD VCC, 2020; LBD EAC, 2019). The number of people in need is estimated by aggregating the count of people negatively affected by changes in at least one dimension of need (income, healthcare, access to water, food, education). Next, we empirically estimate the impact of climate hazards and natural disasters, conflict, and the combination thereof, on need. Statistical methods include fixed effect regression models, non-parametric approaches, and more complex spatial models to estimate the number of people exposed to multiple shocks. 2) **Forecasting of political violence globally at both the country and geographically disaggregated level.** This step relies on the existing VIEWS conflict forecasting system, expanded to cover all countries and PRIO-GRID cells globally. VIEWS currently generates monthly predictions of the probability of at least one conflict fatality for every PRIO-GRID level in Africa and Middle-East, and the risk of at least 25 deaths in all countries globally from each type of violence defined by UCDP. VIEWS also forecasts the number of fatalities associated with political violence for both countries and PRIO-GRIDs. The distribution of conflict fatalities is challenging to predict: most observations between 1990 and 2020 are zeros (no conflict) but there are rare cases where conflicts are extremely lethal. This means that the models tend to be surprised by conflict outbreaks or de-escalation. However, VIEWS models are sufficiently flexible to learn quickly from short-lived signals, and adjust their expectations accordingly. VIEWS exploits this signal by maximising the amount of data available for training and testing the models (Hegre et al., 2021). The recent addition of a topic model that relies on information from the news (Mueller and Rauh, 2022) further contributes to increase models' accuracy. To address the challenges raised by the definition and distribution of conflict, we will perform a systematic assessment of armed conflict data based on an expert elicitation with UCDP's team, and incorporate new approaches from the ANTICIPATE project to estimate the measurement uncertainty around fatalities, as well as provide adjusted fatality estimates that correct for reporting bias. More accurate conflict data will help improve predictive performance. 3) **Monthly forecasts of different dimensions of need of humanitarian assistance.** The final step integrates the outputs of steps 1-2 in an expanded data and modelling setup, and adapts the VIEWS pipeline to produce forecasts of need. We use state-of-the-art methods and machine-learning techniques, including decision-tree based algorithms, Markov Models and Neural Networks. Input data and modeling algorithms are combined using ensembles to yield superior predictive performance. We explore two modes of forecasting need. In the first, we derive forecasts of conflict and natural disasters (step 2) and combine them with the estimated effect of these on need (step 1) to obtain the forecasts. Alternatively, we formulate the forecasting models with the need indicators as the outcomes and make use of the data collected in step 1 and 2 as predictors. We expect the latter approach to yield the most precise results, but believe the former is valuable to understand what drives the forecasts we produced. In some cases, we do not have access to high-quality, geographically precise data for the need outcomes for the most recent years. In those cases, we apply nowcasting techniques to estimate the current situation, making use of more updated data at the country level if available.

Alignment with and Commitment to CRAF'd Principles	VIEWS-PIN is fully aligned with CRAF'D principles, as elaborated below for each of them. 1) VIEWS-PIN studies how armed conflict and climate hazards impact humanitarian needs, and produces monthly forecasts of need of humanitarian assistance in LMICs, which are mostly vulnerable to human and natural disasters. At its core, VIEWS-PIN prioritizes and benefits the interest of populations in fragile settings, and argues that alleviating human suffering and minimising the negative impacts of human and naturally induced disasters is possible if we share solid, transparent, timely information based on validated and accurate statistical models, informed by decades of empirical research. We believe that a transparent early warning system that is shared with policymakers and stakeholders can inform better, earlier, and more targeted anticipatory actions for increased preparedness and humanitarian response. Consistently, we only use open access input data, commit to full transparency in our modelling approach, release all forecasts publicly, and maximise stakeholders' engagement via a co-production of policy reports, monthly newsletters, social media tools, and an interactive website including a data dashboard. 2) VIEWS-PIN fully commits to the principle that CRAF'D ecosystem can only be sustainable if partners share risks burdens and benefits. Accordingly, VIEWS-PIN relies on an established network of academic and non-academic institutions across different fields, and is supported by a number of long-term research funding (see also point 5). 3) VIEWS-PIN fully commits to a responsible use of data in compliance with the FAIR principles. First, VIEWS-PIN is aimed at common good and accessible. The engagement with policy-makers, IGOs, NGOs and the wide public ensures that the project is oriented towards societal needs and guarantees that the results are disseminated to agents that operate for the common good. Second, the system is continuously monitored and resilient. VIEWS-PIN informs users about the use of machine-learning algorithms in any project-related outcome and activity, and makes the code and data used in the project fully accessible and transparent. The data and code management is continuously monitored to guarantee maximal security. VIEWS, on which VIEWS-PIN will rely, has already developed a highly advanced and robust digital infrastructure to handle data ingestion and updating, training of state-of-the-art machine-learning models to forecast political violence, updating and posting predictions monthly based on the most recent data. The third iteration of this infrastructure (VIEWS3) has recently been put in production. Users can interact with the VIEWS3 system using a web-based CLI called viewser, albeit such use requires a database certificate/special access. VIEWS3 and viewser are documented in a suite of open-source GitHub repositories. To guarantee safety and transparency, the database as well as the need forecasting model runs produced by VIEWS-PIN will be completely versioned; new versions will be automatically produced through a custom-made backup-and-store process every week, as well as after each data update. A unique copy of the database will be created with each backup and stored separately, to prevent data tampering or corruption. Lastly, VIEWS-PIN methods, data and outcomes are fair and diverse and minimise the potential for exclusion. Equal respect for the moral worth and dignity of all human beings is ensured, by combining a diverse, expanded, data collection with an accessible communication and maximal involvement of relevant stakeholders. 4) VIEWS-PIN gives open access to all outputs using inter-operable and open data standards. The system is fully transparent. To maximise accessibility, all input data utilized by VIEWS-PIN will be open access. VIEWS already gives open access to its source code and output data through a GitHub repository (https://github.com/prio-data/viewsforecasting) and an API (https://github.com/prio-data/views_api), respectively. Input and output data in VIEWS-PIN will be fully inter-operable, thanks to the integration of unique country-level (ISO-codes and codes from Gleditsch and Ward, 1999) and sub-national identifiers (PRIO-GRID from Tollefsen et al., 2012). The project will make use of innovative tools (such as surrogate models), as well as maps and plots that enhance the readability and help the interpretation of the results for non-experts. VIEWS-PIN will continuously test and validate the forecasting performance of its models, including by performing rigorous `retrospective' evaluations of how the models fare when evaluated against unseen, future observations (as in Hegre et al., 2021). As part of the VIEWS-PIN project, we will complement the existing conflict forecasts with measures of uncertainty that will ease the understanding of conflict risks from policymakers and stake-holders. 5) As VIEWS-PIN relies on a complex theoretical, methodological, and data-processing infrastructure, we would allocate funding from complementary projects to support its completion and guarantee its feasibility. In particular, we would support VIEWS-PIN with an additional 0.5M USD funding from VIEWS -- ongoing research programs for which we have secured funding until 2027. This additional funding would maintain a solid foundation and ensure continuous support to the infrastructure that is necessary to run the proposed research, while at the same time avoiding double-funding. Funding by CRAF'D would only be allocated to the theoretical, methodological, and data-management expansion that are needed to accomplish the specific goals of VIEWS-PIN i.e. to study humanitarian need, and to provide temporally and spatially disaggregated forecasts of need in LMICs.

CRAF'd Data Ecosystem Impact & Use Cases	VIEWS-PIN will publish **open-access, accurate, reliable forecasts of the need** of humanitarian assistance. The forecasts will be made publicly available through frequent policy reports, as well as a newsletter that is openly shared with stakeholders, policymakers and any other interested end-user. Forecasts of the people in need will also be presented through an interactive dashboard available in a dedicated section of the existing VIEWS website, complemented by tailor-made, user-friendly analytics and assessments. The strategies to actively engage stakeholders and encourage the use of forecasts are summarised as follows: • Targeted and/or country-specific policy reports • Dedicated quarterly newsletter to briefly and intuitively summarize the forecasts of humanitarian need, making use of easy-to-read visualisations and maps of hotspots and drivers of need. • Fast-paced engagement and interactions with practitioners and stakeholders through social media, via the VIEWS dedicated Twitter (or similar) and LinkedIn account and/or a targeted social media accounts created for VIEWS-PIN. • A dedicated, open and user-friendly section in the 'umbrella' VIEWS website (viewsforecasting.org) that will make tailored/ready-to-use outputs available to the target audience, summarise the objectives, output, and methodology of VIEWS-PIN, provide news and updates, and link to additional material including reports and academic publications. • Participation of the research team and presentation of the project results in policy-oriented workshops on forecasting which gather academics and practitioners, such as the workshop organized annually by the German Center for Crisis Early Warning (KompKFE). We plan to target national and local **decision-makers, practitioners, and/advocates such as UN agencies, the World Bank, IGOs and governmental organizations**, as users for the forecasts by: • Building on and expanding the existing network of IGOs, NGOs, and government agencies that the VIEWS project has secured throughout the years. VIEWS has collaborated with (and has received funding funding from) various UN agencies (UNESCWA, UNHCR), the World Bank, and the UK FCDO. • Policy reports of foreseen emergency situations and key drivers thereof, including visual tools and analytics of humanitarian needs, disaggregated by group (e.g., women, children), and sector (economic conditions, access to food, water, healthcare, education). The targeted policy reports will be co-produced with stake-holders and decision-makers: co-production of knowledge will be ensured by a dynamic and continuous engagement through bilateral and multi-lateral meetings in person and online. • Continuously presenting the results of the projects (via the channels illustrated above, other than more academic outlets) and actively soliciting end-users, decision makers, and stakeholders to provide feedback -- via email, informal meetings and workshops -- in order to maintain a dynamic and engaged discussion on what aspects of the projects are useful from a policy perspective and what could be improved. Stake-holders and users will leverage VIEWS-PIN insights and outputs for improved decision-making, earlier, more targeted and more dignified programming for conflict prevention and mitigation, and resource allocation aimed at minimising human suffering in the face of crises.
Sustainability	The sustainability of VIEWS-PIN is guaranteed by the overarching **VIEWS infrastructure**, which have funding well beyond the duration of this project. The existing projects under the umbrella of VIEWS are essential to support the feasibility of the research project that we propose here. VIEWS provides and maintains the data-management and methodological infrastructure that are needed to train and test the forecasting models, as well as a consistent theoretical framework, and facilitates the expansion of the pipeline that is necessary to provide monthly forecasts of different societal indicators of need at both the country and the geographic level. The provision of monthly forecasts of need will be enabled by multiple factors: • the development of an automatic codebase to store, clean, process, and manage input and output data; • a flexible, open-access modelling infrastructure based on the existing VIEWS system to forecast armed conflict, which can be expanded to include other outcomes; • the consolidated experience of the VIEWS team in machine-learning, forecasting, and big data analytics and tools; • the utilisation of only publicly available data; • a commitment to principles of transparency, safety, and openness in the use of data, which mitigates risks of data leakage, loss and corruption; • a collaborative implementation and early sharing of the codebase for data retrieval and modelling which minimises the potential for human mistakes and guarantees an efficient debugging.
Scalability	VIEWS-PIN has potential to be **expanded to all countries** in the world. VIEWS already produces forecasts of conflict risk and fatalities globally for every country-month. An expansion of the conflict forecasts to global at the PRIO-GRID-month level is in process, and can be easily finalized with CRAF'D funding. While the expansion of the forecasts of humanitarian need to cover all countries globally is feasible and can be reasonably achieved as an extension to the proposed project, a global provision of sub-national forecasts of need is, at the moment, constrained by data availability. Input and output data at a sufficient spatial and temporal granularity are not currently available to enable the provision of global forecasts of need at the PRIO-GRID level. However, expansions of this project can **overcome data constraints** by supplementing existing observational and modelled data with cross-national, longitudinal surveys. Subject to new data from surveys and other geographically disaggregated indicators of need becoming available, a global expansion of the forecasts of humanitarian need at the sub-national level can be achieved at low costs, given the flexible data and modelling infrastructure provided by VIEWS and expanded by VIEWS-PIN.

Innovation	VIEWS-PIN is **ambitious and innovative** in all its dimensions: no previous effort has produced systematic estimates and forecasts of need. The project sheds light on the main drivers of need of humanitarian assistance, provides empirically validated estimates of the impacts of climate hazards and armed conflict on need, and publishes monthly forecasts of people in need for both the country and the sub-national level. Several elements ensures the feasibility of the project and enables us to solve previous challenges: • first, the increasing availability of spatially disaggregated data on socio-economic indicators, climate hazards and armed conflict for all LMICs; • the open-access infrastructure provided by VIEWS to forecast armed conflict and related fatalities for every month up to 3 years into the future (Hegre et al., 2019; 2021); • the recent progress of machine-learning and statistical methods to forecast zero-inflated outcomes with challenging distributions (Hegre et al., 2022); • an enhanced pool of evaluation metrics to appropriately test and assess the predictive performance of forecasting models (Vesco et al., 2022); • increasing awareness about the measurement uncertainty around armed conflict data and approaches to address the challenges arising from it (Williams et al., 2022); • a considerable shift of the international community and development agencies away from reactive policies and towards anticipatory actions. VIEWS-PIN will introduce a number of **innovations from a scientific, societal, and environmental perspective**. The project contributes to the academic literature on the impacts of armed conflict and compound events on societal well-being, advances collective knowledge on the drivers of humanitarian need, and produces the first systematic forecasts of need up to three years ahead. Societally, the release of accurate, transparent forecasts of need for all LMICs will assist better, earlier, more dignified anticipatory actions that minimize human suffering in response to climate hazards and armed conflict. Environmentally, improved understanding of the impact of climate hazards and natural disasters on the exposed population and their needs can inform policy strategies aimed at supporting the resilience and boosting the adaptive capacity of exposed population, while minimising damages.
Cost Effectiveness	The VIEWS track record and existing infrastructure ensure that the objectives of VIEWS-PIN are met in the most timely and cost-efficient manner. Cost-effectiveness is maximised by various elements: • the long-lasting experience of the VIEWS team in producing openly available forecasts of political violence; • a flexible, transparent data infrastructure that enables easy processing and management of input and output data; • an open access, empirically validated modelling pipeline that trains, calibrates, and tests machine-learning models to forecast conflict and can be expanded to forecast additional outcomes; • a multi-decadal experience of the UCDP team in coding, vetting, and releasing data on armed conflict; • a solid network of decision-makers and stakeholders, including various UN agencies, which have ongoing collaborations with VIEWS and can maximise the project's outreach and dissemination. The system put in place by VIEWS, which constitutes the foundations of the proposed project, has been running since 2017, initiated with the support of an **ERC-Advanced Grant** (694640) of almost 2.5 million euros. Throughout the years, VIEWS was developed, refined, and expanded with additional funding from the UN ESCWA, UNHCR, and the UK FCDO, and it is currently funded by many research grants, including a new ERC-Advanced grant (**ANTICIPATE**), and funding from RJ (**Societies at Risk**). VIEWS-PIN relies on the infrastructure, modelling setup, and theoretical knowledge developed by the VIEWS consortium, and is supported by in-kind funding sources that will enable its completion. The outcomes of the VIEWS-PIN project are only possible thanks to VIEWS pre-existing work that has benefitted from an investment of almost 3 million euros. It is evident that by relying on the existing VIEWS infrastructure, the previous theoretical and methodological work conducted by the team, and the support of in-kind funding, we are able to minimise the request of funding to CRAF'd and achieve the objectives of the VIEWS-PIN project in the most cost-effective way.

SDG Targets

Target	Description
Main Goals	
Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development	
TARGET_17.14	17.14 Enhance policy coherence for sustainable development
Secondary Goals	
Goal 13. Take urgent action to combat climate change and its impacts2	
TARGET_13.1	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build ef...	
TARGET_16.1	16.1 Significantly reduce all forms of violence and related death rates everywhere
TARGET_16.a	16.a Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime

SDG Indicators

Indicator Code	Description
C200303	13.1.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population

Indicator Code	Description
C160102	16.1.2 Conflict-related deaths per 100,000 population, by sex, age and cause
C160a01	16.a.1 Existence of independent national human rights institutions in compliance with the Paris Principles
C171401	17.14.1 Number of countries with mechanisms in place to enhance policy coherence of sustainable development

Contribution to SDGs

Participating Organization	% TARGET_13.1	% TARGET_16.a	% TARGET_17.14	% TARGET_16.1	% Total
PRIO	40	25	10	25	100
Total contribution by target	**40**	**25**	**10**	**25**	
Project contribution to SDG by target	**40**	**25**	**10**	**25**	**100**

List of documents

Document	Document Type	Document Source	Document Abstract	Document Date	Classification	Featured	Status	Modified By	Modified On
PRIO_Prodoc_231124.pdf	Pro Doc	Project	ProDoc signed by CRAF'd Secretariat	24-Nov-2023	Internal	No	Finalized	jauer@un.org	24-Nov-2023 8:46:22 AM
CRAFD_Indicators_Measuring_VIEWS_PIN.xlsx	Other Docs	Project	Table 1. List of RBM Indicators and measures and tools to verify/monitor the progress in achieving the target value. The table is the same as reported in the RBM Manage Indicators section in the online platform, with the addition of a 'Definition and measuring of target' column which reports how we specifically define and monitor the progress in achieving the target value.	17-Apr-2023	Internal	No	Draft	paoves@prio.org	17-Apr-2023 7:32:18 AM
TOC_VIEWS-PIN.jpeg	Other Docs	Project	Figure 1. VIEWS-PIN Theory of Change (TOC). The Figure details the project inputs, outcomes, outputs, impacts, and assumptions.	09-Mar-2023	Internal	No	Draft	paoves@prio.org	09-Mar-2023 2:50:32 PM

Project Results

Outcome	Output	Description
1. Enhanced understanding of drivers of humanitarian need		Empirically-driven understanding of societal responses to compound risks, and enhanced insight on how climate hazards, armed conflict, and their combination affect need and its key dimensions
	1.1 Systematic review of the literature on the drivers of need	Systematic review of the literature on the drivers of need

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Systematic search of the literature on humanitarian need	Keyword search in repositories and databases to identify articles on drivers of humanitarian need	PRIO - PRIO		
Definition of criteria for articles inclusion and exclusion	Definition of criteria for including and excluding articles in the systematic review	PRIO - PRIO		
Selection and review of relevant articles on humanitarian needs	Scanning, selection and preliminary review of selected articles	PRIO - PRIO		
Analysis of empirical studies on drivers of need	Analysis of empirical findings from the selected studies on the impacts of armed conflict, climate hazards, and compound shocks on humanitarian need	PRIO - PRIO		

Outcome	Output	Description
	1.2 Retrieval, download, storage, and curation of weather data	Design of transparent codebase for retrieving, cleaning, storing, processing and aggregating weather data to the country and PRIO-GRID level, and ingesting it into the VIEWS infrastructure

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Codebase to retrieve and store climate data	Codebase to retrieve and store climate data: Design and integration of a transparent codebase to retrieve, download, and store weather and climate seasonal data from Copernicus ERA5	PRIO - PRIO		
Processing, curation and ingestion of climate data	Design and integration of a transparent codebase to curate and process weather and climate seasonal data from Copernicus ERA5, compute Climate Extreme Indices, aggregate them to the PRIO-GRID and country level, and ingest them in the VIEWS infrastructure	PRIO - PRIO		

	1.3 Retrieval, download, storage, and curation of data on indicators of need	Design of transparent codebase for retrieving, cleaning, storing, processing, aggregating data on need to the PRIO-GRID and country-level, and ingesting it into the VIEWS infrastructure

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Codebase to retrieve, store, clean, process and ingest data on different dimensions of need	Design and integration of a transparent codebase to retrieve, download, store, clean, process, aggregate, and ingest data on income, access to healthcare, water, food, education into the VIEWS platform	PRIO - PRIO		

	1.4 Mapping and quantification of people exposed to armed conflict and climate hazards	Mapping and quantification of the spatial overlay of armed conflict and climate hazards, to estimate the number of people exposed to compound shocks

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Spatial models to quantify the number of people exposed to armed conflict and climate hazards	Development of spatial models for mapping and quantification of the spatial overlay of armed conflict and climate shocks, for estimating the number of people exposed to compound shocks	PRIO - PRIO		

	1.5 Models to estimate the effect of armed conflict, climate hazards, and the combination thereof on need	Statistical and machine-learning models to estimate the effect of armed conflict, climate hazards, and the combination thereof on need

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Statistical models of drivers of need	Design, training and validation of statistical and machine-learning models to estimate the effects of armed conflict, climate and compound shocks on need	PRIO - PRIO		

2. Improved conflict forecasting accuracy and enhanced spatio-temporal coverage of conflict forecasts		Improved conflict forecasting accuracy thanks to an expanded spatial and temporal coverage of VIEWS armed conflict forecasts and improved estimates of uncertainty in conflict data

Outcome	Output	Description
	2.1 Expanded spatial and temporal coverage of armed conflict forecasts	Expansion of the ViEWS pilot system to provide forecasts of armed conflict globally at the PRIO-GRID-month level

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Expanded coverage of VIEWS conflict forecasts	Expansion of the VIEWS data infrastructure and modelling pipeline to provide forecasts of armed conflicts for all countries and all PRIO-GRID cells globally for every month up to 36 months ahead	PRIO - PRIO		

	2.2 Systematic assessment of conflict data to improve forecasts	Systematic assessment of input conflict data to estimate measurement error and uncertainty, minimise bias, and improve forecasting accuracy

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Survey on conflict measurement uncertainty	Survey with UCDP team to obtain experts' probabilistic assessments of measurement uncertainty in conflict data	PRIO - PRIO		
Probability distribution of 'corrected' fatality estimates	Draw probability distribution of 'corrected' fatality estimates that account for measurement uncertainty	PRIO - PRIO		
Nowcasting model for more precise conflict data	Nowcasting modelling to approximate high-quality, annual UCDP-GED data based on the monthly UCDP-candidate data	PRIO - PRIO		
New modelling approaches to estimate conflict uncertainty	Incorporate new approaches to estimate uncertainty in conflict fatalities from ANTICIPATE project	PRIO - PRIO		

3. Enhanced early warning system of need of humanitarian assistance		Early warning of need and its key components; policy reports presenting the forecasts of people in need, including visual tools and analytics of emergency situations, disaggregated by group (women, children..), and sector (economic conditions, access to food, water, healthcare, education)
	3.1 Machine learning models to forecast need	Training, calibration, testing of machine learning models to forecast need for all LMICs at the country and sub-national level for every month up to 3 years into the future

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Training of machine-learning forecasting models of need	Training of machine-learning models to forecast need for all LMICs at the country and sub-national level for every month up to 3 years into the future	PRIO - PRIO		
Calibration of the forecasting models	Calibration and testing of forecasting models of need against historical data	PRIO - PRIO		
Models to link monthly input data to annual output data	Development of statistical models to link conflict and climate data available at a monthly resolution to outcome variables that are available only at coarser temporal resolutions, e.g. annual data for need indicators	PRIO - PRIO		

	3.2 Validation of the forecasting models	Out-of-sample evaluation of the models' forecasting accuracy against historical data

Outcome	Output	Description
	Activities	

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Validation of need forecasting models	Out-of-sample evaluation and cross-validation of machine learning models to forecast need for all LMICs at the country and sub-national level for every month up to 3 years into the future	PRIO - PRIO		

	3.3 Interpretative tools and analytics	Design of interpretative tools, visualisations and analytics to illustrate the forecasts

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Interpretative tools and analytics	Design of codebase to produce interpretative tools, visualisations and analytics to illustrate the forecasts	PRIO - PRIO		

	3.4 Policy reports on hotspots of humanitarian need	Co-production of policy reports to highlight key hotspots of need in the future

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Policy reports writing and editing	Drafting of policy reports to highlight key hotspots of humanitarian need in the future	PRIO - PRIO		
Stakeholders engagement	Continuous and dynamic engagement with policymakers and stakeholders for the co-production of reports	PRIO - PRIO		

	3.5 Outreach and communication	Communication, outreach, and dissemination of results of the need forecasts

Activities

Title	Description	Lead Participating Organization	Participating Organization	Other Organizations
Communication and outreach activities	Communication, outreach, and dissemination of the forecasts of need to policymakers, end-users, stakeholders, IGOs, NGOs	PRIO - PRIO		

Signature Indicators

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
No signature indicators available.												

Imported Fund Outcome / Output Indicators

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
Stakeholders that use project outputs to support crisis action.		This indicator aims to measure the extent to which entities use project outputs for crisis action, including for programming, decision-making, and resource allocation.	Surveys, interviews, analysis of public policy documents/emergency response plans/reports, other documents.	Capacity	Yearly	Global	Number	0	2024	10	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.5 Outreach and communication

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
	Stakeholders that use project outputs for crisis anticipation,	This indicator aims to measure the extent to which the project outputs are used by entities specifically for crisis anticipation, including for programming, decision-making, and resource allocation.	Surveys, interviews, analysis of public policy documents/emergency response plans/reports, other documents.	Capacity	Yearly	Global	Number	0	2024	10	2025	
	Stakeholders that use project outputs for crisis prevention.	This indicator aims to measure the extent to which the project outputs are used by entities specifically for crisis prevention, including for programming, decision-making, and resource allocation.	Surveys, interviews, analysis of public policy documents/emergency response plans/reports, other documents.	Capacity	Yearly	Global	Number	0	2024	5	2025	
	Stakeholders that use project outputs for crisis response.	This indicator aims to measure the extent to which the project outputs are used by entities specifically for crisis response, including for programming, decision-making, and resource allocation.	Surveys, interviews, analysis of public policy documents/emergency response plans/reports, other documents.	Capacity	Yearly	Global	Number	0	2024	10	2025	
Project partners involved in the implementation of the project.		This indicator aims to measure the number project partners ('participating organizations' and 'implementing partners') involved in the implementation of the project.	Internal tracking.	Capacity	Yearly	Global	Number	0	2024	1	2025	**Outcome:** 2. Improved conflict forecasting accuracy and enhanced spatio-temporal coverage of conflict forecasts **Output:** 2.2 Systematic assessment of conflict data to improve forecasts
Downloads and/or users of project outputs.		This indicator aims to measure the use and dissemination of project outputs by tracking the number of downloads and/or users of the project outputs.	Surveys, interviews, internal statistics.	Capacity	Yearly	Global	Number	0	2024	1000	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.5 Outreach and communication

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
External reports and other tangible products that feature data or analytics from the project.		This indicator aims to measure external reports and other tangible products that feature data or analytics from the project.	Internal tracking.	Other	Yearly	Global	Number	0	2024	500	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.4 Policy reports on hotspots of humanitarian need
Datasets provided by the project.		This indicator aims to measure the provision and dissemination of datasets by the project to stakeholders.	Internal tracking.	Capacity	Yearly	Global	Number	0	2024	4	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.5 Outreach and communication
	Datasets provided with granularity at the sub-national level or below (spatial resolution).		Internal tracking.	Capacity	Yearly	Global	Number	0	2024	2	2025	
	Datasets provided with at least monthly granularity, (temporal resolution).		Internal tracking.	Capacity	Yearly	Global	Number	0	2024	4	2025	
	Datasets provided that are disaggregated by sex, age, disability, etc. (at least one).		Internal tracking.	Capacity	Yearly	Global	Number	0	2024	2	2025	
	Datasets provided with open access.		Internal tracking.	Capacity	Yearly	Global	Number	0	2024	4	2025	
	Datasets provided in non-proprietary formats,	E.g., csv, json, xml, txt, sql (not dta, spss or similar proprietary file formats).	Internal tracking.	Capacity	Yearly	Global	Number	0	2024	4	2025	
Analytics products provided by the project.		This indicator aims to measure the provision and dissemination of analytics products by the project to stakeholders.	Internal tracking.	Capacity	Yearly	Global	Number	0	2024	10000	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.3 Interpretative tools and analytics

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
	Analytics products that are leveraged for action frameworks, including for anticipatory action.	This sub-indicator aims to measure the provision of analytics products that are action frameworks or part thereof (linking analysis to policy / programming recommendations).	Surveys, interviews, analysis of public policy documents/emergency response plans/reports, other documents.	Capacity	Yearly	Global	Number	0	2024	100	2025	
	Analytics products that allow comparison by sex, age, disability, etc. (at least one).		Internal tracking.	Capacity	Yearly	Global	Number	0	2024	100	2025	
	Analytics products with open access.		Internal tracking.	Capacity	Yearly	Global	Number	0	2024	100	2025	
	Analytics products provided with open source code.		Internal tracking.	Capacity	Yearly	Global	Number	0	2024	1000	2025	
Knowledge and capacity building Initiatives conducted as part of the project.		This indicator aims to measure the provision of knowledge and capacity building initiatives by the project to stakeholders. The indicator reflects the extent to which the project has supported the development of skills, knowledge, and expertise related to the project's goals and objectives.	Internal tracking.	Beneficiaries	Yearly	Global	Number	0	2024	30	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.4 Policy reports on hotspots of humanitarian need
Participants in knowledge and capacity initiatives as part of this project.		This indicator aims to measure the number of individuals who have participated in knowledge and capacity building initiatives provided by the project. The indicator reflects the extent to which the project has engaged stakeholders in the development of skills, knowledge, and expertise related to the project's goals and objectives.	Surveys, registration statistics.	Beneficiaries	Yearly	Global	Number	0	2024	100	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.4 Policy reports on hotspots of humanitarian need

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
	Non-male participants in knowledge and capacity initiatives as part of this project.	This sub-indicator aims to measure the number of non-male individuals who have participated in knowledge and capacity building initiatives provided by the project.	Surveys, registration statistics.	Beneficiaries	Yearly	Global	Number	0	2024	40	2025	
	Participants from fragile and crisis-affected settings in knowledge and capacity initiatives as part of this project.	This sub-indicator aims to measure the number of individuals from fragile and crisis affected settings who have participated in knowledge and capacity building initiatives provided by the project.	Surveys, registration statistics.	Beneficiaries	Yearly	Global	Number	0	2024	20	2025	
	Non-male participants from fragile and crisis-affected settings in knowledge and capacity initiatives as part of this project.	This sub-indicator aims to measure the number of non-male individuals from fragile and crisis affected settings who have participated in knowledge and capacity building initiatives provided by the project.	Surveys, registration statistics.	Beneficiaries	Yearly	Global	Number	0	2024	10	2025	
Publications produced as part of this project.		This indicator aims to measure the number and quality of publications produced by the project, which may include scientific reports, best practices, guidelines, and other types of knowledge products. The indicator reflects the extent to which the project has generated new knowledge, shared best practices, and disseminated findings related to the project's goals and objectives.	Internal tracking.	Capacity	Yearly	Global	Number	0	2024	10	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.5 Outreach and communication

Project Indicators

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
Maps and figures produced as part of this project		This indicator aims to measure the number and quality of analytics and tools produced by the project, which may include interactive dashboards, visualisations, maps and figures.	Maps, dashboard, figures, plots, time trends to represent forecasts of need	Capacity	Yearly	Global	Number	0	2024	10000	2025	**Outcome :** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.3 Interpretative tools and analytics
	No components available.											
Use of the predictions of need produced by the project		This indicator aims to measure the usage of the forecasts produced by the project.	Downloads of the dataset, requests for interactions, visualisations of the website	Capacity	Yearly	Global	Number	0	2024	100	2025	**Outcome :** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.5 Outreach and communication
	No components available.											
Evaluation metrics to assess forecasting performance		This indicator aims at measuring the number of new evaluation metrics implemented and applied to assess the performance of the forecasting models	Number and usage of evaluation metrics	Capacity	Yearly	Global	Number	0	2024	50	2025	**Outcome :** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.2 Validation of the forecasting models
	No components available.											

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
Website visualisations		This indicator aims to measure the number of visualisations of the project website	Number of visualisations of the project website	Capacity	Yearly	Global	Number	0	2024	10000	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.5 Outreach and communication
	No components available.											
Multilateral funding instruments and other entities that use project outputs to facilitate funding decisions		This indicator aims to measure the number of funding instruments and other entities that use project outputs to facilitate funding decisions	Number of of funding instruments and other entities that use project outputs to facilitate funding decisions	Capacity	Yearly	Global	Number	0	2024	TBD	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.5 Outreach and communication
	No components available.											
Funding allocated for crisis action with the support of project outputs		This indicator aims at measuring the amount of funding allocated for crisis action with the support of project outputs	Amount of funding allocated for crisis action with the support of project outputs	Policy	Yearly	Global	Number	0	2024	TBD	2025	**Outcome:** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.5 Outreach and communication
	No components available.											

Indicator Title	Component Title	Description	Means of Verification	Category	Cycle	Scope	Value Type	Baseline Value	Baseline Year	Target Value	Target Year	Linked Outcome / Output
Understanding of the datasets / analytical tools by the key stakeholders		This indicator aims at measuring ofnderstanding of the datasets / analytical tools by the key stakeholders	Level of understanding of the datasets / analytical tools by the key stakeholders	Beneficiaries	Yearly	Global	Percentage	0	2024	TBD	2025	**Outcome :** 3. Enhanced early warning system of need of humanitarian assistance **Output:** 3.5 Outreach and communication
	No components available.											

Risks

Event	Category	Level	Likelihood	Impact	Mitigating Measures	Risk Owner
Data disruption or loss	• Operational	Medium	Unlikely	Moderate	Weekly data backups in safe data storage system, safety measures including firewalls, integration of data in the VIEWS SQL database, two-factor authentication for codebase.	PRIO, Uppsala University
Decreased system credibility due to unexpected and un-forecasted disaster	• Strategic	Medium	Likely	Major	systematic assessment of measurement uncertainty in conflict data to provide better representation of uncertainty and coding bias around fatality estimates, provide adjusted estimates of conflict fatalities, and enhance the representation and visualization of uncertainty in conflict estimates; use of ensembling techniques to improve predictive performance; testing of performance based on innovative evaluation metrics that provide more comprehensive assessment of forecasting accuracy; use of innovative algorithms (Markov Models, Long-Short Term Memory Neural Networks) which have potential to provide accurate predictions for difficult distributions; systematic information to users/the audience about the uncertainties involved	PRIO, Uppsala University
Missingness or limited availability of time-variant, spatially refined output data on different dimensions of need	• Operational	Medium	Possible	Major	use of survey and re-analysis data as alternative to observational data; use of nowcasting techniques to estimate data from the last available estimates; use of multiple imputation techniques to fill in missing data.	PRIO
Constraints to provide immediate open access to the forecasts or other outcomes of the project (articles, data, code)	• Organizational	Low	Unlikely	Minor	Enable users to have access to the data, code, or output upon request; deposit data and metadata in open-access repositories (Github, API, website); provide fast and interactive information about the project through the website, dashboard and newsletter.	PRIO
Obstacles in engaging with policymakers and stake-holders	• Political	Low	Unlikely	Major	Leverage existing VIEWS' network of UN agencies, governmental and non-governmental decision-makers and other stakeholders; draft the policy reports without involving a specific agency, and then present and discuss the main findings at policy-relevant workshops, conferences, high-level meetings and similar; disseminate the results of the project through newspaper articles, podcasts, guest lectures, and blogposts to maximise stakeholder engagement even if obstacles to a direct involvement with policy-makers arise.	PRIO
Controversial interpretation and reaction to the 'need' metric from governments and institutions -- some governments may react against or respond critically to the provision of estimates of people in need, marking them as politicized or unfair	• Social and Environmental • Political	Medium	Possible	Insignificant	Solidly anchor the project on empirical, scientific evidence; avoid any discretionary or subjective definition of need; avoid any normative assumption regarding what 'good' outcomes of the projects are.	PRIO

Budget by UNSDG Categories: Over all

Budget Lines		PRIO (7%) *	Total
1. Staff and other personnel		$369,673.00	$369,673.00
2. Supplies, Commodities, Materials		$42,476.00	$42,476.00
3. Equipment, Vehicles, and Furniture, incl. Depreciation		$2,619.00	$2,619.00
4. Contractual services		$33,334.00	$33,334.00
5. Travel		$6,665.61	$6,665.61
6. Transfers and Grants to Counterparts		$23,429.00	$23,429.00
7. General Operating and other Direct Costs		$176,009.00	$176,009.00
Project Costs Sub Total		**$654,205.61**	**$654,205.61**
8. Indirect Support Costs		$45,794.39	$45,794.39
Total		**$700,000.00**	**$700,000.00**

Budget by UNSDG Categories: 2024

Budget Lines	Fiscal Year *	Description	PRIO (7%) *	Total
1. Staff and other personnel	2024	Direct salary costs (documentable). 1 month salary for PI Hegre; 6 months salary for senior researcher; 12 months for a RA; 6 months for Executive Officer and Project Coordinator.	$173,155.00	$173,155.00
2. Supplies, Commodities, Materials	2024	Server to store and backup input and output data, save and retrieve the predictions and guarantee data security and optimal efficiency	$18,619.00	$18,619.00
3. Equipment, Vehicles, and Furniture, incl. Depreciation	2024	Data and software licences	$1,333.00	$1,333.00
4. Contractual services	2024	Machine learning / data science consultancy helping to set up the data infrastructure and Machine Learning pipeline	$23,810.00	$23,810.00
5. Travel	2024	4 European trips for 1 person, or 2 inter-continental trip for 1 person	$3,332.61	$3,332.61
6. Transfers and Grants to Counterparts	2024	Provision and update of monthly data on armed conflict; systematic assessment of measurement uncertainty in armed conflict fatalities	$18,619.00	$18,619.00
7. General Operating and other Direct Costs	2024	Shared costs at organization level including admin, office costs, IT support (not directly documentable)	$81,469.00	$81,469.00
Project Costs Sub Total			**$320,337.61**	**$320,337.61**
8. Indirect Support Costs			$22,423.63	$22,423.63
Total			**$342,761.24**	**$342,761.24**

Budget by UNSDG Categories: 2025

Budget Lines	Fiscal Year *	Description	PRIO (7%) *	Total
1. Staff and other personnel	2025	Direct salary costs (documentable). 1.5 month salary for PI Hegre; 8 months salary for senior researcher; 12 months for a RA; 5 months for Executive Officer and Project Coordinator	$196,518.00	$196,518.00
2. Supplies, Commodities, Materials	2025	Server to store and backup input and output data, save and retrieve the predictions and guarantee data security and optimal efficiency; consumable costs for project workshop including support to travel costs for the participants, lunch and dinner.	$23,857.00	$23,857.00
3. Equipment, Vehicles, and Furniture, incl. Depreciation	2025	Data and software licences	$1,286.00	$1,286.00
4. Contractual services	2025	Machine Learning/Data Science consultancy to help maintaining and developing Machine Learning forecasting models, data infrastructure and pipeline	$9,524.00	$9,524.00
5. Travel	2025	2 European trips for 1 person, or 1 inter-continental trip for 1 person	$3,333.00	$3,333.00
6. Transfers and Grants to Counterparts	2025	Provision and update of monthly data on armed conflict	$4,810.00	$4,810.00
7. General Operating and other Direct Costs	2025	Shared costs at organization level including admin, office costs, IT support (not directly documentable)	$94,540.00	$94,540.00
Project Costs Sub Total			**$333,868.00**	**$333,868.00**
8. Indirect Support Costs			$23,370.76	$23,370.76
Total			**$357,238.76**	**$357,238.76**

Budget by UNSDG Categories: 2026

Budget Lines	Fiscal Year *	Description	PRIO (7%) *	Total
1. Staff and other personnel	2026			$0.00
2. Supplies, Commodities, Materials	2026			$0.00
3. Equipment, Vehicles, and Furniture, incl. Depreciation	2026			$0.00

Budget Lines	Fiscal Year *	Description	PRIO (7%) *	Total
4. Contractual services	2026			$0.00
5. Travel	2026			$0.00
6. Transfers and Grants to Counterparts	2026			$0.00
7. General Operating and other Direct Costs	2026			$0.00
Project Costs Sub Total			**$0.00**	**$0.00**
8. Indirect Support Costs			$0.00	$0.00
Total			**$0.00**	**$0.00**

Performance-based Tranches Breakdown

Tranche			Total
Tranche 1	PRIO (50%)	$350,000.00	$350,000.00
Tranche 2	PRIO (50%)	$350,000.00	$350,000.00
			$700,000.00

Programme Outcome Costs

Outcome	Output	Activity	Implementing Agent	Time Frame								
				2024				2025				2026
				1	2	3	4	1	2	3	4	1
1. Enhanced understanding of drivers of humanitarian need												
	1.1 Systematic review of the literature on the drivers of need											
		Systematic search of the literature on humanitarian need										
			PRIO	☑	☐	☐	☐	☐	☐	☐	☐	☐
		Definition of criteria for articles inclusion and exclusion										
			PRIO	☑	☐	☐	☐	☐	☐	☐	☐	☐
		Selection and review of relevant articles on humanitarian needs										
			PRIO	☑	☑	☐	☐	☐	☐	☐	☐	☐
		Analysis of empirical studies on drivers of need										
			PRIO	☑	☑	☐	☐	☐	☐	☐	☐	☐
	1.2 Retrieval, download, storage, and curation of weather data											
		Codebase to retrieve and store climate data										
			PRIO	☑	☑	☑	☐	☐	☐	☐	☐	☐
		Processing, curation and ingestion of climate data										
			PRIO	☑	☑	☑	☐	☐	☐	☐	☐	☐
	1.3 Retrieval, download, storage, and curation of data on indicators of need											
		Codebase to retrieve, store, clean, process and ingest data on different dimensions of need										
			PRIO	☑	☑	☑	☐	☐	☐	☐	☐	☐
	1.4 Mapping and quantification of people exposed to armed conflict and climate hazards											
		Spatial models to quantify the number of people exposed to armed conflict and climate hazards										
			PRIO	☐	☑	☑	☑	☐	☐	☐	☐	☐
	1.5 Models to estimate the effect of armed conflict, climate hazards, and the combination thereof on need											
		Statistical models of drivers of need										
			PRIO	☐	☑	☑	☑	☐	☐	☐	☐	☐
2. Improved conflict forecasting accuracy and enhanced spatio-temporal coverage of conflict forecasts												
	2.1 Expanded spatial and temporal coverage of armed conflict forecasts											
		Expanded coverage of VIEWS conflict forecasts										
			PRIO	☐	☑	☑	☑	☑	☐	☐	☐	☐
	2.2 Systematic assessment of conflict data to improve forecasts											
		Survey on conflict measurement uncertainty										
			PRIO	☑	☐	☐	☐	☐	☐	☐	☐	☐
		Probability distribution of 'corrected' fatality estimates										
			PRIO	☑	☑	☑	☑	☑	☐	☐	☐	☐
		Nowcasting model for more precise conflict data										
			PRIO	☐	☐	☑	☑	☑	☐	☐	☐	☐

Outcome	Output	Activity	Implementing Agent	Time Frame								
				2024				2025				2026
				1	2	3	4	1	2	3	4	1
		New modelling approaches to estimate conflict uncertainty										
			PRIO	☑	☑	☑	☑	☑	☐	☐	☐	☐
3. Enhanced early warning system of need of humanitarian assistance												
	3.1 Machine learning models to forecast need											
		Training of machine-learning forecasting models of need										
			PRIO	☐	☐	☐	☑	☑	☑	☐	☐	☐
		Calibration of the forecasting models										
			PRIO	☐	☐	☐	☑	☑	☑	☐	☐	☐
		Models to link monthly input data to annual output data										
			PRIO	☑	☑	☑	☑	☐	☐	☐	☐	☐
	3.2 Validation of the forecasting models											
		Validation of need forecasting models										
			PRIO	☐	☐	☐	☐	☑	☑	☑	☐	☐
	3.3 Interpretative tools and analytics											
		Interpretative tools and analytics										
			PRIO	☐	☐	☐	☐	☐	☑	☑	☐	☐
	3.4 Policy reports on hotspots of humanitarian need											
		Policy reports writing and editing										
			PRIO	☐	☐	☐	☐	☐	☑	☑	☑	☐
		Stakeholders engagement										
			PRIO	☐	☐	☐	☐	☐	☐	☑	☑	☐
	3.5 Outreach and communication											
		Communication and outreach activities										
			PRIO	☐	☐	☐	☐	☐	☐	☑	☑	☐

Signatures

PRIO: PRIO (Manual)

Lars Even Andersen

larsea@prio.org

SIGNATURE: DocuSigned by:

[redacted]

4C4BC740C64A4AD...

DATE: 01-Dec-2023