

CREATING
HOPE
IN CONFLICT:

A HUMANITARIAN
GRAND CHALLENGE

This case study was created
in collaboration with

TRIPLELINE



OUTCOME CASE STUDY

HALA SYSTEMS
DECEMBER 2023

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CASE STUDY SUBJECT

INNOVATION PROJECT TITLE	Scaling Sentry		
NAME OF IMPLEMENTING ORGANIZATION	Hala Systems	TIMEFRAME	1st August 2019-31st December 2020
LOCATION	Northwest Syria	CASE STUDY PERIOD	June-October 2022
GRANT VALUE	CAD \$997,484	GRANT TYPE	TTS3
CASE STUDY AUTHORS	Triple Line: Simon Hale, Clarissa Poulson & Esther Winslow (UK) Jouri: Mohammed Bashar Mahrousa & Mohamad Alhayes (UK & Turkey)		

EXECUTIVE SUMMARY

Creating Hope in Conflict: A Humanitarian Grand Challenge contracted Triple Line Consulting to deliver a series of outcome and value for money case studies for a sample of funded innovations. Below is a summary of the findings of the outcome and value for money case study developed for Hala Systems.

Since 2013, airstrikes have been a significant cause of civilian death in Syria. According to Hala Systems, it is estimated that airstrikes have killed up to 80,000 civilians and injured up to 240,000.¹ During this time, the only known early warning systems available to civilians were manual alarms and human sentries located within the Civil Defence Centres run by White Helmets – Syria Civil Defence.² These consisted of an ad-hoc walkie-talkie network relying on manual activation of sirens, resulting in long warning lead times and limited civilian reach. Its effectiveness was therefore limited. In 2016, Hala Systems began to develop an early warning system, Sentry, using multiple information sources to deliver accurate, automated and timely warnings giving civilians and humanitarian actors time to take protective measures and thus reduce casualty numbers. Sentry warnings are triggered when the system receives multiple credible reports of incoming aircraft. Reports are validated and analysed by algorithms and analysis triggers an alarm delivered through multiple communication channels. The comprehensive data collected can also be used by humanitarian actors and the media for accountability reporting and evidence.

INTERMEDIATE OUTCOMES ACHIEVED, THEIR SIGNIFICANCE AND CHIC CONTRIBUTION

OUTCOME 1 – CHIC support to achieve scale and sustainability. Despite Covid-19 and the challenges faced by increased internally displaced populations, Hala Systems overachieved the CHIC grant intention of scaling the Sentry alarm system to new areas and new partners, installing 426 devices in 261 locations (against a target of 200) and training intermediaries in hospitals in how to use and maintain the devices. The Sentry system is estimated to reach 2.2 million people. Hala Systems now receives unsolicited partnership opportunities to expand service delivery into new geographies and contexts, demonstrating a new turning point in the maturity of the organisation. The Sentry alarm system, as it has been rolled out within Syria, cannot be directly applied to other contexts due to the unique nature of each conflict, however the work done through the CHIC grant to refine and develop Sentry positions it to be adapted and applied in many other contexts. CHIC support included flexible funding and technical assistance.

OUTCOME 2 – Further investment and completion of seed phase. In all a total of USD 15.5m in additional investment had been secured by Hala Systems.³ This included multi-year Government grants worth over USD 10m from the USA, UK, Canada, Netherlands and Germany, as well as USD 3.5m series A investment funding to diversify the platform. Hala Systems established a wide-ranging set of partnerships both at global level and on the ground during the grant period, with many different types of organisations: private enterprise, academia and NGOs. Hala Systems attained ‘successful completion’ of their project within their extended timelines, largely meeting milestones and output targets.

OUTCOME 3 – Use of innovation by vulnerable populations affected by conflict and by humanitarian responders. Hala Systems’ end users include both individual civilians and agencies running health, education and community centres. Hala estimates that by the end of the grant, more than 812,000 people were protected by Sentry warnings, delivered both directly and indirectly and including through social media, and Sentry was deployed in 31 towns

¹ Hala Systems Final Progress Report Jan 2021

² Interview with SCD staff member

³ HGC 2022 Annual report

throughout Northwest Syria. There was evidence of roughly even usage by men and women, although male/female splits varied significantly in different regions. There was a strong focus on involving female end users in the design, implementation and delivery of trainings and Hala Systems increased the number of female subscribers through various initiatives. Medical facilities, schools, public marketplaces and first responder centres had Sentry alarms installed and were trained in how to use them and respond and alarms were installed in IDP camps in response to increased offensives in December 2020. There was unanimous agreement from local partners that the Sentry alarms were faster and more reliable than anything they had used in the past.

OUTCOME 4 – Humanitarian ecosystem is strengthened. Hala Systems participated in CHIC hosted events although report gaining minimal benefits from formal capacity building or learning activities.

Unforeseen intermediate outcome level results include the incorporation of Covid-19 awareness raising into their work; the contribution which Sentry can contribute to bringing perpetrators to justice; the wider benefits arising from the increased confidence which parents and providers have in the physical safety of children; strengthened relationships between White Helmets and other actors arising from their work with Sentry; and an increase in women's economic empowerment through promotion of female White Helmets outreach officers.

CHIC's contribution to results was principally through its grant funding which enabled technology development (rarely funded by donors) and implementation of the improved early warning system. Flexibility in funding was particularly significant.

Key lessons: that CHIC provided a unique and necessary funding opportunity for Hala Systems; gaining the trust of target end users is key to scaling innovation; innovation funders must be flexible to allow innovators to adapt to unforeseen changes (and examples of how this occurred with Hala Systems are given)

VALUE FOR MONEY ASSESSMENT

THE VALUE FOR MONEY ASSESSMENT FOR HALA SYSTEMS EXAMINES ITS CONTRIBUTION TO IMPACT AGAINST EXPECTATIONS.

IMPACT 1 – INNOVATION COSTS AND BENEFITS:

Assessment: Very good the impact exceeds expectations.

Benefits were:

- Reduced casualties from air strikes
- Reduced mental stress across the population
- Against a more holistic set of value considerations, evidence although incomplete is highly favourable.

IMPACT 3 - INNOVATION ADOPTION IN THE HUMANITARIAN SYSTEM:

Assessment: Sub-optimal Not an explicit objective when the grant was awarded although analysis indicates the potential to develop into an innovation of wide application in humanitarian settings.

IMPACT 2 - Increasing efficiency and cost-effectiveness of humanitarian assistance:

Assessment: Not possible Assessment not possible using agreed methodology but tentatively Good in the light of available qualitative evidence.

OVERALL VALUE FOR MONEY ASSESSMENT:

Applying the methodology developed for innovation VFM assessment: no overall assessment can be made.

- On a wider view of VFM in this case, and acknowledging the tentative nature of the methodological framework, the overall assessment is Good.

I. DESCRIPTION OF INNOVATION AND DELIVERY CONTEXT

Since 2013, airstrikes have been a significant cause of civilian death in Syria. According to Hala Systems, it is estimated that airstrikes have killed up to 80,000 civilians and injured up to 240,000.⁴ During this time, the only known early warning systems available to civilians were manual alarms and human sentries located within the Civil Defence Centres run by White Helmets – Syria Civil Defence.⁵ These consisted of an ad-hoc walkie-talkie network relying on manual activation of sirens, resulting in long warning lead times and limited civilian reach. Its effectiveness was therefore limited.

In 2016, Hala System began developing an early warning system called Sentry Syria that uses multiple information sources to deliver accurate, automated (remotely triggered) and timely warnings, allowing civilians and humanitarian actors time to take action to protect themselves and others and thereby reduce the casualties inflicted by airstrikes. Sentry uses a cohesive and robust system that provides 8+ minutes of warning, works across multiple platforms, and augments human expertise with advanced technology.

Sentry reaches civilians living in areas targeted by airstrikes through social media, Sentry-connected devices such as air raid sirens and warning lights, rebroadcasts of warnings on the radio, and through secondary channels such as through friends/family or from other information sources that use Sentry warnings. To date, Sentry has recorded 100,000+ observations and sent tens of thousands of warnings, averaging 140 warnings per day. Alarms are also installed in community facilities, along with supporting internet connection, and (originally) solar electricity and battery to power it. Depending on the facility type, a combination of sirens and lights are used to convey the type of attack. For example, the visual alarms installed in hospitals using lights have 3 colours, where yellow means there might be a strike because there is a plane within 25 – 50km, red means that the facility itself is probably being targeted, and blue means a strike has happened nearby so staff can expect casualties. In collaboration with White Helmets, Hala Systems conducts regular safety and security checks on the alarms installed within facilities in their network to ensure the devices are maintained.

HOW IT WORKS:

Sentry warnings are triggered when the system receives multiple credible reports of incoming aircraft from (a) acoustic and other sensors, (b) searches of open media (social media and news sites) and (c) human observations reported to Hala Systems using an app on observers' phones. The reports are validated and analysed by algorithms and a likely target and arrival time of the airstrike is calculated, also by an algorithm. This analysis then triggers alarms in the area targeted, which are delivered through multiple channels of communication.

THE SENTRY EARLY WARNING SYSTEM IS MADE UP OF SIX COMPONENTS:

Sensing: The system is built on three pillars for gathering information: news and social media gathered via machine-learning (ML) algorithms; trained human observers who use a mobile app to report aircraft observations; and remote sensors that detect events of interest.

Preserving: Once the data is gathered, it must be preserved so it can be used. Furthermore, for accountability or justice-related uses, evidence must be preserved in such a way that it can be proved that it has not been altered.

Validating: The next step is to validate the incoming data by determining whether the information is trustworthy or not. Hala ensures the validity of aircraft data by vetting and training observers and monitoring their performance.

Validating: The next step is to validate the incoming data by determining whether the information is trustworthy or not. Hala ensures the validity of aircraft data by vetting and training observers and monitoring their performance.

Understanding & Analysing: Once the data is gathered, preserved, and determined trustworthy, it is analysed, and turned into useful information that can inform decisions and lead to action. This ranges from analysis such as combining aircraft observations to form a track (and corresponding prediction of destination) to historical trends of attacks and future risk profiles for an entire region.

⁴ Hala Systems Final Progress Report Jan 2021

⁵ Interview with SCD staff member

Sharing: Within seconds of validation, analysis, and prediction, Sentry sends out warnings to civilians via social media, radio stations, and sirens. Hala also shares data with key stakeholders to counter disinformation and bring accountability for war crimes.

Acting: Hala works with civilians and local responders to ensure they know how to respond when a warning has been triggered – for example a mother deciding to gather her children and run to a shelter, or a health worker evacuating patients to safety. Sentry’s end goal is to support life-saving action.

In addition to saving civilian lives through early warnings, Sentry compiles comprehensive data regarding the air war in Syria, providing reports and analysis of all of the airstrikes against civilians, as well as correlated observations of military aircraft conducting those attacks. This information can be used by humanitarian actors and media for accountability reporting.



2. INTERMEDIATE OUTCOMES ACHIEVED, THEIR SIGNIFICANCE AND CHIC CONTRIBUTION

INTERMEDIATE OUTCOME 1: ENHANCED EFFECTIVENESS AND EFFICIENCY OF CHIC IN SUPPORTING HUMANITARIAN INNOVATIONS TO ACHIEVE SCALE AND SUSTAINABILITY

This outcome is focused on the support which CHIC provides to innovators to position them to continue operations beyond the grant and/or move along the innovation pathway (e.g. from proof of concept to adoption or scaling). Of the five indicators of achievement in the CHIC logframe, two are relevant to the innovation case studies: one measuring collaborations, connections and partnerships introduced or cultivated through CHIC (intermediate outcome indicator 1.4) and one measuring satisfaction with the CHIC technical assistance (TA) in supporting scale or sustainability (immediate outcome indicator 1). This section opens with the scaling achieved by the innovation before exploring CHIC's contribution towards it (through partnerships and TA) and the challenges to scaling and sustainability encountered.

SCALING ACHIEVED

At the outset, the primary aim of the Scaling Sentry transition to scale (TTS) project was to enable Hala Systems to undertake technology development and increase distribution channels so that they could reach more people by extending the coverage and quality of their services in conflict zones.⁶ Completion milestones were formulated accordingly, although the fundamental change in circumstances with the Covid-19 pandemic and the regime offensive in the first half of 2020 (discussed in the VFM assessment on page 29) meant that the aim expanded to include restitution of a large number of destroyed warning devices with better specified relays; and the installation of sirens in new camps for internally displaced persons (IDPs). Addressing gender inequality in who was benefitting from the EWS also became an aim and Hala Systems took steps to expand their outreach activities accordingly, with some success (see VFM assessment of Impact 1). This section on Intermediate outcome 1 focuses on the scaling of the sentry system through reaching more civilians and partner organisations. The technological development achieved is discussed in Outcome 2.

Despite Covid-19 and the challenges faced by increased internally displaced populations, Hala Systems overachieved their intended scaling of the Sentry alarm system to new areas and new partners. The aim was to install Sentry alarm systems in 200 health, education and community facilities. By the end of the project, they had installed 426 devices in 261 locations (for detail please see outcome 2). Training sessions were held at hospitals for intermediaries to learn how to use and maintain the devices. (Further detail can be found in Outcome 3). As a result, Hala Systems estimates that the Sentry system is now reaching 2.2 million people, either directly through air raid sirens, radio broadcasts, social media channels, walkie talkies, and unofficial social media channels, or indirectly by word of mouth.⁷

Scaling activities conducted using CHIC funding in order to achieve this outcome included:

- Installing physical alarms: sirens in town centres, and flashing lights or buzzers in health and other facilities run by partners such as Hurras, Hand in Hand for Aid and Development (HiHFAD) and Syrian American Medical Society (SAMS).
- Developing specialised awareness content for each type of facility, such as schools and hospitals according to the nature of the alarms and their technologies at each stage. For example, warning lights vary according to the nature of the facility's work, i.e., there is no blue light at schools – the light indicating that there has been an airstrike nearby, only orange and red (warnings about impending strikes). The training consisted of what the alarm means and how best to respond.
- Conducting a specialised training-of-trainers and a training platform, particularly targeted at female outreach officers in White Helmets.

⁶ Hala Systems Grant Agreement August 2019

⁷ CHIC Annual Report 2022

- Conducting additional online training for the enumerators on how to use personal protective equipment (PPE), hygiene practices and maintain distance while in the field to reduce risk of Covid-19 infection.
- Conducting outreach work to enrol individual Sentry 'subscribers' to receive warnings through a WhatsApp group, Telegram, FB, Twitter or Zello on their phones, and provide training for them on what the message means and what response is indicated.
- Providing warnings to local radio stations for them to broadcast.
- Expanding to civilians and organisations outside mobile coverage areas by installing remote connectivity (internet hubs) and creating stand-alone radio broadcast systems.
- Installing WiFi hotspots along with the visual warning systems in schools medical/first responder facilities.
- Creating new relationships with NGOs (Violet, Syria Relief, Ihsan, Bonyan, Hand in Hand).

SCALING BEYOND NORTHWEST SYRIA

Hala Systems now receives unsolicited partnership opportunities to expand service delivery into new geographies and contexts, demonstrating a new turning point in the maturity of the organisation. Their reputation is spreading among the Conflict and Stabilization community as an emerging organisation with deep-technical expertise driving impactful interventions in conflict affected locations.

The Sentry alarm system, as it has been rolled out within Syria, cannot be directly applied to other contexts due to the unique nature of each conflict. For instance, the nature of the threat to civilians from airstrikes in Yemen differs significantly from that in Syria, necessitating a very different approach in terms of the political engagement required. However, the main feature of the Sentry system is a robust data pipeline that can ingest data from a number of sources, process it rapidly to define incidents of note, then push out warnings through a messaging or warning system, which doesn't have to be specific to airstrikes. This means that the work done to refine the sensing technology (e.g. training acoustic detection algorithms to identify a broader range of threats) and create algorithms that better process incoming data can be adapted and applied to many other contexts, including natural disasters. At the end of its CHIC funding, Hala Systems was starting to make progress in applying Sentry within Yemen and Nigeria although no such rolled out early warning system is currently in active operation outside Syria.⁸

PARTNERSHIPS / COLLABORATIONS ESTABLISHED WITH CHIC SUPPORT

CHIC introduced Hala Systems to NeedsList, a fellow CHIC grantee, as a potential partner to facilitate logistical supply trading in NW Syria through their local partner network. The two organisations ended up collaborating on a CHIC-funded Covid-19 response project in Syria. CHIC also facilitated new conversations with potential donors that significantly contributed to Hala Systems' growth into Yemen (see IOC 2).

Being part of the CHIC programme also enhanced Hala Systems' relationship with each of the individual donors and, although nothing concrete came of it, CHIC made efforts to introduce Hala Systems to their donors and partners.

Hala System's partnerships are discussed in more detail under Outcome 2.

CHIC'S TECHNICAL ASSISTANCE SUPPORT FOR SCALING AND SUSTAINABILITY

The primary route through which CHIC supported Hala Systems in scaling was through their flexible funding, which provided a stable income for the organisation, enabling them to maintain staffing and focus on trainings required in order to scale and build White Helmets's capacity in managing the Sentry alarms.

Additionally, the tailored Gender guidance provided supported Hala Systems to develop their Gender Equality Plan in January 2020, which steered their female-focused outreach activities (discussed under Outcome 3).

⁸ Security sensitivities meant that any further information about steps towards scaling Sentry beyond Syria could not be shared, confirmed or denied.

Hala Systems attended CHIC innovator workshops and participated in some mentoring opportunities offered early in their grant. They explored potential collaborations with other CHIC-funded organisations such as Humanity Data Systems, Humanitarian OpenStreetMap Team, and Johns Hopkins University and received one-on-one mentorship from WFP⁹ on scaling the work of a company. However, there was no evidence that this technical assistance helped Hala Systems to scale their operations.

STRENGTH OF EVIDENCE

Strong: Evidence is from Hala Systems progress reports, Exigo's independent evaluation,¹⁰ interviews with CHIC staff, Hala Systems staff, and end users (i.e. local NGO partners) in NW Syria. Evidence has been triangulated wherever possible.

INTERMEDIATE OUTCOME 2: INCREASED EFFECTIVENESS AND EFFICIENCY OF INNOVATORS IN GENERATING FURTHER INVESTMENT AND SUCCESSFULLY COMPLETING THE SEED AND TRANSITION-TO-SCALE PHASES

This outcome focuses on innovator-led actions to support successful grant delivery during the grant period. Indicators relate to leveraging of additional funding (intermediate outcome indicator 2.1) and establishing quality partnerships (indicator 2.2) to support this, evidence about innovation cost efficiency (indicator 2.3) and successful completion (immediate outcome indicator 2). This section presents evidence for each of these, starting with the completion achievements, before examining the leveraged funding, partnerships, and demonstrated cost efficiencies, exploring also how success was achieved.

GRANT COMPLETION

Hala Systems attained 'successful completion' of their project within their extended timelines, largely meeting milestones and output targets.

Principal end of project service delivery milestones¹¹ were as follows:

TECHNOLOGY DEVELOPMENT MILESTONES:

- Remote acoustic sensors: as part of a wireless network communicating information to and from Hala's servers, remote sensors enable Hala to collect more data and reduces reliance on observers to identify potential threats. Target: completion of hardware development, prototyping and testing.
 - Achieved: Proof of concept demonstration completed of a sensor which collects acoustic data and sends it to the Hala cloud infrastructure over a cellular network.
- Software Simulation: the testing simulation environment for Hala development on the Amazon Web Service (AWS) servers, critical for validation and testing of all advanced algorithms, which is essential for transitioning to scale. Target: completed development of software simulation environment
 - Achieved: Hala completed additional deployment and testing of the development environments.
- Algorithm Aggregation: an algorithm which groups together data related to the same event from across different sources, crucially enabling data to be organised for users plus other key capabilities. Target: completion of algorithm development and testing.
 - Partially Achieved: By the end of the CHIC funding period, the level of effort allocated to the development of the algorithm was completed, but the development is 'ongoing'.
- Reporter mobile application and trust scoring: development of a mobile app to allow civilians, in addition to current trusted spotters, to report on potential threats and a validation algorithm to determine the trustworthiness of data that is received and reported by the system by providing a "trust score" or confidence level in every element of information that is reported. Target: development of algorithm completed.
 - Partially achieved: Working proof of concept achieved (and framework developed for simulating events and observations to then estimate events or incidences using different algorithms) but subsequent development for the public is not yet available. Hala's implementing partner, Hurras, is however currently making use of the Reporter app.

⁹ World Food Programme – one of CHIC's technical assistance providers

¹⁰ The Exigo report was not always clear as to whether findings referred to mobile app users only, Sentry alarm users, or those who had heard of Sentry, regardless of how they received early warnings. Many questions in the Quantitative report ask about the impact of an EWS in general, not about Sentry, whereas the Qualitative report reflects perceptions about a system (the sirens) that is in fact a Sentry system. Many of the Sentry-specific questions were asked of 'Sentry users' only, meaning those who use the app (27% of the overall sample).

¹¹ Hala Systems Grant Agreement Attachment C – Schedule of Milestones

- Trusted ledger hashing process: required for preservation and immutability of all event data stored by Hala in a real-time system. Target: completed testing and integration of the hashing trusted ledger
 - Achieved: Ability to hash data complete (Oct 2019) and described as “fully implemented”

SERVICE DELIVERY MILESTONES (AS DISCUSSED IN OUTCOME 1)

- Expanded outreach channels: these include visual/audible warning systems in hospitals, IDP camps, and civil society institutions in conflict settings in order to extend Hala’s service offering. Target: 60 additional EWSs in these settings – later extended to 200; update on increased service coverage as a result of deployment.
 - Exceeded: A total of 426 devices – lights, sirens and buzzers – had been installed in 261 locations at the end of the project.¹² Working in partnership with local organisations, Hala Systems installed WiFi hotspots and visual warning systems in 15 schools and 137 medical facilities (from a baseline of 60), 53 ‘first responder’ facilities and 54 public marketplaces in Northwest Syria¹³ (Idlib, Western Aleppo, Hama and Latakia.¹⁴) 60 hospitals had been reached by the end of Phase I and another 60 by the end of phase 2, despite delays caused by violence.¹⁵
- Update on future service delivery plans, specifically plans to improve or increase Sentry in Syria and other conflict settings
 - Since 2019, Hala Systems has expanded their service delivery across Syria to provide protection outside of the existing mobile network coverage and installed remote connectivity via internet hubs and radio broadcasting. For example, in December 2020, Hala installed the first independent internet radio station in Idlib, increasing network coverage to approximately 200,000 people. Beyond Syria, Hala Systems reported expanding their presence into Yemen and establishment of local partnerships in NE and middle-belt of Nigeria in 2020¹⁶ although we understand that Sentry is not currently operational in these locations. In Yemen, however, the technology has been used to help facilitate meaningful dialogue towards international peacebuilding objectives.
- Final report on how technology development has improved service delivery including in relation to coverage, cost, accuracy, user/customer value and user/customer satisfaction
 - Partially Achieved: Hala Systems provided a high-level summary of technological developments related to service delivery,¹⁷ and further details around accuracy and user feedback and satisfaction of the Sentry Syria system via an external evaluation report.



¹² Hala Systems RMAF Jan 2021

¹³ Hala Systems Final Progress Report Jan 2021

¹⁴ Service Delivery Milestone Report

¹⁵ Ibid.

¹⁶ Hala Systems Final Progress Report Jan 2021

¹⁷ Tech Development Milestones reporting

Additionally, Hala Systems over-achieved five out of six outreach activity targets, as recorded in the RMAF:

INDICATOR	DEFINITION	EXPECTED	ACHIEVED
No of intermediaries using Hala services	Number of health workers + humanitarian aid workers working as observers and warners	80	629
No of intermediaries trained in Hala services	Number of organisations whose members have received Hala training	130	416
No of outreach/ awareness activities	Training for affected people on existence of warnings and what they mean	508	1,497
No of potential beneficiaries reached through outreach activities ('end users')	Number of people at risk who received such training	10,000	16,000
No of intermediaries reached through outreach activities	Number of health and humanitarian aid workers who received such training	600	901
No of members of the general public reached through outreach activities	Number of people beyond the above two categories who received such training	1,000	500

ADDITIONAL FUNDING

The Hala Systems grant, awarded in October 2019, was for nearly CAD1m. A year later, they reported a '49% compounding annual growth rate in procurement' and had secured multi-year Government grants worth over \$10m from the USA, UK, Canada, Netherlands and Germany.¹⁸ Much of this funding was for expansion of Hala's work into Yemen and their reports attributed their funding success to 'conversations initiated by the CHIC management team'.¹⁹ Interview evidence was more varied however: from seeing the CHIC grant as 'enhancing and improving our relations with donor countries' to being more equivocal on the point, whilst recognising that Hala's performance – enabled by the CHIC grant – was crucial to securing funding.

Additionally, at the end of the CHIC grant, Hala had also secured a \$3.5m series A investment to 'diversify Hala's platform into adjacent commercial markets'. Whilst not an expansion of the CHIC-funded Sentry programme, such diversification would put Hala Systems on a better commercial footing and could therefore position it better for innovation scaling.²⁰

In all, the HGC 2022 Annual report states that a total of USD 15.5m in additional investment had been secured by Hala Systems. GCC have stated their expectation that CHIC funding would be 'catalytic' – as envisaged by the Grand Challenges model – and this does therefore seem to have been the case to at least some extent for this grantee. Despite the substantial funding secured, it is notable that there are few obvious routes for funding: stabilisation grants are not sufficiently flexible and are very short-term whilst aid budgets do not easily apply to developing innovations and mitigating violence as Hala seeks to do.

¹⁸ Hala Systems Interim Progress Report Oct 2020. It is assumed that dollars are USD rather than CAD, unless otherwise stated.

¹⁹ Ibid.

²⁰ Final Progress Report Jan 2021

Future financial stability would seem to rely on commercial contracts – which the Series A investment looks to support – and potentially non-grant funding from other Government departments.

PARTNERSHIPS

Hala established a wide-ranging set of partnerships, both at global level and on the ground, during the grant period. Partners include many different types of organisations: private enterprise, academia and NGOs.²¹ The nature of the partnerships varied as follows.

GLOBAL STAKEHOLDERS

Private enterprises Hala Systems report having secured partnerships with private enterprise to strengthen technical implementation: technical consultancy from Google to support the acoustic sensor prototype; pro-bono storage from Hedera of ledger data about human rights violations; and technical development assistance with the ‘Hyperledger Fabric’ used to share data safely among human rights defender organisations.

Academic institutions Top US universities have engaged with Hala systems to support quality of evidence and make use of it. Stanford Law School’s technical and legal consultancy on product design serves to ‘elevate the evidence chain of custody documentation’ while UC Berkley’s Human Rights Centre uses Hala Systems data to support investigations.

Additionally, Hala reported a potential partnership to help develop their commercial footing (which would contribute to the organisation’s financial security) through Amazon Web Services and Amazon Marketplace who enable individuals to licence services.

Accountability organisations The Hala Systems M&E Plan, in the section on partner engagement, identifies the OHCHR Commission of Inquiry on the Syrian Arab Republic and the Organisation for the Prohibition of Chemical Weapons as a global stakeholder for the purposes of holding perpetrators to account for war crimes, as well as the media (the New York Times).

In-country partners

Hala Systems worked extensively with and through trusted local organisations to roll out the Sentry system and improve its effectiveness. These organisations included NGOs managing hospitals and education centres and first responder or monitoring organisations. These groups provided additional observation capacity and also benefited from the devices – for example, through the warning light in hospitals alerting staff to incoming casualties and nearby aircraft. Hala Systems has worked with Syria’s main civil defence NGO (Syrian Civil Defence or White Helmets) as the main implementing organisation from the outset and White Helmets will take over administration of Sentry in NW Syria in its entirety from the end of 2022. (Work undertaken by White Helmets is described in Outcome 3.)

Original partners who have remained engaged throughout the project include the Syrian American Medical Society (SAMS), the Union of Medical Care and Relief Organizations (UOSSM), and the Health Directorates in Idlib and Aleppo Governorates. Newer relationships have been formed with local partners Syria Relief, Ihsan, Bonyan, Hand in Hand and Violet, a child-protection NGO engaged with in March 2020 whose work was oriented to the needs of IDP camps. These relationships helped inform end-user needs, which were fed into design decisions.

Hala Systems large ground presence in NW Syria and connection with 27 local first-responder organisations also meant that the early warning system and outreach teams were able to extend their work to include Covid-19 awareness education. Beyond supporting Sentry implementation, NGOs (both Syrian and global) have co-ordinated with Hala Systems to strengthen the evidence base for incidents and thereby support work to hold perpetrators to account in the longer term, through interviewing witnesses (Syrian Archive) and providing verified on the ground imagery to correlate with Hala Systems observation data (The Global Strategy Network).

²¹ Ibid.

INNOVATION AND COST EFFICIENCY

No data was found on the cost efficiency of the innovation on its own terms and there is no similar EWS operating with which costs could be compared in order to make a judgement about efficiency gains. (Sentry's contribution to the efficiency of humanitarian action is considered by the VFM case study, under Impact 2).

STRENGTH OF EVIDENCE

Strong: Evidence is from Hala Systems progress reports and KIs. Interviews with Hala Systems and CHIC staff confirmed that the expected tech developments were achieved or adapted to more relevant ones. Some tech development milestone reports were available, but documentation of milestone achievements was insufficiently systematic to enable a comprehensive picture of achievement. There was no data on cost efficiency.

INTERMEDIATE OUTCOME 3: INCREASED USE OF HUMANITARIAN INNOVATIONS AMONG THE MOST VULNERABLE POPULATIONS AFFECTED BY HUMANITARIAN CRISIS CAUSED BY CONFLICT, AND/OR HUMANITARIAN WORKERS

This outcome focuses on innovation take up and use, and by whom. (The benefits arising from this are appraised in the value for money assessment of impact.) Indicators relate to end-users - in this case study civilians benefitting from Sentry (intermediate outcome indicator 3.1); intermediaries trained to install sentry alarms and train civilians how to respond to them (indicator 3.2) and successful deployment of the innovation as intended (immediate outcome indicator 3.1). This section assesses each of these and their significance in turn.

END USERS

Hala Systems' end users include both individual civilians and agencies running health, education and community centres.

Hala estimates that more than 812,000 people²² were protected by Sentry warnings deployed in 31 towns throughout Northwest Syria by the end of the grant. Warnings were sent through a mixture of direct communication channels to civilian end users, and through community organisations installing and using Sentry alarms within their facilities.

a) CIVILIAN END USERS

Approximately 256,000 people received warnings through radio broadcasts and 1.2 million individuals received warnings through indirect means, such as unofficial alert channels and word-of-mouth. Additionally, 60,000 follow the Sentry Facebook page, and its Telegram channels have 16,400 subscribers.²³ In a random population survey conducted by Exigo, 27% of 3,033 survey respondents subscribed to Sentry on their phones. The same survey indicated that 89% of those who receive Sentry warnings²⁴ use them to take action of some kind such as warning others, seeking a safer location or seeking further information.

When breaking down Sentry use by gender and other characteristics, the Exigo survey found roughly even usage by men and women, although male/female splits varied significantly in different regions. Subscription rates were lower in elderly populations compared to adults and younger responders; and lower in IDPs compared to host communities.²⁵

²² Hala Systems Final Progress Report

²³ Ibid.

²⁴ The report does not specify through which means these respondents received the Sentry warnings

²⁵ Exigo Quantitative Report

There was a strong focus on involving female end users in the design, implementation and delivery of trainings because of the unique barriers they face in accessing information and technology. Due to cultural norms, household responsibilities and lower digital literacy, women are less likely to attend outreach sessions, have access to mobile devices, and receive information via word-of-mouth through social interactions compared to men.

Hala Systems increased the number of female subscribers by training them on how to use the apps used for information dissemination, increasing the number of female observers, and tailoring the outreach and information distribution approach to women's needs. The latter included providing women-only training sessions, and a new strategy for in-person outreach that engaged essential female workers in public spaces commonly frequented by women (hairstresser, sewing workshops, girls' schools, gynaecologists, maternity hospitals, and women's clothing shops). These steps were in line with Exigo's survey findings that suggested women trusted information more when it was distributed by other women, liked the more detailed information received through the mobile-device channels compared to alarms and radio, and preferred to have both internet and non-internet-based information streams. Hala also launched a series of publicised, but RSVP-only virtual sessions using Facebook, Telegram, FB Messenger and WhatsApp in a more targeted approach than used for earlier online engagement.

Female outreach officers learned how to use online platforms not just for Sentry but also for health awareness and other information. Some women in White Helmets were promoted to senior positions as a result of the training.

b) FACILITY END USERS

By the end of the programme, as noted, an additional 137 medical facilities, 15 schools, 54 public marketplaces, and 53 first responder centres were using Sentry alarms installed in their facilities, having received training on how to use them and what to do in the event of an alarm. Alarms were also installed in IDP camps in response to the regime offensive in 2019/2020. High-priority schools and hospitals were identified in collaboration with the partners managing the facilities based on UN 2018 report of incidences of attacks.

Men and women had equal access to these community-based distribution channels, but there were some challenges in reaching women in IDP camps due to low mobile phone access. People with disabilities and the elderly were reached through the caregivers responsible for them, such as hospital staff.

The infrastructure in each facility was tailored. White Helmets worked with the local partners to install the alarms in the most appropriate location to get the best signal and recommended evacuation procedures differed according to the warning time and facility type. There is strong evidence that all partners used the Sentry system installed in their facilities. For example, Hurras reported 1 – 5 attacks a month on their schools, resulting in 75 alarms and 18 evacuations successfully completed by school staff in second half of 2021, with staff deciding whether evacuation or under-desk sheltering was best given the time remaining before the attack.

There was unanimous agreement from local partners that the Sentry alarms were faster and more reliable than anything they had used in the past. Hurras reported that every attack that their facilities experienced had been detected by the Sentry alarm system in advance, giving them the chance to evacuate. As well as finding Sentry effective, it was economic for facility end-users. There were no costs for installation to the facilities themselves unless they previously did not have access to internet, in which case facilities were required to pay for this service (around \$10 per month) to keep the Sentry alarm connected.

TRAINED INTERMEDIARIES

The main intermediary trained by Hala Systems in the installation, maintenance and use of the Sentry alarm system and in related management and outreach work was Syria Civil Defence or White Helmets. White Helmets have installed early warning devices (in White Helmets centres, schools and hospitals) and now reliably maintain the service, they trained White Helmets and partner personnel (e.g. hospital staff and teachers) in how it worked and

how to respond in an emergency, stayed in contact with the facilities to help address any issues and have undertaken outreach work to raise awareness raising about the EWS and increase subscriber numbers amongst the civilian population. There is a shared interface for managing tasks related to disconnecting, installing, or maintaining equipment between White Helmets and Hala Systems. Management of the technical process is still central at Hala Systems.

STRENGTH OF EVIDENCE

Strong: Evidence is from Hala Systems progress reports, Exigo's external evaluation and KIIs. Evidence has been triangulated wherever possible.

INTERMEDIATE OUTCOME 4: HUMANITARIAN ECOSYSTEM STRENGTHENED

This outcome focuses on how CHIC strengthens innovators and others within the humanitarian ecosystem. The sole indicator relates to engagement with HGC-facilitated learning or capacity building activities (intermediate outcome indicator 4.1). The impact of the innovation itself on the humanitarian system is examined in the value for money assessment. This section therefore examines Hala Systems' engagement with HGC-led ecosystem strengthening activities.

CHIC managers report that Hala Systems participated in the WFP Accelerator week, presented on the CHIC-hosted panel discussion on misinformation and showcased their innovation at a CHIC-hosted donor networking event. However, during KIIs, Hala Systems staff reported gaining minimal benefits from formal learning or capacity building activities. One rare example was a workshop for conflict sensitivity mapping which was described as 'brief and a one-off evolution' yet Hala's progress report which mentioned this also made a strong request for events to enable learning from other grantee organisations and from 'experienced donor staff' to help understand how innovators can support policy goals and objectives.²⁶

STRENGTH OF EVIDENCE

Fair: Evidence was from a single progress report and interview and is not very substantial; this could be because KII interviewee engagement with learning activities seems to have been limited.

UNFORESEEN INTERMEDIATE OUTCOME LEVEL RESULTS

Whilst not all strictly outcomes, the case study has identified several unforeseen (or previously unevidenced) benefits of Sentry.

Outreach officers incorporated Covid-19 awareness raising into their work. The outcome of this is not known but it is not unreasonable to assume that their activities, such as distribution of flyers and posters and in-person workshops about Covid-19 risks and staying safe, did lead to some mitigation of infection.

Sentry can contribute to bringing perpetrators to justice. The data collected through Sentry has been used by NGOs and others collecting evidence of human rights abuses and war crimes and is of sufficient quality to identify perpetrators and to be used in prosecutions.

Increased confidence in the physical safety of children in school due to Sentry has led to wider benefits. Parents are less reluctant to send their children to school, knowing that there is an effective EWS and trained staff in place. Reduced concern about physical safety has released NGO time to focus on the quality of education and the well-being of children, including for example fund-raising for child protection work.

White Helmets's work of implementing and supporting Sentry has led to strengthened relationships with humanitarian actors and community organisations.

²⁶ Interim Progress Report Oct 2020

Increase in women's economic empowerment. Female White Helmets Outreach Officers were promoted as a result of their achievements when taking on outreach activities aimed at increasing women's use of Sentry and appropriate response to warnings.

STRENGTH OF EVIDENCE

Fair: Some of these findings are from a single evidence source; the latter three rely solely on interview evidence.

CHIC CONTRIBUTION RESULT

The grant agreement states that CHIC support was intended to enable Hala Systems to undertake technology development, noting that donor funding was 'often restricted to service delivery'. (A point borne out by evidence presented in outcome 2 above on secured funding.) Technology development was largely achieved, whilst funding also enabled implementation of the improved EWS which in turn saved and improved lives, as examined in this case study. It was clear that informants believed that CHIC's funding had supported advanced tech R&D which otherwise 'wouldn't have happened', some of which – the development of algorithms – was particularly significant due to being 'portable' across geographies thus allowing potential further scaling.

The flexibility of CHIC funding was particularly significant to CHIC's achievement of results, and indeed to its ability to continue to deliver its life-saving services. CHIC had agreed to funds being used to bridge a cash flow difficulty and CHIC funds were described in interviews as 'a contributing factor to our ongoing existence' and enabling the organisation to 'keep the lights on'.

Notwithstanding the difficulties of securing funding for such a niche and innovative service, CHIC was significant to Hala's ability to do so, by 'advancing and improving ... relations with donor countries'.

CHIC contributed to the Gender Equality Strategy, and consequently the outreach approach through their tailored technical assistance provided to Hala Systems.

STRENGTH OF EVIDENCE

Strong: Evidence was limited but consistent from interviews and documents.

3. LESSONS LEARNED AND CHALLENGES

CHIC PROVIDED A UNIQUE AND NECESSARY FUNDING OPPORTUNITY FOR HALA SYSTEMS

Hala Systems has generated considerable additional funding recently, although this did not come through the channels they had originally intended. Early plans for scaling assumed that government grants would be available for the type of research and development that is needed to strengthen the Sentry early warning system. However, Hala Systems has not been able to access these types of grants because they operate in a niche sector of technology for military settings (such as testing a sound sensors' ability to pick up different explosives) applied to civilian protection. Whilst US Government defence funding is plentiful for military-focused research and development, it is not accessible to organisations researching and developing tech for civilian protection. On the other hand, government funding for civilian protection is limited in its quantity and duration, and often comes with restrictions as to how the money can be used, which limits innovation development. CHIC was perceived by Hala Systems as one of the first programmes offering funding appropriate for organisations wishing to conduct research for the purpose of driving innovation (as opposed to directly improving operations).

Hala Systems felt that GCC had worked effectively with government donors to ensure that compliance processes met both donor requirements for assurance and innovator needs for flexibility to use the funding where it was most needed at different times in the grant period. Reporting frameworks allowed Hala Systems to illustrate their impact in a way that made sense for the innovation, as opposed to reporting to fixed tangible 'operational' achievements that are usually expected from donors funding development programmes. This flexibility supported Hala Systems to fill a funding gap for staff salaries when challenges such as Covid-19 paused outreach activities and allowed the focus to change to internal (and White Helmets) capacity building as and when it was needed.

GAINING THE TRUST OF TARGET END USERS IS KEY TO SCALING INNOVATION

Fostering relationships and trust with local communities takes time and effort, but it was critical to ensuring potential beneficiaries of Sentry were engaged and willing to adopt the innovation. Hala Systems found that it was challenging to gain the trust of many of their target users due to the trauma they had experienced. They were (understandably) distrustful of strangers offering help and distrustful of technology that supposedly made it safer to send their children to school after so many years of being under siege. Some facilities feared installing the warning system, presuming that it would transmit a signal or pinpoint the location of the facility, exposing it to bombardment. Hala Systems had to rely on their partners' relationships with end users to gain their trust. For example, once the alarms were installed in schools, Hurras had to work hard to encourage parents to send their children back to school after a series of attacks and persuade them that despite airstrikes still occurring, schools were now much better able to manage children's safety. They had some success: Hurras noticed higher enrolment in their schools from Sept 2021.

It should be noted that Covid-19 posed an additional barrier to building trust with communities because all outreach activities had to move online. In a context in which community members have a strong preference for face-to-face interactions, partners such as White Helmets had to work extra hard to gain their trust in these circumstances.

INNOVATION FUNDERS MUST BE FLEXIBLE TO ALLOW INNOVATORS TO ADAPT TO UNFORESEEN CHANGES

During the lifetime of the grant, Hala Systems had to adapt their innovation in response to many external challenges and unforeseen changes in context. Some examples of how the flexibility of CHIC funding allowed them to adapt are as follows:

- As a result of the major offensive in Syria in 2019-2020, Hala Systems lost many relays which had to be rebuilt. The loss of power infrastructure also meant they had to deploy new power kits - solar, marine batteries, cables - to power the relays and the warning devices. The outreach strategy also changed to a stronger focus on IDP camps in response to nearly 1 million civilians being displaced from various front-line areas. By the end of the grant period, Hala Systems reached the same number of civilians as their original target, but by different means, as a result of this change in context.
- Covid-19 created barriers to the full implementation of the gender equality strategy mapped out in 2019. The pandemic meant that the focus had to shift to a 'remote-first' engagement strategy that relied on mobile devices, but this negatively impacted the number of women who could participate in outreach activities due to their lower tech-literacy and mobile access. However, once the Female Outreach Officers adapted to the new operating environment after May 2020 (as outlined above) the engagement strategy picked up pace and achieved most of the targets established.
- Power cuts and mobiles being out of charge were obstacles to effective use of the Sentry system, as was lack of internet access. Hala Systems overcame this by adapting the Sentry alarms and working with local partners to ensure they had internet access and alternative power supply arrangements.
- Changes to Facebook's subscriber policies meant that the Sentry bot was no longer able to send effective warnings to civilian subscribers through Facebook. The change blocked messages from being pushed to subscribers who had not interacted with the bot in the last 24 hours. Hala reached out to Facebook to request an exception to this policy. They also had to look into shifting subscribers to other social media platforms.

4. IMPACT AND VALUE FOR MONEY ASSESSMENT

ASSESSMENT CRITERIA

An assessment is made of the innovation's impact using the three impact criteria in the revised CHIC logframe. These criteria have been slightly rewritten for the purposes of VfM assessment:

- to clarify that innovation benefits are defined and assessed by the intended beneficiaries and users of the innovation
- to clarify that benefits includes social and environmental benefits
- to take into consideration social and environmental costs
- to ensure a cross-cutting assessment of equity.

The logframe impact criteria have been re-ordered 1,3,2 as this is a more logical sequence for analysis.

IMPACT 1: INNOVATION COSTS AND BENEFITS

To what extent has the innovation brought net benefits to conflict-affected people (that is, the benefits experienced by beneficiaries outweigh any costs experienced by either beneficiaries or users) – 'benefits' here meaning benefits that have increased survival or improved lives.

To the extent that the innovation has brought benefits, it is a successful project.

IMPACT 3: INNOVATION ADOPTION IN THE HUMANITARIAN SYSTEM

To what extent is the innovation spreading beyond its project²⁷ location and is contributing to product, process or system-level change in the humanitarian system (or is on a pathway towards doing so)?

To the extent that the innovation is both a successful project (Impact 1) and is being adopted more widely (Impact 3), it is a successful innovation.

IMPACT 2: INCREASING THE EFFICIENCY AND COST-EFFECTIVENESS OF HUMANITARIAN ASSISTANCE

To what extent does (or might) such change increase either the efficiency or cost-effectiveness of humanitarian assistance?

INNOVATION VALUE FOR MONEY ASSESSMENT

What were CHIC's initial expectations for the innovation's impact? This is the implicit VfM Benchmark.

The grant was made in the expectation that the innovation would demonstrate an impact (defined by the three impact criteria) as anticipated in the Grant Application. HGC was making the claim that if the innovator meets these expectations, this represents good value (= impacts) for money (the grant + TA).

{Note that this logic depends on demonstrating that the HGC grant made a significant contribution to the innovator's achievement of results – this is covered in the Contribution section of the Case Study}

How does each impact measure up to CHIC's expectations? Compared with the benchmark, is the impact assessed as sub-optimal, good or very good, taking context into consideration?

The benchmark may be imprecise, and circumstances will throw up obstacles and/or enablers to the achievement of impacts, hence this will be a judgement call, supported by reasoned argument.

²⁷ Note: 'project location' is a rewording from previous VfM case studies where this was 'pilot location'.

THE VALUE FOR MONEY ASSESSMENT

The benchmark may be imprecise and circumstances will throw up obstacles and/or enablers to the achievement of impacts, hence this will be a judgement call, supported by reasoned argument.

The Value for Money Assessment

The VfM of the innovation is sub-optimal, good, or very good to the extent to which the innovation's overall impact is assessed as sub-optimal, good or very good overall.

IMPACT I: INNOVATION COSTS AND BENEFITS

LOGFRAME IMPACT I:

Increased survival and improved lives among the most vulnerable populations affected by humanitarian crises caused by conflict through the implementation of humanitarian innovations.

- What benefits has the innovation brought to conflict-affected people, either directly or indirectly, and were they distributed equitably? Has it brought environmental costs or benefits?
- What costs or downsides have been experienced by users of the innovation?
- Does the innovation deliver a significant net benefit (that is, benefits taking costs into consideration) that increases survival or improves lives of conflict-affected people?

EXPECTED BENEFITS FOR CIVILIANS TARGETED BY AIR STRIKES (VULNERABLE POPULATIONS)

Hala Systems and GCC anticipated that CHIC support for Sentry would contribute towards achievement of the following benefits for vulnerable populations in Syria:

1. Reduced casualties from air strikes
2. Reduces mental stress across the population.²⁸

These benefits and the dependencies and assumptions underlying them are elaborated as follows.

For vulnerable populations and facilities covered by the Sentry early warning system (EWS) who have received training on how best to protect themselves from air-strikes, and who are provided with accurate and timely warnings of attacks, the expected benefits are that:

BENEFIT 1. In the minutes before an airstrike, vulnerable people and facilities are able to take protective measures for themselves and their charges (such as children or patients), and responders are able to make preparations, with consequent reduction in number of casualties.

BENEFIT 2. Vulnerable people experience a general reduction in mental stress through knowing that they, or those responsible for them or for their children, will be warned of an air strike and hence can take protective measures, and they know what those measures will be.

The number of people who experience these benefits will depend on the extent to which Hala Systems:

- Consistently operated and maintained an accurate and timely threat detection system. The system has three elements: sensors (observers, acoustic sensors, data from social and other media); data processors to make sense of the data and make accurate predictions of air-strikes; and warning devices (sirens, radio broadcasts, cellphone apps, buzzers, alarms).

²⁸ This summary of benefits is based on Application Project Summary (page 15), Application Section E: Expected TTS Outcomes and Outputs, Section 4.1 Outcomes (pages 29 – 30) supplemented by key informant interviews which drew out the conjectural elements.

- Built trusting relationships with a competent implementing organisation (White Helmets) and its partners (running vulnerable health facilities, schools, etc), through which it:
- Installed reliable warning devices in vulnerable facilities and locations plus associated infrastructure (power supply; internet access), and trained facility staff, and:
- Ran a successful outreach programme to civilians to increase subscriptions to the warning app and train people on protective actions in response to warnings through the app, community sirens or radio broadcasts.

ACTUAL BENEFITS

BENEFIT 1. In the minutes before an airstrike, vulnerable people and facilities are able to take protective measures for themselves and their charges (such as children or patients), and responders are able to make preparations, with consequent reduction in number of casualties.

There is agreement from all sources that Sentry early warnings give vulnerable people and facilities sufficient time to take some protective measures and give responders the opportunity to prepare to assist casualties of an impending air strike. A large majority of users of the Sentry cell phone warning system ('Sentry users', as distinct from beneficiaries of the sirens²⁹) believe that Sentry has helped reduce the number of people who die or are injured from airstrikes.³⁰

Sentry warnings are viewed 'overwhelmingly' as reliable and credible in contrast to other EWSs. 'Across the board', Exigo FGD participants who are Sentry users reported finding the content and messaging of the Sentry warnings useful. In particular the detail and timeliness of the system was seen as 'especially beneficial'.³¹ Sentry installers and facility managers variously described Sentry as accurate, reliable and effective, and far better than any other EWS.³²

There is widespread understanding among vulnerable populations as to what action to take in the event of a warning.³³ Where facility warning devices use the coloured light code, this alerts the facility either that it is a target, or that it should expect casualties from a nearby target, enabling facilities to take appropriate measures.³⁴

Protective measures are pre-prepared and depend on circumstances. For individuals, these include taking shelter in a bomb shelter, or in a safer location in their building such as a basement or doorway, or getting off the street by knocking on a nearby door for shelter. For groups and facilities, these include evacuation, moving everyone to a safer location (or postponing a planned move to an unsafe location), cancelling outpatient clinics and routine medical procedures, or cancelling school trips.³⁵

Effectiveness of protective measures: reduction in deaths and injuries

The Exigo survey maintains that a large majority of respondents to the surveys said that Sentry has helped to reduce the number of people who die or are injured from airstrikes³⁶, and this view is endorsed by key informants for this case study.³⁷ Hala Systems' analysis of casualty rates in Eastern Ghouta and Idlib in 2017 and 2018, when the EWS consisted of sirens and social media messages, indicated that overall mortality was reduced by 20% - 30% when timely warnings are available. In their final report they narrow the estimate to a more conservative 20% reduction in mortality attributable to the EWS in operation in 2019 – 2020.³⁸ It was beyond the scope of this assessment to validate the Hala Systems'

²⁹ Exigo Quantitative Report, page 12, note 6.

³⁰ Exigo Quantitative Report, page 6.

³¹ Exigo Qualitative Report, page 9/10 supported by KIs.

³² KIs with Sentry facility managers.

³³ Exigo Qualitative Report, page 19.

³⁴ KIs with Sentry-protected facilities

³⁵ Exigo Qualitative Report, page 11

³⁶ Exigo Quantitative Report, page 6.

³⁷ Exigo Quantitative Report, pages 20/21, noting that the survey data on which this appears to be based is a sub-sample of respondents who are 'Sentry users'

³⁸ Hala Systems Grant Application Section 3.3.3, pages 26 – 27, and Final Progress Report to GCC; Results and Findings, pages 1 - 4

methodology. In what they consider to be a conservative assessment³⁹, Hala Systems estimate 106 lives saved over the grant period and 363 injuries averted.⁴⁰

Effectiveness of protective measures: school enrolments

School enrolment rates reportedly fell with the major regime offensive of December 2019 to mid-2020 as parents no longer felt that their children were safe in school. Enrolment rates improved in September 2021, attributed to successful communication of the benefits of the Sentry EWS, which was installed after the offensive.⁴¹

Limitation of Sentry System

Limitations in the system noted in surveys and KIIs were that it did not warn of artillery, mortar or missile attacks; that it was vulnerable to internet outages; and that people did not always respond appropriately, particularly when warnings were frequent, the latter attributable to fatigue and apathy brought on by years of air-strikes.⁴²

Hala Systems estimates that 2.2 million people receive warnings from Sentry directly from warning devices, or indirectly by word of mouth; it is not clear what the total vulnerable population is. The Exigo survey found that most people can hear a siren from their house, and hence may benefit from it, though they may not be 'aware' of an EWS called Sentry; only 40% of respondents had heard of Sentry.⁴³ Just over a quarter (27%) of the respondents subscribed to the Sentry cell phone warning system. Of the small number (355 out of a total sample of 3,033) of survey respondents who are aware of Sentry but do not or cannot access any of its channels, the most common reason given for non-access is that sirens do not cover their area (34%)⁴⁴; other reasons are: sirens not working, the community in question not having any airstrikes, not owning a smartphone, being recently displaced to the area – or simply to avoid the fear and distress triggered by a warning.

No evidence source pointed to any costs or downsides for Sentry users.

BENEFIT 2. Vulnerable people experience a general reduction in mental stress through knowing that they, or those responsible for them or for their children, will be warned of an air strike and hence can take protective measures, and they know what those measures will be.

Exigo estimated that 50% of its survey population experienced severe psychological distress. Most worry about airstrikes often or the majority of the time. A slight majority have had family members injured; a slight minority have had family members killed.⁴⁵ Thus the prevailing levels of trauma and stress are very high and the reduction is a correspondingly important benefit.

Where discussed, all sources agree that there is a substantial reduction in mental stress among Sentry users due to their perception of it as a reliable, accurate and helpful EWS.

Hala Systems estimates 162,000 people experienced reduction in trauma and stress as a result of the system.⁴⁶ A large majority of respondents to the Exigo survey believe that an EWS in general and (where they had heard of it) Sentry in particular reduces the worry and emotional distress of community members. Asked to what extent an EWS relieves their worries, half responded 'somewhat' and 20% responded 'significantly'.⁴⁷

³⁹ KIIs with GCC staff

⁴⁰ Sentry RMAF, adjusted for the GCC Semi Annual Report, October 2021, and Annual Report, April 2022

⁴¹ KIIs

⁴² Exigo Qualitative Report, page 12 and KIIs

⁴³ Exigo Quantitative Report, page 6, and footnote to page 7. Sentry 'awareness' among survey respondents was around 40% (pages 17 and 26). The 'awareness' survey question was: 'Are you aware of an early warning service called 'Al Rased & Marsad Syria' [Sentry] which sends out alerts to warn communities against likely airstrikes?'

⁴⁴ Exigo Quantitative Report, page 31

⁴⁵ Exigo Quantitative Report, pages 8 and 18.

⁴⁶ Hala Systems Final Progress Report to GCC; Results and Findings, pages 1 – 4, quoted in HGC Semi-Annual Report, October 2021 and Annual Report, April 2022. The number originally proposed by Hala Systems was 570,000, later reduced to 162,000 by GCC on re-analysis of survey results using a more conservative methodology (KII).

⁴⁷ Exigo Quantitative Report, page 8.

Facility managers report that workers feel more secure as a result of the system; the school enrolment report above suggests a reduction in mental stress among parents in relation to their children's safety.⁴⁸

BENEFITS (1) AND (2): HALA SYSTEM'S IMPLEMENTATION OF SENTRY WITH GCC SUPPORT

The benefits discussed above were realised as a direct result of Hala Systems' implementation of the Sentry EWS. In this section we consider the key elements of the Sentry implementation and the extent to which GCC contributed. There are four key elements.

1. Hala Systems consistently operated and maintained an accurate and timely threat detection system. It has three elements: sensors (observers, acoustic sensors, data from social and other media); data processors to make sense of the data and make accurate predictions of airstrikes; and warning devices (sirens, radio broadcasts, cellphone apps, buzzers, alarms).

Hala Systems maintained a consistent operational presence over the grant period; it reports that it could not have done so without CHIC. It had multiple funders but not consistent core funding. With GCC agreement, Hala Systems used CHIC funds to pay core costs for periods when all other funding sources ceased.

The Hala Systems Final Report to CHIC in early 2021 reports an increase in the number of remote warning devices, installation of internet hubs where there is no mobile network coverage, and roll-out of radio broadcasts similarly funded by CHIC. The importance of the latter is emphasised by partner KIIs pointing to the importance of radio given the significant lapses in internet access experienced by communities.

Hala Systems technical reports, and KIIs with Hala Systems staff and implementing partners (White Helmets and facility management partners), together paint a consistent picture of successful technical development of the Sentry system leading to improved quality of the service (reliability and accuracy of warnings) and increased reach; however, KIIs took place in late 2022 which was nearly two years after the CHIC grant had ended, and so not all reports from KIIs could confidently locate events in the CHIC grant period.

Hala Systems technical reports and Hala Systems KIIs point in particular to the development of improved acoustic sensors and the development and roll-out of warning device relays with new, robust, solar-powered power kits in 2020 as key achievements funded by the CHIC grant. Partner KIIs confirm the importance of the relays. Other technical developments such as the data aggregation algorithm were said to be funded from several sources, and so KIIs were unable to reliably quantify the CHIC contribution.

2. Hala Systems built trusting relationships with a competent implementing organisation (White Helmets) and its partners (running vulnerable health facilities, schools, etc.).

Several sources emphasised the key role of trust-building between Hala Systems, White Helmets, the managers of the facilities where Hala Systems hoped to fit warning devices, and generally with the population. As one Syrian KII put it: "It is not easy for people to know who to work with when you're under siege." The high levels of trauma and stress noted above are relevant here.

3. Hala Systems installed reliable warning devices, with associated power supply and internet access, in vulnerable facilities and locations, and trained facility staff.

The RMAF reports installation of 261 warning devices (of all kinds) in the grant period (against a target of 200). This total includes Wi-Fi hotspots and visual warning systems in 15 schools and 138 medical/first responder facilities.⁴⁹ KIIs report corresponding systematic training of facility staff on the use and maintenance of the warning devices.

⁴⁸ KIIs

⁴⁹ Hala Systems Final Progress Report to GCC; Results and Findings, pages 1-4

4. Hala Systems ran a successful outreach programme to civilians to increase subscriptions to the warning app and train people on protective actions in response to warnings through the app, community sirens or radio broadcasts. The RMAF reports over-achievement in outreach activities against five of their six targets, as follows:

The RMAF reports over-achievement in outreach activities against five of their six targets, as follows:

TARGET	EXPECTED	REPORTED
No of intermediaries using Hala services (Meaning number of health workers + humanitarian aid workers working as observers and warners):	80	629
No of intermediaries trained in Hala services (Meaning number of organisations whose members have received Hala training):	130	416
No of outreach/awareness activities (Meaning training for affected people on existence of warnings and what they mean):	508	1497
No of potential beneficiaries reached through outreach activities (Meaning number of people at risk ('end users') who received such training):	10,000	16,600
No of intermediaries reached through outreach activities (Meaning number of health and humanitarian aid workers who received such training):	600	901
No of members of the general public reached through outreach activities (Meaning number of people beyond the above two categories who received such training):	1,000	500

Both Hala staff and partners described a successful transition to online training as the Covid pandemic took hold in 2020.

EQUITY

The equity question is: To what extent does the Sentry EWS benefit everyone equally, meaning equal access to the system, equal awareness of warnings and equal opportunity to take protective measures?

'Equal access' in this context applies to women and girls, small children, elderly and disabled people and recently arrived IDPs.

Most KIs report that access in relation to warning devices in schools, health and other facilities is comprehensive: everyone has access, everyone hears or sees the warnings, everyone takes protective measures. Children are looked after by teachers; patients by hospital staff – and White Helmets staff train the care-givers on evacuation procedures.

However, equity issues do arise for individuals receiving warnings at home or in public spaces, from sirens, radio broadcasts, or through the app, as follows.

IDPs were reported often to be at a disadvantage as they moved into new areas. Lower numbers of IDPs report being within earshot of sirens compared with residents; KIIs with partners indicated that White Helmets was aware that additional alarms and associated training were needed where IDPs settled and provided them accordingly.⁵⁰

IDPs were often less able to take protective measures: those in IDP camps may have no adequate shelter to go to. For those in urban areas, local knowledge and local networks were reported to be a key element in protection. IDPs may lack both: they may not know where public shelters are located; nor are they always welcomed by residents.⁵¹

Small children, elderly and disabled people depend on their caregivers and family members to assist them to safety and often there aren't enough people to provide adequate assistance, for example where a family has several children and elderly members.

Women and girls have been a focus of the Sentry outreach. Hala Systems⁵² and KIIs report that outreach to spread awareness and use of the Sentry cellphone app targeted women as women are seen as responsible for safety and security in homes. This was enabled by recruiting women to the awareness raising team – 8 out of 12 team members were female. Surveys indicated that women often did not have access to a mobile device; Hala Systems reports that this influenced their plans for radio broadcasts. KIIs report three main outreach achievements: a virtual platform, necessitated by Covid but useful for reaching women who may otherwise have difficulties leaving their homes for meetings; capacity building in gender awareness with partners; training of trainers for female outreach workers.

Women report being at a disadvantage when trying to protect themselves, for cultural reasons: a tendency to put others first at their own risk; the need to dress modestly before leaving the house; and through a reluctance to take shelter in a shelter crowded with men. Male family members are said sometimes to exacerbate the risk by pressuring women to stay indoors.⁵³

ENVIRONMENTAL IMPACT

There do not appear to be major adverse environmental implications of Hala System's products, or way of working. Hala Systems report⁵⁴ and KIIs confirm that the power consumption of devices is low and as noted they are often powered from solar panels. Hala Systems reports use of locally-sourced products for its hardware. Hala Systems staff report a 'paperless' office and default use of video for communications rather than international travel. Clearly the environmental impact of war is negative, not least due to the carbon footprint of airstrikes, clean-up operations, casualty treatment and re-building destroyed infrastructure. To the extent that benefits 3 and/or 4 (discussed in the box below) arise from the EWS, the environmental impact of war is reduced.

⁵⁰ Exigo Quantitative Report, page 6.

⁵¹ Exigo Qualitative Report, page 17.

⁵² Hala Systems Final Progress Report to GCC; Results and Findings, pages 1-4

⁵³ Exigo Qualitative Report, page 16.

⁵⁴ Grant Application Section B: Subsection 1.1.8 Environmental Impact

ADDITIONAL EXPECTED BENEFITS FOR CIVILIANS TARGETED BY AIR STRIKES

In addition to the benefits foreseen in the documentation, two other (somewhat conjectural) benefits were in the minds of GCC and Hala Systems:

3. Conjecturally, reduced likelihood of airstrikes because of their reduced effectiveness.

There is a third potential benefit, necessarily conjectural, for both currently vulnerable and potentially future vulnerable populations, arising from the success of the EWS in reducing casualty numbers caused by airstrikes.

BENEFIT 3. Vulnerable people are less likely to be targeted for an airstrike, and hence less likely to be killed or injured, as a result of the airstrikes' reduced effectiveness.

This benefit will be felt to the extent that:

- a) The Sentry EWS consistently reduces casualties compared with those suffered by vulnerable populations under air attack who did not have access to the EWS.
- b) Air-strike decision-makers know (or believe) this to be the case.
- c) Air-strike decisions are made by a rational process in which casualty rates are a factor, hypothetically through some cost-effectiveness analysis of the harm caused by the airstrike relative to the cost of launching it.
- d) By reducing the actual or perceived effectiveness of air-strikes to cause casualties, it is less likely that air-strikes will be ordered.

While there is evidence for proposition (a)—that Sentry reduces the casualty rate on average by around 20% compared with an air strike hitting without warning—no other elements of this proposition have been tested by this assessment.

4. Conjecturally, reduced likelihood of airstrikes because of the increased accountability risk for perpetrators.

Exactly the same (conjectural) benefit may arise from a different feature of the Sentry system, the ledger-hashing project, which is intended to ensure a verifiable record of evidence available to the media or the courts, and which is hoped will act to deter perpetrators:

BENEFIT 4. Vulnerable people are less likely to be targeted for an air-strike, and hence less likely to be killed or injured, as a result of increased accountability risk for perpetrators.

This benefit will be felt to the extent that:

- a) The set of input data being hashed (observations, sensor readings, data from media) is itself convincing.
- b) The hashing process is robust and the hash is stored on a public distributed ledger (blockchain technology), providing verification that it hasn't been tampered with while in Hala Systems' custody.
- c) Media, legal and other investigators make use of the data.
- d) Air-strike decision-makers believe that they may be identified and exposed in the media as responsible for illegal acts such as airstrikes on schools and hospitals, sanctioned in some way, or prosecuted for war crimes.
- e) Such exposure or possible sanction or prosecution is a deterrent factor in their decision calculus for air strikes

There is evidence to support propositions (a), (b) and (c).

In relation to (a) and (b), the ledger hashing project has been fully implemented with some (unquantified) contribution from GCC among other donor funds.

In relation to (c), there is reported to be increased interest from accountability organisations and the media in the data stored on the ledger. The timeframe for prosecutions in the International Criminal Court (ICC) is many years and it is too early to say to what extent their prosecutors will call on Hala evidence.

As with Benefit 3, the remaining elements in the logic chain are conjectural. We have no evidence relating to them.

LOGFRAME IMPACT 3:

CONTRIBUTE TO AND FOSTER SYSTEMS CHANGE WITHIN THE HUMANITARIAN ECOSYSTEM

- What product, process or system-level change in the humanitarian system is the innovation contributing to (or is on a pathway to do so)?
- To what extent has the innovation spread beyond its project location and what is the pathway to wider adoption?

3.1 WHAT PRODUCT, PROCESS OR SYSTEM-LEVEL CHANGE IN THE HUMANITARIAN SYSTEM IS THE INNOVATION CONTRIBUTING TO (OR IS ON A PATHWAY TO DO SO)?

Sentry is a product-level change in the way the system functions: by virtue of its entire design, making use of current technology in its sensors, algorithms, warning devices, power supplies and networking (e.g. use of satellite internet connections) coupled with a comprehensive training and outreach programme, it has far superseded all previous EWSs in its technical capabilities.⁵⁵

The system vision as described in the Application⁵⁶ is potentially applicable in a wider range of humanitarian settings, both conflict settings (e.g. detecting artillery, mortar or small arms fire, not just air attacks) and in environmental disasters. As an airstrike EWS, Sentry is a niche product. However, the core of the system is described as a robust data pipeline to ingest data from a number of sources, process that rapidly to define incidents of note, then push out warnings through a messaging or warning system – and that doesn't have to be specific to airstrikes.

3.2 TO WHAT EXTENT HAS THE INNOVATION SPREAD BEYOND ITS PROJECT LOCATION AND WHAT IS THE PATHWAY TO WIDER ADOPTION?

The Project Application anticipated that the system would be developed and deployed in Yemen⁵⁷ and was applicable in Eastern Ukraine (Donbas) and DRC (East Kivu) where discussions were said to be underway.⁵⁸ Hala Systems' Final Report notes that the system has not been implemented in Yemen⁵⁹ and at the date of the case study (late 2022) expansion is said to be on pause.⁶⁰ The vision of wider adoption is unchanged, but the obstacles are said to be considerable.

Firstly, while the basic design of the system is applicable to many contexts, the actual data inputs, whether acoustic or linguistic, will be different in each context, necessitating considerable detailed technical adaptation. Secondly, the system has to perform to a high standard and this depends both on the technology and on a large team of skilled people working well together, most of whom will need to be recruited and trained locally, and on building trusted relationships with local partners. This is a potentially lengthy and resource-intensive process. Thirdly, conflict settings set considerable logistical challenges to importing and setting up the hardware, recruiting and training staff etc. Fourthly, there is often a lack of reliable power and connectivity. And finally, conflict settings are often extremely dynamic, with rapidly changing needs and movements of IDPs.⁶¹

⁵⁵ The system is described in Application Section B: Innovation and the Grant Agreement Section B: project Description and Attachment J: Proposed development of new components. Previous EWSs are summarised on page 15. A summary of the system's innovative features is on page 20. KII views are unanimous that it is way ahead of other EWS.

⁵⁶ Application page 24 and following pages.

⁵⁷ Application Project Summary page 21

⁵⁸ Application Project Summary page 23 and 28

⁵⁹ Final Progress Report, page 2

⁶⁰ KIIs

⁶¹ Application page 24 and KIIs

Funding is key. Hala Systems reports difficulties in accessing suitable or sustained donor funding yet this is essential to address these issues. Hala Systems needs continuity of expert staff. Its funding needs call for a donor whose mandate covers mitigation of violence, whose timeframe for grants is multi-year and whose grant size is adequate to the development and continuity of a country programme (such as Syria, or Yemen). Hala Systems reports that neither aid, humanitarian or stabilisation funds easily meets all three requirements.

IMPACT 2: INCREASING EFFICIENCY AND COST-EFFECTIVENESS OF HUMANITARIAN ASSISTANCE

Logframe Impact 2:

Maximise value for money by increasing the efficiency and cost-effectiveness of humanitarian assistance

To what extent may (or might) the innovation either:

- Increase the efficiency of humanitarian activities (through, for example, reducing costs of certain common humanitarian outputs), or
- Increase the cost-effectiveness of humanitarian actions (through, for example, improving outcomes (while keeping costs low) from certain common humanitarian interventions)?

There was a range of views among stakeholders as to the appropriate framing of the cost-effectiveness question when applied to Sentry. The following lines of argument emerged.

COST-EFFECTIVENESS OF THE SENTRY SYSTEM IN THE CONTEXT OF HUMANITARIAN COUNTRY BUDGETS

The Sentry system – and potentially any future iterations in other conflict or disaster settings – saves lives, reduces injuries and reduces stress and trauma in a way that no other intervention achieves in Syria. It improved outcomes in Syria by providing an ability to take action which could be life saving and thus provides a degree of reassurance to 2 million Syrians at a cost of CAD \$997,484⁶², which is low in the context of the humanitarian country budget.

There is no comparable intervention with which to make a quantitative cost-effectiveness comparison. In 2019, Hala Systems made a broad-brush cost-effectiveness comparison with surgical interventions elsewhere using the WHO Disability-adjusted-life-year (DALY) methodology⁶³ but it is hard to see why this is appropriate, as the difference in the interventions does not seem sufficiently close to make a meaningful comparison.

LIKELY REDUCTION IN OVERALL HUMANITARIAN COSTS

It can be plausibly argued that Sentry reduces overall humanitarian assistance costs in two ways as follows, though cost analysis is beyond the scope of this assessment.

Physical and psychological violence in humanitarian settings will incur medical and psycho-social care costs; thus any reduction in casualties and stress levels through mitigation will reduce the caseload and hence cost of reactive humanitarian assistance. Such violence will also reduce resilience and people's ability to support themselves, thus increasing the need for more general assistance, for example to support livelihoods.

Protracted and severe violence is likely to lead to mass displacement of vulnerable populations (as seen in Syria when lines of control change) which entail downstream costs for shelter, WASH, food, health and education for those displaced.

By analogy with other comparative costings of preventive versus reactive humanitarian measures, it is not hard to surmise that the downstream costs of not having an early warning system are likely to far exceed the cost of a Sentry system.

⁶² Final GCC Financial Report, September 2021.

⁶³ Application Section 3.3.3 pages 26 – 27.

DETERIORATING THE EFFECTIVENESS OF AIR STRIKES (WITH REFERENCE TO THE CONJECTURAL BENEFITS 3 AND 4 IN BOX ABOVE)

A quite different approach is to consider the possible deterrent effect of Sentry on the decision-making calculus of those who order air strikes. This is necessarily hypothetical. The logic is as follows.

1. Military leaders make decisions about undertaking bombings in rebel-held areas of Syria
2. Those decisions weigh up factors that include the:
 - a. Military or political advantage of bombing
 - b. Financial cost of bombing
 - c. Costs to shield populations from the awareness of bombing campaigns
 - d. Cost of covering up the military cost
 - e. International and local political cost should civilian deaths make the news
 - f. International reputational impact
 - g. Personal risk of being prosecuted at the International Criminal Court
3. Every decision to bomb civilians increases the risk of making the news and deteriorating the image of national leaders in the eyes of the public.
4. Commentators on the Syrian conflict advise that hospitals, roads, water infrastructure and civilians are not collateral damage in modern warfare, but a primary target to destroy morale and displace people. Civilian deaths are a military objective.
5. Anything that can be done to reduce the cost-effectiveness of bombing campaigns – and therefore, it is hoped, make them less favourable to military decision-makers – represents good use of donor funds.
6. Hala Systems has demonstrated that deploying their innovation reduces civilian casualty numbers between 20% and 30%
7. The reduced effectiveness of the airstrikes (fewer casualties) plus the hashing system (evidence collected) means that it now is proportionately more difficult and expensive – in terms of effort, cover-up as well as costs – for the aggressors to achieve their objectives.
8. The Sentry system makes the killing of civilians more difficult. If a few million dollars spent on Sentry System waste hundreds of millions on bombs and makes bombing less likely and less effective – potentially even to the point where very costly or ineffective campaigns will not be started at all – then that is exceptionally good value for money.

EWS PROTECTION AS A BASIC HUMANITARIAN DELIVERABLE

It can be argued that effective protection from violent aggression should be seen as a basic humanitarian deliverable to people in need, falling under the protection agenda, as well as a basic means of delivering duty of care to humanitarian actors working in potential targets. In this framing, there is no argument about whether to do it, only an argument about how best to do it. In VfM terms, this means that the salient consideration is how to deliver Sentry-type protection as efficiently as possible. Efficiency here means getting the right balance of quality (accurate and reliable warnings), timeliness (warnings delivered immediately threats are identified) and cost.⁶⁴ This logic is familiar to tech developers (and in particular to Hala Systems decision-makers) in the form of the slogan: 'Cheap, fast or good – pick two.'⁶⁵ A suitable VfM analysis (beyond the scope of this assessment) would be to test whether Hala Systems has made the right choices.

⁶⁴ The Cost-Quality-Timeliness (CQT) approach.

⁶⁵ KII.

INNOVATION VALUE FOR MONEY ASSESSMENT

- What were HGC's expectations for the innovation's impact? This is the implicit VfM Benchmark.
- How do the impacts measure up to CHIC's expectations? Compared with benchmark, is the impact achieved rated as sub-optimal, good or very good, taking context into consideration?
- VfM Assessment: The innovation is assessed as representing sub-optimal, good, or very good value for money overall.

IMPACT 1: INNOVATION COSTS AND BENEFITS

EXPECTATIONS AND ACHIEVEMENT

Benefits 1 and 2: Reduced casualties from air strikes and reduced mental stress across the population

CHIC's expectations of their support for the Hala Systems project at the impact level were framed as targets for numbers of lives saved (1,217) and injuries averted (3,651). At the output level Hala Systems' results measurement framework set a target for number of people with access to warnings (3.8 million).⁶⁶ Hala Systems did not reach these targets. There are good methodological and circumstantial reasons why the targets should be set aside.

Methodologically, the lives saved/injuries averted metric responds not just to the effectiveness of Sentry but also to the frequency of air-strikes; if these decrease, though the protection conferred by Sentry may be high, the numbers killed or injured will drop. Furthermore, the frequency of air strikes cannot be forecast, or assumed to stay constant. These factors make target achievement both arbitrary (dependent on factors wholly outside Hala Systems control) and perverse (effectiveness makes the target harder to reach).

The project was launched in August 2019. The Covid pandemic struck in early 2020 resulting in movement restrictions and diversion of effort into Covid-related responses. Before that, in December 2019, the regime launched a 6-month offensive that unexpectedly moved the line of control in its favour, resulting in the loss of a considerable amount of Hala Systems equipment, displacement of its and its partners' staff, and substantial movements of IDPs into the now smaller non-regime-controlled area. Under these circumstances the target for coverage cannot be considered relevant.

Further, these measures distract from what some sources consider to be the more important value consideration from an innovation funder's perspective⁶⁷, whose criteria might be stated as follows:

- How well did Hala Systems response to dramatically changing circumstances?
- How well did it use donor (in this case CHIC's) funds in the mix of funding it had available?
- Did it pursue implementation appropriately and responsively?
- Did it continue to innovate successfully?
- Did it deliver an increasingly effective EWS with clear benefits for vulnerable populations?
- Is it developing its potential for more widespread adoption throughout the humanitarian system?

This amounts to a different and more holistic methodological approach for assessing VfM. The evidence in response to these questions is incomplete but what was gathered is highly favourable. Hala Systems demonstrated a capacity to absorb the losses and setbacks resulting from the regime offensive and implement its system with innovative tech products (sensors and relays), expanding its reach beyond GCC targets, with benefits that were widely recognised by vulnerable populations.⁶⁸ The CHIC grant was part of a mix of funds in the grant period. CHIC's exact contribution to individual elements of Hala Systems' work (radio broadcasts, improved sensors, new relays,

⁶⁶ GCC did not set a target for number of people relieved of mental stress, though it did report the estimated actual number in the RMAF. In addition to the metrics mentioned, GCC set a series of output level targets which were summarised in the text earlier, most of which Hala Systems exceeded.

⁶⁷ KII's

⁶⁸ KII's

enhanced outreach etc) cannot be documented across the board, though two points stand out: sources are clear that without CHIC, (a) Hala Systems would not have been able to pay core costs and continue to operate throughout the grant period, with potentially serious consequences for the organisation (such as loss of staff), and (b) CHIC is credited with funding a large number of the new warning device relays, described as a key achievement in the period. Overall, sources concur that CHIC made a significant contribution to Hala Systems' achievements in the grant period.

ASSESSMENT:

In the absence of meaningful metrics for Impact 1, a VfM assessment using the agreed methodology (How well did impacts measure up to HGC's expectations?) cannot be made.

An assessment made through the lens of the more holistic approach (the six bullet points in the foregoing section) would be that VfM was Very Good, though with the caveat that there are no explicit judgement criteria by which to make assessments against each question.

BENEFITS 3 AND 4: CONJECTURALLY, REDUCED LIKELIHOOD OF AIR-STRIKES BECAUSE OF THEIR REDUCED EFFECTIVENESS, OR BECAUSE OF THE INCREASED ACCOUNTABILITY RISK FOR PERPETRATORS

These conjectural benefits were not articulated at the outset and no assessment can be made.

IMPACT 3: INNOVATION ADOPTION IN THE HUMANITARIAN SYSTEM

EXPECTATION AND ACHIEVEMENT

Sources noted that at the date of the grant, one of the first awarded under CHIC, CHIC did not have a well-articulated systems change agenda and hence this was not an explicit objective. However, CHIC did have expectations that the system would be developed and deployed in Yemen; these expectations have not been met, as the direction of the conflict and the military/political circumstances have caused it to be paused.

The analysis indicates that Sentry has the potential to develop into an innovation of wide application in humanitarian settings. However, it has not done so yet, as it has not been recognised as such by donors or adopted by major implementing agencies.

ASSESSMENT:

The assessment is Sub-optimal.

IMPACT 2: INCREASING EFFICIENCY AND COST-EFFECTIVENESS OF HUMANITARIAN ASSISTANCE

EXPECTATION AND ACHIEVEMENT

An increase in efficiency and cost-effectiveness was not an explicit expectation at the date of the grant. As discussed above, there is a range of ways to define cost-effectiveness in this context.

ASSESSMENT:

An assessment cannot be made using the agreed methodology. However, the qualitative evidence summarised above in relation the various cost-effectiveness approaches discussed suggest that it would reasonable tentatively to make an assessment of Good.

OVERALL ASSESSMENT:

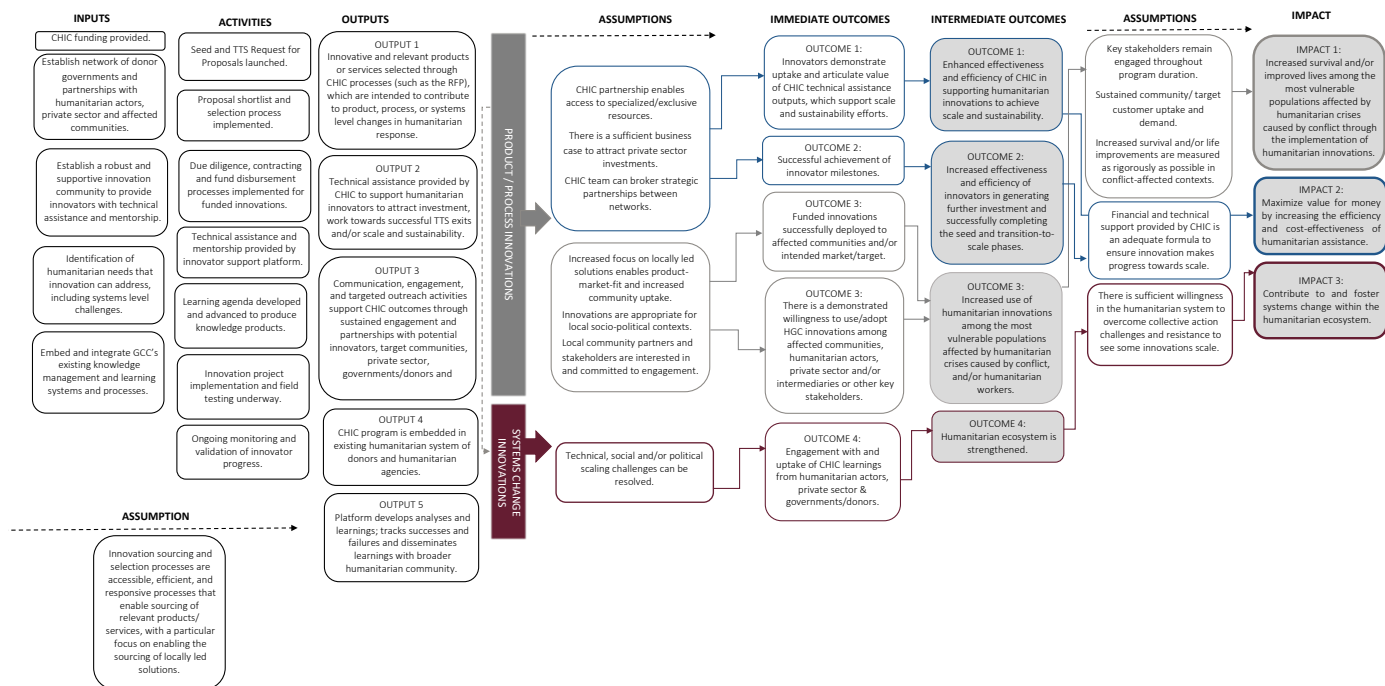
Applying the methodology developed for innovation VFM assessment: no overall assessment can be made.

On a wider view of VFM in this case, and acknowledging the tentative nature of the methodological framework, the overall assessment is Good.

Annex I. Strength of Evidence Assessment Criteria

STRONG	FAIR	WEAK
Evidence is coming from multiple data sources or one highly reliable one, and is triangulated with feedback from external stakeholders	Evidence is coming from multiple data source or from one highly reliable data source (e.g. progress report) but could not be triangulated with feedback from external stakeholders	Evidence is mostly from one data source and could not be triangulated with feedback from external stakeholders (i.e. stakeholders other than the innovators of CHIC)

Annex 2. CHIC Theory of Change



PROBLEM | As the length, frequency, and scope of the world's conflicts increase, it is becoming more difficult to reach affected people in insecure areas with life-saving and life-improving humanitarian assistance. New and scalable solutions are needed that respond to the needs of vulnerable, inaccessible communities through strengthened funding partnerships, while ensuring sustained innovation uptake learning within the broader humanitarian system.

VISION | To save and improve the lives of populations affected by conflict by reducing gaps in humanitarian assistance, while fostering systems change across the humanitarian sector.



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Grand Challenges Canada
Grands Défis Canada

Annex 3. Evidence Sources

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Nachiket Deval	Grand Challenges Canada	Grantee Manager
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Dan Henebery	Hala Systems	Monitoring and Evaluation Officer
Fadi Dabbas	Hala Systems	Field Coordinator for White Helmets
John Jaegar	Hala Systems	Chief Executive Officer
Razan Alam	Hala Systems	Syria Team Lead
Ahmad Mansour	Hand in Hand for Aid and Development (HiHfAD)	Medical Operations Manager
Karim Alsibai	Hand in Hand for Aid and Development (HiHfAD)	Senior Partnership and Compliance Officer
Mohannad Alwazer	Hand in Hand for Aid and Development (HiHfAD)	Field Security Officer - Syria
Karam Alameer	Hurras	Education Programme Officer
Hamzeh Hasan	SAMS – Syria	Deputy Field Manager
Ahamad Akoup	White Helmets – Syria	Sentry IT Officer
Batoul Jahdo	White Helmets – Syria	Sentry Awareness Officer
Mohammad Diab	White Helmets – Istanbul	Sentry Project Coordinator

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