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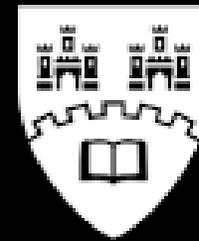
Thinking Service Design for Improvements in Emergency Preparedness and Response: Cases from Pakistan (Lahore, the Punjab) and Azad Jammu and Kashmir, AJK) and the International Emergency Team UK



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Acknowledgments: Mehrban Sadiq (Chair, IETUK), Daryl Oprey OBE (Trustee, IETUK), Colin Bowman, Ehtasham Arshad (MSc student), Khansa Sadiq MSc, Iris Weber (Odisee University College, Brussels), Muhammad Ashan and colleagues at the Emergency Services Academy of the Punjab Emergency Services (Rescue 1122)



**Northumbria
University**
NEWCASTLE

That's design ... creativity and innovation

“Design is what links *creativity* and *innovation*. It shapes ideas to become practical and attractive propositions for users and customer”.

“Design may be described as creativity deployed *to a specific end*.”

“Service design is all about taking a service and making it meet the user's and customer's needs for that service. It can be used to improve an existing service or to create a new service from scratch.” Interaction Design Foundation

<https://www.interaction-design.org/literature/article/the-principles-of-service-design-thinking-building-better-services>



Sir George Cox, Chair UK
Design Council



Northumbria
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HOW CAN WE REDUCE RISK?

$$\text{RISK} = \text{HAZARD} \times \text{EXPOSURE} \times \text{VULNERABILITY}$$



We can improve our abilities to monitor and forecast hazards



Increased awareness of the hazards faced by communities and their exposure to them



The greatest benefits can be achieved by reducing the vulnerability to natural hazards

Source: (Tostevin, R, and Gill, J. 2014).

https://www.researchgate.net/publication/313185393_Hazards_and_the_Himalaya

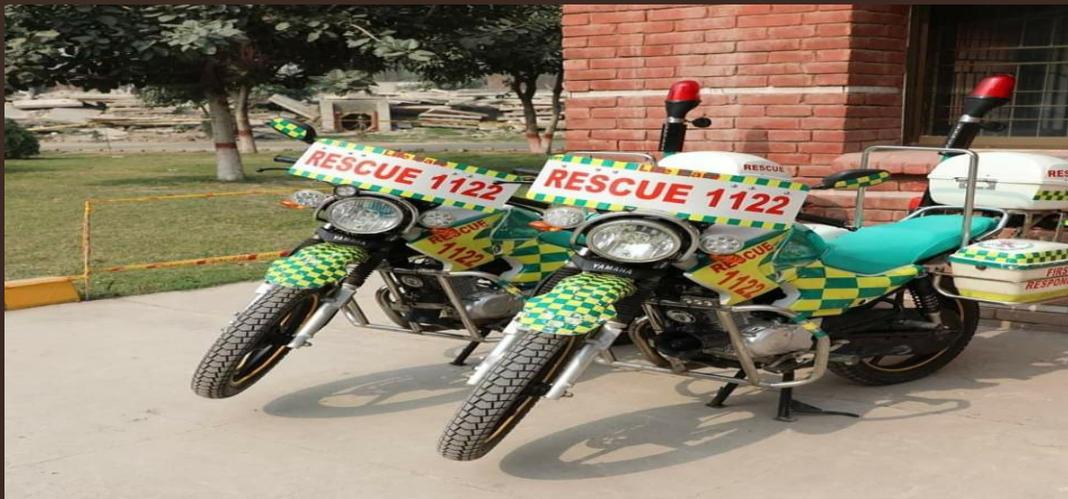
Risk “Formula”

- Lahore is a mega-city; with multiple risks relating to traffic, fire etc.
- AJ&K is hazardous region and is exposed to both natural and manmade hazards; with its peculiar hazardous environment, the risks are accentuated for current state of physical, socio-economic and organizational vulnerabilities and exposure (SDMA, 2008).

<http://www.ndma.gov.pk/plans/Provincial%20DRM%20Plan%20AJK.pdf>



(THE 17 GOALS | Sustainable Development, 2020)



Vision and Mission of the International Emergency Team UK (IETUK)

- **Vision** :“Assisting with the development of a safe and diverse community”
- **Mission** : “To inspire and assist a multi-agency approach to risks, safety and emergency planning to support local humanitarian need in line with the Sustainable Development Goals (2015 – 2030) and The Sendai Framework for Disaster Risk Reduction 2015 – 2030”

IETUK

- **Who they are :** The United Kingdom International Emergency Team (IETUK) is a charitable, non-profit organization based in the United Kingdom that works to provide humanitarian assistance to developing countries.
- **What they do:** The United Kingdom International Emergency Team (IETUK) has an established track record in providing a broad spectrum of services to the developing world under the umbrella of humanitarian assistance.
- **Projects delivered:** A number of projects have been delivered, from research and technical assistance to donations.



(International Emergency Team UK, 2020)

Unlike developed cities within the UK, Lahore does not have a water main supply network that is available to the emergency services at times of emergency. When IETUK were made aware of this issue, we knew we had to help to find a solution that would fit local firefighting demands. The team set about undertaking a gap analysis of the situation and quickly determined that the problem was two fold:

- At the time, the current Fire Appliance design in the Punjab carried a limited quantity of water for firefighting. This restricted quantity of water combined with a fire pump only capable of delivering water at low pressure / large volume meant that they had limited extinguishing capability and working duration.
- The traditional set-up was typically only using hose lines with low-pressure jets, and sprays to extinguish fires.
- From a tactical perspective Incident Commanders were limited by these current restrictions. There was no ability to adopt modern firefighting techniques via high pressure / low volume equipment, as is standard practice in the UK and other developed countries.



In resolving this issue the IETUK team entered into joint discussion with the local fire appliance manufacturer in Lahore and the Punjab Emergency Service (Rescue 1122). The underlying system was modified, and also firefighters' training at the Emergency Services Academy revised.

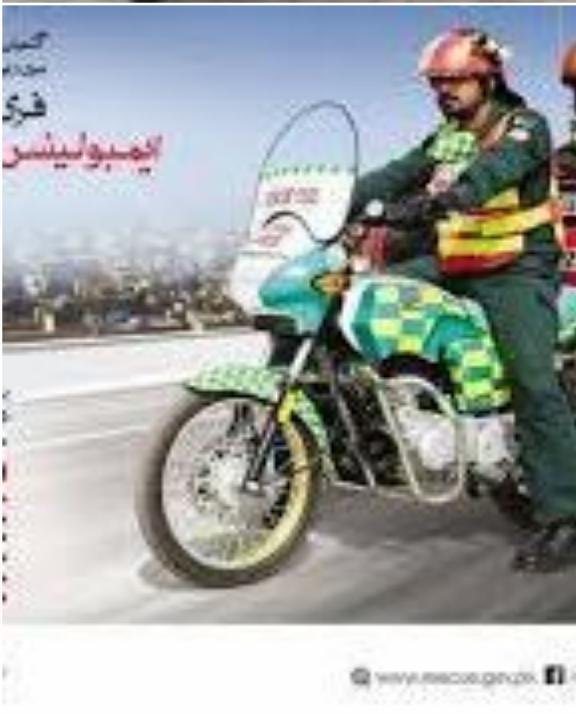
This project has realised significant improvements to the Punjab Emergency Service, not least that they can undertake firefighting operations more economically with increased capability, capacity and resilience.

- The end result has seen the development of a dual stage firefighting pump that is a game changer for the emergency service in the Pakistan.
- New Fire Appliances are subsequently being fitted with this pump as standard and the fire & rescue service is currently retro fitting the new pump to the existing fleet.
- The additional issue identified by the gap analysis was capacity and the ability to maintain adequate water supplies to deal with an incident.
- Typically a standard fire appliance in the Punjab carries around 400 Gallon (1818 Litre) of water. Utilising their current equipment provision and firefighting tactics this may last as little as 6 minutes.
- In resolution of this issue, it was agreed that Fire Appliance Water Tankers would be secured and mobilised to incidents in support of the initial firefighting appliance. Given the large capacity of a Water Tanker, this gave a significant increase in firefighting water capacity.



In addition to the mobilising of Water Tankers the team also worked with Punjab Emergency Service to determine strategic locations for the construction of above ground water storage tanks.

These are utilised to quickly replenish Water Tankers, tactically providing a shuttle service to maintain firefighting water supplies at the incident ground.



A First Responder (Paramedic) Motorbike Ambulance Service for Lahore / the Punjab

- Until recently residents in the Punjab region, including children, women and the elderly, were unable to receive appropriate emergency medical care, simply due to sparse geographical medical provision and narrow road networks.
- Emergency vehicles (ambulances) were often either unavailable or unable to attend quickly to a medical emergency putting lives of the local community in danger.
- This situation is made worse in times of disaster with disruption of communications networks, including roads and bridges.
- When IETUK were made aware of this issue, we knew we had to help to find a solution that would fit the demands of the country.
- With the support of various UK blue light services, vehicle manufacturers in the Punjab and an extensive network of UK community fundraisers, that's exactly what we did.

Our solution: a First Responder Paramedic Motorbike designed to carry wide ranging medical equipment. A solution that would see first responders provide wide geographical coverage and be able to navigate the hazardous road network to reach patients, helping to save lives.

- Of course, this service had to be, and is integrated into the emergency health provision in the Punjab, with ambulances, hospitals and doctors taking over after a first response.
- Directly resulting from fundraising in the UK, ten First Responder Paramedic Motorbikes were manufactured by a local business in Lahore, assisting local employment opportunities, and were presented to the Chief Minister and Punjab Emergency Service Rescue 1122.
- This capability was married with appropriately trained Paramedic First Responders from the Punjab Emergency Services aka Rescue 1122.
- The initial success of this project was such that the Chief Minister of the Punjab Government subsequently chose to support an expansion of the project. An order for a further 900 motorbikes was placed with the manufacturer.
- This investment by the Punjab Government has not only saved lives, but also created a thousand jobs in the supply chain and thus firmly supported the community.

The additional Paramedic First Responder Motorbikes have been rendering medical assistance to the Punjab community since September 2017. Rescue 1122 statistics indicate that they have attended over 168,000 calls in the first year and 386,000 calls for assistance from the community over the first two years, achieving an average four-minute attendance time.



<https://www.geo.tv/latest/327582-watch-firdous-ashiq-awan-rides-a-rescue-1122->

AJK (Pakistan), Study Area



Azad Jammu and Kashmir - AJ&K (also called as Pakistan Administered Kashmir PAK) lies between longitude of 73° to 75° and latitude of 33° to 36°

It comprises an area of 5134 square miles (13297 square kilometres)

AJ&K is mostly hilly and mountainous with some stretches of plains. The land is blessed with snow covered mountains, thick green forests, fast flowing rivers and streams

The main rivers are Jehlum, Neelum and Poonch. AJ&K climate is characterized by sub-tropical highland type with an average yearly rainfall of 1300 mm (SDMA, 2008).

HOPE



WELFARE TRUST

<https://www.hopewelfaretrust.org/maternity-hospital/>

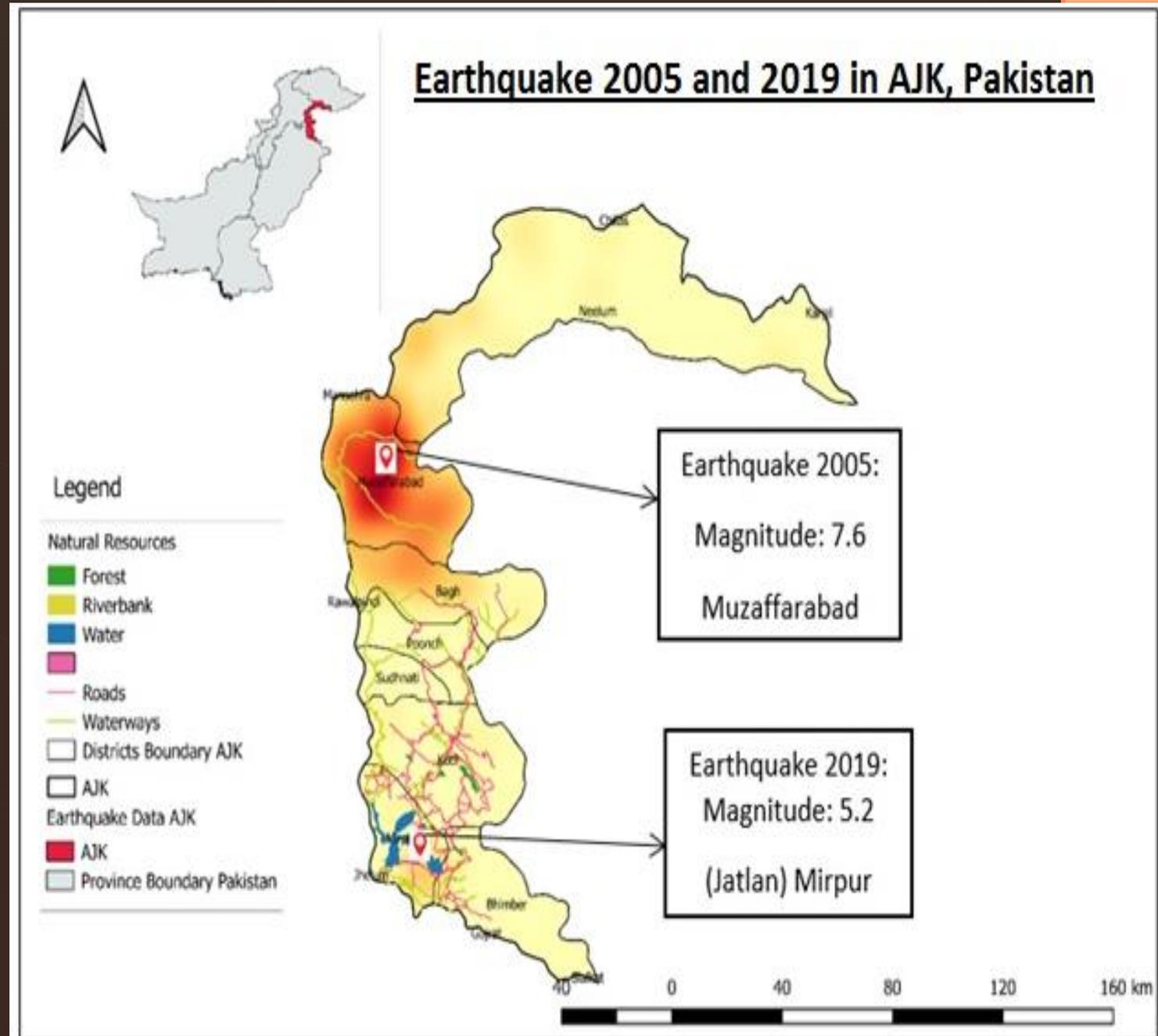
- "The Hospital opened its doors in April 2018, and has seen scores off patients since. We are working in partenership with the AJK government to provide all facilities necessary.
- There have been 60 births in the hospital and 95% of these families didn't pay any fees due to their poor background.
- We have introduced a Zakaat Card for orphans, widows and poor families. This card is valid for 2 years and the holder is entitled to free tests, x-rays, medication and other facilities available at the hospital.
- The hospital is operational 24 hours per day 365 days per year. Majority of the hospital equipment has been sent from the UK. We have had a number of Dental camps and eye camps at the hospital for free of cost to all patients."



Earthquakes in AJK

The map shows a major earthquake intensity that hit Muzaffarabad, AJK in Oct, 2005. More than 75000 people lost their lives (EERI, 2006).

A very recent earthquake hit the same region (AJK), especially the Mirpur area, in September 2019. More than 15 people died and 300 were injured (NDMA, 2019).



Landslides in AJK, Pakistan

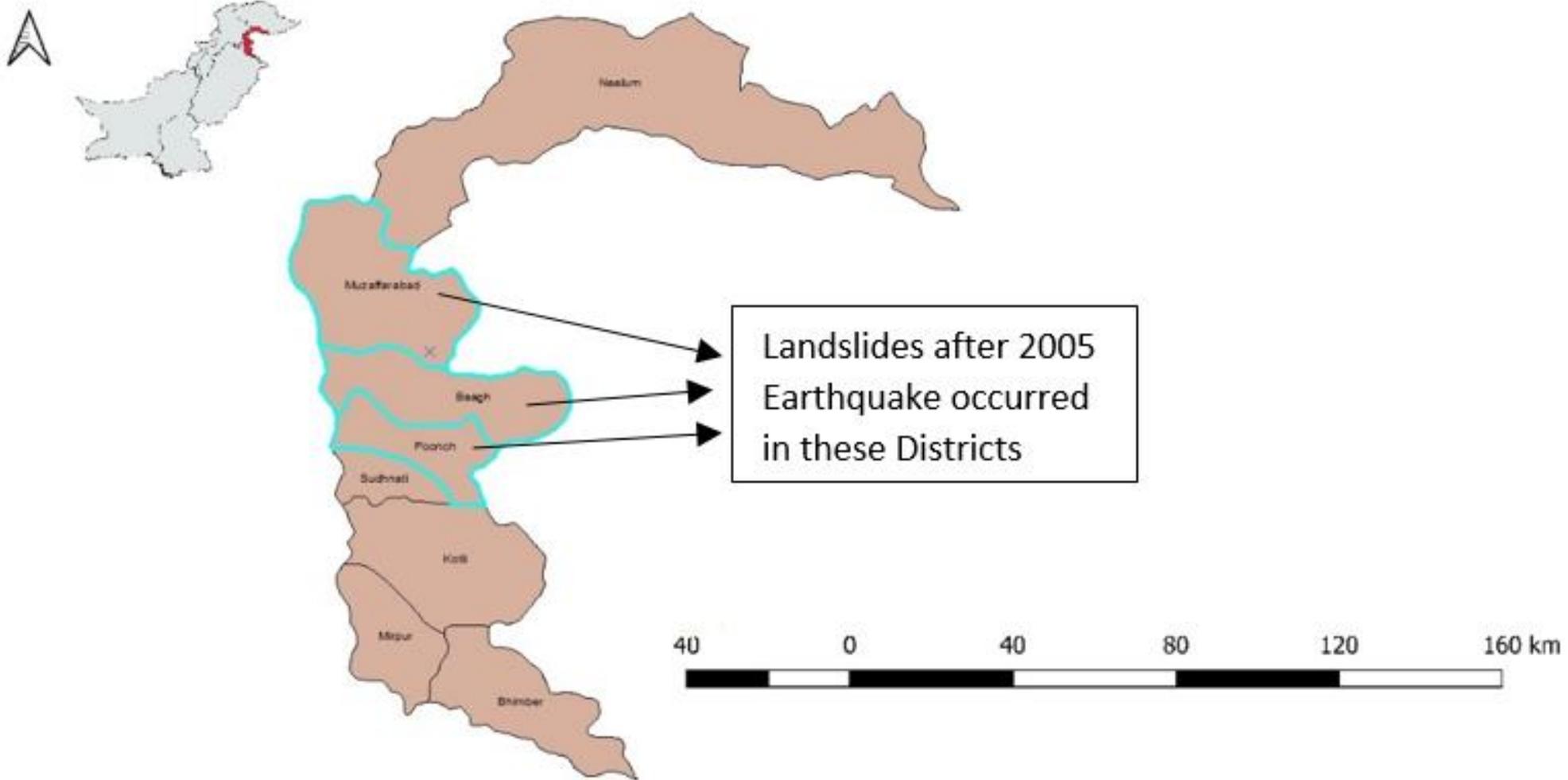
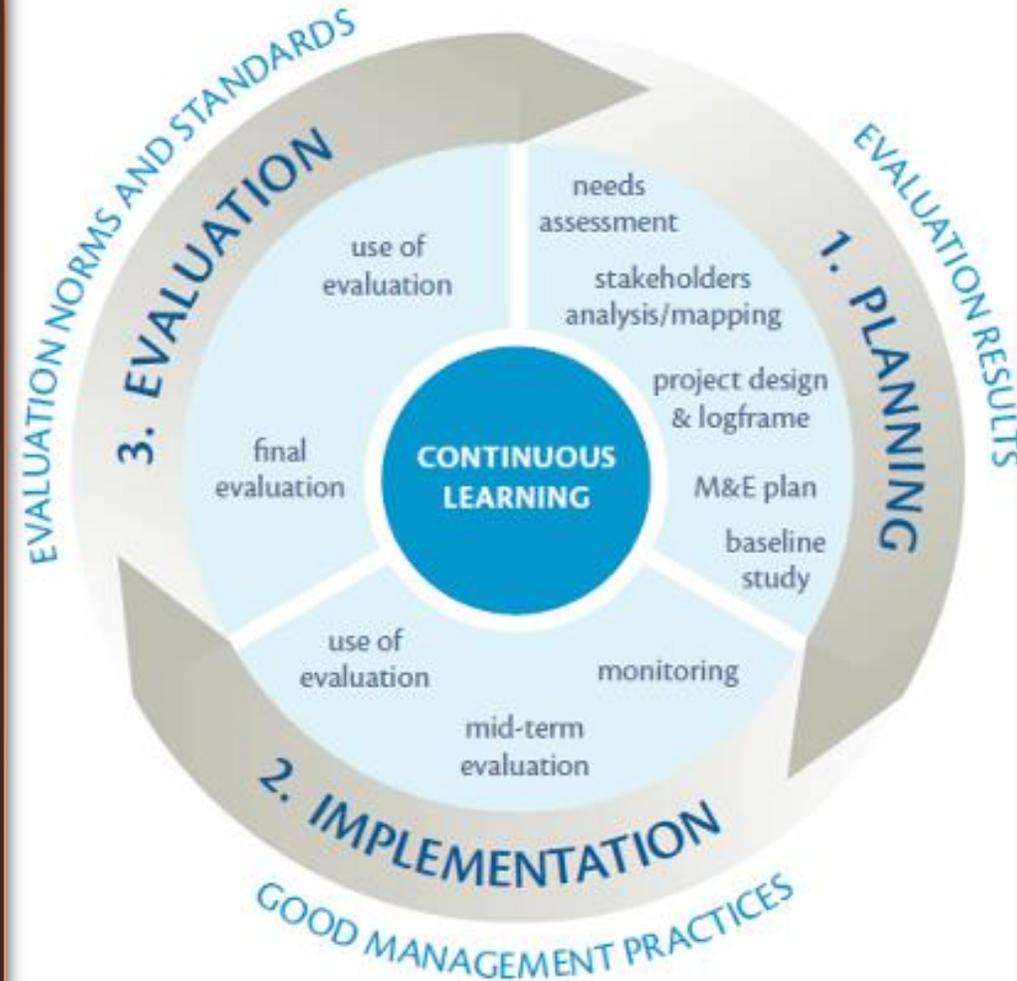


FIGURE 3.1 EVALUATION IN THE PROGRAMME/PROJECT LIFECYCLE



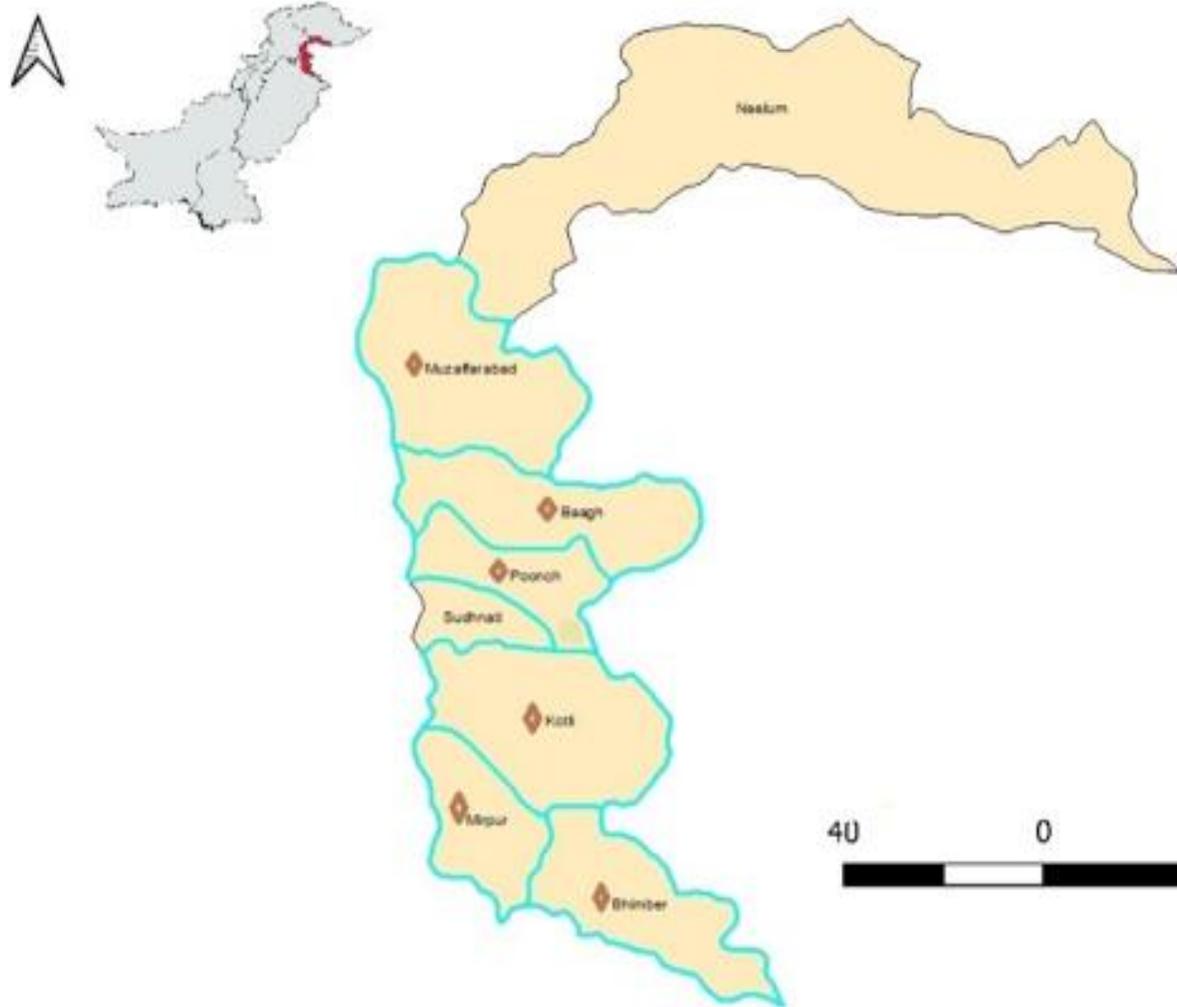
What is Project evaluation?

A systematic and objective assessment of an ongoing or completed project with aim to determine project success on basis of following (ILO: PROJECT EVALUATION, 2020):

- Project objectives
- Development effectiveness
- Efficiency
- Impact and sustainability

(Evaluation Handbook Guidance for designing, conducting and using independent evaluation at UNODC, 2017)

Healthcare Infrastructures which deals with Accident & Emergency (A&E) in AJK, Pakistan



Muzaffarabad:

- ⊕ CMH Hospital
- ⊕ Abbas Institute of Medical Sciences (AIMS)
- ⊕ Kashmir Surgical and General Hospital (KSGH)

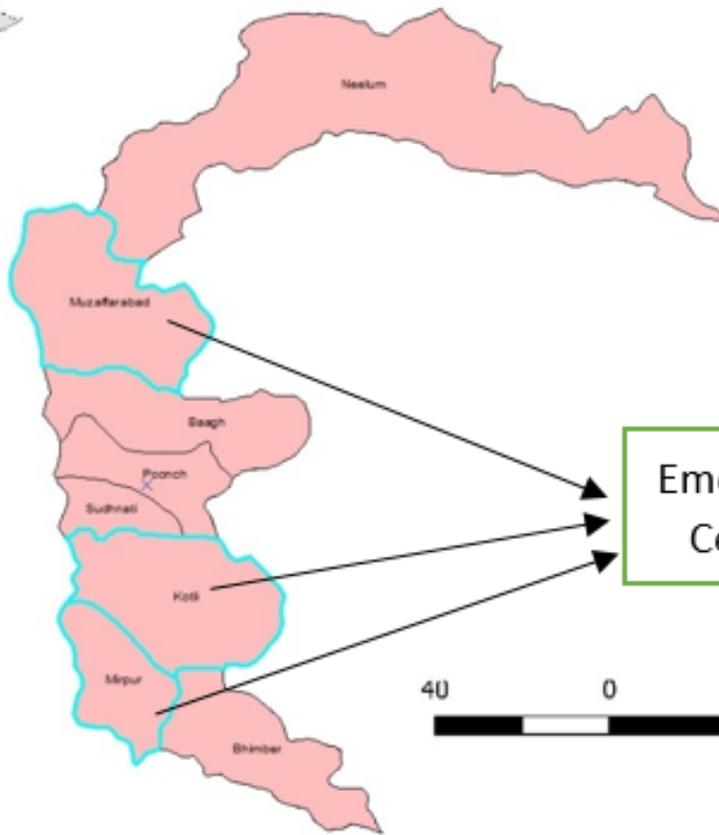
Poonch

- ⊕ CMH Hospital

Mirpur, Bhimber, Kotli, Bagh:

- ⊕ DHQ Hospitals

Emergency centres in AJK, Districts, Pakistan



Emergency
Centres



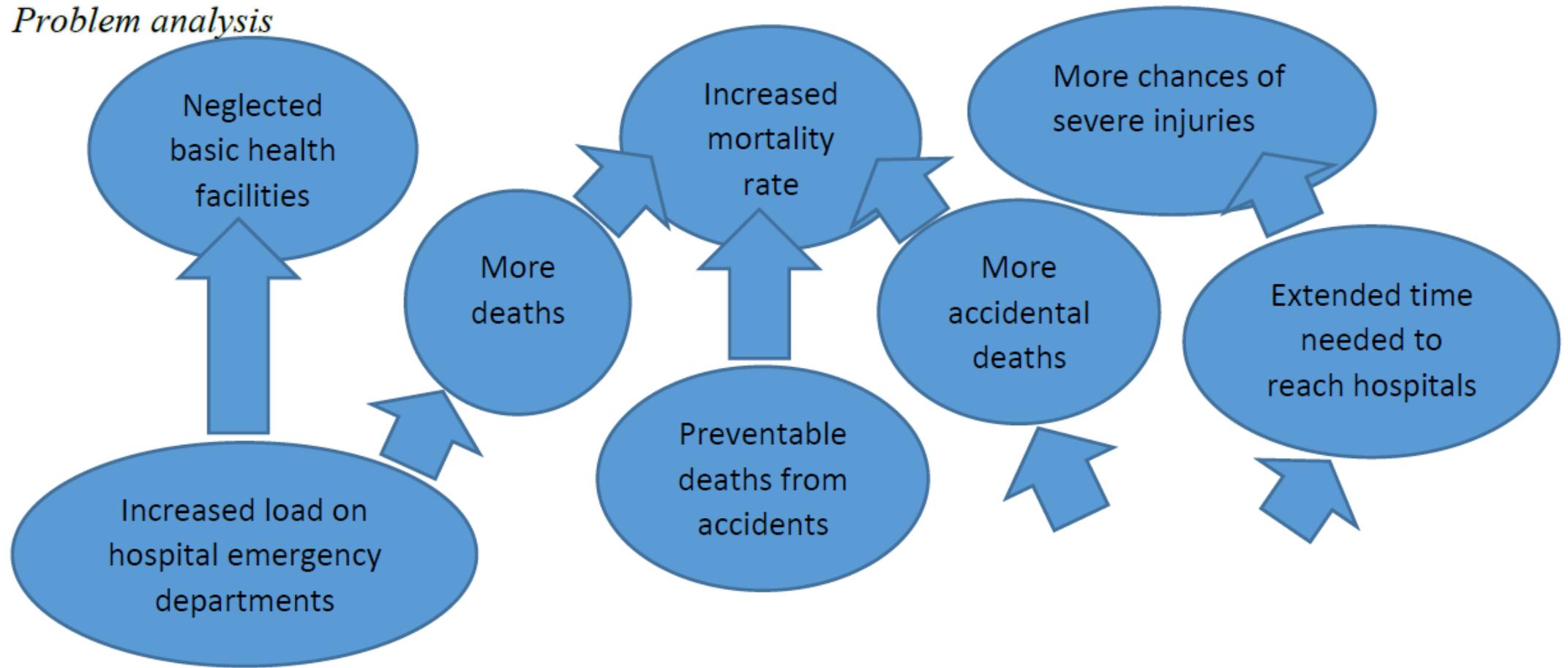
**Distance from
Muzaffarabad to Kotli:**

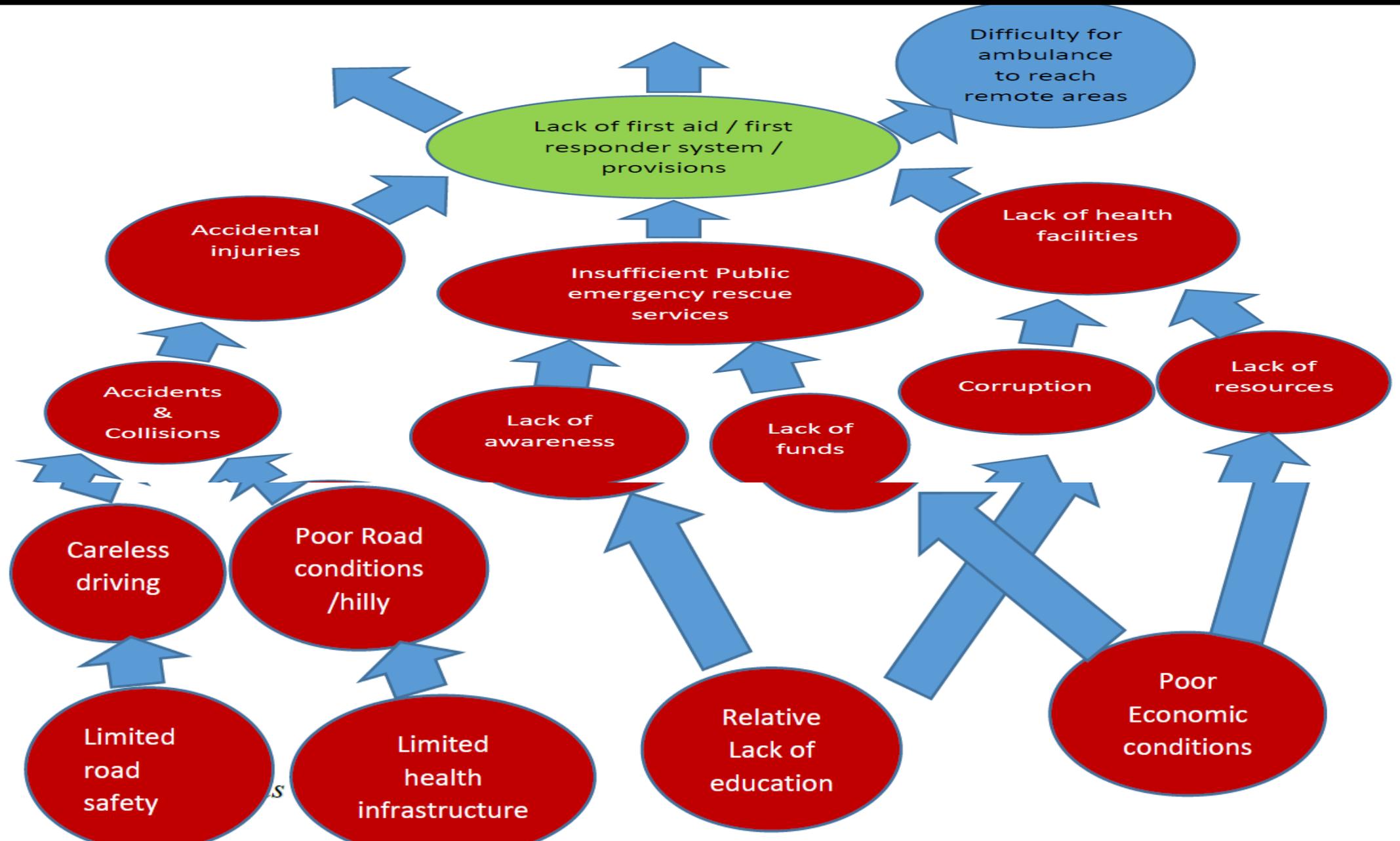
103km (5hrs 29 mins by
car)

**Distance from Kotli to
Mirpur:**

95.5km (2 hrs 23 mins by
car)

Problem analysis





Intervention



**Paramedic Motorbikes
(Service)**



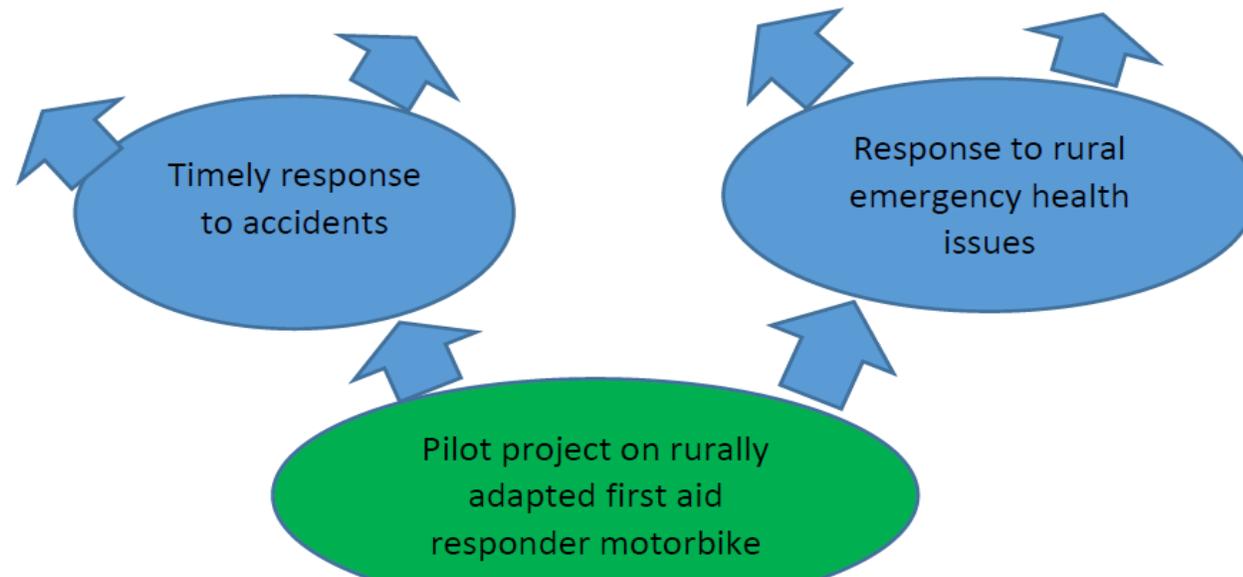
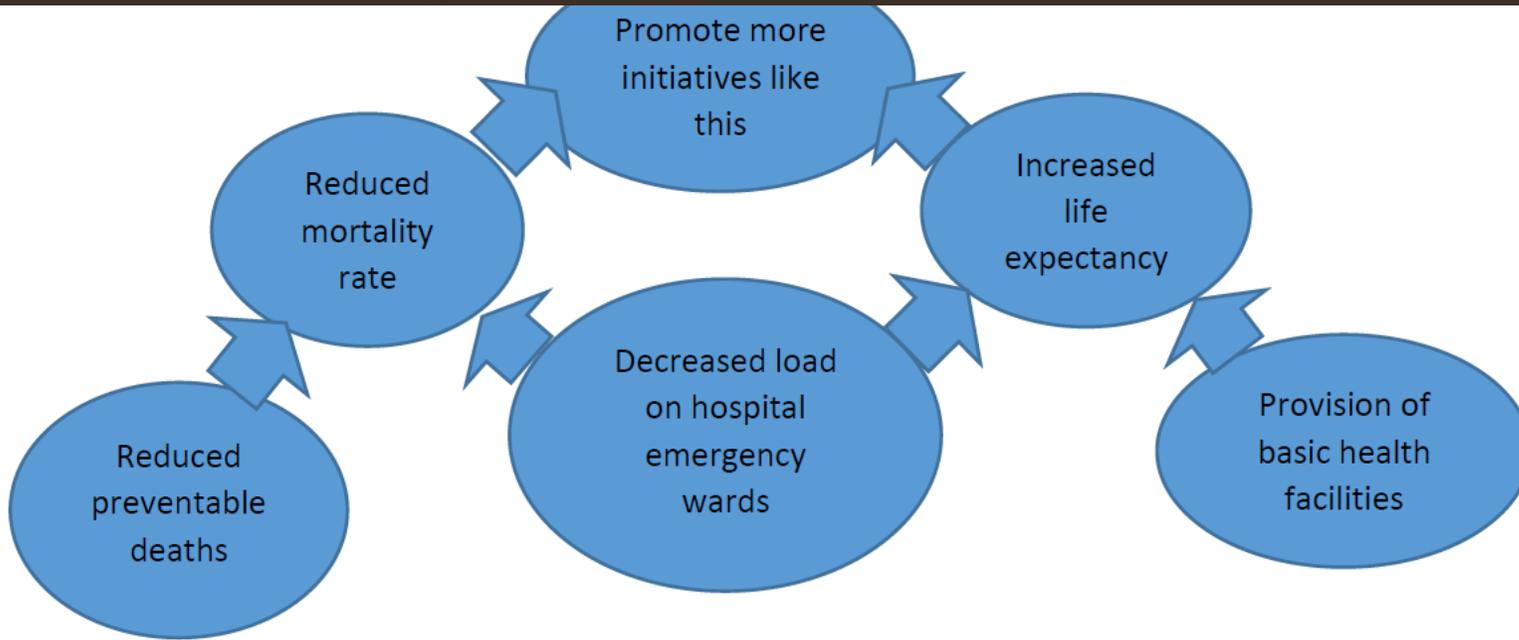
**Midwifery (Hope Welfare
Trust)**

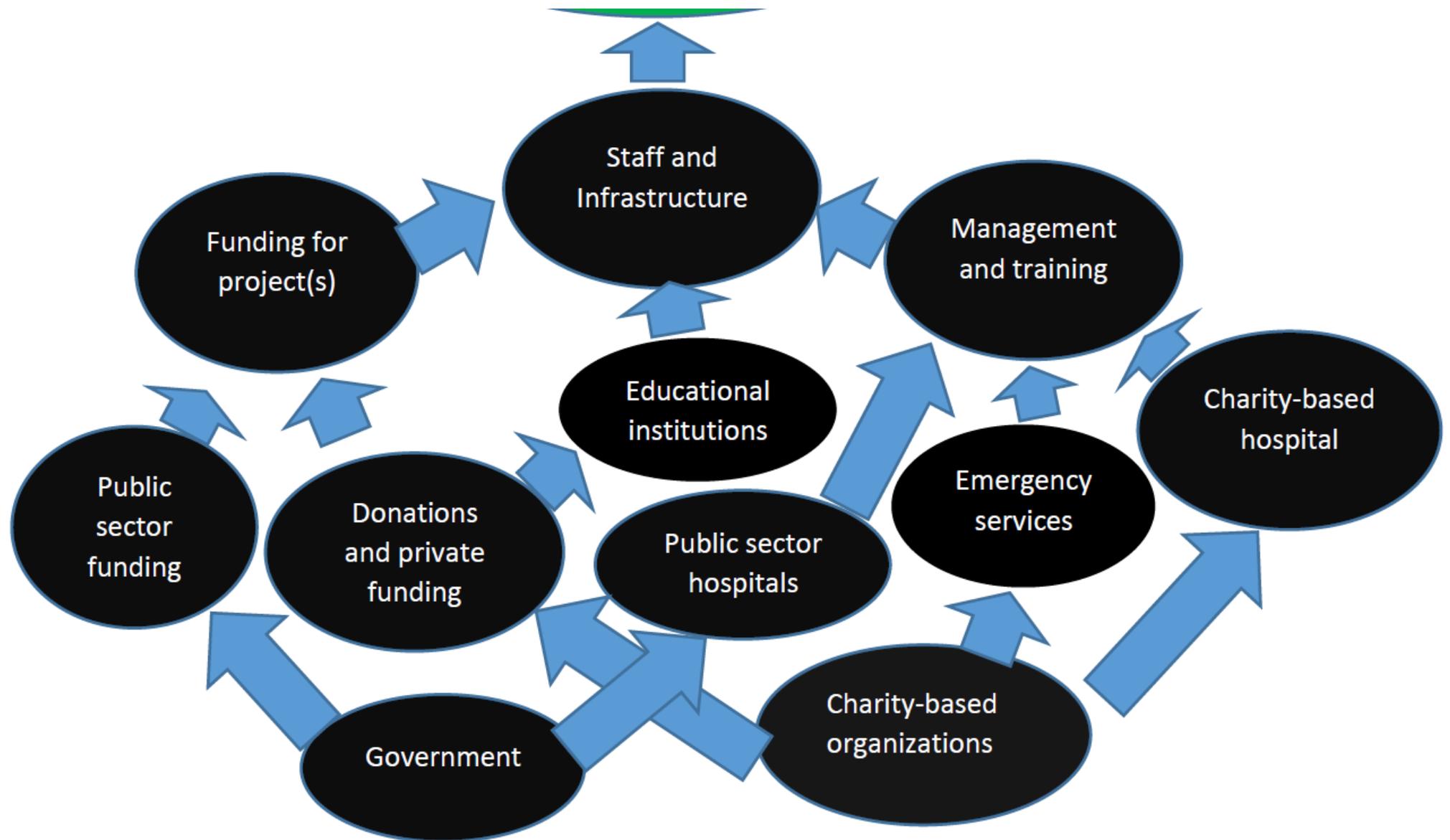
**First Responder System
(Ambulance)**

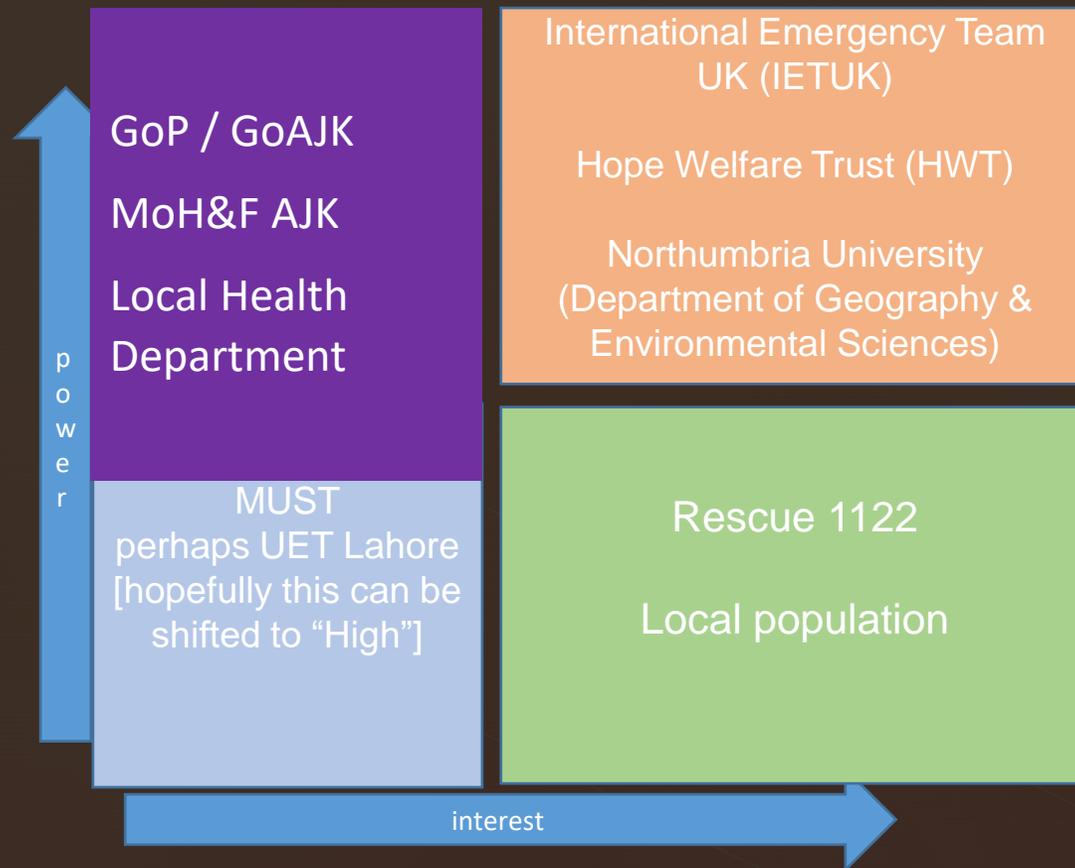


- **Deployment**
- **Risk can be
Minimized**

Centralized
Decentralized







Stakeholder key:

GOP: Government of Pakistan

GoAJK: Government of Azad Jammu Kashmir (AJK), Pakistan

UET: University of Engineering and Technology, Lahore, The Punjab, Pakistan

MUST: Mirpur University of Science and Technology, Mirpur, Azad Jammu Kashmir (AJK), Pakistan

MoH&F AJK: Ministry of Health and Finance, Azad Jammu Kashmir (AJK), Pakistan

Evaluation criteria

- Targeted Sustainable development goals
- HOPE Welfare Trust and IETUK success criteria
- Benefits and impacts of project



Targeted SDGs (THE 17 GOALS | Sustainable Development, 2020)

	Project summary	Indicators	Means of verification	Assumptions
Goals	<ul style="list-style-type: none"> To find out whether The pilot project is beneficial or not by the stakeholders' criteria [to be set out]? Were the relevant Sustainable Development Goals (SDG 3, 4, 5, 10, 11, 17) contributed to or not (and perhaps to which degree)? 	<ul style="list-style-type: none"> Reduced preventable deaths or serious loss of quality of life Better perception of the healthcare facilities by the end users 	<ul style="list-style-type: none"> Government mortality register Reduced number of accident cases to be treated in local hospitals 	<ul style="list-style-type: none"> First responder motorbike will attend every emergency timely, and be equipped and with skilled human resources to respond paramedicly
Outputs	<ul style="list-style-type: none"> Increased life expectancy and quality of life of clients/patients Increased efficacy, reach and efficiency of Hope Welfare Trust in AJK's rural setting (Kotli district) Helpful in demonstration of potential of future rural first aid responder motorbike projects 	<ul style="list-style-type: none"> Reduced mortality rates and of a significant loss of quality of life User satisfaction 	<ul style="list-style-type: none"> Government mortality register Hope Welfare Trust AJK hospital anonymized medical records (quantitative and/or qualitative) Data collected from service users / community and the provider 	<ul style="list-style-type: none"> First responders will do their job with competence, professionalism and dedication Facility users will be happy with facility
Impacts	<ul style="list-style-type: none"> Social and gender equality Community wellbeing 	<ul style="list-style-type: none"> Improved community health 	<ul style="list-style-type: none"> Visual descriptions Available quantitative and/or qualitative data – see below Interviews of both genders – yielding qualitative data 	<ul style="list-style-type: none"> First responders will attend emergency cases without any gender or social discrimination
Evaluation Activities	<ul style="list-style-type: none"> Interviews Meetings Questionnaire Visual descriptions Focus groups 	<ul style="list-style-type: none"> SMART data collection – see below Active participation 	<ul style="list-style-type: none"> Comparing and cross-checking (triangulation) of data collected from different participants 	<ul style="list-style-type: none"> Stakeholders, staff / trustees and community will actively and without being biased participate in different and appropriate dimensions of evaluation when required

Evaluation methods

Following methods are adopted for evaluation and data collection (Future Oriented Collaborative Policy Development for Rural Areas and People, 2020), (Haughey, 2020) and (Peersman, 2020).

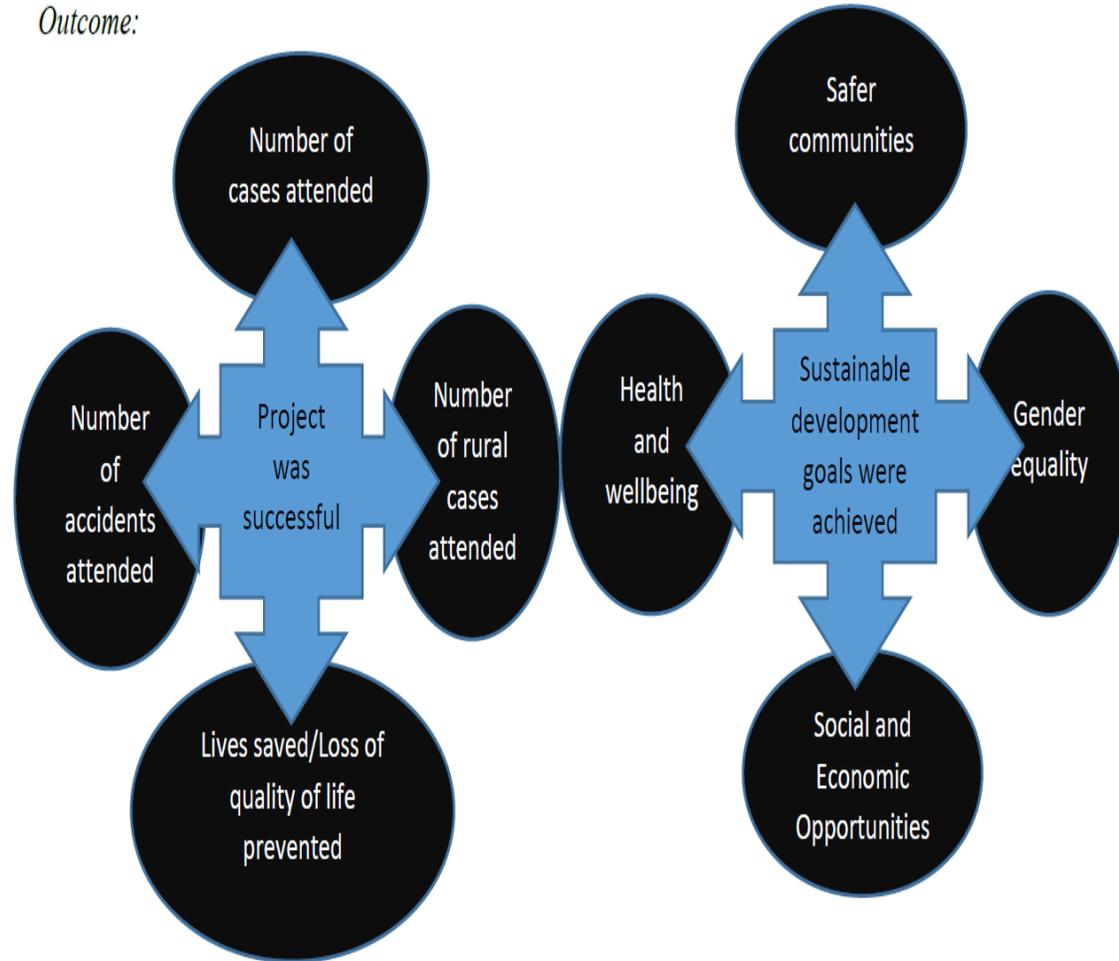
- Analytical approach:
 - Stakeholder analysis
 - Logical framework analysis
 - Theory of change
 - SWOT analysis
- Quantitative approach

Undertaking statistical analysis, depending on quantitative dataset(SMART data collection) accessible through HOPE Welfare Trust

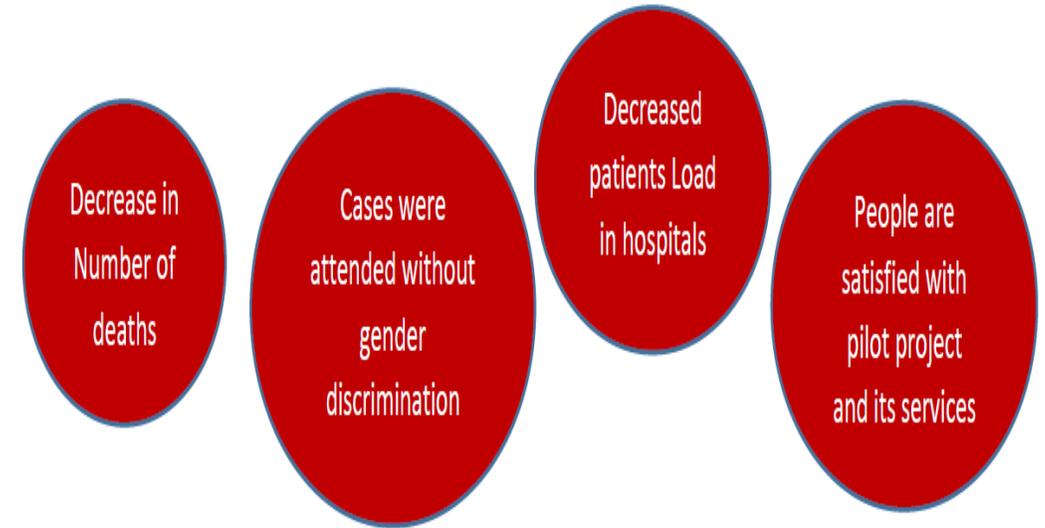
Aim:

Evaluate the rurally adapted first aid motorbike pilot project

Outcome:



Assumptions:



Activities:



Inclusions (primary variables affecting directly on the pilot project)

Geography (locality, weather conditions, religion)

Adapted motorbike (cost effectiveness, engine efficiency, availability of parts, and paramedic equipment on the bike)

Equipment (quality and quantity)

Staff (efficiency and behaviour)

Communication system (range, durability)

Cost (project cost A to Z, from installing to running)

Beneficiaries (people getting first aid)

Management (how efficiently)

Time (effectiveness and response time)

Basic facilities at the place of work for employees

Community (typical health needs)

Age (how different age groups are assisted, based on their needs)

Gender (of patients, as well as staff attending)

Job creation

Health benefits

Emergency situations (incidents and disasters)

Training needs

Exclusions (secondary variables affecting indirectly on the project)

Political scenario (please note the project and IETUK as a UK-based humanitarian charity is politically neutral. Furthermore, the pilot project in Kotli district is well away from the "Line of Control" between Pakistan and India, and thus any direct tensions and military violence and impact on civilians there are not of service relevance here for the pilot project).

Economy (as this is a small-scale pilot project); however, so structural issues are reflected on, and were built into the Logical Framework Analysis.

Interim Results

- Cases attended:

By end of 2020, a total of 60 cases were attended; average 9 minutes response time

Zero false call outs

- The type of cases attended were:

- Catheter
- Blood Pressure checks
- Basic Life Support
- attending Road Traffic Accidents,
- Intravenous (IV)-line maintenance
- Nasogastric-tube checking
- Home treatment
- Anemia
- Dressing of Wounds

- Community response:

Snacks and food offerings, donations and home invitations for staff for food (declined as part of organizational policy)



Paramedic bike responder Attending a CASE (HWT, 2020)

TESTIMONY VIDEO



TESTIMONY VIDEO:

Key points of the Hope Welfare Trust health worker testimony

- Name and post: Kalsoom working as Lady Health Visitor (LHV)
- Greetings for IETUK
- Local terrain: hilly area (difficult terrain). The First Responder Motorbike help us to reach people's home for health check-up
- Commonly first aid is rendered for: High Blood Pressure, Diabetes and Catheter
- One incident: A pregnant woman got injured and her ultrasound was done at home. It was possible because of the First Responder motorbike

SWOT analysis

Strengths	<ul style="list-style-type: none">• First “pilot project of rurally adapted first responder motorbike system” in the whole of AJK• the paramedic bike has advantage of access over an ambulance in the hilly and tracks terrain and the close village environments• Two international yet also local charitable organizations working for community benefit through mutual partnership• High community satisfaction level so far• Targeted SDGs are being contributed to
Weaknesses	<ul style="list-style-type: none">• No government financial support• Only one paramedic bike• Pilot project is not part of core activities yet – at least in systematic monitoring
Opportunities	<ul style="list-style-type: none">• A learning experience• Open ways for new adventures like this especially for rural communities in low-income countries• Potential for upscaling
Threats	<ul style="list-style-type: none">• Continuous financial support required for maintenance• Limited resources• One paramedic motorbike can't be successful in case of large emergencies

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