Annex 9: Indigenous practice and Nature-based solution

Disaster risk reduction (DRR) and climate change adaptation aim to manage uncertainty, lessen vulnerabilities, and increase the resilience of communities at risk. Climate change increases disaster risk by intensifying hazards and exacerbating vulnerabilities affecting livelihoods, health, water and sanitation and food systems. CCA can support DRR by reducing long-term vulnerability, supporting humanitarian interventions to take a longer-term perspective to prepare communities for not only current, but also projected environmental and climate-related risks. This can include using Nature-based solutions (NBS) as a part of an overall adaptation strategy.

NBS are sustainable and cost-effective approaches that are inspired and supported by nature to address social, economic, and environmental challenges. Nature-based solutions also work in natural hazard risk reduction and provide benefits to avoid loss of life, injury, humanitarian assets, and livelihood resources. They also improve the health of the environment and the services it provides within and between humanitarian settlements, supporting survival, livelihoods, and well-being.

9.1. Nature based solutions for shelter and settlements in Nepal

Nature-based solutions for buildings are ways to incorporate natural elements into the design, construction, and operation of buildings and settlement in order to reduce their environmental impact, improve their performance, and create healthier and more sustainable spaces. Some examples of nature-based solutions in shelter and settlements for Nepal include:

- Green roofs: A green roof is a layer of vegetation installed on top of a building. It provides insulation, reduces stormwater runoff, and improves air quality.

- Rain water harvesting and ground water recharge: Rain water harvesting is the collection of rainwater from the roof for storage or ground water recharge. The majority of precipitation in Nepal takes place during the monsoon so storage of the rain water shall minimize the water scarcity during dry season and pressure on groundwater. It also reduces stormwater generation, minimizing the amount of pollutants to enter waterways and recharge groundwater.
- Orientation and Natural ventilation: Orientation of the building optimizes the use of solar radiation and natural ventilation uses the natural movement of air to cool and ventilate a building, reducing the need for building heating and air conditioning. The south orientation of the building in Mountains and Hill shall optimize the use of solar radiation for building heating while in Terai the shed in the south side shall help in cooling of the building.
- Daylighting: Daylighting is the practice of using natural light to illuminate interior spaces, reducing the need for artificial lighting and improving the quality of indoor environments.
- Use of local materials: Use of environmentally sustainable local materials as far as possible shall reduce the environmental impact through reducing impact caused during production, packaging, transportation, operation and end of use waste generation.
- Biogas: Biogas production can be a sustainable source of energy for rural areas replacing firewood with availability of animal dung and waste from kitchen and toilets.

9.2. Key considerations for Climate Change Adaptation and Nature Based Solutions[1]

- Ensure environmental experts/ engineers for environmental sensitive design and to increase the technical capacity amongst the affected population.
- Avoid environmental sensitive and socio-cultural sites for project planning and construct
- Consider nature-based solutions/ least impact design to address storm water management in project sites and settlement planning
- Use nature-based solutions to provide thermal comfort. For example, planting trees next to houses can provide solar shading and green roofs can provide thermal insulation.

[1]Adapted from: Nature-based solutions for climate resilience in humanitarian action: a Sphere unpacked guide (forthcoming in 2023) - Referred from Environmental Country Profile - Bangladesh

- Utilise space surrounding dwellings for subsistence activities such as kitchen garden, fruit trees, rainwater harvesting.
- Design structures to be climate resilient, maximising energy efficiencies for heating or cooling.
- Design terraces that are natural or hybrid infrastructure to mitigate landslide and flood risk. Look for opportunities to incorporate food crops as slope-stabilising vegetation.
- Identify local techniques based on nature including traditional techniques and innovations tested in the territory.

9.3. Indigenous practice of Nature Based Solutions in Nepalese buildings

Traditional vernacular architecture has been developed in Nepal over centuries without creating much environmental concern or health problems. The buildings were well developed to adapt the climates and cultures of the location by using local building materials and techniques[2].

The traditional Nepalese buildings used nature-based solutions to respond to the climate of the location and ensure thermal comfort of the buildings. This was done by designing and siting the building according to prevailing wind directions, solar radiation and incorporating solar passive measures. The houses were designed in a way to provide the most comfortable shelter with the building materials and technologies that were locally available and had minimal impact on the environment. With the modernization of the building sector the traditional knowledge of nature-based solutions of smart and climate responsive design is being lost. Traditional architecture is decreasing dramatically, being replaced by modern design with artificial materials and alien technology. The modern building design is dominated by universal architecture that neglects local climate conditions and traditional construction techniques and materials.

However, with the increasing understanding of the environmental impact and building comfort now the communities and organizations are working to build resilience and promote sustainability in their communities through Nature based solutions. Incorporating

[2] Nepal: Traditional Houses, Sustainable Houses and Living in the Hot-Humid Climates of Asia, Hom B. Rijal, 2018

nature-based solutions into the design and construction of buildings, we can reduce the environmental impact of buildings and create healthier, more sustainable spaces for people to live and work. Nepal's vulnerability to natural disasters shall also be minimized with nature-based solutions in landslide and flood protection and mitigation and adaptation to climate change.

Resources and guidance

- The Nature Navigator, IFRC, 2022
- Climate risk in humanitarian action guidance, EHA Connect, UNEP/OCHA JEU
- Eco-system approach to DRR guidance, EHA Connect, UNEP/OCHA JEU
- Disasters and Ecosystems, Resilience in a Changing Climate Source Book, UNEP, 2019
- EbA Tool Navigator, FEBA, IIED, IUCN, UNEP-WCMC, n.d.
- NbS in Humanitarian Contexts Key Messages, IUCN, 2021
- Words into Action: Nature-based solutions for disaster risk reduction, UNDRR, 2020
- Environment and Humanitarian action, UNEP/OCHA Environment Unit, 2014