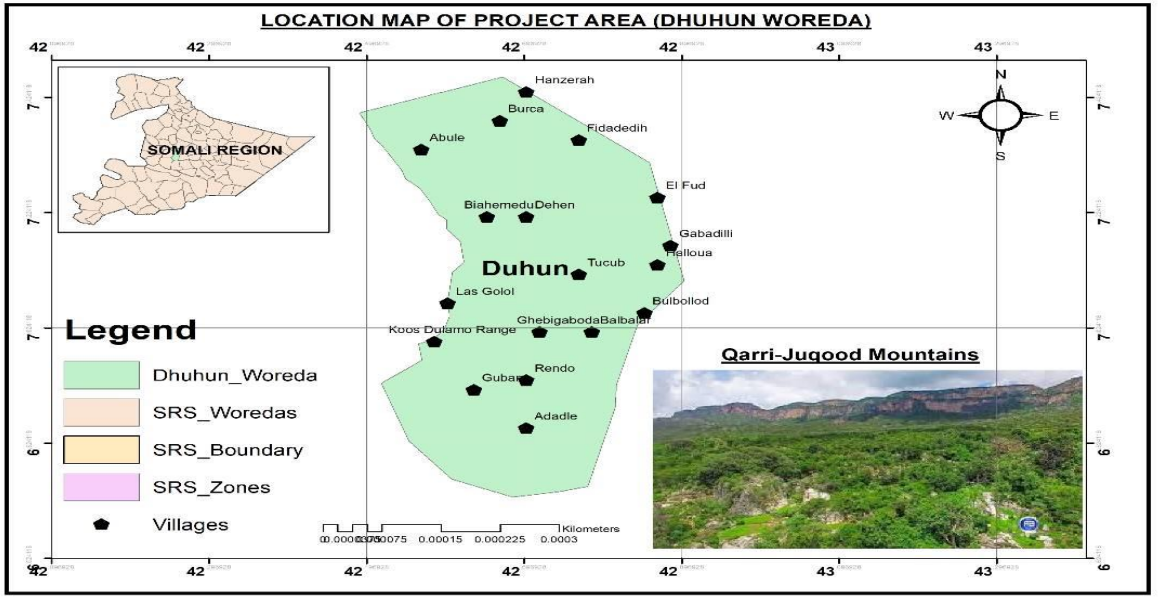
Environmental Protection & Rural Land Administration Bureau, SRS.

Biodiversity Development Conservation Director.

Report for



Somali Regional state, Government bureau

June,2023

This Report is revealing the resource map and ecosystems of the qarijiqood mountain, collected new data on framework of indicators and develop targeted design action plans of the mountain accordingly to the biodiversity variations in the area. Creating an Ecosystem Map is a great way to begin a project, and it will continue to provide value through to the end. It was resulted the plant species and Animal species of the mountain

Ecosystem Mapping and Biodiversity in Qari-jiqood Mountains, Nogob Zone, Somali.

Qarijiqood one of largest mountains in Nogob zone,SRS,

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Aden Mohamud, Land Use, EPRLAB

- **Target Area: Qarijiqood mountains**
- **Project title:** Ecosystem mapping and Design of Qarijqood mountain
- **Executive Agency:** Environmental protection and Rural administration
- **SCOPE:** The activity focused on the Ecosystem mapping and design of Qarijiqood mountain, Nogob zone, Somali region.
- **Ecosystem and Biodiversity Species:** The activity focused on both fauna and flora species of the mountain
- **Plant species:** Boswellia frereana (Yagcar), Boswellia sacra (Moxor), Commiphora myrrha L. (Dhidin), Acacia senegal (Jaleefan ; cadaad ; Cadaad-geri), Acacia tortilis (Qudhac), Balanites orbicularis (Kulan), Commiphora ogadensis (Xagar madow), Commiphora Spp. (Qadhoon; Qaroon), Cordeauxia edulis (Gud; geed-yicib) and opoponax (Hadi).
- **General Fauna Species:** cheetah, leopard, lion, serval, caracal, spotted hyena, striped hyena, common warthog, harre, günther's dik-dik, salt's dik, silver dik, gerenuk, greater kudu, white backed vulture, fox.

1: Summary of the activity

This activity is conducted the map and design ecosystems of the qarijiqood mountain, collected new data on framework of indicators and develop targeted design action plans of the mountain accordingly to the biodiversity variations in the area.

Creating an Ecosystem Map is a great way to begin a project, and it will continue to provide value through to the end. The purpose of this activity is design and acquire greater understanding of the target ecosystem in Qarijiqood mountain, Nogob zone, Somali regional state, Ethiopia. The Gateway activity was developed more nuanced understanding of the two major Biodiversity variations (Flora and fauna), that implied Wildlife and plants in mountain as well as the landscape, topography and the major map of the mountain. One of the most crucial expectations from the existence of ecosystem variations. Hence, the importance of the mapping is clear-it provided all the essential information of mountain in one place. The work performed in mapping the participating ecosystems is expected to significantly expand the capacity of the startup Somali region mountain ecosystem mapping and design, while increasing awareness of its existence in the surrounding communities.

1: Introduction of the activity

This activity was conducted to map and design ecosystems of the qari-jiqood mountain, collect new data on framework of indicators and develop targeted design action plans of the mountain accordingly to the biodiversity variations. Creating an Ecosystem Map is a great way to begin a project, and it will continue to provide value through to the end. The purpose of this activity is design and acquire greater understanding of the target ecosystem in mountains Somali regional state, Ethiopia. The Gateway activity will develop more nuanced understanding of the two major Biodiversity variations (Flora and fauna), that will imply Wildlife and plants in mountains as well as the landscape, topography and the major map of the mountain. One of the most crucial expectations from the existence of ecosystem variations and there is suspect issue that there is gap between community's knowledge around the mountain areas and its actual nature and support activities. Hence, the importance of the mapping is clear-it will provide all the essential information of mountain in one place.

1. **Problem and issue description**

it is expected that better picture of the region's biodiversity resources and cultural sites could be designed. This activity, the first its kind in the area, is therefore, proposed to fill some these gaps in the existing about the Ethiopian Somali region by investigating flora and fauna species found the mountains that are potentially reveal the region's historical and cultural contribution in the general history and tourism medieval of the country. Therefore, the activity proposes to design and map the Somali regional state mountains of major themes, ecosystem and species diversity.

1.2. Aims and Objectives

- Mapping and borders design of qarijiqod mountain resources
- Baseline information on the status of Flora and fauna resource in the mountain
- To develop an intensive participatory process and quantify ecosystem, managing landscapes in the area through the assessment of Ecosystem bundles.

2: Qariqood mountain Area Description

It is located in Somali Regional state in Nogob zone, Duhun woreda 20km away from Bermil and 65 km from Segag. Dhuhun means stone, a name given to a mountain located in the immediate outskirts of the town in its western direction so named because of the enormous quantity of rock found inside the mountain. Therefore, the town gets its name from the mountain that overlooks the flourishing settlement that spread over east of the mountain. It is the eastern most part of a mountain terrain called Qerchiqod (Qarijiqood in the Somali language) that runs from west to east, Nogob zone, Somali regional state.

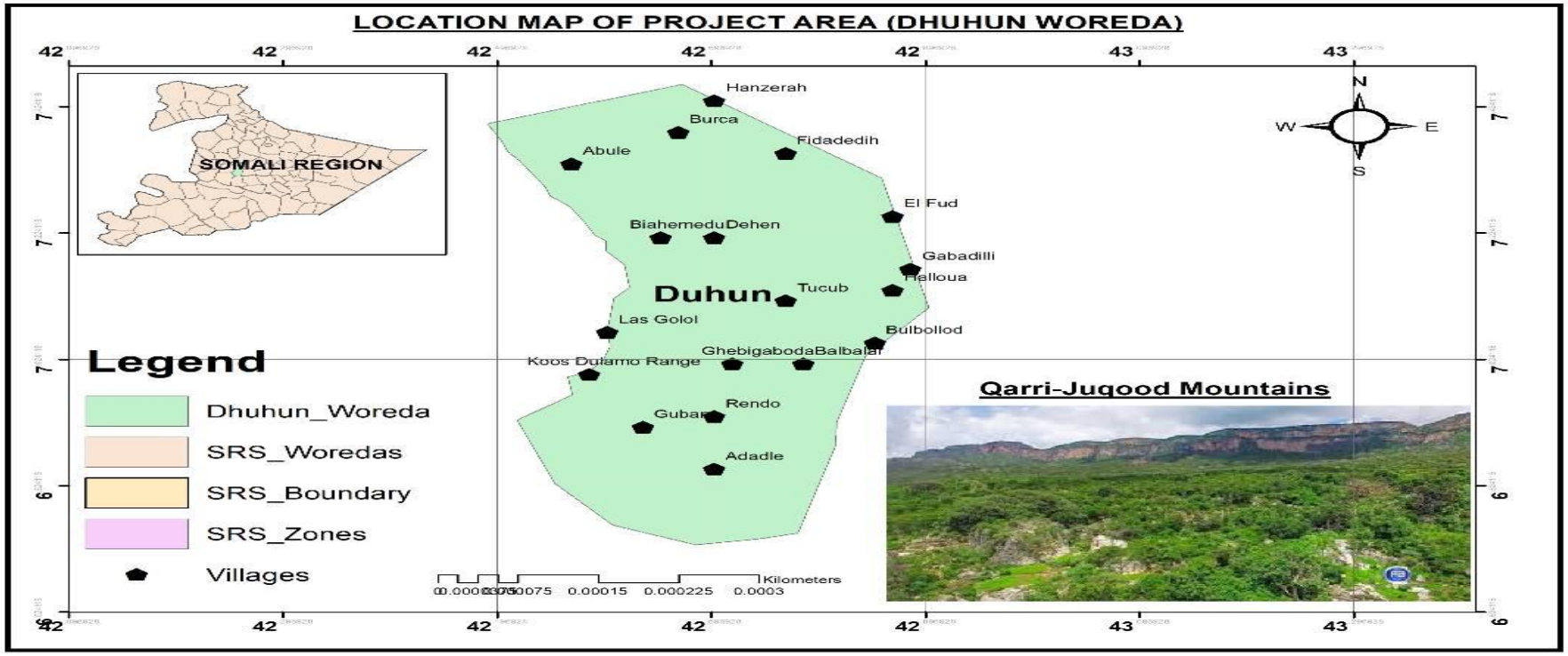


Figure1: Source: EPRLAB, June,2023.

2.1. Flora sampling techniques

Woody plant species were recorded and confirmed to be present at each sample location, which included three randomly arranged 22m x 22m (484m2) plots to measure woody vegetation. Finally, 27 plots of 484 m2 (3 areas grazing areas x 3 trial plots x 3 plots) were used to calculate the species composition, diversity, richness, frequency, abundance, and importance value index (IVI) of tree vegetation. The height of woody species was measured with a 5 m measuring rod with 10 cm markers. The tag was used to label trees and shrubs where they were numbered or measured, ensuring they were not missed or counted twice. The verbal names of the key informants were used to identify the species in the field. Two grazing areas were systematically selected, as well as two peaks of the mountain.

Figure2: Sample of vegetation quadrant (Sied boqore from SORPARI)

Figure3:Vegetation photos of qarijiqood mountain

Vegetation density, relative density, frequency, relative frequency, abundance, base area, relative base area, total base area, and the Important Value Index (IVI) were all determined by the (Kalidass, 2014) (Appendix 1) formula. To identify statistical differences between treatment means, vegetation data were analyzed for one-way variance using the IBM Statistics package for Social Sciences version 26. GIS were used for mountains resource designs.

2.2. Methods wildlife information mountain

Direct observation/Surveying for tracks and signs representing different habitat (walking into jungle looking for footprints in sand or clay substrate, or looking for scats), Observation was made using camera drones, and Nikon action 10 x 50 binocular driving along the mountains, Listening for roars and other sounds. Interviews with elders and community members.

Figure4: Mowlid,observing wildlife via Binocular

Figure5: Qarijiqood mountain east parts

3-Results Mountains Design: were obtained. along readily-identifiable features such as Kebeles, Roads, rivers, Woredas.The

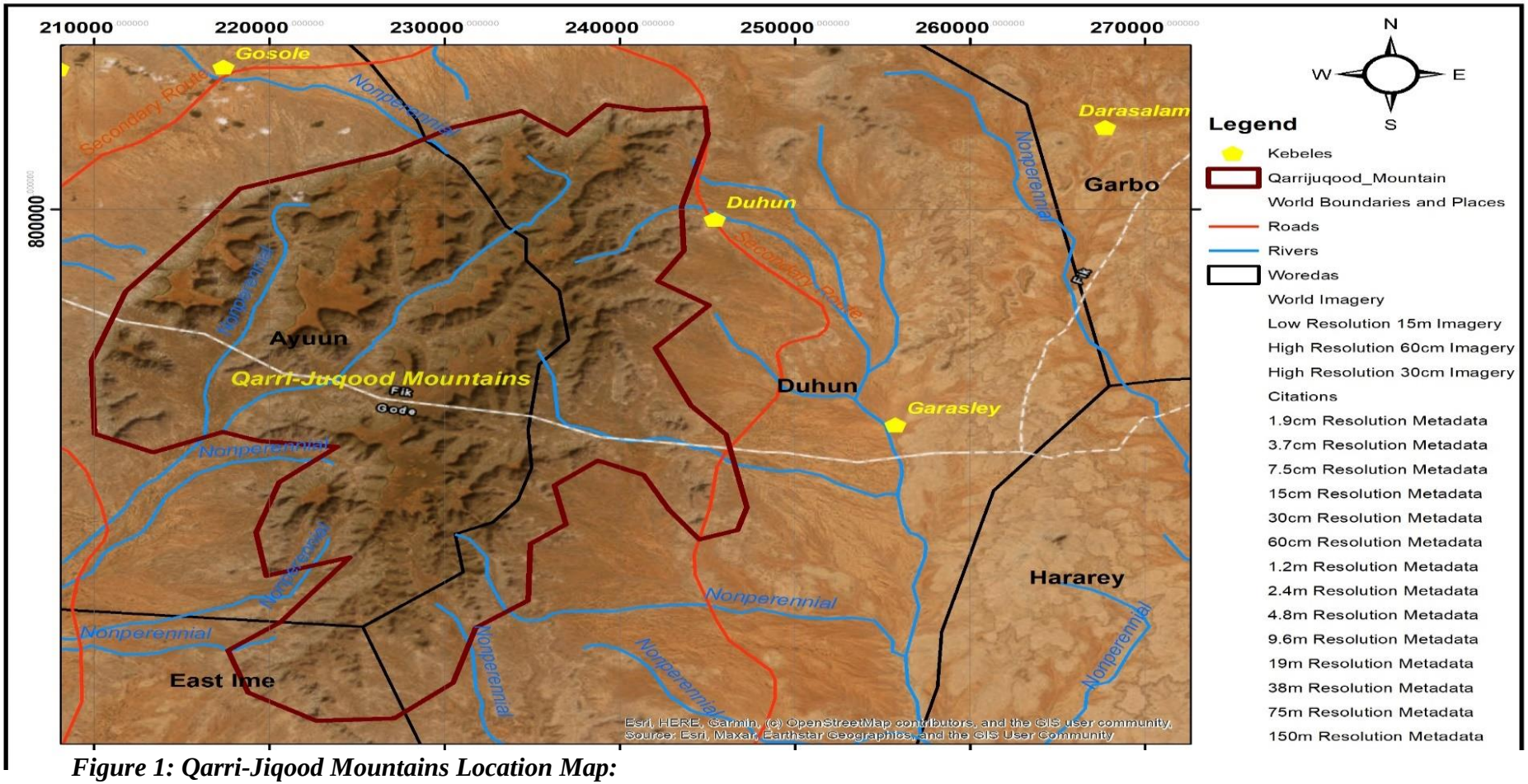


Figure 1: Qarri-Jiqood Mountains Location Map:

Ethiopian Somali Regional State has nine zones- Shinile, Jigjiga, Degahbur, Fiq, Nogob, Qorahe, Gode, Werder, Afder, and Liben. The town of Jigjiga, located 625 kilometers from Addis Ababa, is the administrative center of the regional government. About four hundred kilometers away from the town of Jigjiga is qarijiqood mountain historical site located in Dhuhun district of Nogob zone. The site is located about two kilometers from Dhuhun town.

3-1. Mountain vegetation resource result

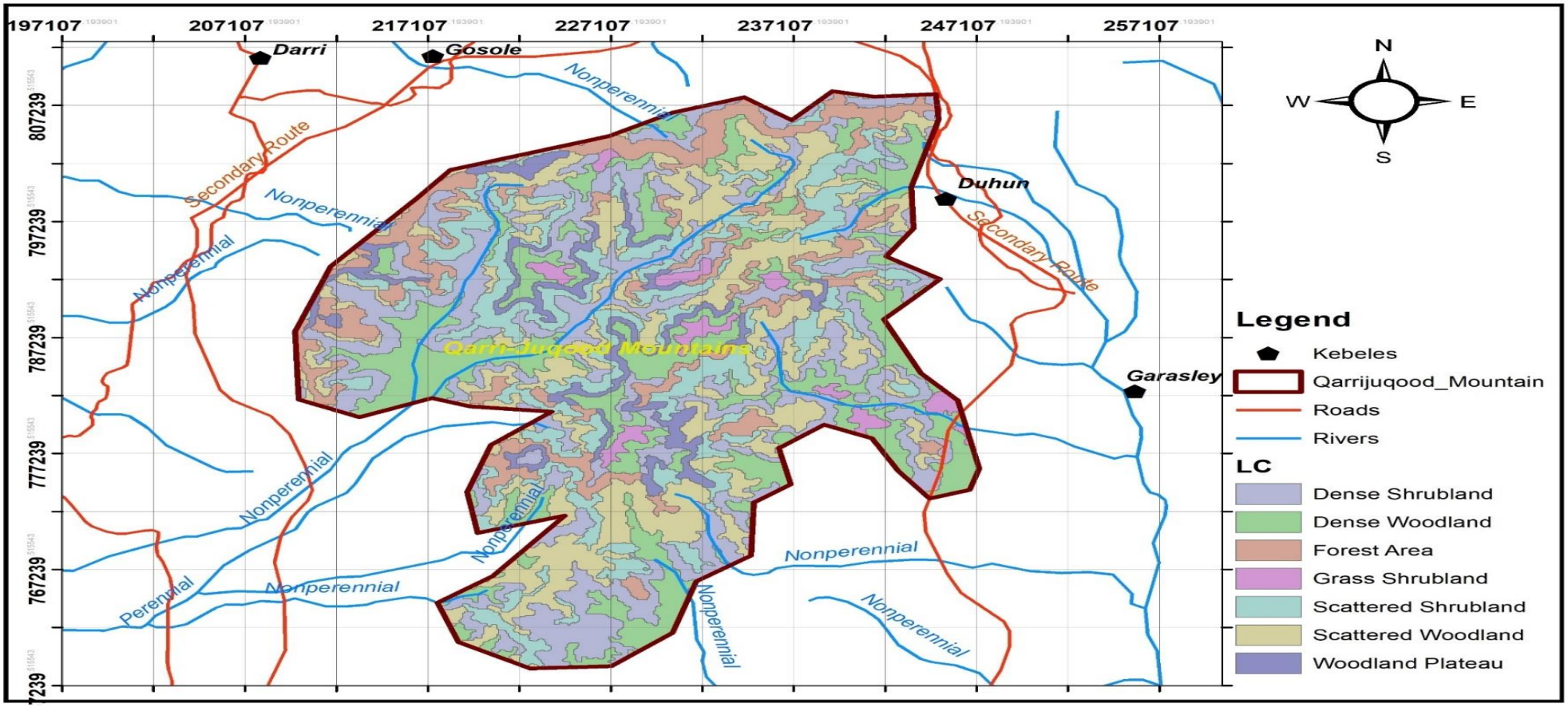
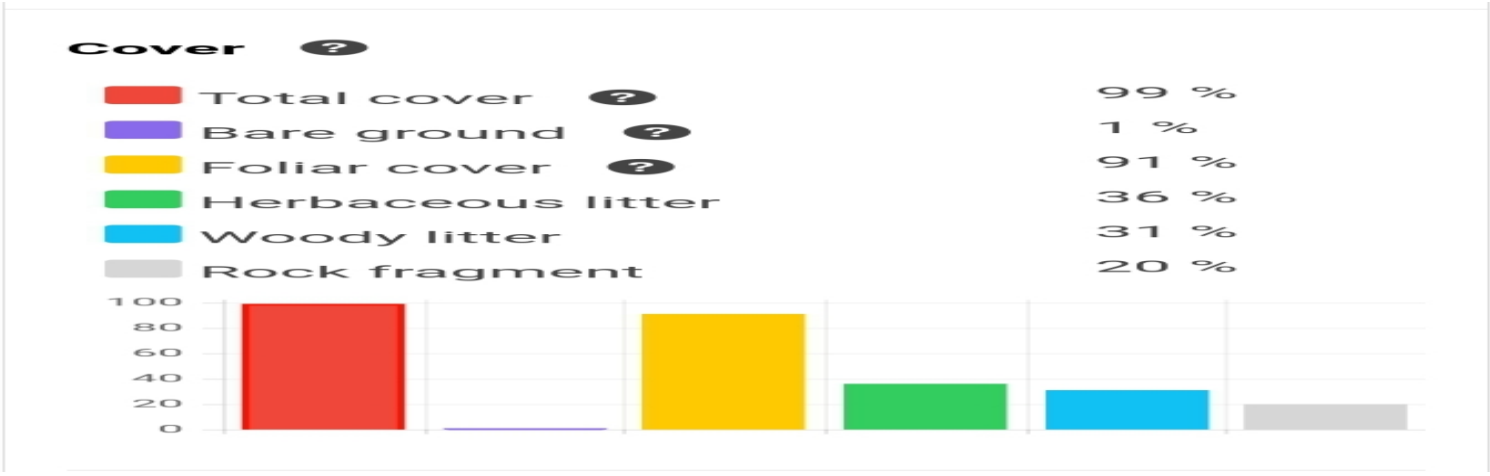


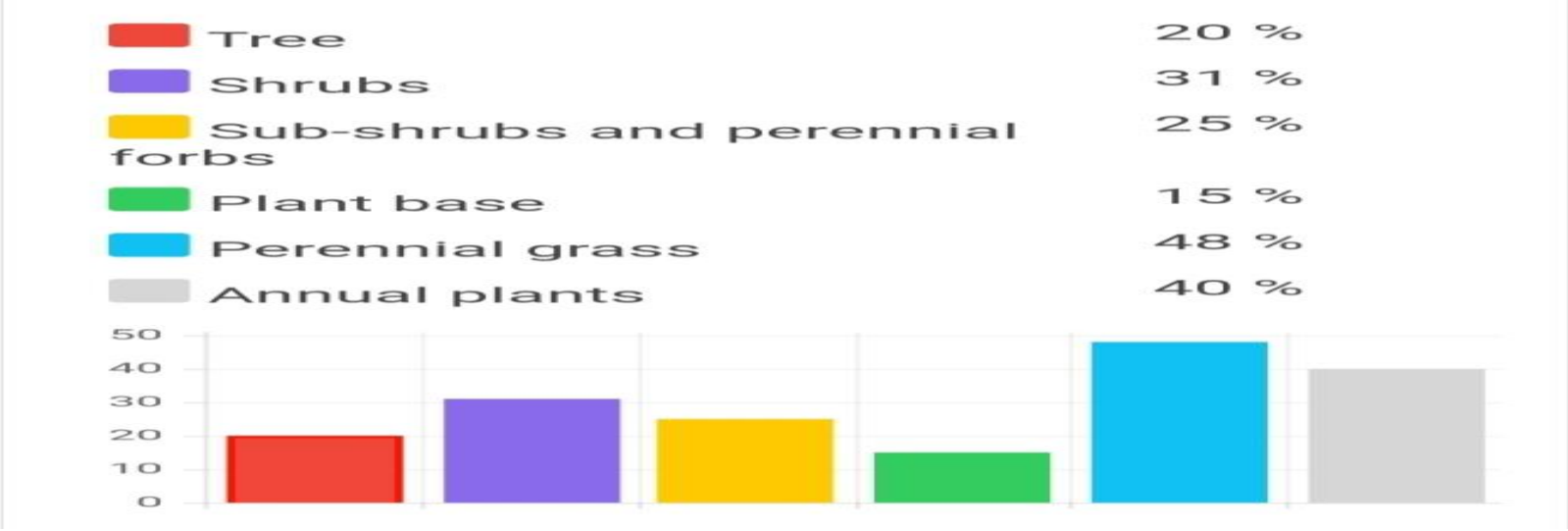
Figure 2: Qarri-Jiqood Mountain Land Cover Map. Vegetation resources includes, Dense shrubland, woodland, forest area, grass shrubland, scattered shrubland and all plants in plateau. This implies that the mountain has full resources and varieties of species. These habitats of the mountain support different Types animals, livestock and people. For illustration, shrublands and woodlands host unique species adapted to specific environmental condition and enhance ecological richness

3.2. Quadrant result for vegetation (Based on number of frequencies, basal area coverage, important value of spp).

S.N	Scientific name	local name	Family	D	F (%)	BA	AB	IVI (%)
1	Acacia bussei	Galool	Mimosaceae	1.0	66.7	89.9	1.5	16.7
2	Acacia etbaica	Sogsog;	Mimosaceae	1.0	66.7	50.2	1.5	13.5
3	Acacia hamulosa	Cadaad	Mimosaceae	1.3	66.7	63.6	2.0	15.9
4	Acacia nilotica	Maraa	Mimosaceae	0.7	33.3	78.5	2.0	11.8
5	Acacia nubica	Guumaer	Mimosaceae	1.0	66.7	78.5	1.5	15.8
6	Acacia Senegal	Aadaad	Mimosaceae	1.7	100.0	95.0	1.7	22.5
7	Acacia tortilis	Qudhac	Mimosaceae	1.7	100.0	38.5	1.7	17.8
8	Balanites aegyptiaca	Quud	Balanitaceae	1.0	100.0	78.5	1.0	18.4
9	Boscia minimifolia	Meygaag	Capparidaceae	1.3	66.7	63.6	2.0	15.9
10	Cadaba forinosa	Dumaay	Capparaceae	1.0	66.7	70.9	1.5	15.1
11	Combretum molle	Cobol	Combretaceae	0.7	33.3	58.1	2.0	10.1
12	Commiphora Africana	Xagar	Burseraceae	1.7	100.0	95.0	1.7	22.5
13	Commiphora ogadensis	Xagar madow	Burseraceae	2.0	100.0	50.2	2.0	20.1
14	Dobera galabra	Guurues	Salvadoraceae	2.3	66.7	63.6	3.5	20.0
15	Grewia villosa	Kobosh	Tiliaceae	1.7	66.7	78.5	2.5	18.5
16	Prosopis Juliflora	Garawaa	Fabaceae	3.3	100.0	113.0	3.3	30.7
17	Salvadora persica	Aadaay	Salvadoraceae	1.3	66.7	50.2	2.0	14.8

3.3. Mountain Vegetation cover





This result implicating that the vegetation of mountain is covered by annual plants and perennial grass.

4-Wildlife found in mountain

Based on observation and community discussion, we summarized the as expert verified sightings of wildlife presence and human-wildlife conflict in the mountain. We provide ecologically important range extensions for cheetah (*Acinonyx jubatus*), leopard (*Panthera pardus*), and lion (*Panthera leo*) which will be useful for updating IUCN distribution maps for these species, and confirm spotted hyaena (*Crocuta crocuta*) and striped hyaena (*Hyaena hyaena*) persistence matching old maps for Hyaenids. The Major wild animals found in Somali regional state are Lesser Kudu (*Tragelaphus imberbis*), Gerenuk (*Litocranius walleri*), Salt's Dik Dik (*Madoqua saltiana*), Soemmering's Gazelle (*Gazella soemmeringii*), Warthog (*Phacochoerus aethiopicus*), Black Backed Jackal (*Canis mesomelas*), Common Jakal (*Canis aureus*) Hamadryas Baboon (*Papio hamadryas*), Abyssinian Hare (*Pronolagus rupestris*) and spotted hyena (*Crocuta crocuta*). Among birds Mourning Collared dove (*Streptopelia decipiens*), Tawny Eagle(*Aqulia rapax*), Kori Bustard (*Ardeotis kori),* Abyssinian Roller (*Coracias abyssinicus*), Crowned Plover, White bellied Go away bird (*Corythaixoides leucogaster*), Martial Eagle(*Polemaetus bellicosus*), Orange billed Parrot, Secretary Bird(*Sagittarious serpentarius*), Blue eared glossy Starling, Black faced Sand Grouse(*Pterocles decorates*), Red billed Hornbill (*Tockus erythrorhynchus*),Hooded Vulture(*Necrosyrtes monachus),*

Temperatures of mountains can be accurately predicted by using an energy balance method. The technique was tested by performing micro-meteorological measurements.

Qarijiqood Temperature:

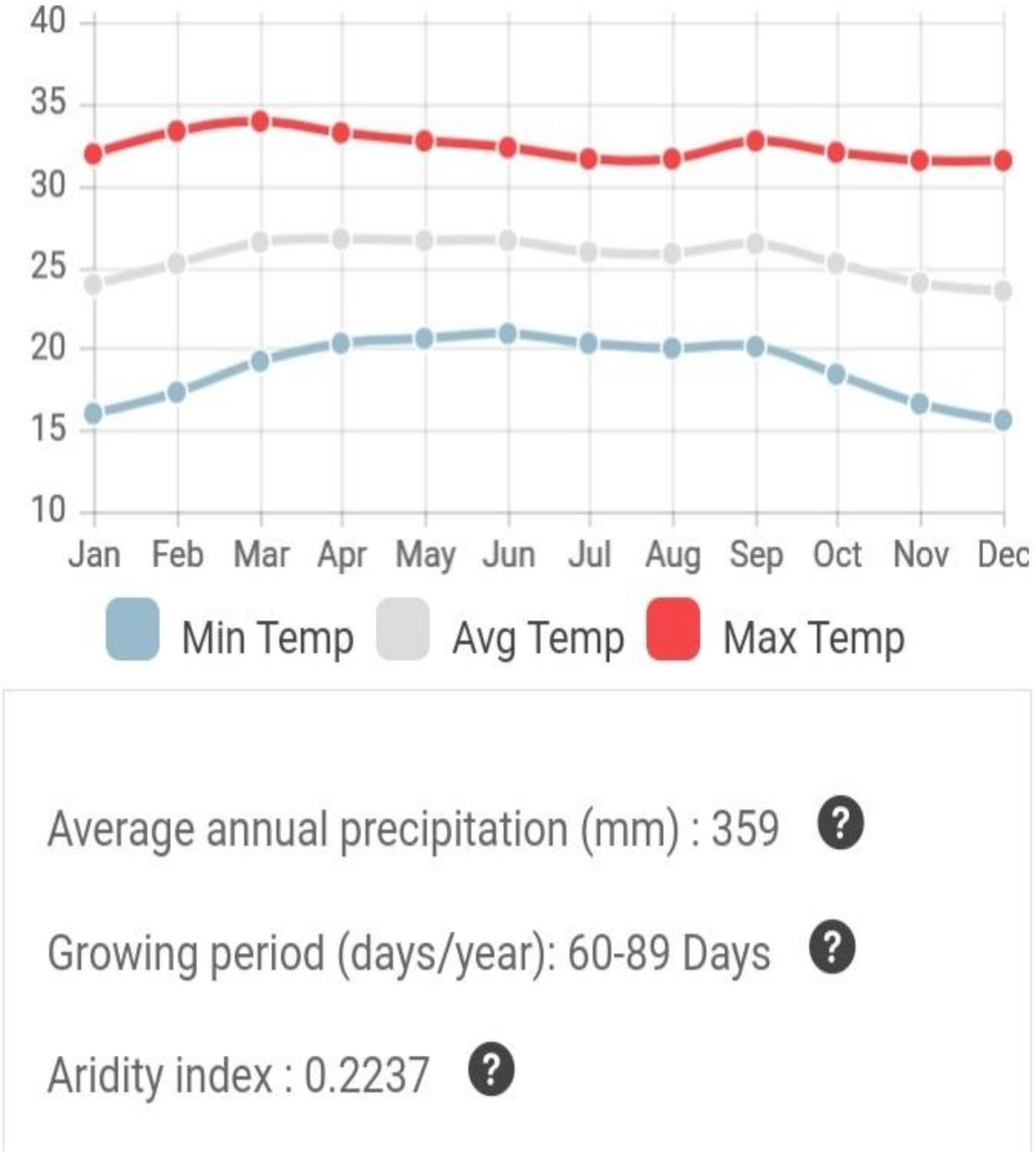


Figure 3: Qarijiqood Area - Annual Temperature

Climate and Precipitation

Annual rainfall was calculated from the 1981-2019, accordingly the availability of the data in the satellite as recorded qarijiqood mountain. This implies that the currently, rainfall of mountain was declining according to the past years. Likewise, April, May, September and October are the highest monthly in rainfall precipitation in the mountain

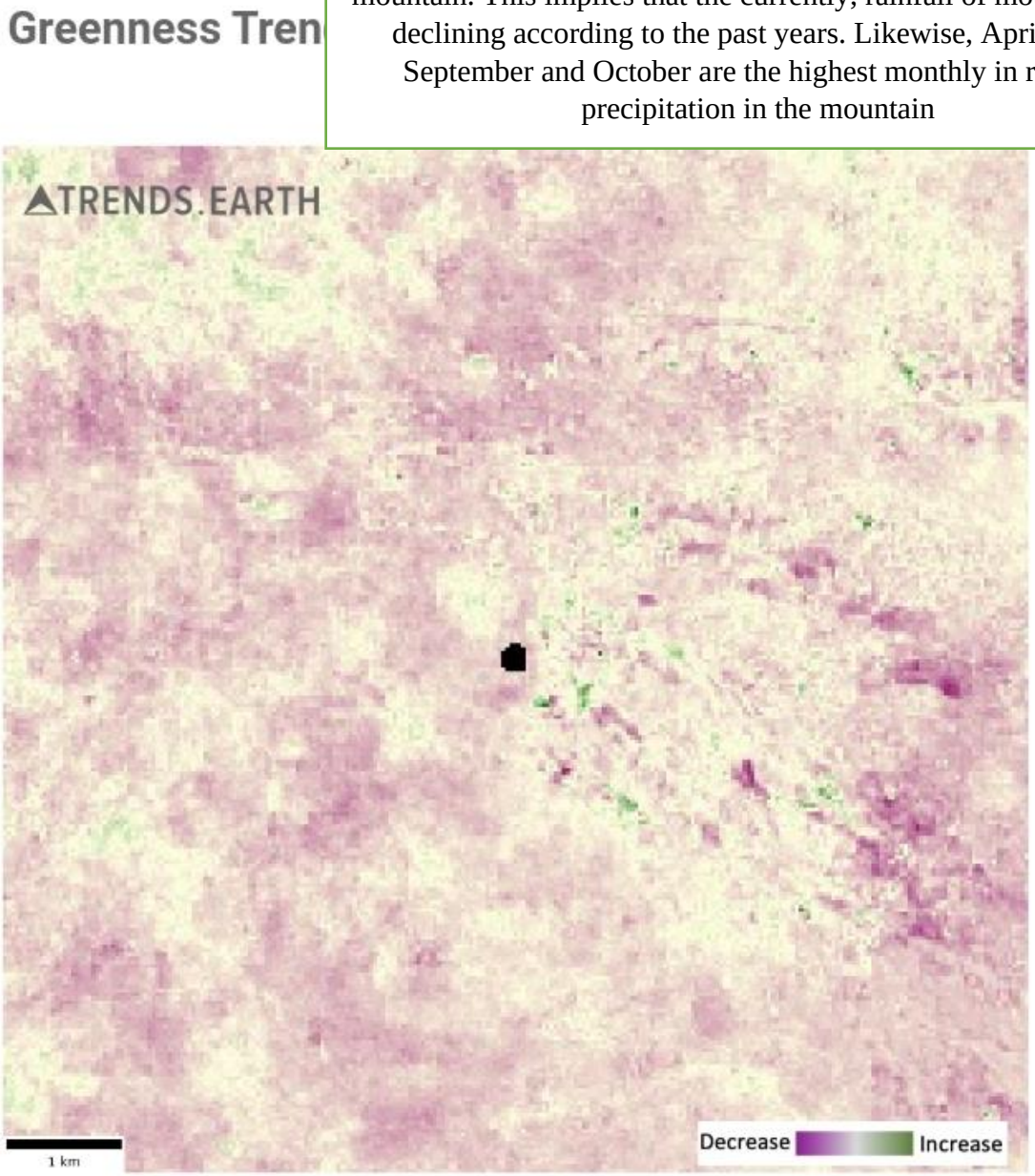


Figure 5: Qarijiqood Area - Greenness Trend 2014-2019

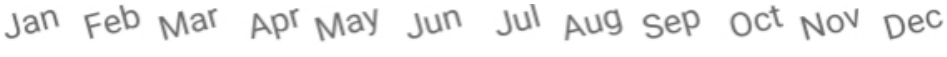


Figure 4: Qarijiqood Area - Annual and Monthly Precipitation

Figure 6: Qarijiqood Area – Greenness picture, June,2023.

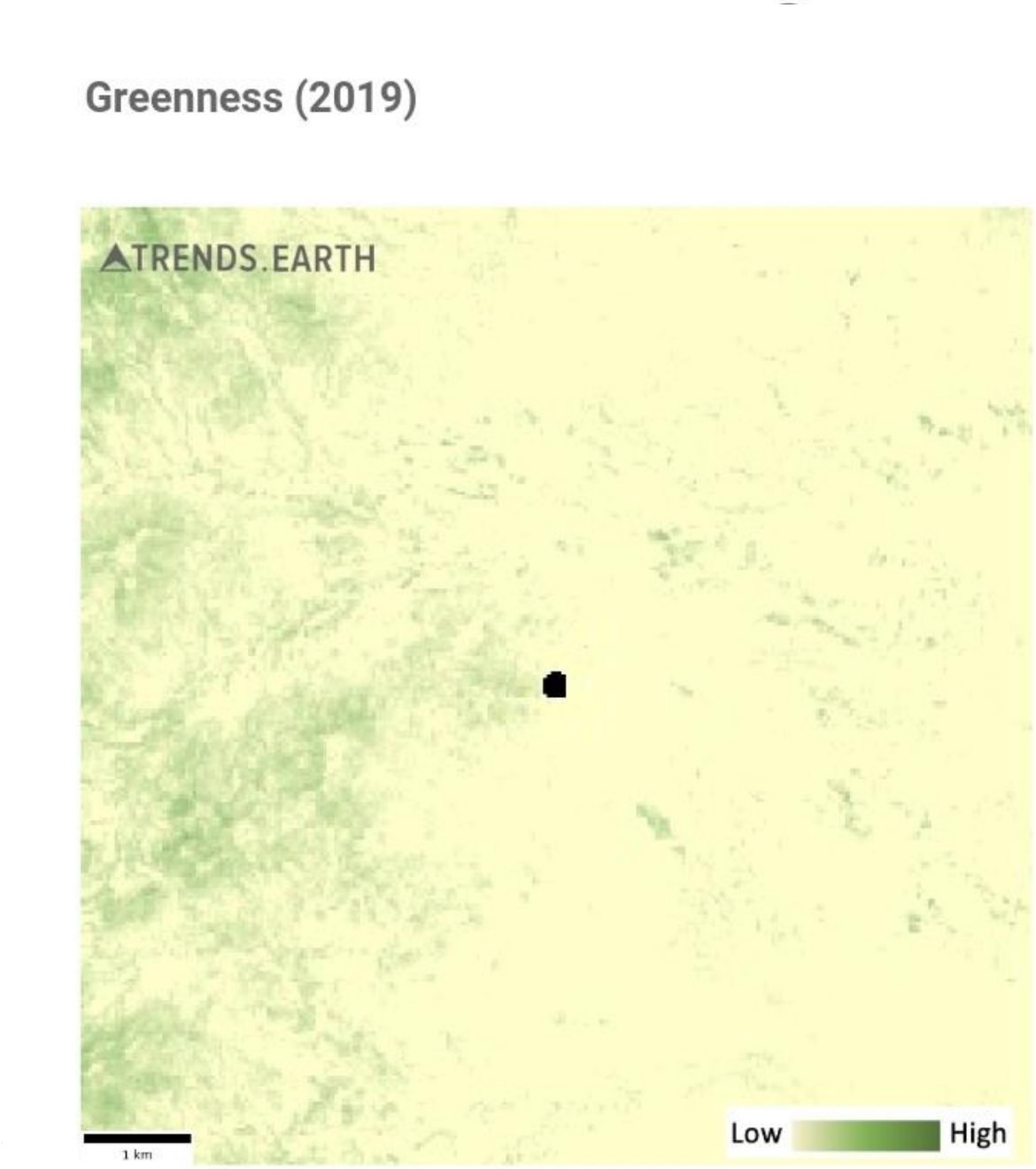


Figure 8: Qarijuqood Area - Greenness 2014