

TASK F5: Rangelands

The open desert in the NE Badia is very varied. Not all is suitable for grazing yet you will be surprised how much sustenance a sheep or goat can extract from seemingly barren desert. With their incisor teeth they can pluck at the tiniest of green shoots. Grass would be ideal but there is little of that. Probably the best plant is the *Atriplex* shrub (Fig.F8), which provides food for sheep, goats and camels. The upper parts of the shrub are enjoyed by camels while the sheep nibble the base. Goats seem to be omnivorous. The problem lies in allowing the shrub to grow sufficiently without being totally demolished by grazing livestock.



Fig.F9: *Atriplex leucocrada*.



The traditional grazing regime is based on the *beit sha'ar* (goat hair tent) from which the livestock are taken in the early morning to roam to a new grazing area and back again the evening. This means that the vegetation close to the *beit sha'ar* becomes very heavily grazed to a point where it becomes necessary for the family to move to a new site.

When populations become more sedentary with a fixed abode in a village this problem is magnified.

When wars take place in adjacent countries the refugees sometime drive their flocks with them across the borders adding to the pressure on grazings.

When land becomes so over-grazed we say that it is 'desertified'. This implies that the situation is irreversible. However it is possible to recreate the right conditions for plant growth. This Task and Field Unit F26 look specifically at this issue.

Fig. F10: Tal al Rimah Rangelands Project

<ul style="list-style-type: none">⌘ Area previously overgrazed due to<ul style="list-style-type: none">š sheep driven here from Iraq during Gulf Warš settlement of Bedouins concentrated herds in one area⌘ Area protected between 2003-2007 to allow plant growth.⌘ Contour harvesting maximises collection of water⌘ Project required the co-operation of the local people who owned the land. Community benefits because of employment in preparing land, and receipts from grazing permits	
<ul style="list-style-type: none">⌘ Grazing habits of goats, sheep and camels studied:<ul style="list-style-type: none">š Goats eat top of plantš Sheep eat middleš Camels eat top and middle⌘ Plants more palatable for camels because they are salty⌘ Plants more palatable for sheep after rain⌘ Trimming is necessary to remove woody growth⌘ Hand dug trenches⌘ New planting occurs after rain plus one further irrigation. Plants then establish themselves by extending roots in search for water	

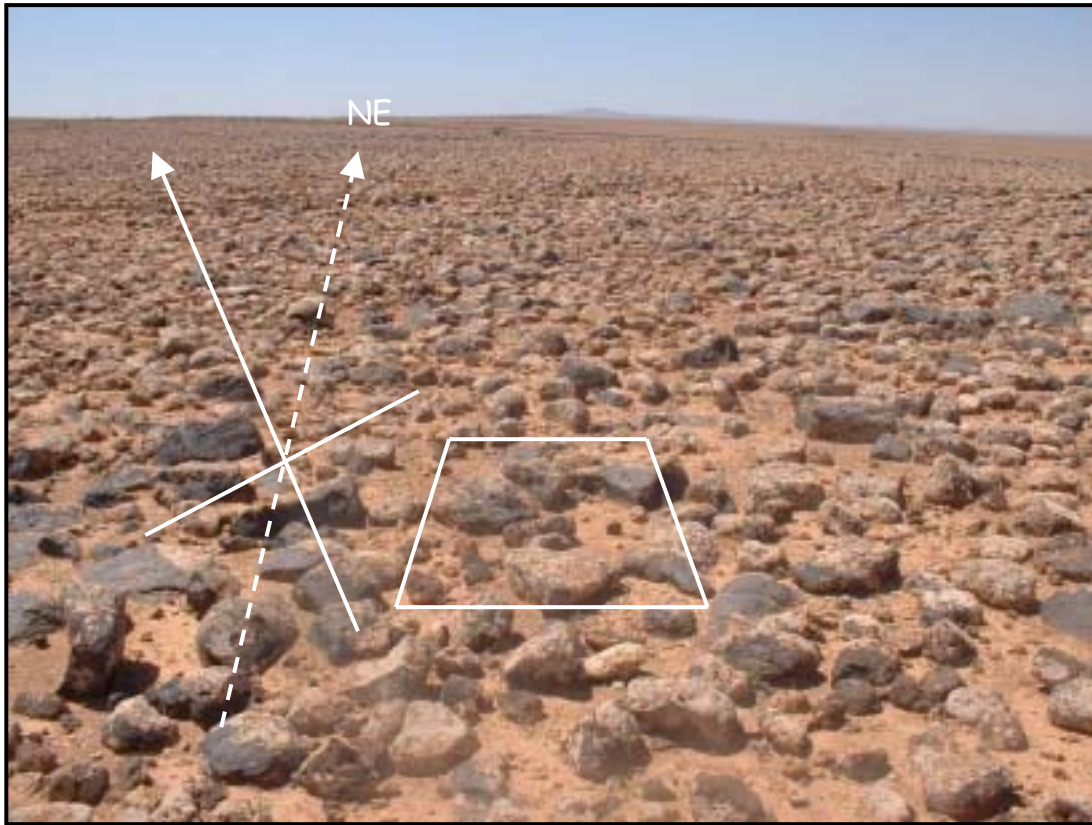


Fig.F11: View NE across the basalt desert east of Azraq (volcanic cone in the background). The white square represents a quadrat of approx 1m².

Boulders	Fines	Lichens		Other Vegetation
		W-facing	E-facing	
%	%			%

Fig.F12: Estimated contents of 1m² within the basalt desert zone.

1: Study the landscape shown in Fig.F11. Estimate the proportion of boulders to fine material within the quadrat. Record your estimates in the chart (Fig.F12)

2: Note that the lichens (brownish mottled) appear to grow mostly on one side (E-facing). Take each large stone within the quadrat and estimate how many are covered with lichens on the western and eastern-facing sides.

3: Roughly how much additional vegetation is there within the quadrat?

3: In the past the Bedouin have cleared patches of boulders to allow broader areas of fine material, to encourage more vegetation and to provide easier movement for the flocks. With your knowledge of the climate can you suggest some possible disadvantages to doing this.



Fig.F13: The seasonally dried up Qa'a of Al-Dahek. Limestone escarpment in the background.

When and if winter rains bring a flashflood of water into this basin it becomes flooded from wall to wall to a depth of up to 1m. Over a period of a few weeks the water evaporates or seeps into the substrate.

- 1: What evidence is there that flashfloods have flowed into this basin?
- 2: When the water dries up what will happen to the exposed muds? Is there any evidence for this in the photograph?
- 3: Why do you think that much of the surface seems to be covered with small, gritty material?
- 4: Clearly there is quite a lot of vegetation in this basin. Briefly describe its distribution.
- 5: Suggest reasons why this might be a good place to bring livestock for grazing.



Fig.F14: Camel bones in the desert just north of Al-Dahek

This image is taken only a short distance from the previous photograph yet shows a very different landscape. The location has been reached by driving up the escarpment that forms the side of the Al-Dahek depression to reach expansive, exposed and open desert. There is some vegetation but very little to provide nourishment for livestock. Nevertheless flocks will be found here given the competition for available grazing. The location is close to the Saudi Arabian border crossing where the border with Jordan takes a sharp, angular turn to the south-east.

1: Given the location described above locate the approximate position of this area on Fig. A2 (Geology), Fig. A3 (Rainfall) and Fig.A4 (Vegetation). Write a brief description of this area and its suitability for livestock grazing.

2: With reference to the maps referred to above estimate how much of Jordan experiences the same type of landscape and conditions.



Fig.F15: The Tal Al-Rimah Rangeland Project site (June 2007)

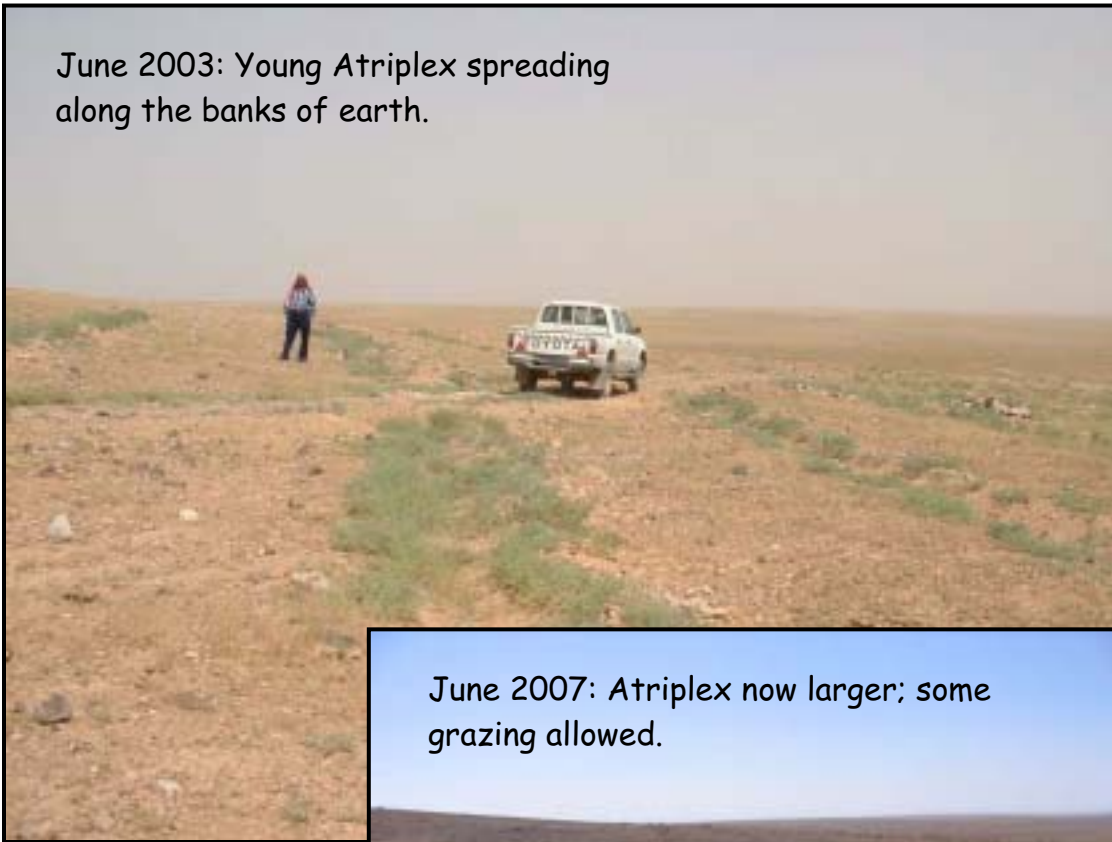
1: Draw a simple field sketch of this photograph and label the following:

- | | |
|-------------------------------------|---|
| €# well vegetated improved plot | €# Flock of sheep and goats avoiding the improved plot |
| €# bare open desert | €# Village of Tal Al-Rimah (arrow pointing right off image) |
| €# manually-constructed earth banks | |
| €# thriving atriplex bushes | |

2: The Badia Research and Development Centre (BRDC) spent time discussing rangeland improvements with the villagers. In partnership with them they prepared the ground that you see, constructed water traps to channel water to the plot and planted Atriplex bushes. Subsequently other vegetation has developed here, trapped on the wind by the Atriplex. The local farmers have taken ownership of the scheme and keep their flocks off the plot while it develops thus avoiding the need for costly fencing. Fig.F16 shows further images over a period of time.

From what you see and read assess the success of such community-based projects.

June 2003: Young Atriplex spreading along the banks of earth.



June 2007: Atriplex now larger; some grazing allowed.



Fig.F16: The Tal Al-Rimah Rangeland Project

Oct. '08: heavily grazed Atriplex.



Oct.'08: fresh shoots emerging



TASK F6: Why did a flower make a lot of people happy?

To answer this question you must read the contents of the boxes below (Fig.F15). Then, using the information and the title above, either:

- ≠ write an essay or
- ≠ prepare a poster or
- ≠ prepare a PowerPoint presentation

You may wish to photocopy the two pages, cut the boxes out and move them around to create a story board.

Fig.F17: 'Mystery' storyboards:

Jordan's national flower the Black Iris was seen in the Rangeland area after disappearing for a number of years.

The University of New Mexico is carrying out some joint research into plants in the rangeland area

Uncontrolled grazing means that sheep overgraze and degrade the rangelands resulting in reduced plant biomass production (less food to eat) and increased erosion

More and more Bedouin are becoming crop farmers and civil servants like teachers rather than nomadic herdsmen

If local people are involved in controlling grazing, fences are not needed to keep sheep from the rangelands

When grazing is controlled plants return, even those that haven't been seen for years like the black iris

Water harvesting techniques like stone strips have been shown to be effective in helping plants to grow

The reduction in the subsidy for concentrated sheep fodder may result in fewer sheep being kept

Flocks of sheep are sometimes moved by truck and so can get to fresh grazing more quickly

Water and fodder is taken to the flocks rather than the flocks being taken to the water and grazing.

In a region with little water climate change effects may not be as noticeable.

Short sharp showers results in water flowing rapidly down slopes.

Wind erosion can remove fine surface materials.

Relatively recent country borders cut across traditional nomadic grazing routes meaning that families tend to roam over smaller areas.

Average annual rainfall varies from 250mm to 50mm per year.

Precipitation is seasonal with most rain falling between December and March

The hot dry summers result in high rates of evaporation

The traditional way of life is nomadic pastoralism, herding flocks of sheep, goats and camels

Traditionally, the size of the herds was in balance with the vegetation availability

Many Bedouin now live in houses in towns and villages

Towns and villages provide schools and medical centres

Experiments with water harvesting show that over grazed areas can be revegetated

Atriplex is a shrub which grows well in the desert environment

The subsidy on sheep fodder made the Badia a good place to keep sheep. Larger and larger flocks were kept leading to overgrazing

Sheep have to be fed on concentrated fodder during the dry months

The Gulf war caused many refugees to leave Iraq to the east and move to the Badia, often with their sheep and goats