

# **KISR Research on Biodiversity Conservation**

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# Outline

- Introduction
- Biodiversity
- The stability of the ecosystem
- Flora of Kuwait
- Environmental challenges in Kuwait
- Conservation measures and major achievements of KISR

# Introduction

- 1- Repotting, transplanting.
- 2- Drawing, competition.
- 3- Examining viable vs. non viable seeds.
- 4- Visit to other booths at the exhibition.

# Biodiversity

- Meaning:
- Variety of life

- Examples:
- Genetic
- Species
- Ecosystem



# Terrestrial Biodiversity In Kuwait

## Plant Species:

**Recorded species: 374** (250 annuals, 83 herbaceous perennials and 34 shrubs and under-shrub species and one tree species)

## Plant Families: 55

## Mammalian Species: 28

**Extinct large mammals: 4** (gazelle and the Asiatic cheetah).

**Extremely rare carnivores: 3** (wolf, caracal and jackal)

**Endangered mammalian species: 5** (fennec fox, the red fox, honey badger, Indian grey mongoose and the wild cat).

## Avifauna:

More than 350 species recorded:

18 species breed locally

332 migratory birds

# In-Situ Conservation

National parks, reserved areas

Abstract blue geometric shapes, resembling stylized leaves or petals, overlapping and curving upwards from the bottom left towards the top right, filling the lower half of the slide.

# Environmental challenges in Kuwait

- Drought
- Scarce water resources
- Extreme temperatures
- High evaporation rates
- High level of soil salinity
- High degradation (over 90%)
- Frequent sand storms
- Urban pollution
- Overgrazing

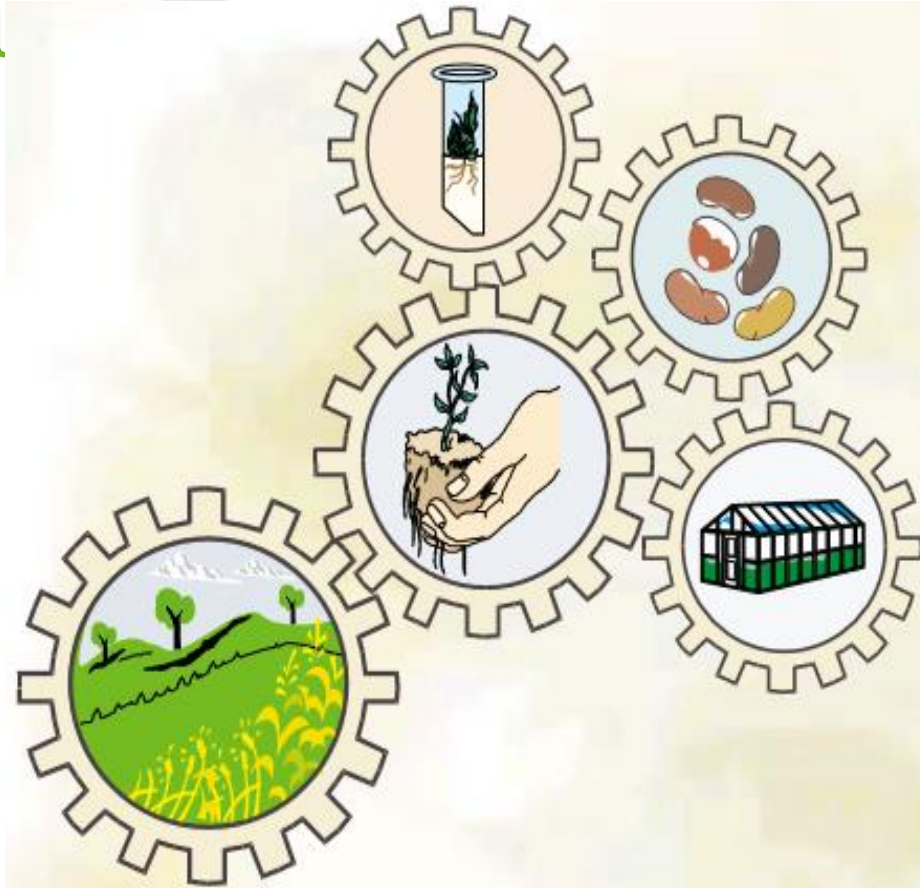


# Agriculture Research Station



# Ex-Situ Conservation

- The conservation of biological diversity by preserving an endangered species outside its native habitat.
- Maintains the genetic integrity of the material.
- Assists reintroduction and helps to overcome propagule limitation.



# KISR projects of ex-situ conservation:

1. Restoration.
2. Seed Bank Unit for Native Plants of Kuwait.
3. KISR Herbarium for Native Plants of Kuwait.



# Restoration

- The recovery of ecosystem that has been damaged or destroyed.
- Replanting the area with the right native plants where eventually natural succession of regeneration of themselves is occurred.



# KISR Seed Bank Unit

- Established in **2003**.
- Current collection includes **360** accessions of **88** different species.
- Stores seeds for the restoration projects in different period of time including short and long term storage.
  - Short term; seeds are stored in 4° C for 5 years
  - Long term; seeds are stored in -18° C for about 20 years.
- Objectives:
  - Collect and conserve native seeds.
  - Make the native seeds available for research.
  - Reintroduce the native plants into degraded ecosystems and rehabilitation programs.
  - Maintain and promote public interest in plant conservation.



**Medium term storage  
walk in cold room**

**Inside view**



**Containers for medium and long term storage**



***Rumex vesicarius* fruit and seeds**



***Peganum harmala* fruit and seeds**



***Rhanterium epapposum* fruit and seeds**



***Picris babylonica* seeds**

# KISR Herbarium for Native Plants of Kuwait

- Established in **1970**.
- Collection of preserved plant specimens and an excellent reference source for plant identification.
- Dried plant specimens stored in cabinets with full labelled data.
- Specimens are sorted alphabetically by family and genus, of common native plants.

- Herbarium contains multiple collections of the most common native plants.
- The collection contains approximately **2200** specimens belonging to **55** families.

# The preparation of herbarium specimen:

- 1) Field visits
- 2) Collection of specimens
- 3) Drying
- 4) Mounting on a herbarium sheet
- 5) Preservation
- 6) Labelling
- 7) Proper storage



## Cabinets used for storing Herbarium specimens



## Arrangement of folders in the steel filing cases



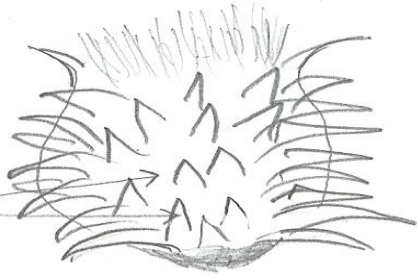
## A Herbarium specimen

**Thank you!**

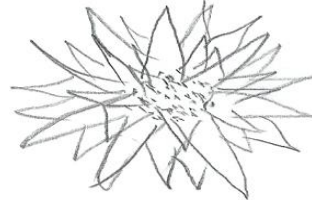
# Seeds of native plants of Kuwait

Side  
view

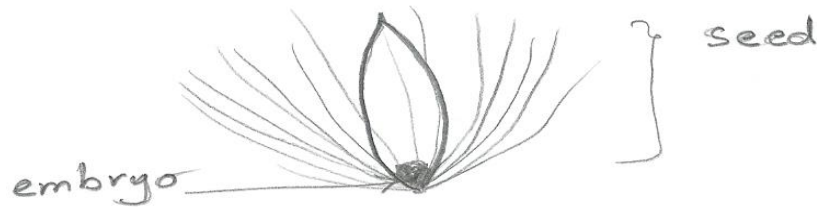
Seeds



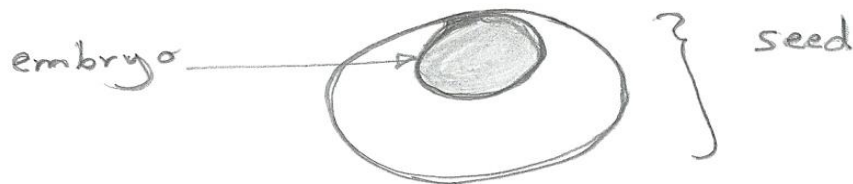
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Rhanterium epapposum



Pennisetum divisum



Farsetia aegyptia

