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Sustainable Agricultural Livelihood Restoration, Rehabilitation and Resilience in Kenya Training Manual

2.5.4 SUB-MODULE 4: INVASIVE SPECIES MANAGEMENT AND CONTROL

Invasive plants

These are plants that have, or are likely to spread into native or minimally managed systems and cause economic or environmental harm by developing self-sustaining populations and becoming dominant or disruptive to those systems. Invasive species are an emerging problem in the drylands creating disasters affecting communities. Livestock keepers are directly affected by the invasion and continued spread. Many regions in the dryland of Kenya are currently under the threat of invasive species. There is a need to mitigate the impacts of invasive species in the drylands to safeguard and build the resilience of the communities affected.

Examples of these species in Kenya include: - *Ipomoea* species, *Prosopis juliflora* (Mesquite), *Acacia reficiens*, Prickly pear (*Opuntia ficus*), water fern, Water hyacinth, *Acacia polyacantha*, *Lantana camara* and *Parthenium hysterophorus* (parthenium weed). *Acacia reficiens* is a very aggressive species in the northern parts of the country while *Opuntia* spp is found mostly in the arid and semi-arid zones of the country. *Prosopis Juliflora* has invaded thousands of acres in east Africa while *Ipomoea kituensis* is currently ravaging many parts of southern Kenya. *Parthenium hysterophorus* is another species fast spreading in central Kenya including Kajiado and Naivasha regions. All these species have been noted to be a menace in the environment as well as the ecosystems in which they are found affecting livelihoods.

Origin, spread and distribution of invasive species

Invasive species are either introduced intentionally or accidentally. Most originate long distances from the point of introduction. For instance, the invasive species Mesquite (*Prosopis juliflora*), native to South America, was intentionally introduced to combat desertification and tackle energy needs in the drylands of Kenya by the Government through the National Irrigation Board (NIB). Origins of other invasive species and the current spread or distribution are however unknown due to limited studies on this topic. Invasive plants are mainly distributed in the semi-arid and arid zones of the country. These are areas where these species find it easy to establish and colonise mainly due to favourable environmental conditions. Their invasion and spread is however mostly driven by land use changes and climate change. The plants are mostly spread through different pathways including animals, birds, people, tourism, agriculture inputs, water along roads, among other factors.

Features of invasive species and invaded environments

- Invasive species characteristics - High adaptability, tolerance to a variety of environmental attributes, rapid maturation, High reproductive output, seeds have a high percentage germination, ability to colonise from a single propagule, Effective dispersal mechanisms, Aggressive behaviour and competitive ability, have longer photosynthetic periods
- Invaded environments - similarity to origin, disturbed environments, lower biodiversity, availability of secondary pathways for invasion

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Ipomoea kituensis invasion in Kajiado County



Mesquite plant (*Prosopis juliflora*) invasion in Garissa County

Impacts of invasive effects of invasive species

The effects of invasive species on the environment and communities are wide-ranging. These can be categorised into environmental, economic, and social effects.

Environmental effects

- Displacing all herbaceous and grass species wherever they are growing e.g *Prosopis juliflora* and *Ipomoea kituensis*. As a result, livestock will suffer due to reduced availability of forage.
- Modification of the hydrological cycle
- Breeding ground for pests and diseases.

Economic effects

- Damage to goods and infrastructure - roads and pathways thereby restricting movements and displacing infrastructure
- Land which used to be used for cropping and forage production for livestock has hence been taken over by invasive species hence reduced productivity.
- Generally, economic losses effects are manifested in control costs and reduced productivity

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- Social effects
- Invasive effects normally lead to losses including loss of life
- Increased poverty, and deprived livelihoods.
- Impaired access to food, shelter, health, security and social interaction.

Control techniques of invasive species

Different control techniques have been suggested for the control and management of invasive species. Some of these include manual control, chemical, biological control, and integrated approaches but the key remains the application of rangeland management principles to prevent invasion. The most common practice utilised is the manual control where communities are involved aided by investments from government and private sector.

Principles

- Control when first seen - uprooting manually
- Control before flowering or before seed setting
- Plant other species after removal - adapted species – grasses, legumes and appropriate woody species
- Capacity building on control, management, utilisation
- Education and awareness - shows and exhibitions

Use and benefits of invasive species

Not only do invasive species contribute negatively to the environment, but they also provide several goods and services to communities living in the drylands. However, their relative values depend on what is displaced. Some of the benefits include the

- Provision of firewood and briquettes
- Timber for construction and building materials
- Compost making
- Barrier plants and medicines
- Contribution to soil stability
- Provision of feed for livestock - *Acacia*, *Opuntia* and *Prosopis* pods are used as feed by many livestock species in the drylands hence a crucial source of protein.
- Invasive species also provide crucial ecosystem services
- Habitat and shelter for wildlife and livestock
- Environmental services such as carbon storage and sequestration
- Water filtration
- Soil stabilisation

The key element, therefore, remains to manage the invasive species to levels where the environment and people living in the areas where they are found do not suffer irreversibly when removed.