REVIEW ON DROUGHT TOLERANT MEDICINAL PLANTS

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ABSTRACT:

In India, where agriculture is the main occupation of about 70% of the population, the total area under cultivation is about 169.7 M ha. The frequency and intensity of extreme weather events like droughts have increased during the last few decades due to global warming. In our country 1/6th of the total geographical area (51.1M ha) contributing 12% of population is drought prone. It covers 13 states including 74 districts.

Drought results in recurrent crop failure and yield reduction. Besides this, medicinal species are difficult to obtain in sufficient quantities from traditional suppliers owing to manpower scarcity and rising production cost, necessity of their cultivation in farms arises. So, the drought-tolerant plant species with medicinal values have been listed. Out of these, some plant species like Adhatoda, Tribulus & Ricinus require very low maintenance and manpower.

Now-a-days, good foreign market exists for species like Aloe, Withania, Cassia, Liquorice, Rouwolfia, Datura and Lowsonia. So these cash crops procured from drought prone area can fulfill their high demand in market & contributes to India’s performance in terms of value. Therefore, a cultivator of these medicinal plants in drought-prone land will be sure of his investments in terms of cost-benefit ratio.

Further, average land holding in India is tiny and often split into scattered pieces which comes under marginal land holding (below 1 ha). For people below poverty line, cultivation of these drought tolerant plants provides a significant proportion of self-employment opportunities and supplements the income of most sections of India.

KEYWORDS-

Drought prone region, drought tolerant medicinal plants, cultivation

INTRODUCTION:

In India, agriculture is the main occupation of the people and about 70% of the population is engaged in this activity. The total area under cultivation is about 169.7 M ha; an additional area of 0.4M ha is under population crops. In our country, the average holding is tiny and split into dispersed pieces. Five main categories of them are:

1. Marginal- below 1 ha
2. Small- 1-2 ha
3. Semi-medium- 2-4 ha
4. Medium- 4-10 ha
5. Large- 10 ha and above

Drought results in recurrent crop failure and yield reduction. Due to manpower scarcity and rising production cost, medicinal species are difficult to obtain in sufficient quantities from traditional suppliers which results in
necessity of their cultivation in farms. So, the drought-tolerant plant species with medicinal values have been discussed here and which plant species require very low maintenance, low man power and can fulfill their high demand in market are studied.

AIM AND OBJECTIVES:
1. To review the drought prone area in India
2. To review the drought tolerant medicinal plants in India

MATERIAL AND METHODS:

Drought prone areas of India:
The frequency and intensity of extreme weather events like droughts have increased during the last few decades due to global warming. Drought is defined by deviation from the traditional rainfall. Possibilities of drought occurrence in India vary from once in 2 years in western Rajasthan to once in 15 years in Assam. In our country 1/6th of the total geographical area (51.1M ha) contributing 12% of population is drought prone. It covers 13 states including 74 districts. The areas that receive an annual rainfall up to 60 cm are the most prone. Maximum drought prone areas are found in arid, semi-arid and sub-humid regions of the country, which experience but average annual rainfall. These drought affected areas in India are divided in 2 tracts:
1. Desert and semi-arid regions- 0.6 million sq.m. Rajasthan and Gujarat Rainfall is less than 750 mm (some places <400 mm)
2. East of the western ghats up to a distance of 300 km from coast (Rain shadow area of western ghat)- Rainfall is < 750 mm
In Maharashtra 1290 km2 area (0.42%) is arid; while 189580 km2 (61.61%) is semi-arid.

Drought tolerant medicinal plants:
Indians are fortunate to be blessed with varieties of climate, from tropical to alpine and desert to humid. It has therefore, a large array of vegetation and having more than 20000 plant species. Out of these following are some drought tolerant medicinal plants:
- Neemba- Margosa tree (*Azadiracta indica*) – Meliaceae
- Gambhari- Coomb teak (*Gmelia arborea*) – Verbenaceae
- Karanja (*Pongamia pinnata*) - Leguminoseae
- Arjuna- Arjun tree (*Terminalia arjuna*) - Combretaceae
Haritaki - Chebulic myrobalan (Terminalia chebula)- Combretaceae

Bibhitaka - Belleric myrobalan (Terminalia belerica)- Combretaceae

Eranda - Castor (Ricinus communis)- Euphorbiaceae

Dhatura (Datura metel)- Solanaceae

Methika - Fenugreek - (Trigonella fenumgraecum)

Chandana - Sandalwood (Santalum album Linn.)

Ashwagandha - Winter cherry (Withania somnifera)- Solanaceae

Agnimantha (Clerodendrum phlomidis Linn.f.)- Verbenaceae
Kashthadaru (*Polyalthia longifolia* Benth & Hook.f.) - Annonaceae

Gunja (*Abru precartorius*) – Fabaceae

Apamarga (*Achyranthes aspera*) – Amaranthaceae

Ingudi (*Balanites aegyptica*) – Balanitaceae

Shallaki (*Boswellia serrata*) – Burseraceae

Chakramarda (*Cassia tora*) – Fabaceae

Dhattur (*Datura metel*) – Solanaceae

Laangali (*Gloriosa superba*) – Liliaceae
DISCUSSION-

Drought results in recurrent crop failure and yield reduction. Besides this, medicinal species are difficult to obtain in sufficient quantities from traditional suppliers due to manpower scarcity and rising production cost. Owing to this, necessity of their cultivation in farms arises. So, the drought-tolerant plant species with medicinal values have been
listed above. Out of these, some plant species like Adhatoda, Tribulus & Ricinus require very low maintenance and man power.

Now-a-days, good foreign market exists for species like Aloe, Withania, Cassia, Liquorice, Rouwolfia, Datura and Lowsonia. So these cash crops procured from drought prone area can fulfill their high demand in market & contributes to India’s performance in terms of value. The medicinal plant industry is on the verge of entering into a high growth phase in botanicals required for production of Ayurvedic medicines. Medicinal castor oil (Eranda taila), Sandalwood oil (Chandan taila) and cassia leaves (sanay patra) are substantial contributors to India’s economy. Arka (Clerodendrum phlomidis), Shankpushpi (Convolvulus pluricaulis) and Jeevanti (Leptadenia reticulata) have good demand in market and they could be integrated with millet and legume crops with minimum efforts. Therefore, a cultivator of these medicinal plants in drought-prone land will be sure of his investments in terms of cost-benefit ratio and which is related to his selection of crops, its agro technology of growing, proper harvesting techniques, post-harvest management and marketing prospects of his produce.

Developing country like India is the leading supplier of following plants:

**Medicinal plants**- Eg. Cinchona species (Kasani), Rouwolfia species (Sarpagandha), Glycyrrhiza (Yashtimadhu)\(^1\)

**Commercial crops**- Vrukshamla- Kokum (Garcinia indica Choisy)

**Export potential plants**- Madhukari (Stevia rebaudiana)

**Long gestation plants**- Bael, Shinshapa, Saptaparna, Gambhari, Guggulu, Raktachandan, Shweta-Chandan

CONCLUSION:

A cultivator of these medicinal plants in drought-prone land will be sure of his investments in terms of cost-benefit ratio. For people below poverty line, cultivation of these plants provides a significant proportion of self-employment opportunities and supplements the income of most sections of India.

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