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Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development

Joint written statement* submitted by "ECO-FAWN" (Environment Conservation Organization - Foundation for Afforestation Wild Animals and Nature), Akshar Foundation, Patiala Foundation, Rajasthan Samgrah Kalyan Sansthan, Samarthanam Trust for the Disabled, non-governmental organizations in special consultative status

The Secretary-General has received the following written statement which is circulated in accordance with Economic and Social Council resolution 1996/31.

[29 May 2023]

* Issued as received, in the language of submission only.

Climate Change - Invasive Weeds and its Impact on Agriculture and Food Grains in India

Invasive weeds in agriculture impede productive crop yield in agriculture, are host to pests, dominate primary lands, deter cattle forage and possess massive expansion potential with no sign of abatement without human intervention. Absence of government intervention on weed management practices in agriculture burdens fragile agriculture economy. At present weed control is tackled by high dependence on chemical weedicides, subsequently affecting the quality of soil, water and natural ecosystems. Weed removal through hazardous weedicides, although banned officially, its existence in the markets cannot be extirpated by the government machinery which is superseded by agricultural demand of farmers. Moreover, literacy rate of cultivating farmers in India is quite low which only makes it difficult to comprehend the ill effects of cruel weed removal methods.

The invasive weeds have penetrated deep inside the forests, in water bodies, common lands and elsewhere, its high time government step in and initiate control measures on large scale, the benefits include productive agriculture, enhanced soil, quality of potable water and prosperous biodiversity. The forest vegetation predominated with invasive weed species replaces dietary preferences of herbivores in forests and domestic animals, absence of the wide feeding preferences prompts herbivorous to raid crops where farmers are compelled to killing of herbivores which naturally lead to man-animal conflict.

Addressing the United Nations' Sustainable Development Goals

Addressing invasive weed management meets following SDG's.

SDG 1 No Poverty

SDG 2 Zero Hunger

SDG 4 Clean Water

SDG 8 Decent work and Economic Growth

SDG 10 Reduced inequalities

SDG 13 Climate Action

SDG 14 Life below water

SDG 15 Life on Land

Preventing the introduction of invasive alien species is the most cost-effective way to address their impacts, which are estimated to cost the global economy billions of dollars annually. Nearly all countries (98 percent) now have national legislation to prevent or control invasive alien species, Adequate resources are crucial to an effective response. However, only 55 percent of countries have reported allocations from their national budgets to deal with invasive species, while only 37 percent have accessed global financing mechanisms.

Successive Controlling Measures with Good Practices in Field:

Many of the alien invasive weeds are problematic since their occurrence in agriculture, control of such problematic weeds is done by the farmers, forest managers and aquatic systems' managers to save the crops, forest, and aquatic ecosystem, respectively. State Government agencies like agriculture, forest, and lakes departments besides municipalities are bound to take appropriate control measures time to time as and when required. Recently, Chhattisgarh Forest Department cleared Lantana from about 2 lakh hectares area costing Rs 15000 to 45000 per hectare. In general, removal of water hyacinth from an aquatic body may cost Rs 25000 to 60000 depending on the severity of infestation.

At country level to make people aware about the menace and management of one of the most problematic weeds named Parthenium, ICAR-Directorate of Weed Research situated at Jabalpur observe "Parthenium Awareness Week "every year during 16 to 22 August.

This is being done since 2004, which has resulted immense awareness among the public to control not only Parthenium but other alien invasive weeds also. ICAR-Directorate of Weed Research has distributed culture of bio agents in different states for the management of the alien invasive weeds like Parthenium water hyacinth and water fern.

First successful classical biological control of a weed (prickly pear) was achieved unintentionally in India when cochineal insect 'Dactylopius ceylonicus' was mistakenly introduced from Brazil in place of D.cacti to produce dye from Opuntia vulgaris. This incident led to biological control of weeds. In 1926, D. opuntiae, a North American species, was imported from Sri Lanka and its colonization resulted in spectacular suppression of Opuntia stricta and related O. elatior. So far in India, about 30 exotic biological control agents have been introduced against weeds, of which six could not be released in the field, 3 could not be recovered after release while 21 were recovered and established. From these established bioagents, 7 are providing excellent control, 4 substantial control and 9 partial control. Biological agents, mainly insects provided excellent biological control of prickly pear, Opuntia elatiorand O. vulgaris by D. ceylonicus and D. opuntiae; Salvinia molesta by weevil, Cyrtobagous salviniae; water hyacinth by weevils Neochetina bruchi and N. eichhorniae and galumnid mite Orthogalumna terebrantis; and Parthenium hysterophorus by chrysomelid beetle Zygogramma bicolorata.. There are many bioagents which have been introduced in other countries and have shown varying degree of success through combined effect. In Australia, 9 bioagents have been introduced against Parthenium alone. Such successful bioagents need to be introduced in India against some of the problematic weeds like Parthenium, water hyacinth, Pistia, alligator weed etc

Extents of Damage Done by Such Weeds in Agriculture and Economy

The invasive alien weed species are ready colonizers in disturbed ranges and cause considerable ecological damage to India's natural areas, speed the disappearance of threatened and endemic species, reduce the carrying capacity of pastures, increase the maintenance costs of croplands, forest land and aquatic systems and interfere with our enjoyment of the outdoors. Of these, some species may have invaded only a restricted region, but had a huge probability of expanding damage.

In general, as many as 330 plant and animal species are declared invasive out of more than 2,000 alien species in India and the costs of $127.3 billion as documented in the study comes from only 10 of these 330 alien invasive plant and animal species, making India the second topmost invasion-cost bearing country after the United States of America. Out of this estimated cost, more than 70% loss is caused by weeds.

Study at ICAR- DWR in 2018 to estimate the yield and economic losses due to weeds using the data from 1581 On-Farm Research trials conducted by All India Coordinated Research Project on Weed Management between 2003 and 2014 in major field crops in different districts of 18 states of India. The study revealed that potential yield losses were high in case of soybean (50–76%) groundnut (45–71%). Greater variability in potential yield losses were observed among the different locations (states) in case of direct-seeded rice (15–66%) maize (18–65%). Three factors viz. location (state), crop, and soil type significantly ($p < .0001$) explained the variability in actual yield losses due to weeds at farmers' fields. Significant differences were also observed between different locations, crops and soil types. Actual economic losses were high in the case of rice (USD 4420 million) followed by wheat (USD 3376 million) and soybean (USD 1559 million). Thus, total actual economic loss of about USD 11 billion was estimated due to weeds alone in 10 major crops of India viz. groundnut (35.8%), soybean (31.4%), greengram (30.8%), pearl millet (27.6%), maize (25.3%), sorghum (25.1%), sesame (23.7%), mustard (21.4%), direct-seeded rice (21.4%), wheat (18.6%) and transplanted rice (13.8%).

A study was also done to estimate the loss caused by the alien invasive weed Parthenium in waste and vacant land. In general, about 35-million-hectare land has been estimated to be infested with Parthenium. The increase of Parthenium infestation in crop area in recent past is alarming. For the management of Parthenium, two hand weeding or two chemical sprays are essentially required to get complete relief.

It was estimated that 182000 or 18200 crores will be required per year to mitigate the problem by manual labour and Rs 119000 million or 11900 crores are required to manage the weed by Chemical method besides Rs 880 crores for treatment of health and about 10 crores on researchable issues related to biological control in particular and integrated management in general including people awareness programmes. The losses caused by this weed may be much higher if we take into consideration the cost involved in restoration of biodiversity and aesthetic value already lost due to Parthenium.

The Solution:

The solution to the above invasive weeds in agriculture can be overcome by weeding manually, periodically for at least 5-8 years, by this way weed menace would be addressed creating rural employment simultaneously countering biodiversity issues, needless to mention clean air, water and soil, no wonder doubling farmers income by 2030.

Role of "ECO-FAWN" (Environment Conservation Organization - Foundation for Afforestation Wild Animals and Nature):

The "ECO-FAWN" (Environment Conservation Organization - Foundation for Afforestation Wild Animals and Nature) has gathered information from all the stake holders of Agriculture, Animal husbandry, Soil & Ground water department, Fertilisers & Pesticides, Forest department, made a report with comprehensive information and addressed all constitutional offices in India, information started to come in, hope the government of India responds positively at the earliest. "ECO-FAWN" (Environment Conservation Organization - Foundation for Afforestation Wild Animals and Nature) has collaborated with Akshar Foundation, Rajasthan Samgrah Kalyan Sansthan (RSKS), Samarthan Trust for the Disabled and Patiala Foundation to work in different states in India. The society’s ambition is to control invasive alien weeds completely in agriculture and help farmers tackle with the invasive weed problem.

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*Facts & figures from ICAR-Directorate of weed Research, Jabalpur, M.P. India. F.No. 3(1)/2019-Estt. Dated: 13.02.2023 letter addressed to Mettu Sai Sampath Founder-President ECO FAWN Society

ICAR-DWR Indian Council of Agriculture Research, Directorate of Weed Research, Jabalpur, Madhya Pradesh, a Government of India Organization.

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