

Supplementary Material

Perceptions of Impacts and Management of Invasive Alien Plants: A case study from Mirzapur, India

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Table 1:	Table	showing	origin,	properties	of	Invasiveness	and	impacts	of	IAP	s.
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Name of	Englis Origi	Origi	Invasiveness			Impacts				Pathway			Refere	
Taxa	h Name	n	IE	RMS	MMR	MMD	B1	B2	B3	RE	PR	РР	PI	nces
Ageratum houstonia num	Floss flower	Tropi cal Amer ica	~	V			V	~	~	~	EF C	OP ; TH M	In	Kohli et al. 2006
Argemon e mexicana	Mexic an poppy	Mexi co	~	~			~	~		~	EF C; RN ; TC S	OP ; LI	In ; U ni	Sankara n et al. 2013; Naithan i et al. 2017
Cassia tora	Sickle senna	Centr al Amer ica	~	~			~	~		~	EF C		In	Gupta & Yadav 2007
Calotropi s procera	Apple of Sodom	Afric a and Asia	~	~			~	~	~	~	TC S; EF		In	Kaur et al. 2021

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Name of Englis		Origi		Invasi	veness]	Impact	S		Pathway		y	Refere	
Taxa	h Name	n	IE	RMS	MMR	MMD	B1	B2	B3	RE	PR	РР	PI	nces	
											C; RN				
Hyptis Suaveole ns	Pig nut	Tropi cal Amer ica	~	~	~	~	~	~	~	~	TC S	TH M	In ; U ni	Sankara n et al. 2013; Sekar 2012	
Ipomoea carnea Jacq.	Pink morni ng glory	Centr al & South Amer ica	~	~	~	~	~	~	~	~	EF C; RN	OP ; Ho rt	In ; U ni	Chaudh ari et al. 1994; Laxma ppa et al. 2014	
Lantana camara L.	Lantan a	Tropi cal Amer ica	~	~	V	~	~	~	~	~	EF C	OP ; Ho rt	In	Love et al. 2009; Sankara n et al. 2013	
Partheni um hysteroph orus L.	Congr ess weed	Tropi cal North Amer ica	~	~	~	~	~	~	~	~	TC S	FC; SC	Uni	Gunase elan 1998; Sankara n et al. 2013; Kaur et al. 2014; Bashar et al. 2021	
Saccharu m spontane um	Wild sugarc ane	Tropi cal west Asia	~	~	~	~	~	~	~	~	EF C		In	Naithan i et al. 2017; CABI 2022	
Sonchus oleraceus	Annua 1 Sow Thistle	Euro pe	~	~		~	~			~	EF C; TC S	Ag; Ho rt; TH M	In ; U ni	Peerzad a et al. 2019	

Name of Taxa	Englis h Name	Origi n	Invasiveness			Impacts				Pathway			Refere	
			IE	RMS	MMR	MMD	B1	B2	B3	RE	PR	РР	PI	nces
Stylosant his hamata	Caribb ean stylo	Tropi cal Amer ica	V	~		✓		V		~	EF C, RN	TH M	In ; U ni	Annor & Cofie 2007
Typha angustifo lia	Lesser bulrus h	Peru, South Amer ica	~	~	~	~	~	~	~	~	EF C	OP	In	Sekar 2012; Naithan i et al. 2017

Note: IE - Invasive Elsewhere; RMS – Rapid Multiplication and Spread in different ecosystems; MMR – Multiple Modes of Reproduction MMD – Multiple Modes of Dispersion; Impacts: B1- affecting ecosystem functions and services; B2-Biodiversity loss; B3- Economic loss and health hazard (human and wildlife); RE - Range Extension (Continues spread of the alien species); PR – Pathway Route; PP- pathway Purpose; PI – Pathway Intentionality EFC - Escape from confinement; RN – release in Nature; TCS - Transport - Contaminant & Stowaway; OP – Ornamental purpose; LI – landscape improvement; Ag- Agriculture; Hort – Horticulture; FC- Food Contaminant; SC – Seed Contaminant; THM- Transport of habitat material; In – intentional; Uni – Unintentional

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Questionnaire structure and contents

Section I: Environmental Awareness and Knowledge

This section was designed to assess people's environmental knowledge and familiarity with IAPs, which were depicted using images of 12 different IAPs from the region. These species were *Ageratum houstonianum* (floss flower), *Argemone mexicana* (Mexican poppy), *Cassia tora* (Sickle senna), *Calotropis procera* (Apple of Sodom), *Hyptis suaveolens* (pignut), *Ipomoea carnea* (pink morning glory), *Lantana camara* (prickly lantana), *Parthenium hysterophorus* (carrot grass), *Saccharum spontaneum* (wild sugarcane), *Sonchus oleraceus* (Common sowthistle), *Stylosanthis hamata* (Caribbean stylo) and *Typha angustifolia* (lesser bulrush). The respondents were also asked about the local names of plants, if they had observed their existence near them and where they were supposed to be.

Section II: Perceptions of Ecosystem Services and Disservices

This section was designed to assess the perceptions and attitudes of respondents towards the IAPs in terms of the benefits, uses or services they derive (ES), and the harmful impacts on health, crops, plants and livestock (EDS), they perceive.

Section III: Attitude toward Management of Invasive Species

1. Which practices do you use to control invasive species?

On a Likert scale of 1 (strongly disagree) to 5 (strongly agree), indicate your level of agreement with the statement.

2. Do you agree with the management of these species? (Likert scale: 1 to 5)

3a. Would you be willing to contribute towards managing invasive species? (Yes/No)

3b. If yes, then how? (Financially/Awareness/Volunteer time)

4. According to you, is controlling IAPs necessary to help conserve the environment and protect biodiversity? (Likert scale: 1 to 5)

- 5. Is controlling IAPs necessary to protect the well-being of people? (Likert scale: 1 to 5)
- 7. Would you be opposed to the removal of one or more of these plants? (Yes/No)

Section IV: Socio-demographic Information

Socio-demographic factors comprised gender, age, educational qualifications, source of livelihood, income, type of family, household size, location and duration of stay in the location.

 Table 2: Summary of the responses received for open-ended questions viz. local name, expected location, ecosystem services and ecosystem disservices of IAPs.

Services	Local Name	Expected location	Ecosystem Services	Ecosystem Disservices
Ageratum houstonianum	Gandhela, Foolenia ghass, Phulwari	Open grasslands, along roadsides, disturbed land	Fodder, fencing, ornamental	Toxic, allergic, spread rapidly
Argemone mexicana	Bambhaad, Bharbhand, Kaati, noknia, Peeli Datoora	Wastelands, open areas, along raodsides, edges of agriculture fields	Medicinal use (piles, pains), food (adulterant)	Toxic, allergic, loss of diversity, obstruction to mobility, reduction in crop production, reduces soil fertility
Cassia tora	Chakwad, Chakor	Along roadsides, agricultural fields, open grasslands	Medicinal use (eye), veterinary medicine, fodder, food (leafy vegetable), worship	Reduces soil fertility, reduction in crop production (weed), loss of diversity, spread rapidly
Calotropis procera	Madaar, Aak	Edges of agricultural land, barren land, rocky soils, roadside, banks of canals	Worship, medicinal use (toothache, wound healing, knee pain, snake bite), basket making, fencing, furniture, fuel, fodder, leaf is used for litti baking	Toxic milk, toxic for eyes, allergic, reduction of crop production, reduces soil fertility, loss of biodiversity, obstruction to movement
Hyptis suaveolens	Ban-Tulsi, Vilaiti tulsi,	Disturbed habitats, along roadsides, open grasslands	Medicinal use (for cold, anal infection, veterinary), furniture, fuelwood, fencing, shed making, roof thatching, worship, food	Toxic, highly prone to fire, reduces soil fertility, reduction in crop production, suppress local species, biodiversity loss, barrier to movement
Ipomoea carnea	Behaya, Lataar, Sadabahar, Besharam	Near water bodies like ponds, lakes, riverbanks	Medicinal use (knee pain, wound healing, veterinary), worship, fuelwood, fodder, roof thatching, fencing	Toxic, allergic, poisonous smoke, harmful for agricultural land, reduction in crop production, biodiversity loss
Lantana camara	Lantana, Mewari	Disturbed forest areas, open grasslands and forest edges, edges of cultivated land, banks of canal	Fodder, food, digestive fiber, roof thatching, basket making, fencing, fuel	Toxic, allergic, barrier to movement, reduction in crop production, reduces soil fertility, loss of diversity, prone to fire
Parthenium hysterophorus	Gajar ghass, Carrot grass, Congress grass,	Disturbed areas, agricultural fields, along road sides, pasture land	Medicinal use (pain, skin), fodder, fuel	Toxic, allergic, loss of diversity, reduce agricultural productivity, reduces soil fertility, prone to fire
Saccharum spontaneum	Kass, kansh, Sarpat	Riverbanks and wetlands, flood plains, edges of agricultural fields, grassland	Medicinal use, fuel, shed making, furniture, basket making, roof thatching, broom, mandap making, fencing, worship	Obstruction to mobility, allergic, reduces soil fertility, reduces agricultural productivity, prone to fire

Sonchus oleraceus	Dudhi, Makkhani	In and around agricultural fields, along roadsides,	Medicinal use (coolant for stomach ulcer), fodder, fuel, food	Toxic, allergic, reduction in crop production, reduces soil fertility
Stylosanthis hamata	Khesari, Stylo- caribbean	Grasslands, open fields, pastures	Medicinal use, fodder	Toxicity, allergic
Typha angustifolia	Sarpoka, Nerui, Hathi ghass, Nagarmotha, Patera	Edge of ponds, shallow water, marshes, riverside	Medicinal use, shed making, roof thatching, basket making, fuel, fodder, food	Loss of biodiversity, barrier to movement, allergic, prone to fire