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Pictorial Guide to Paddy Weeds of Economic Importance: Agronomic and Ethnomedicinal Perspective

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Abstract:

Paddy (rice) is a staple food for billions globally, but weed infestation remains a major constraint to its productivity, causing an estimated yield loss annually. Accurate identification of paddy weeds is crucial for implementing effective management strategies. The present study investigates weeds of economic importance in paddy fields in Usur. Random vegetation surveys were used to conduct the study from June to October 2020. A quadrat measuring 1 m x 1 m was randomly placed in the weed-infested area. Plants observed were photographed, geo-referenced, collected, and prepared as herbarium specimens. Standard keys, manuals, and checklists were utilized for plant identification and organized using the angiosperm plant phylogeny (APG) classification system. Component features in the study were scientific and family names, common English names, life cycle, native/exotic species, lifeforms and medicinal uses. A total of (72) species distributed within (16) families and (50) genera were inventoried. Native (47) and exotic (25) species. Results obtained from this study will be useful in weed management programmes for keeping records of the diversity and distribution of weed species.

Keywords: Agriculture ecology, Biological activities, ethnobotanical medicine, flora, homeopathy, pharmaceuticals, therapeutics

Introduction

Paddy fields are often infested with diverse weed species, causing significant yield losses and escalating production costs. Weeds compete with rice plants for nutrients, water, light, and space, leading to reduced crop growth and productivity. The tropical climate of Nigeria and other West African countries exacerbates weed growth, making weed management a critical component of rice production systems. Therefore, timely and accurate identification of paddy weeds is essential for implementing effective control measures, emphasizing their economic importance and providing visual guides to support farmers botanist, agronomist and researchers. Weeds are plants found growing in our compound, backyard, farmyards and in our cultivated crop fields or wild, and these plants are important for both

medicinally or as food, as medicine weeds are used for curing diseases and illness, while as food are use because of their nutritional contents. Paddy rice is commonly cultivated in rain-fed agriculture upland and aquatic ecologies in 40 countries in Africa a nearly 10 million ha with about 25 million tones production, paddy rice is the most consumed staple food, providing about 27% of the calories of the billions of people across several countries in Africa (GRiSP, 2013; Udemezue, 2018; Daramola *et al.* 2022), Weed are species of plant which grow on their own without human efforts and reproduce aggressively. Weed plants are a primary source of supplements, phytonutrients, and secondary metabolites (Zevollas, 2021). Gerasimova and Mitova (2020) reported that, in agriculture weeds are grown in association with crops and snatches major parts of water, light, nutrients, space and carbon dioxide (CO_2) available to the crops. According to Gerasimova and Mitova (2020) weeds are the components of biological diversity in the agricultural systems (agrobiodiversity) and one of the greatest limiting factors to efficient organic crop production. The effect of weeds on rice production can cause tremendous damage to food security. In 2022, weed infestation in Nigeria caused significant rice yield losses with estimates reaching 48-100% in upland rice and 28-89% in direct-seed lowland rice. Of all the factors attributed to low yields of rice, weeds competitions is one of the most deleterious one resulting to about 48-100% yield reduction (Kolo, *et al.,* 2020) globally scale about 37% of all rice yield is considered to lost to weeds (Oerke and , Dehne 2004; Daramola *et al.,* 2020). The beneficial circumstances created by efficient weed management reduced the competition between the crop and weed during the crop's critical growth and yield stage, Perumal *et al.,* (2025).

The use of weed as traditional medicine come along old age, the science of traditional medicine encompasses all knowledge and practices, whether explainable or not, used in diagnosing, preventing, and treating physical, mental, or social imbalances, traditional medicine relies solely on practical experience and observations passed down through generations, either verbally or in writing, Shariat Ullah *et al.* (2025). The use of medicinal plants was acknowledged, as large number of works on complementary and alternative medicine and studies focusing on ethnomedical knowledge (Wegener, 2017). The use of plants (weeds) for primary healthcare continues in both developed and developing countries, in rural areas where healthcare facilities are limited, conventional medicine is expensive and resources are often mismanaged, parents turn to herbal remedies instead of modern medicine to treat children's illnesses (Shariat Ullah *et al.* 2025). Bello *et al*. (2024) investigates the medicinal values of paddy weeds which are used for curing different diseases and illness such us wound, typhoid, ulcer, pile, syphilis, and cancer etc., the weed parts (roots, leaves, stems, flowers, bark or whole plant) are prepared or applied in the body or consumed as food or as a drink. Weeds such us *Ageratum conyzoides* (L) cure gonorrhea; *Indigofera hirsuta* (L) treat epilepsy; *Cynodon dactylon* removes toxins and *Amaranthus spinosus* (L) treats kidney diseases. Herbal medicine, in particular seems to emphasize promoting health and preventing illness, rather than just focusing on curing diseases (Karakaya *et al.* 2019). In developing countries, traditional medicines offer an affordable and alternative source of primary healthcare, driven by the lack of modern health facilities, their effectiveness, and cultural preferences and choices (Aziz *et al*. 2018).

Material And Methods

Description of the study area

Usur village is located approximately six kilometers from Gashua town, Gashua which is the headquarters of Bade Local Government Area. Bade Local Government Area is found in Yobe state in the Northeast, Nigeria between latitude 12^0 52^I $18^{`}$ N and longitude 10^0 58^I $47^{``}$ E with an altitude of 335m above sea level (Bello *et al.* 2023; 2024; 2025). Bade has an area of 772 Km^2 with a population of 139,804 (NPC, 2010: Bello *et al.* 2025).

Vegetation

Vegetation is sparse Sudan Savannah with scattered Acacia trees, also Sahel Savannah consisting of sandy soils and thorn scrub located far North (Wakawa *et al.*, 2017). The plants include short trees about 5 - 10 m such as *Anogeissus leiocarpa, Acacia seyel, Balanites aegyptica, Faidherbia albida* and grasses *Cenchus biflorus, Heteropogon contortus* (Bello *et al.* 2013).

Climate

The climate is characterized with high temperature ranges between 10-20^{0}C in December/January and 34 - 40 ^{0}C in March / May, with an annual rainfall of about 500 to 1000mm, (NEAZDP, 2015; Hassan *et al.,* 2019; Bello *et al.* 2023; 2024). The soil is sandy loamy high in bulk density, low porosity, weak structure and very low in organic matter content. (Alhassan *et al.,* 2018; Bello *et al.* 2024).

Method adopted

An area of 10 hectares of paddy field was sampled using random vegetative survey method. The research follow the method of Ellenberg *et al.* (1974), Ekeke *et al.* (2019) and Bello and Abba (2025) was used for plant collection.

Data collection

An area of 10 hectares was sampled using 1 m x 1 m square quadrant at random. The weed sampled was collected from the month of June-October, 2020. The sample were collected before planting and after planting of rice at their vegetative stage and when the flowers were set and the seed were produced for easily and clearly identification.

Instrument and materials used for data collection

Instruments and materials used for weed collection range from hand pulling, simple hand tools like hoe/hand trowel, Mapping sticks; 100m tape; Plant press/Newspapers; exercise book, A4 papers/pencil and Germin etrex 10 Worldwide Handled (GPS) Navigator Model No. 010-00970-00.

Identification of weed species

Plant observed were photograph, the Morphological characteristics of plant parts involving fruits, flowers, leaves, stem bark and sap also weed floras, checklist, standard keys, manuals, and checklist were utilized for identification, and are organized using angiosperm plant phylogeny (APG) classification system and were arranged alphabetically according to the distribution of the family and recognized through Raunkier (1934), (Akobundu and Agyakwa, 1998; Balogun, 2015; Bello *et al.* 2025).

Data analysis

Data analysis of identified weeds was organized according to the classification systems established in the Angiosperm Phylogeny Group Classification for the orders and families of flowering plants, APG III (2009) and African Plant Data Base (Samba *et al.,* 2020). The life forms were recognized using Raunkiaer (1934) classification system.

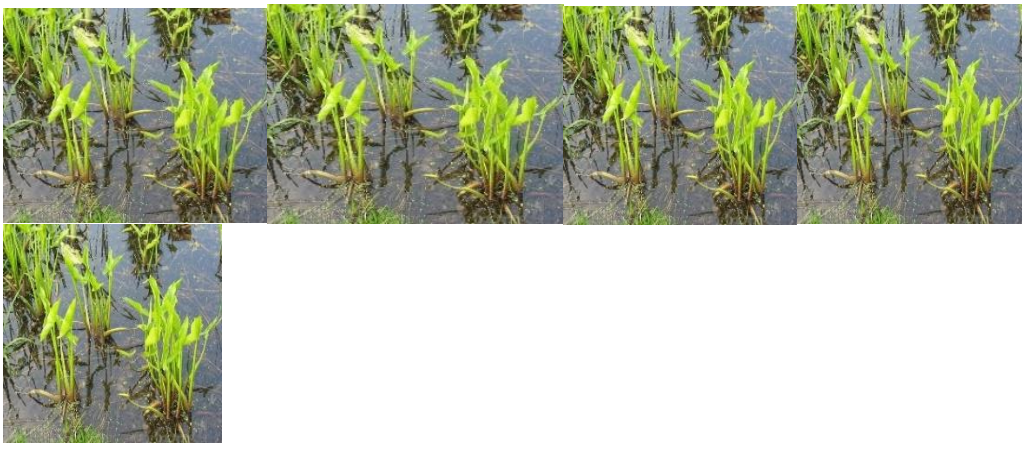
The existing study on the Pictorial Paddy Weeds of Economic Importance has a primary focused on Usur Bade local government area, Yobe State, Nigeria. The main aim of this study is to determine the pictorial paddy weeds of economic importance and the objectives of the study includes: To identify the paddy weed species affecting paddy field.

Results And Discussion

The results obtained from the study shows 72 species belonging to 16 families and 50 genera were identified. (Table 1) family distribution in order of most prevalence was poaceas 20(27.78%), Asteraceae's and Cyperaceae 8(11.11%) each. Malvaceae 7(9.72%), Fabaceae 6(8.33%), Amaranthceae 5(6.94%), Lamiaceae and Rubiacea 3(4.17%) each, Cleomaceae, Commelinaceae, Euphorbiaceae and Solanaceae 2(2.78%) each, and for Araceae, Onagraceae, Portulaceae and Sphenocleaceae 1(1.39%) each. Figure 1 shows the distribution of identified paddy weeds families based on their genus and species, and Table 2 indicates 47 native species and25 exotic species (Bello and Abba, 2025). Plates 1 to 16 show the pictorial identification of the collected paddy weed.

				
Alternanthera ficoidea (L.) (Treat hepatitis Antiviral, cough)	*Alternanthera sessilis* (L.) DC (Cure Asthma, Leprosy, pile)	*Amaranthus graecizans* (L.) (Cure ulcer, snake bite, diarrhea)	*Amaranthus spinosus* (L.) (Treat arthritis, kidney disease)	*Gomphrena celosoide* Mart. (Treat infertility, liver disease)

Plate. 1. 1-5 Distribution of identified weed flora species family Amaranthaceae.



Peltandra virginica (L.) Schott (Treat kidney failure, stabilize sediment and toxic)

Plate 2. 1 Distribution of Identified Weed Flora Species Family Araceae.

			
Ageratum conyzoides Linn. (Cure ulcer, kidney, malaria, gonorrhea)	*Blainvillea gayana* cass (Treat malaria, headache)	*Chrysanthemum indicum* Linn. (Cure hypertension, migraine)	*Eclipta alba* (L.) (Treat leprosy, eye/ear disease)
			
Eclipta prostrata (L.) (Cure elephantiasis, convulsion)	*Lactuca virosa* (Cure infertility, arthritis, skin disease)	*Vernonia ambiguum* Kotschy & Per. (Anticancer, anti-inflammatory, bilharzia)	*Vernonia perrottetti* Sch. Bip. Ex. Walp. (Anticancer, anti-inflammatory, bilharzia)

Plate 3. 1-8 Distribution of Identified Weed Flora Species Family Asteraceae.

	
Cleome gynandra Linn. (Cure fever, pile, scorpion bite, rheumatism, headache)	*Cleome viscosa* Linn. (Cure ulcer, pimples, hypertension, inflammation, liver disease)

Plate 4. 1-2 Distribution of Identified Weed Flora Species Family Cleomaceae.

	
Commelina diffusa Burm.f. (Treat yellow fever, burns, oedema, gonorrhea)	*Commelina benghalensis* (L.) (Treat leprosy, epilepsy, burns, rabies, snake bites, ophthalmic)

Plate 5. 1-2 Distribution of Identified Weed Flora Species Family Commelinaceae.

			
Cyperus esculentus Linn. (Cure diarrhea, dysentery, menstrual)	*Cyperus iria* Linn. (Cure astringent, stimulant)	*Cyperus rotundus* Linn. (Treat diarrhea, dysentery, epilepsy)	*Fimbristylis dichotoma* (L.) Vahl (Cure anti-inflammatory, dysentry)
			
Kyllinga erecta Schumach. (Treat whooping cough, malaria)	(*Kyllinga squamulata* Thonn. Ex. Vahl) Treat whooping cough, fumigant, antimalaria	*Rhychospora corymbosa* (L.) B. (Treat abdominal pains)	*Schoenoplectus senegalensis* (Steud.) (Treat snake bite, stop bleeding, abscesses)

Plate: 6. 1-8 Distribution of Identified Weed Flora Species Family Cyperaceae.

	
Euphorbia hirta Linn. (Cure, asthma, cough, venereal disease, diarrhea, dysentery)	*Phallantus amarus* Schum & Thonn. (Treat skin disease, Worms, fever, antimicrobial, diarrhea)

Plate 7. 1-2 Distribution of Identified Weeds Flora Species Family Euphorbiaceae.

		
Aeschynomene indica Linn. (Use as spermicide, gun powder)	*Chamaecrista mimosoides* (L.) Greene (Cure pain relief, convulsion, dysentery, paralysis, antidotes)	*Crotalaria retusa* Linn. (Treat skin disease, scabies, dysentery, liver disease)
		
Indigofera hirsute (L.) (Treat epilepsy, poison, ophthalmia, analgesic)	*Cassia obtusifolia* (L.) H.S. Irwin & Barneby (Treat ulcer, skin disease, ulcer, leprosy, vomiting)	*Cassia occidentalis* (L.) Link (Treat mental disorder, fever, hypertension, leprosy)

Plate 8. 1-6 Distribution of identified weeds flora species family Fabaceae.

		
Leucas martinicensis Jacq. Ait.f. (Treat snake bite, antidotes, epilepsy)	*Leucas cephalotes* (Roth) Spreng *(*Treat snake bite, diabetes typhoid, filarial)	*Occium gratissimum* Linn. (Treat rheumatic pains, antiseptic, wounds, fever)

Plate 9. 1-3 Distribution of identified weed flora species family Lamiaceae.

		
Corchorus aestuans (L.) (Treat pneumonia, fever, stomachache)	*Corchorus olitorius* (L.) (Treat dysentery, pains & tumors, liver disorder)	*Corchorus tridens* (L.) (Treat therapeutic to stress, antioxidant)
		 
Sida acuta Burm.f. (Treat asthma, cold, ulcer, tuberculosis, liver)	*Sida cordifolia* (L.) (Treat flu, asthma, gonorrhea, diarrhea)	*Sida rhombifolia* (L.) (Treat rheumatism, headache)	*Waltheria indica* (L.) (Treat inflammation, malaria)

Plate 10. 1-7 Distribution of identified weed flora species family Malvaceae.

Ludwigia hyssopifolia (G. Don) Excell. (Treat Jaundice, syphilis, flatulence, dysentery, diarrhea)

Plate 11. 1 Distribution of Identified Weed Flora Species Family Onagraceace.

Brachiaria lata (Sch.) C.E. Hubbard (Famine food, anti-cancer)	*Cenchrus biflorus* Roxb. (Anti-asthmatic, anticancer)	*Chloris pilosa* Schmach (Treat rheumatism, diabetes skin disease)	*Brachiaria falcifera* (Trin.) Stapf (Positive input beef, milk in animals)
			
Cynodon dactylon (Linn) Per. (Treat menstrual bleeds, food poison)	*Dactyloctenium aegyptinum* Linn. (Treat dysentery, remedy lumbago)	*Digitaria horizantalis* Wild. (Cure typhoid, anti-biotic)	*Echinochloa colona* Linn. Link. (Treat spleen problem, antimicrobial)
			
Echinochloa crusgali (L.) P. Beauv.	*Eleusine indica*	*Eragrostis ciliaris* (L.) R. Br.	*Eragrostis tenella* (L) P. Beauv Ex. R. & Schult
Cure cancer, spleen trouble, wounds Anti-dysenteric, menstruation, ringworm Treat wound, stomach pain, whitlows Treat rheumatic pains, antioxidant			
			
Eragrostis tremula Hochst. Ex. Steud. (Recover memory enhancement)	*Heteropogon contortus* (L.) (Cure arthritis, measles)	*Paspalum scrobiculatum* Linn. (Treat pile, menstruation)	*Pennisetum pedicellatum (*Treat mumps, stop bleeding,wounds*)*
			
Pennisetum polystachion (L.) Schult (Treat wounds, cuts, ear/eye, analgesic)	*Polypogon monspeliensis* (L.) Desf. (Treatment of epilepsy.)	*Oryza barthi* A. Chev. (Anticancer)	*Oryza longistaminata* A. Chev & Roehr (Anticancer)

Plate 12. 1-20 Distribution of identified weed flora species family Poaceaes

Portulaca oleracea Linn. Treat syphilis, urinary disorder, jaundice, diabetes, abscesses

Plate 13. 1 Distribution of identified weed flora species family Portulaceae.

Oldenlandia corymbosa Linn (Cure appendicitis, viral infection, fever, depression)

Oldenlandia herbacea Linn. Roxb. (Cure asthma, rheumatic fever, body swelling)

Spermacoce stachydea (DC.) Hutch & Dulz (Treat venereal disease, menstruation, kidney)

Plate 14. 1-3. Distribution of Identified Weed Flora Species Family Rubiaceae.

Physalis angulate Linn (Cure indigestion)

Solanum nigrum (L.) (Cure menstrual disorder, diarrhea, asthma)

Plate 15. 1-2 Distribution of identified weed flora species family Solanaceae

Sphenoclea zeylanica Gaertn (Cure ulcer, sting of venomous animals)

Plate 16. 1 Distribution of identified weed flora species family Solanaceae.

Table1. Identified paddy weed Species of economic importance

S	Family	Genus	Species	Common Names	Life Cycle Native/Exotic	Medicinal Uses
1	Amaranthaceae (Broad-Leaves)	*Alternanthera*	*Alternanthera ficoidea* (L.)	Joseph coat	Perennial (P) herb, evergreen (Exotic)	Treat hepatitis Antiviral, cough
2		*Alternanthera*	*Alternanthera sessilis* (Linn.) DC	Sessile joy	Perennial (P) herb, creeping (Exotic)	Cure Asthma, Leprosy, cough, lung infection, pile
3		*Amaranthus*	*Amaranthus graecizans* (L.)	Spreading pig weed	Glabrous annual (A) herb (Native)	Cure ulcer, snake bite, diarrhea,
4		*Amaranthus*	*Amaranthus spinosus* (Linn.)	Spiny pig weed	A robust erect herb annual (A) (Exotic)	Treat arthritis, antidiabetic, antimalarial, kidney trouble (Abiodium, *et al* 2019)
5		*Gomphrena*	*Gomphrena celosoides* Mart.	Prostrate globe Amaranth	Decumbent Perennial (P) (Exotic)	Treat infertility, liver disease, antifungal/bacterial
6	Araceae (Broad-Leaves)	*Peltandra*	*Peltandra virginica* (L.) Schott	Arrow-arum	Emergent perennial (P) (Exotic)	Stabilize sediment and toxic, prevent kidney failure
7	Asteraceae (Broad-Leaves)	*Ageratum*	*Ageratum conyzoides* Linn	Chick weed	Erect annual (A) herb (Exotic)	Antiulcer, kidney disease stomach pain, rheumatism, wound, malaria, gonorrhea
8		*Blainvillea*	*Blainvillea gayana cass*	Blainvillea	Annual (A) herb (Exotic)	Cure hypertension, malaria
9		*Chrysanthemum*	*Chrysanthemum indicum* Linn.	African wild daisy	Erect perennial (P) herb (Exotic)	Cure-hypertension/migraine, and also serve aa blood tonic
10		*Eclipta*	*Eclipta alba* (L.)	False daisy	Erect, herb prostrate annual (A) (Exotic)	Cure liver disease, dental, hair problem, leprosy, worm
11		*Eclipta*	*Eclipta prostata* L.	False daisy	Erect herb prostrates annual (A) (Exotic)	Elephantiasis, inflammatory, convulsion and catarrh, (Shreelakshmi *et al.* 2024)
12		*Lactuca*	*Lactuca virosa* L.	Wild lettuce	Annual (A) herb (Exotic)	Cure infertility, arthritis, skin disease sedative
13		*Vernonia*	*Vernonia ambigua* Kotschy&peyr	Iron weed	Erect Annual (A) herb (Native)	Anti-inflammatory, treat infertility, anticancer, bilharzia, insect repellent
14		*Vernonia*	*Vernonia perrottettii* Sch. Bip. Ex. Walp	Iron weed	Erect (A) annual herb (Native)	Anti-inflammatory, insect repellent, anticancer, treat bilharzia
15	Cleomaceae (Broad-leaves)	*Cleome*	*Cleome gynandra* Linn.	African cabbage	Erect branched annual (A) (Native)	Cures fever, rheumatism, pile, scorpion bite, headache
16		*Cleome*	*Cleome viscosa* Linn.	Spider flower	Erect herb annual (A) sticky (Native)	Cure wound, ulcer, ear/liver disease, inflammation
17	Commelinac	*Commelina*	*Commelina*	Wondering	Creeping stem herb	Treat rabies, leprosy,

	eae (Broad-Leaves)		*benghalensis* (L.)	jew	annual (A) (Native)	epilepsy, snake bites, burns, cold, eye problem
18		*Commelina*	*Commelina diffusa* Burm. F	Spreading day flower	Prostrate herb, (P) climbing (Native)	Leprosy, cure yellow fever, gonorrhea, oedema, cold
19	Cyperaceae (Sedges)	*Cyperus*.	*Cyperus esculentus* Linn.	Yellow nut-sedge	Perennial (P) herbs (Native)	Treat diarrhea, dysentery, menstrual discharge
20		*Cyperus*	*Cyperus iria* Linn.	Rice field flatsedge	Smooth tufted (A) Annual (Native)	Astringent, stimulant and stomachic
21		*Cyperus*	*Cyperus rotundus* Linn.	Nut grass	Smooth erect (P) perennial (Native)	Treat dysentery, epilepsy, fever, diabetes diarrhea, inflammation
22		*Fimbristylis*	*Fimbristylis dichotoma* (L.) Vahl	Forked fimbry	Erect tufted, (P) perennial (Native)	Anti-inflammatory, fever, antidiarrhea and dysentery
23		*Kyllinga*	*Kyllinga erecta* Schumach.	Spike sedge	Erect, robust (P) Perennial (Native)	Treat whooping cough, placenta
24		*Kyllinga*	*Kyllinga Squamulata* Thonn. ex Vahl	Kyllinga nemoralis	Weak tufted (A) Annual (Native)	Treat whooping cough, antimalaria, root as fumigant
25		*Rhychospor a*	*Rhychospora corymbosa* (L.) Britton.	Golden beak sedge	Robust (P) perennial (Native)	Treatment of abdominal pain
26		*Schoenoplec tus*	*Schoenoplectus senegalensis* (Steud.)	Bull rush	Small tufted (A) (Native)	Treat snake bite, stop bleeding, trat abscesses
27	Euphorbiace ae (Broad-Leaves)	*Euphorbia*	*Euphorbia hirta* Linn.	Asthma plant	A hairy herb (A) annual (Exotic)	Asthma, eye conjunctivitis, wound, cough, dysentery, venereal disease
28		*Phallantus*	*Phallantus amarus* Schum. &Thonn.	Gale of the wind	A Small annual (A) herbs (Exotic)	Treat skin disease, Worms. Antimicrobial, diarrhea, fever
29	Fabaceae: Papilionoide ae (Broad-Leaves)	*Aeschynome ne*	*Aeschynomene indica* Linn.	Budda pea	Sub-shrub erects (A) herb (Native)	Use as spermicide, charcoal is use as gun powder
30	Fabaceae: Caesalpinio deae	*Chamaecrist a*	*Chamaecrista* mimosoides (L.) Greene	Japaneese tea	Erect herb or low shrub (A) (Native)	Cure dysentery, paralysis, convulsion, pain killer
31	Fabaceae: Papilionoide ae	*Crotalaria*	*Crotalaria retusa* Linn.	Devil bean or Rattle weed	Erect, herb angular annual (A) (Exotic)	Treat skin disease, scabies, dysentery, fever, flatulence
32	Fabaceae: Papilionoide ae	*Indigofera*	*Indigofera hirsuta* (L.)	Hairy indigo	Erect herb spreading annual (A) (Native)	Analgesic, liver/ kidney disorder, epilepsy, poison eye disease, cough
33	Fabaceae: Caesalpinio deae	*Senna*	*Senna obtusifolia* (L.) H.S. Irwin & Barneby	Sickle pod	Erect herb branched (A) (Exotic)	Treat skin disease, ulcer, leprosy, vomiting, snake bite
34	Fabaceae Caesalpinio deae	*Senna*	*Senna occidentalis* (L.) Link	Coffee weed	Perennial (P), Erect Shrub with pinnate leaves (Exotic)	Treat mental disorder, leprosy, rheumatism, worm hypertension
35	Lamiaceae (Broad-Leaves)	*Leucas*	*Leucas martinicensis* (Jacq.) Ait. f.	Wild tea	Erect, herb annual (A) (Native)	Snake bite antidote, treat epilepsy
36		*Leucas*	*Leucas cephalotes* (Roth) Spreng.	Guma	Stem erect herb annual (A) (Exotic)	Treat diabetes, fever, typhoid and filarial

						diseases
37		*Ocimum*	*Ocimum gratissimum* Linn.	African basil	Erect round (P) Perennial (Native)	conjunctivitis, rheumatism, wound, fever, antiseptic
38	Malvaceae (Broad-leaves)	*Corchorus*	*Corchoru aestuans* (L.)	Mallow jute	Erect, herb prostrate annual (A) (Native)	pneumonia, stomachache, toothache, fever, bladder vegetable soup
39		*Corchorus*	*Corchorus olitorius* (L.)	Jews mallow	An erect annual (A) herb (Native)	liver disorder, dysentery, tumors, aches, bladder, complaint, fever, toothache
40		*Corchorus*	*Corchorus tridens* (L.)	Jute mallow	Erect herb branched annual (A) (Native)	Antioxidants, therapeutic to stress, vegetable soup, bladder problem, toothache
41		*Sida*	*Sida cordifolia* (L.)	Flannel weed	Erect sub- shrub (P) perennial (Native)	Treat asthma, diarrhea, tuberculosis, gonorrhea, cough, worms, flu, headache
42		*Sida*	*Sidarhombifolia* (L.)	Arrow leaf sida	Erect, (P) ever-green perennial (Native)	Leaves relieve headache, root treat rheumatism
43		*Sida*	*Sida acuta* Burm.f.	Wire weed	Aerial, erect (P) perennial (Native)	Treat asthma, tuberculosis, cold, flu, kidney/liver infection disease
44		*Waltheria*	*Waltheria indica* Linn.	Sleepy Morning	Several erect (P) perennials (Exotic)	Treat inflammation, fever
45	Onagraceae (Broad-Leaves)	*Ludwigia*	*Ludwigia hyssopifolia* (G. Don) Excell	Seed box	Erect, glabrous herb (A) (Exotic)	Treat jaundice, dysentery, diarrhea, syphilis, flatulence
46	Poaceae (Grass)	*Brachiaria*	*Brachiaria falcifera* (Trin.). Stapf	Signal grass	Tufted herb perennial (P) (Exotic)	Add positive input in beef and milk, anticancer
47		*Brachiaria*	*Brachiaria lata* (Schumach) C.E. Hubbard	Signal grass	Loosely grass (A) annual (Native)	Seed as famine food, anticancer
48		*Cenchrus*	*Cenchrus biflorus* Roxb.	Hedgehog grass	grass (A) annual (Native)	Anti-asthmatic, antioxidant, anticancer
49		*Chloris*	*Chloris pilosa* Schumach.	Finger grass	Tapering & erect annual (A) (Native)	Treat skin disorder, cure diabetes, rheumatism, antibacterial
50		*Cynodon*	*Cynodon dactylon (*Linn.) pers.	Bahamas grass	Glabrous grass (P) perennial (Native)	Menstrual/Nose bleeding, indigestion, skin disease, fainting, toxin, poison
51		*Dactyloctenium*	*Dactyloctenium aegyptium* (L.) P. Beauv.	Crow foot grass	Tufted creeping grass (A) (Native)	Remedy lumbago, dysentery
52		*Digitaria*	*Digitaria horizantalis* Wild	Crab grass	Prostrate, tuft annual (A) (Native)	Anti-diabetic, antibiotic, anti-thyroid, antioxidant
53		*Echinochloa*	*Echinochloa colona* Linn. Link	Jungle rice	Tufted, erect annual (A) (Native)	Spleen problem, wound, antioxidant, antimicrobial
54		*Echinochloa*	*Echinochloa crusgali* (L.) P. Beauv	Barnyard grass	Robust, tufted annual (A) (Exotic)	Treat cancer, spleen troubles, and wounds
55		*Eleusine*	*Eleusine indica* (L.) Gaertn.	Goose grass	Tufted annual (A) (Native)	Anti-dysenteric, cough, diarrhea, treat menstruation disorder, blood complaint
56		*Eragrostis*	*Eragrostis ciliaris*	Love grass	Tufted (A) loosely	Treat whitlows, stomach

			(L) R.Br.		(Native)	pain and wounds
57		*Eragrostis*	*Eragrostis tenella* (Linn.) P. Beauv.	Japaneese love grass	Delicate tufted annual (A) (Native)	treat rheumatic pain, antioxidant
58		*Eragrostis*	*Eragrostis tremula* Hochst. ex Steud.	Annual love grass	A loosely tufted (A) annual (Native)	Treat rheumatic pain, recover memory lost
59		*Heteropogon*	*Heteropogon contortus* (L.)	Spear grass	Tufted, (P) perennial (Native)	Cure measles, arthritis
60		*Paspalum*	*Paspalum scrobiculatum* (Linn.)	Kodo millet	tufted (P) Perennial (Native)	Cure pile, menstrual (Idu *et al* 2007)
61		*Pennisetum*	*Pennisetum pedicellatum* Trin.	Desho grass, kyasuwa	Erect jointed (A) Annual (Native)	Treat mumps, wound and stop bleeding
62		*Pennisetum*	*Pennisetum polystachion* (L.) Schult	Foxtail, Feathery pennisetum	Tufted grass (A) annual (Exotic)	Heal cuts/wounds cure conjunctivitis, earache analgesic (Balogun, 2015)
63		*Polypogon*	*Polypogon monspeliensis* (L.) Desf.	Annual beard grass	Erect annual (A) (Exotic)	Treat epilepsy (Ken Fern, 2021)
64		*Oryza*	*Oryza barthii* A. Chev	African wild rice	Erect to semi-erect annual (A) (Native)	Anticancer
65		*Oryza*	*Oryza longistaminata* A. chev&Roehr	Wild rice	Robust, erect (P) perennial (Native)	Anticancer
66	Portulaceae (Broad-Leaves)	*Portulaca*	*Portulaca oleracea* Linn.	Duck weed	Erect, prostrate stem (P) (Native)	Treat syphilis, diabetes, urinary disorder, snake bite (Sahrawat, *et al.* 2020)
67	Rubiaceae (Broad-Leaves)	*Oldenlandia*	*Oldenlandia corymbosa* Linn.	Diamond flower	Glabrous, erect herb annual (A) (Native)	Treat viral infection, appendicitis, depression
68		*Oldenlandia*	*Oldenlandia herbacea* Linn. Roxb.	Diamond flower	Much- branched erect (A) (Native)	Ulcer, asthma, rheumatic fever, body swelling
69		*Spermacoce*	*Spermocoe stachydea* (DC.) Hutch. &Dalz	False button weed	Erect, robust (A) Annual (Native)	venereal/kidney diseases, conjunctivitis, menstrual disorder, diuretics
70	Solanaceae (Broad-Leaves)	*Physalis*	*Physalis angulate* Linn.	Goose berry	Erect herb branch annual (A) (Exotic)	Analgesic, improve female fertility, asthma, vomiting, menstrual disorder
71		*Solanum*	*Solanum nigrum* (L.)	Black night shade	Soft wooded herb (A) (Exotic)	Treat pile, indigestion, ulcer, ring worm, skin infection (Shreelakshmi *et al.* 2024)
72	Sphenocleaceae (Broad-Leaves)	*Sphenoclea*	*Sphenoclea zeylanica* Gaertn.	Goose weed	Erect herb hairless (A) (Native)	Treat ulcer, antimicrobial and stings of animal

Key: T-Therophyte, Geo-Geophyte, S-Sedges, G-Grass, B-Broad leaf, A- Annual, Bi- Biennial, P-Perennial, L.F- Lifeform, N-Native, E-Exotic, Spp-Species, Veg.-Vegetation.

Table 2. The identified paddy weeds based on native/exotic species and their origins.

	Species			Species	
	omene indica Linn.	nd Asia (The plant List, 2(		*m conyzoides* Linn	, Central America, (Kew, 2025)
	thus graecizans (L.)	Asia (Kew, 2020)		*nthera ficoidea* (L.)	rica (Kew, 2020)
	lea gayana cass	erde, Tropical Africa (Kew		*nthera sessilis* (Linn.) DC	I. & S. Australia, America (Gha
	ria falcifera (Trin.). Stap	pical Africa		*thus spinosus (*Linn.)	a (USDA, NRCS, 2020)
	ria lata Schumach d	USDA NRCS, 2020)		*obtusifolia* (L.) Irwin & Barneb	merica (The Plant List, 2013)
	us biflorus Roxb.	nd Asia (GBIF, 2020)		*ccidentalis* (L.) Link	l America (USDA, NRCS, 2020)
	ecrista mimosoides (L.) (	Tropical Asia (Kew, 2025)		*nthemum indicum* Linn.	ia, Japan, Korea (Kew, 2025)
	pilosa Schumach &Thor	Kew, 2020)		*ria retusa* Linn.	d America, N. Australia
	gynandra Linn.	nd Asia (USDA, NRCS, 2		*chloa crusgali* (L.) Beauv	America (The plant List, (2013)
	viscose Linn.	l Africa and Asia, (GBIF, 2		*alba* (L.)	merica (The Plant List, (2013)
	lina benghalensis (L.)	nd Asia (Plant List, 2013)		*prostrate* (L.) L.	a (Compositae, *et al.,* 2005)
	lina diffusa Burm. F	nd Asia, (Kew, 2020)		*bia hirta* Linn.	America (kew, 2020)
	rus aestuans (L.)	l Africa		*rena celosoides* Mart.	merica (Kew, 2020)
	rus olitorius (L.)	nd Asia		*pogon contortus* (L.)	l and sub-tropical of S. Central *et al;* 2015)
	rus tridens (L.)			*virosa* L.	Neutralized in N. America
	n dactylon (Linn.). pers	Asia and Europe USDA,		*ia hyssopifolia* (G. Don) Excell	l America (USDA, NRCS, 2020)
	s esculentus Linn.	nd Asia and Europe (GBIF		*ra virginica* (L.) Schott	merica, E. Canada (GBIF, 2020
	s iria Linn.	nd Asia (The Plant List, 2(		*tus amarus* Schum. &Thonn.	l America and S. Mexico (Bach 4)
	s rotundus Linn.	Asia and Europe (Kew, 202		*s angulata* Linn.	l and subtropical America
	ctenium aegyptinum L	l Africa and Asia		*gon monspeliensis* (L.) Desf.	l and subtropical America (Kew,
	a horizantalis Wild	l Africa		*uta* Burm.f.	(Kew, 2020)
	chloa colona Linn. Link	nd Asia (USDA, NRCS, 2		*rdifolia* (L.)	and subtropics Central America
	e indica (L.) Gaertn.	nd Asia (GBIF, 2020)		*ombifolia* (L.)	and subtropics Asia to A rts, 2021)
	tis ciliaris (L) R.Br.	l Africa, Asia and America		*n nigrum* (L.)	and subtropics of N. A merica
	tis tenella Linn. Schult	l Asia		*ia indica* Linn.	America and Asia Royal B s, Kew, 2020; USDA, NRCS)
	tis tremula Hochst. ex S	l Africa			
	tylis dichotoma (L.) Vah	l and sub-tropical of Afric a			
	era hirsuta (L.)	l Africa and Asia			
	a erecta Schumach.	l Africa			
	a Squamata Thonn. ex V	l Africa and Asia			
	cephalotes (Roth) Spreng	o tropical Africa and Asia			
	martinicensis (Tacq.) Ai	l Africa and America			
	gratissimum Linn.	l Africa and Asia			
	ndia corymbosa Linn.	and Asia (Royal B s, Kew, 2020)			
	ndia herbacea Linn. Ro	l Africa and Asia			
	arthii A. Chev	frica (USDA, NRCS, 2020			
	ongistaminata A. Chev &	l Africa			
	m scrobiculatum (Linn.)	l Africa and Asia			
	tum pedicellatum Trin.	l Africa			
	tum polystachion (L.) Sc	l Africa and Asia			
	ca oleracea Linn.	Asia, Europe,			

	spora corymbosa (L.) Br	and America (USDA,			
	pplectus senegalensis (St	frica			
	coe stachydea (DC.)	l Africa			
	clea zeylanica Gaertn.	l Africa and Asia			
	a ambigua Kotschy&pe	l Africa			
	a perrottetti Sch. Bip. E	l Africa			

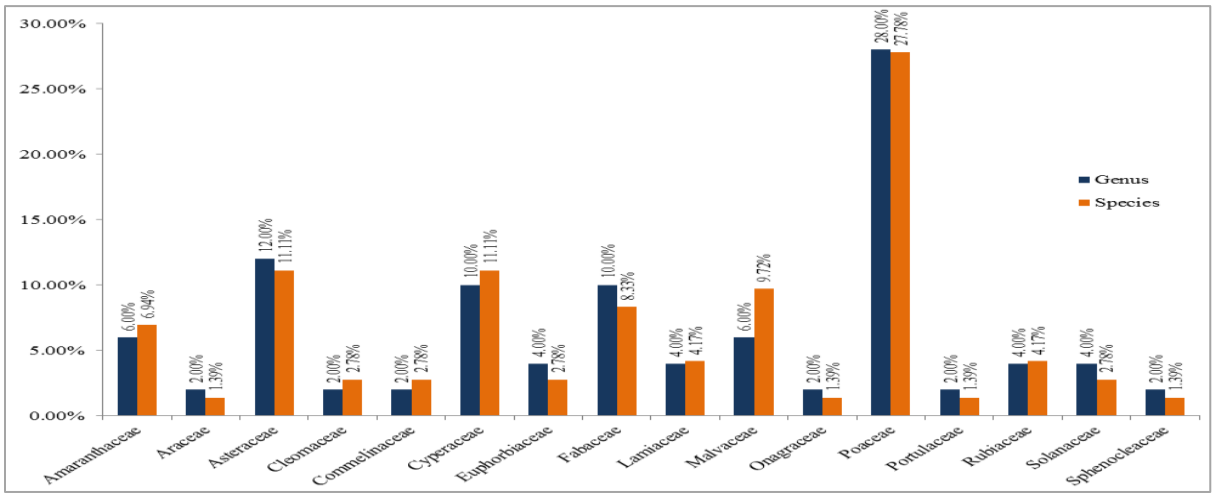


Figure 1. Distribution of identified paddy weeds families based on their genus and species.

Ethnobotanical uses of weed for treatment of disease and illness

Ethnobotany plays an important role in modern life where people of different ethnic groups from various part of the world utilize their plants as native heritage of life for various purpose including medicine, food, and other economic application for life sustenance. Weeds play a significant role in ethnobotanical medicine, the medicinal weeds demonstrate broad-spectrum in biological activities, which includes their diverse phytochemical constituents variety of phytochemicals including phenolics, flavonoids, alkaloids, saponins, and tannins, which contribute to their biological activities and therapeutic potentials, (Rabizadeh, 2022; Sreelakshmi *et al.* 2024); In a community weeds serves as immediate herbal medicine due to low cost, high expensive of modern medicine, poverty and worst the haphazard side effect of modern medicine on health (Bello *et al.* 2024). According to (Padhan and Panda 2015) on their researched carried out on ethnobotanical exploration to find out the medicinal values of common weeds in localities of Koraput, India; find out 33 plant species were identified as being used for the treatment of approximately 36 ailments or therapeutic indications including headache, toothache and eye inflammation. Shariat *et al.* (2025) also shows weeds are medicinally important plants which are utilized for the curing of children disorders include abdominal pain, diarrhea, constipation, wounds and chest pain. Ethnobotanical use of weed as medicine has been accepted worldwide and the practice is continuing thriving.

Homeopathy and natural medicine

In the scientific literature, homeopathy is a practice within the field of complementary and alternative medicine (CAM) involving the use of remedies derived from highly diluted vegetable, animal or mineral ingredients, aimed at managing a myriad of disorders (NCCIH, 2016). Homeopathy is among the most ten and most frequently practiced forms of alternative medicine in Europe and the USA, Maftei, *et al.* (2025). Homeopathic agents are products prepared in accordance with standardized processes, as elaborated in various national homeopathic pharmacopoeias (Jütte and Riley, 2005). The use of homeopathy in treating disease and illness has been published by various authors and has been recorded, diseases such as asthma, otitis, cancer, depression, allergies, migraine, allergic rhinitis, insomnia, sinusitis, psoriasis etc. (Maftei *et al.* 2025; Bello *et al.* 2024). Bello *et al.* (2024) ascertained the used of weeds as herbal medicine in treatment of diseases and other ailment as the extract from herbs were used in many forms such as tea, pills, soup, food and powder to treat chronic and acute diseases including cardiovascular disease, prostrate, typhoid etc. The effectiveness and efficiency for the use of homeopathy in clinical practice in health has shown a positive impact for the wellbeing across a globe for the treatment of different disease in adult and pediatric.

Complementary and alternative medicine

Complementary and alternative medicine (CAM) are viewed as a group of medical and health care systems practices and use of

various products not presently considered part of conventional medicine'; it encompasses the use of pharmacologically active agents (homeopathy, vitamins, minerals, herbs / phytotherapy) special diets, physical techniques (acupuncture/ acupressure, yoga, osteopathy, special exercises, massage, chiropractic) and psychological methods (mindfulness, relaxation, hypnosis) (CAM, 2023; Saghatchian *et al*. 2023). Complementary and alternative medicine are categorized into:

1. Mind body therapies e.g., Meditation: - Trains the mind to be quit, calm, and focused.
2. Nutritional therapies e.g., Vitamins and minerals such as vitamin C or calcium as a pills.
3. Body based therapies e.g., Reflexology puts pressure on certain areas of the feet and hands and Acupuncture is the use of tiny needles to stimulate on the body.
4. Whole medicine system e.g., Ayurvedic medicine uses mainly plant and changes to diet, exercise and lifestyle and Homeopathic medicine uses diluted forms of herbs and minerals.

Ethnomedical and ethnopharmaceutical uses of weeds

Weeds often considered as unwanted plants competing with crops for resources have emerged as significant sources of medicinal compounds offering a rich tapestry of ethnomedicinal and phytochemical potential. The diversity of medicinal properties found in weeds is further illustrated by the extensive research on species like *Achyranthes aspera* and *Leucas aspera*, which have been shown to possess anticancer and anti-inflammatory (Chew *et al.* 2012). Similarly, *Alternanthera sessilis* has shown its efficacy in treating conditions like dyspepsia and skin diseases, reinforcing the notion that weeds can be valuable therapeutic agents (Ragavan *et al.* 2023). Sreelakshmi and Jeeshna (2024) found out the ethnomedicinal uses and biological activity of weeds through different method of extraction as *Ageratum conyzoides* use as antiseptic, wound healing and antimicrobial and antioxidant; *Amaranthus spinosus* use as antidiabetic, inflammatory, and antioxidant, antimicrobial. A comparative study on five wild weeds from West Bengal, India, including *Euphorbia hirta* and *Tridax procumbens* revealed significant antioxidant and antibacterial properties, the aqueous extracts were rich in polyphenols and flavonoids, while ethanolic extracts contained higher levels of alkaloids and cardiac glycosides. *Euphorbia hirta* in particular, showed promising antioxidant activity with minimal cytotoxicity (Singh *et al* 2012; Gosh *et al.* 2020).

Benefits of weeds on agriculture ecology

Weeds form the basis of the agro-ecosystem food web, it provides various ecosystem services such as provisioning of food, medicine, prevention of soil erosion and livestock feed, weeds also help in nutrient cycling through decay of vegetative parts, it also serves as host and nectar for beneficial insect and beautification of landscape e.g., *Cynadon dactylon* (Panda *et al*. 2020). In Africa and some part of the world, some wild edible plants are important sources of vitamins and minerals which serve as supplement for our day-to-day dietary dishes. Despite the negative impacts of weeds both in agricultural and non-agricultural areas, some weeds have some beneficial impacts to man and his environments. Some beneficial weeds repel insects and other pests through their smell (Finch and Collier, 2003). Weeds are also beneficial for soil health and serve as untapped reservoirs of medicinal properties due to their phytochemical content (Gohain *et al.,* 2022).

Impacts of weeds on agriculture

Weeds are problematic both in agricultural and non-agricultural areas so that they potentially cause economic losses in agricultural production (Ekwealor *et al.* 2019). Weeds, through competition with other plants, would almost always have deleterious effects on them. Weed invasion is the most threatening impact on agriculture, and causes a nuisance to human environments, disrupts the natural diversity and balance of ecological communities. The losses caused by weeds exceed the losses from any other category of agricultural pests, such as insects, nematodes and rodents. Among the total annual losses of agricultural product from various pest, weeds account for 45%, insects for 30%, diseases 20% and other's pest 5% (Sahrawat, *et al.* 2020). Weeds compete with other plants for limited resources mainly (nutrients, water and light) and competition can be successful through the use of certain strategies, chief among these strategies is allelopathy, where secondary compounds inhibit germination and growth of other plants, and, as a chemical defense against herbivory. Weeds reduce in the amount of pasture available for grazing, reducing stocking rates and therefore annual income; it may also reduce the quality of production through deterioration in the health of animals from poisonings and injury and contamination of the products e.g., in wool and tainting of milk and also can affect animals' meat because of chemical compounds in the weed.

Pictorial identification of paddy weed

The pictorial identification of paddy weed can be tricky, as weed comes in a different variety of shapes, size, and types. The invasion of weed is the most threatening impact on agriculture which causes losses in rice yield and causes a nuisance to human environments which disrupts the natural diversity and balance of ecological communities. The identification of weed through pictorial view will gave an insight of the knowledge of weed management and how to be used correctly either herbal, ethnomedical and ethno-pharmaceutical, ethnobotanical and homeopathy as alternative medicine or modern medicine or in agricultural field in weed control. Pictorial information can help to utilize weed identification and guide the image recognition which include detailed photograph and description of various weed species that allow the comparison and accurate identification. Weed as the most deleterious is resulting to about 48-100% rice yield reduction (Kolo, *et al.,* 2020); globally scale about 37% of all rice yield losses is due to weed (Oerke and Dehne, 2004; Daramola *et al.,* 2020). The use of weed as medicine is acknowledged as study conducted by Sahrawat *et al.* (2020), the potential benefits of weeds in their findings revealed

Ageratum conyzoide treat stomach pain; *Commelina* spp treat leprosy, *Euphorbia hirta* treat wound and eye conjunctivitis, *Physalis angulata* improve infertility in female, *Portulaca oleucera* is remedy to snake bite while *Solanum nigrum* and *Vernonia* spp treat skin infection and infertility respectively. The work of Shreelakshmi *et al.* 2024 in their research findings in the Medicinal potential of weeds a systematic review shows *Amaranthus spinosus, Eclipta prostata* and *Solanum nigrum* treat antidiabetic, inflammatory and ulcer respectively. In recent times it has also been said that homeopathy has had considerable achievements worldwide, aiding millions of patients with evidence from clinical and laboratory studies, (Dean, 2005; Schmidt, 2014). The knowledge of weed in science is of significant important, in this regard paddy weeds can now be regarded as one of the most precious stone because of its significant in the modern medicine; by integrating weeds into the broader landscape of medicinal plant research, we can uncover new therapeutic agents and promote sustainable healthcare solutions.

Conclusion

In conclusion, weed management is a critical component of paddy production, and accurate identification of weeds is essential for effective control. The medicinal potential of weeds is vast and contain a wide range of therapeutic applications supported by both traditional knowledge and modern scientific research. Therefore, there is a need to make pictorial pictures of weeds for new scholars, botanist, agronomist, pharmacopeias, pharmaceuticals industries and younger generation to make effective usage in integrated weed management, improve crop productivity, food security, and enhance medicinal uses due to their diverse therapeutic applications and the importance of preserving these species for future medicinal uses and to prevent extinction of the species.

Recommendation

Base on the findings in this study, the following recommendation are put forward:

1. The study recommends further research to be conducted on the use of weed as biofuel.
2. The study also recommends further study on the effect of weeds on growth and yield.

CONFLICT OF INTEREST

Authors have declared that no competing interests exist.

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