An ethnobotanical note on wild edible plants of Upper Eastern Himalaya, India

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Abstract. The present article deals with the documentation of tribal knowledge on wild edible plants in Upper Eastern Himalayan Region of India. In total, 269 plant species belonging to 77 families were recorded in the study area of Upper Subansiri District of Arunachal Pradesh. Dioscoreaceae, Rutaceae, Cucurbitaceae and Arecaceae were the dominant families with 16, 13, 12 and 11 plant species, respectively, while Moraceae and Asteraceae followed with 10 species each. Four major life forms were trees, shrubs, herbs and climbers. Trees made the highest proportion of the edible species (81) followed by shrubs (74), herbs (71) and climbers (37). Availability of some of these species might be a serious constraint in near future due to various anthropogenic factors. Need for undertaking vigorous environmental awareness campaign among local tribes has been stressed upon in the article for conserving this valuable biological resource of Eastern Himalayan region of India.

Keywords: Wild edible plants; Hill Miri Tribe; Nyishi Tribe; Tagin Tribe; Galo Tribe; Arunachal Pradesh.

Introduction

Arunachal Pradesh is one of the biodiversity rich states of India in terms of flora and fauna. The state is the largest one among all north eastern states of India situated in the lap of eastern Himalayan region of the country. Varied climatic, topographical and soil conditions favour high species richness and support different types of forests. Broad forest types include tropical moist deciduous, tropical semi evergreen, tropical evergreen, subtropical, temperate and alpine forests. Recorded number of flowering plant species (>5,000) are the highest among all North Eastern states (Hegde, 2000). The state is inhabited by 28 major tribes and 110 sub tribes (Khongsai et al., 2011) who depend immensely on forest flora and fauna for their day to day needs and requirements. It is estimated that, in India about 800 species are consumed as food plants whereas the corresponding figure for north east (NE)
India is around 300. Almost all the edible plants of NE region are represented in Arunachal Pradesh (Arora, 1981; Haridasan et al., 1990).

Many research studies have been conducted on the diversity and traditional uses of wild plants from Arunachal Pradesh state, particularly on medicinal plants (Pal, 1984, 1992; Rawat et al., 1996, 1998; Tag and Das, 2004; Shankar et al., 2008, 2011, 2016; Goswami et al., 2009; Khongsai et al., 2011). Although much has been reported on ethnomedicinal aspects of plants of the region, little has been reported about the wild edible plants of the state. Keeping this aspect in view, a study was conducted as an attempt to explore and identify the wild edible plant resources and indigenous traditional knowledge about their utilization in the Upper Subansiri district of Arunachal Pradesh during 2010-2012 by the State Forest Research Institute, Itanagar, Arunachal Pradesh. The Upper Subansiri District of Arunachal Pradesh lies in the central part of the state in between 28.5° and 28.25° latitudes N and 93.15° and 94.20° longitudes E covering a geographical area on 7,032 km² (Figure 1). The high mountain region near northern boundary of the district is generally cold as remain covered with snow almost throughout the year. The plain areas in foothills are intersected by number of water bodies mainly streams and rivers in the lap of forests (Goswami et al., 2009). The district is inhabited by three major tribes namely Tagin, Hill Miri (now Nyishi) and Galo.

Figure 1. Location map of Upper Subansiri district, Arunachal Pradesh, India. Source: Government of Arunachal Pradesh, India. Available from: <http://www.arunachalpradesh.gov.in>.
Methodology

The ethnobotanical information was collected by field works/survey among aboriginal community, by study with herbaria and museum, by study of rituals, myths and folklores and through folk market survey. Tribal markets or weekly *haats* (local market) were also visited to study the plants sold there. Maps prepared by the Directorate of Economics and Statistics, Government of Arunachal Pradesh were also consulted for identification of approaching routes and location of the select villages. The villages inhabited by the tribesmen were selected randomly for each tribe for the purpose of survey (Table 1).

Table 1. Villages covered during study in Upper Subansiri District.

| S. No. | Name of the Tribe | Name of the village | Name of the circle |
|--------|------------------|---------------------|-------------------|
| 1      | Nyshi            | i) Godak            | Raga              |
|        |                  | ii) Muri Mugli     | Puchi-Geko        |
|        |                  | iii) Babla         | Puchi-Geko        |
|        |                  | iv) Don            | Daporijo          |
|        |                  | v) Dakpe           | Daporijo          |
|        |                  | vi) Ligu           | Daporijo          |
|        |                  | vii) Niji          | Daporijo          |
|        |                  | viii) Mite         | Daporijo          |
|        |                  | ix) Jigi           | Daporijo          |
| 2      | Tagin            | i) Sippi           | Giba              |
|        |                  | ii) Manga          | Giba              |
|        |                  | iii) Taliha        | Taliha            |
|        |                  | iv) Siyum          | Siyum             |
|        |                  | v) Nacho           | Nacho             |
|        |                  | vi) Limiking       | Limiking          |
|        |                  | vii) Orak          | Limiking          |
|        |                  | viii) Reddi        | Limiking          |
|        |                  | ix) Taksing        | Taksing           |
| 3      | Galo             | i) Dumporijo       | Dumporijo         |
|        |                  | ii) Pakka          | Dumporijo         |
|        |                  | iii) Haji          | Baririjo          |
|        |                  | iv) Maro           | Baririjo          |
|        |                  | v) Dula            | Baririjo          |
|        |                  | vi) Tapi           | Baririjo          |
|        |                  | vii) Tashi Doni    | Baririjo          |

Results and discussion

The present investigation comprising of 269 species of plants belonging to 77 families and details like botanical name, local name, family, parts used have been enumerated in Table 2. These species are used by the tribes as wild fruits, vegetables, beverages or in other preparations.
Table 2. Wild edible plants used by tribes of Upper Subansiri District.

| S. No. | Botanical name (var.) | Local name | Family | Habit | Uses |
|--------|-----------------------|------------|--------|-------|------|
| 1      | *Griffithia fusca* Maingrey ex King. | Tok Schein | Annonaceae | Tree | Fruits are edible |
| 2      | *Cissampelos pareira* L. Var.*Linsuita* (Buch.Hami ex DC) | Tabo | Menispermaceae | Shrub | Fruits are edible |
| 3      | *Limacia oblonga* Miers. | Titmilie | Menispermaceae | Shrub | Fruits are edible |
| 4      | *Berberis asiatica* Roxb. ex DC | Tge | Berberidaceae | Shrub | Fruits are edible |
| 5      | *Berberis wallichiana* DC | Tipetere | Berberidaceae | Shrub | Fruits are edible |
| 6      | *Mohonia acanthifolia* G. Don. | Taming As | Berberidaceae | Shrub | Fruits are edible |
| 7      | *Brassica campestris* Linn. | Horyo | Brassicaceae | Herb | Leaves are used as vegetable |
| 8      | *Brassica juncea* L. var. *cuneifolia* (Roxb.) Kitampura | Goyu | Brassicaceae | Herb | Leaves are cooked as vegetable |
| 9      | *Cardamine hirusta* Linn. | Goj Ao | Brassicaceae | Herb | Leaves are used as vegetable |
| 10     | *Stixis suaveolens* (Roxb.) Pierre Syn. *Roydosia suaveolens* Roxb. | Tasser tere | Cappaeridaceae | Climber | Fruits are edible |
| 11     | *Gypsophila cerastoides* D.Don. | Geeda Ao | Caryophylaceae | Herb | Whole plant is used as vegetable |
| 12     | *Portulaca oleracea* Linn. | Tadar Ao | Portulacaceae | Herb | Whole plant is used as vegetable |
| 13     | *Garcinia pedunculata* Roxb. | Mibia | Clusiaceae | Tree | Fruits are edible |
| 14     | *Camellia sinensis* (L.) O. Ktze. Syn. *Thea sinensis* L. | Saa Schein | Theaceae | Shrub | Leaf extract is used as beverage |
| 15     | *Saurauia armata* Kurz. Syn. *Saurauia cerea* Griff. | Hero | Saurauiaceae | Tree | Fruits are edible |
| 16     | *Hibiscus esculentus* Linn. | Bhindi | Malvaceae | Shrub | Fruits are edible |
| 17     | *Bombax ceiba* Linn. | Semmul Schein | Bombacaceae | Tree | Flower buds are used as vegetable |
| 18     | *Sterculia guttata* Roxb. | Tattum Belom, Takom Belom | Sterculiaceae | Tree | Immature seeds eaten by removing pericarp |
| 19     | *Grewia serrulata* DC. *Eleocarpus floribundus* Blume. | Litik | Tiliaceae | Tree | Fruits are edible |
| 20     | *Eleocarpus sphaerius* (Gaertn.) K.Schum. | Jolphai Schein | Eleocarpaceae | Tree | Fruits are edible both raw, cooked |
| 21     | *Oxalis acetosella* Ls. Syn. *O. griffithi* Edgew. | Bhagwan tasse | Oxalidaceae | Tree | Young immature fruits are edible |
| 22     |                      | Pak Huku | Oxalidaceae | Herb | Whole plant is eaten raw as well as eaten cooked |

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Table 2. Continued.

| S. No. | Botanical name | Local name | Family | Habit | Uses |
|--------|----------------|------------|--------|-------|------|
| 23     | Oxalis corniculata | -do- | Oxalidaceae | Herb | Whole plant is edible |
| 24     | Oxalis debilis H.B.K. Var. Corymbosa (DC.) Lourt. | -do- | Oxalidaceae | Herb | Whole plant is eaten for sour taste |
| 25     | Impatiens racemosa DC. | Yamchu | Balsaminaceae | Herb | Leaves are used as vegetable |
| 26     | Aegle marmelos (L.) Correa. | Bhel | Rutaceae | Tree | Fruits are edible |
| 27     | Citrus decumana Linn. Sepen Nane | Rutaceae | Tree | Fruits are edible |
| 28     | Citrus excavate Burm. Sepen Nane Anye | Rutaceae | Tree | Fruits are eaten |
| 29     | Citrus lime (Linn.) Bl. | Nimbu | Rutaceae | Small tree | Fruits are edible |
| 30     | Citrus limetta Risso. Sepen | Rutaceae | Shrub | Fruits are edible |
| 31     | Citrus medicus Linn. Nanya Sepen | Rutaceae | Shrub | Fruits are edible |
| 32     | Murraya koenigii (L.) Spreng. Nyibumturum | Rutaceae | Shrub | Leaves used as flavouring agent |
| 33     | Murraya paniculata (L.) Jack. Nyibumturum | Rutaceae | Tree | Ripened fruits and leaves edible |
| 34     | Toddalia aculeate Pers. Syn.T.asiatica (L.) Lamk. Tiktak Shein | Rutaceae | Shrub | Fruits are edible |
| 35     | Zanthoxylum aphanopodium Edgew. Honyor | Rutaceae | Shrub | Young leaves eaten as vegetable, raw fruits also eaten |
| 36     | Zanthoxylum aramatum DC Syn. Z. alatum Roxb. Honyar | Rutaceae | Small tree | Young leaves and fruits are eaten |
| 37     | Zanthoxylum oxyphyllum Edgew. Honyor | Rutaceae | Climber shrub | Leaves used as vegetable |
| 38     | Zanthoxylum rhesa (Roxb.) DC. Honyor | Rutaceae | Shrub | Leaves used as vegetable |
| 39     | Canarium strictum Roxb. Schellum | Burseraceae | Tree | Fruits are edible |
| 40     | Berchemia floribunda (Wall.) Brongn. Year Ao | Rhamnaceae | Shrub | Leaves are used as vegetable |
| 41     | Rhamnus nepalensis (Wallich) Lawson Biringa schein | Rhamnaceae | Small tree | Fruits are edible |
| 42     | Ziziphus mauritiana Lam. Syn. Z. jujube Lam. Bogori | Rhamnaceae | Small tree | Fruits are edible |
| 43     | Ziziphus rugosa Lamk. Bogori | Rhamnaceae | Shrub | Fruits are edible |
| 44     | Cissus repens Lamk. - | Vitaceae | Climber shrub | Fruits are edible |
| 45     | Leea indica (Burm.f.) Merr. Demborang Sagne | Leeaceae | Small tree | Fruits are edible |
| 46     | Litchi chinensis Sonnar. Syn. Nephetium litchi (Lour.) Lisu, Litchi | Sapindaceae | Tree | Fruits are edible |
| 47     | Turpinia pomifera (Roxb.) DC. Takre-Schein | Staphyleaceae | Tree | Fruits are edible |
| 48     | Mangifera indica Roxb. Toggu | Anacardiaceae | Tree | Fruits are edible |
| S. No. | Botanical name | Local name | Family | Habit | Uses |
|--------|---------------|------------|--------|-------|------|
| 49     | Mangifera sylvatica Roxb. | Motum Toggu | Anacardiaceae | Tree | Fruits are edible |
| 50     | Pegia nitida Colebr. Syn. Tapinia tiria hirusta | Redin | Anacardiaceae | Shrub | Fruits are edible |
| 51     | Spondias axillaries Roxb. | Belam Schein | Anacardiaceae | Tree | Fruits are edible |
| 52     | Spondias pinnata (Linn.f.) Kurz. Syn. S. mangifera Willd. | Tanya Schein | Anacardiaceae | Tree | Young leaves are used as vegetable. Ripened fruits are also edible |
| 53     | Moringa oleifera Lamk. Syn. M. pterygos perma Gaertn. | Saajna | Moringaceae | Tree | Tender capsules and young leaves are used as vegetable |
| 54     | Cajanus cajan (L.) Syn. C. indicus Spring | Daal | Fabaceae | Shrub | Seeds are eaten in cooked form |
| 55     | Canavalia insiformis (L.) DC. Syn. C. gladiata (Jacq.) DC. | Hepetepei | Fabaceae | Climber | Fruits are eaten |
| 56     | Codariocalyx motorius (Houtt.) Syn. Desmodium gyrans (L.f.) DC. | Sha Dach | Fabaceae | Shrub | Leaves are boiled in water and dried, thereafter used as tea leaves |
| 57     | Erythrina stricta Roxb. | Tagek Schein | Fabaceae | Tree | Young tender leaves are used as vegetable |
| 58     | Glycine max Linn. Merr. Syn. G. Soza Auct. Non Sieb and Zucc. | Peayak | Fabaceae | Herb | Seeds are fermented and eaten |
| 59     | Lathyrus sativus Linn. | Emtor | Fabaceae | Herb | Seeds and young leaves eaten as vegetable |
| 60     | Phaseolus vulgaris (Beans) | Paren | Fabaceae | Climber | Pods are used as vegetable |
| 61     | Bauhania purpurea Linn. | Pacham | Caesalpiniaee | Tree | Young leaves and flowers are used as vegetable |
| 62     | Bauhania variegata Linn. | Pachem | Caesalpiniaee | Tree | Young leaves and flowers are used as vegetable |
| 63     | Bauhania wallichii Macbr. Syn. B. macrostachya non Beng. | Pachem | Caesalpiniaee | Climber | Tender leaves are used as vegetable |
| 64     | Tamarindus indica Linn. | Khosuk naan | Caesalpiniaee | Tree | Fruit pulp is eaten raw, used in curries |
| 65     | Mitracarpus verticillatus Schum. & Thom. | Talu | Mimosaceae | Herb | Young leaves and shoots are used as vegetable |
Table 2. Continued.

| S. No. | Botanical name     | Local name   | Family       | Habit | Uses                                      |
|--------|-------------------|--------------|--------------|-------|-------------------------------------------|
| 66     | Parkia roxburghii | Tupum Ash    | Mimosaceae   | Tree  | Young fruits used as vegetable           |
| 67     | Agrimonia pilosa var nepalensis (D.Don) Syn. Agrimonia nepalensis D.Don. Duchenea indica (Andr.) Focke. Syn. Fragaria indica | Tanion Rosaceae | Tree  | Leaves are used as vegetable             |
| 68     |  | Nenye pepro Rosaceae | Herb | Fruits are edible                         |
| 69     | Prunus persica Linn. | Chekom Rosaceae | Tree  | Fruits are edible                         |
| 70     | Prunus domestica Linn. | Naaspe Rosaceae | Tree  | Fruits are edible                         |
| 71     | Pyrus pashia D.Don. | Kean Schein Rosaceae | Tree  | Fruits are edible                         |
| 72     | Rubus ellipticus Smith. | Ta Hinch, Pop taro Rosaceae | Shrub | Fruits are edible                         |
| 73     | Rubus hexagnus Roxb. | Ta Hinch Rosaceae | Shrub | Leaves used as masticators                |
| 74     | Rubus insignis Hk.f. | Pop taro Rosaceae | Shrub | Fruits are edible                         |
| 75     | Rubus moluccanus Linn. | Taa Hich Rosaceae | Shrub | Fruits are edible                         |
| 76     | Hydrangea robusta Hook.f. | Ao Hagmi Hydrangeaceae | Shrub | Leaves are used as vegetable             |
| 77     | Terminalia chebula Retz. | Bunura Combretaceae | Tree  | Fruits are edible                         |
| 78     | Terminalia citrina (Gaertner) Flim. | Hilika Combretaceae | Tree  | Fruits are edible                         |
| 79     | Psidium guajava Linn. | Modhori Myrtaceae | Tree  | Fruits are edible                         |
| 80     | Syzygium cuminii (L.) Skeels. | Jamun Schein Myrtaceae | Tree  | Fruits are edible                         |
| 81     | Syzygium fruticosum DC.Syn. Eugenia fruticosa Roxb. | Kurak Schein Myrtaceae | Tree  | Fruits are edible                         |
| 82     | Melastoma malabathrium Linn. | Doy Oppu Melastomataceae | Shrub | Flowers and ripened fruits are edible     |
| 83     | Melastoma normale D.don. | Yuppa Bo Sie-Dhasha Melastomataceae | Shrub | Bark is removed from stem and eaten raw   |
| 84     | Oxyspora cenua (Roxb.) Hook.F.& Thomson ex triana |  | Melastomataceae | Shrub | Stem is eaten raw                         |
| 85     | Oreocnide integrifolia (Gaud.)Miq.syn. Oxyspora paniculata DC. | Pokeerjali Melastomataceae | Shrub | Fruits are liked by children             |
| 86     | Osbeckia nepalensis Hooker. | Pudrasa Melastomataceae | Shrub | Leaves are used as vegetable              |
| 87     | Osbeckia nutans Wallich ex Clarke. | Rasa Melastomataceae | Shrub | Leaves are used as vegetable              |
| 88     | Sonerila emaculata Roxb. | Jakmalo Melastomataceae | Herb | Leaves are used as vegetable              |
| 89     | Sonerila masculata Roxb. | Takmolo Melastomataceae | Herb | Leaves are used as vegetable              |
| S. No. | Botanical name | Local name | Family           | Habit   | Uses                                                                 |
|-------|----------------|------------|------------------|---------|----------------------------------------------------------------------|
| 90    | *Punica granatum* Linn. | Anar | Punicaceae       | Shrub   | Fruits are edible                                                     |
| 91    | *Carica papaya* Linn. | Omita Schein | Caricaceae       | Tree    | Unripe fruits and flowers are used as vegetable                      |
| 92    | *Cucubita maxima* Duchesne in Lamk. | Tap Payo | Cucurbitaceae    | Shrub   | Fruits are used as vegetable                                         |
| 93    | *Cucumis melo* Linn. | Meble | Cucurbitaceae    | Shrub   | Fruits are edible                                                     |
| 94    | *Cucurbita moschata* Duchesne | Tap | Cucurbitaceae    | Climber | Fruits, young leaf tendrils, flowers used as vegetable               |
| 96    | *Cucumis sativis* Linn. | Mukku | Cucurbitaceae    | Shrub   | Fruits are edible                                                     |
| 97    | *Cucurbita pepo* DC. | Loah | Cucurbitaceae    | Shrub   | Fruits and leaves used as vegetable                                  |
| 98    | *Lagenaria vulgaris* Ser. | Opu, | Cucurbitaceae    | Climber | Tender leaves are used as vegetable                                  |
| 99    | *Luffia acutangula* Linn. Syn. *L. acutangula* var. *amara* Roxb. | Jhika | Cucurbitaceae    | Climber | Fruits and young leaves are used as vegetable                         |
| 100   | *Luffia aegyptiaca* Mill. | Bhol | Cucurbitaceae    | Climber | Fruits are used as vegetable                                         |
| 101   | *Momordica cochinchenensis* (Lour.) Sprieng. *Momordica charantia* Linn. | Bhat Kerela | Cucurbitaceae    | Climber | Fruits are used as vegetable                                         |
| 102   | *Momordica charantia* Linn. | Khechak Kerela | Cucurbitaceae    | Climber | Fruits are bitter in taste, used as vegetable                        |
| 103   | *Trichosanthes anbuina* Linn. | Dhunduli | Cucurbitaceae    | Climber | Fruits are used as vegetable                                         |
| 104   | *Trichosanthes dioca* Roxb. | Duli Ao | Cucurbitaceae    | Climber | Fruits and leaves are used as vegetable                              |
| 105   | *Opuntia dillenii* How. *Begonia palmata* D.Don.syn. *B. laciniata* Roxb. | Tha | Cactaceae        | Shrub   | Fruits are edible                                                     |
| 106   | *Begonia palmata* D.Don.syn. *B. laciniata* Roxb. | Bikku yulu | Begoniaceae      | Herb    | Raw stem of plant is used as vegetable                               |
| 107   | *Begonia roxburgii* (Miq.) DC.Prodr. *Centella asiatica* (L.) Urb. Syn. *Hodocotyle asiatica* L. | Bikku yulu | Begoniaceae      | Herb    | Raw stem used as vegetable                                           |
| 108   | *Coriandrum sativum* Linn. | Nguri | Apiaceae         | Herb    | Leaves are used as vegetable                                         |
| 109   | *Eryngium foetidum* Linn. | Dhania | Apiaceae         | Herb    | Fruits and leaves are used as spice                                  |
| 110   | *Coriandrum sativum* Linn. | Dhaniya pat | Apiaceae         | Herb    | Leaves are used for flavor curry                                    |
| 111   | *Oenanthe javanica* (Blume) DC. Syn. *O. benghalensis* (DC.) Benth. & Hook.f. | Aghama Ao | Apiaceae         | Herb    | Whole plant is used as vegetable                                    |

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Table 2. Continued.

| S. No. | Botanical name                  | Local name   | Family      | Habit | Uses                                  |
|--------|--------------------------------|--------------|-------------|-------|---------------------------------------|
| 112    | *Aralia arnata* (G.Don) Seen    | Thang Ao     | Araliaceae  | Tree  | Leaves are used as vegetable          |
|        | *Brassioptis glomerulata* (Bl.) | Tago         | Araliaceae  | Tree  | Fruits are edible                     |
|        | Regel. Gaertn. Syn. *B. speciosa* Deene and Planch |            |            |       |                                       |
| 114    | *Mussaenda roxburghii* Hook. f. | Pattaa Tochar | Rubiaceae   | Shrub | Young leaves and flowers eaten by Tagin tribe |
|        |                               |              |            |       | Leaves cooked as vegetable            |
| 115    | *Mycteria longifolia* (Wall.) O. Kize. Syn. *Adenosacme longifolia* Wallich. | Tagmge | Rubiaceae   | Shrub |                                       |
| 116    | *Paedaria foetida* Linn.        | Upter Nemi   | Rubiaceae   | Climber | Whole plant used as vegetable         |
| 117    | *Spiracidis bifida* Wallich ex Kurz. | Sokko   | Rubiaceae   | Herb  | Boiled leaves used as vegetable       |
| 118    | *Bidens hirtinata* (Lour) Merr. & Scherr ex Scherr.FT | Tagaem | Asteraceae  | Herb  | Young tender leaves are eaten          |
|        | *Blumea fistulosa* (Roxb.) Kurz. | Rumdum     | Asteraceae  |       | Whole plant used as vegetable         |
| 120    | *Blumea lanceolariia* (Roxb.) Druce. Syn. *B. myriocephala* DC. | -          | Asteraceae  | Shrub | Leaves are used as vegetable          |
| 121    | *Crassocephalum crepidiodes* (Benth) Syn. *Gynura crepidiodes* Benth. | Yamen, Pakcho | Asteraceae  | Herb  | Leaves are used as vegetable          |
| 122    | *Dichrocephala latifolia* DC.   | Pechikai     | Asteraceae  |       | Tender leaves are used as vegetable   |
| 123    | *Emilia sonchifolia* DC.        | Genta Ao     | Asteraceae  | Herb  | Leaves are used as vegetable          |
| 124    | *Galinsoga parviflora* Cav.     | Tedar Ao     | Asteraceae  | Herb  | Whole plant is used as vegetable      |
| 125    | *Sonchus arvensis* Linn.        | Tok Ruru Ao  | Asteraceae  | Herb  | Whole plant is used as vegetable      |
| 126    | *Spilanthes oleoracea*          | Motum Mersh  | Asteraceae  | Shrub | Leaves and inflorescence are used as vegetable |
| 127    | *Spilanthes paniculata* DC.     | Mersha Ao    | Asteraceae  | Herb  | Young leaves are used as vegetable    |
| 128    | *Ardisia thyrsiflora* D.Don.Syn. *Ardisia nerifolia* DC. | Tujum Aep    | Myrsinaceae | Tree  | Fruits are edible                     |
| 129    | *Argreia nervosa* (Burm.f.) Bojer. Syn. *A. speciosa* | -          | Convolvulaceae |       | Young shoots are used as vegetable    |
Table 2. Continued.

| S. No. | Botanical name | Local name | Family       | Habit  | Uses                                                                                          |
|--------|----------------|------------|--------------|--------|------------------------------------------------------------------------------------------------|
| 130    | *Ipomea batatas* L. (Lamk.) | Eghein Phegre | Convolvulaceae | Climber | Young tendrils with leaves used as vegetable. Baked tuber also eaten                           |
| 131    | *Capsicum annum* Linn. | Yuluk, Yaluk | Solanaceae    | Herb   | Fruits are used as vegetable                                                                 |
| 132    | *Lycopersicum esculentum* Miller. | Tomator | Solanaceae    | Herb   | Fruits are used as vegetable                                                                 |
| 133    | *Solanum melongena* Linn. | Bayom      | Solanaceae    | Herb   | Fruits are used as vegetable                                                                 |
| 134    | *Solanum nigrum* Linn. | Hor        | Solanaceae    | Herb   | Fruits are eaten when ripened                                                                |
| 135    | *Solanum torvum* Swartz. | Shoat Beyak | Solanaceae    | Shrub  | Fruits are edible                                                                             |
| 136    | *Solanum tuberosum* Linn. | Alu        | Solanaceae    | Herb   | Tuber is used as vegetable                                                                   |
| 137    | *Physalis peruviana* L. | Donam As   | Solanaceae    | Herb   | Fruits are edible                                                                             |
| 138    | *Boeica filiformis* C.B.Clarke | Jookey    | Gesneriaceae  | Shrub  | Leaves are used as vegetable                                                                |
| 139    | *Boeica fulva* C.B.Clarke | Joke Ao    | Gesneriaceae  | Herb   | Leaves are used as vegetable                                                                |
| 140    | *Rhynchotechum ellipticum* (Wallich ex Dietr.) A.DC. | Jooke    | Gesneriaceae  | Shrub  | Leaves are used as vegetable                                                                |
| 141    | *Phlogacanthus thysiflorus* Nees. | Pilamola  | Acanthaceae   | Shrub  | Red flowers are used as vegetable                                                            |
| 142    | *Strobilanthus furcatus* Biswas | Barche Ao | Acanthaceae   | Shrub  | Leaves and young shoots are edible                                                            |
| 143    | *Callicarpa macrophylla* Vahl. | Upneu     | Verbenaceae   | Shrub  | Fruits are edible                                                                             |
| 144    | *Callicarpa vestila* Wall. ex Cl | Yalu     | Verbenaceae   | Shrub  | Dried stem is used as substitute for tobacco                                                  |
| 145    | *Clerodendron colebrookianum* Walp. | Tippin   | Verbenaceae   | Shrub  | Leaves are used as vegetable                                                                |
| 146    | *Clerodendron serratum* (Linn.) Moon. | Tipin poto | Verbenaceae   | Shrub  | Leaves are used as vegetable                                                                |
| 147    | *Clerodendron viscosum* Vent. Syn. C. infortunatum Gaertn. | Taapin   | Verbenaceae   | Shrub  | Flowers are used as vegetable                                                               |
| 148    | *Gmelina arborea* Roxb. | Gomori Schein | Verbenaceae  | Tree   | Flowers are used as vegetable                                                               |
| 149    | *Premma milleflora* C.B.Clarke. | -         | Verbenaceae   | Tree   | Fruits and leaves are edible                                                                |
| 150    | *Ajuga macropetra* Wall. | Nomdemghor | Lamiaceae     | Herb   | Whole plant is used as vegetable                                                            |
| 151    | *Mentha piperata* Linn. Emend. Huds. | Pudina    | Lamiaceae     | Herb   | Leaves are used in salad and making chutni                                                   |

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Table 2. Continued.

| S. No. | Botanical name | Local name | Family | Habit | Uses |
|--------|----------------|------------|--------|-------|------|
| 152    | *Perilla frutescens* (L.) Britt. | Tanam | Lamiaceae | Shrub | Seeds are used as spice ingredient |
| 153    | *Plantago erosa* Wall. Syn. *P. major* Linn. | Talak Ao | Plantaginaceae | Herb | Leaves are used as vegetable |
| 154    | *Amaranthus gangeticus* Linn. | Data Ao | Amaranthaceae | Herb | Whole plant is used as vegetable |
| 155    | *Amaranthus spinosus* Linn. | Puchu Panya | Amaranthaceae | Herb | Leaves are used as vegetable |
| 156    | *Amaranthus viridis* Linn. | Detta Ao | Amaranthaceae | Herb | Leaves are used as vegetable |
| 157    | *Celosia argentea* Linn. | - | Amaranthaceae | Herb | Leaves are used as vegetable |
| 158    | *Chenopodium album* Linn. | Teya Ao | Chenopodaceae | Herb | Leaves are used as vegetable |
| 159    | *Chenopodium ambrosioides* Linn. | Teya | Chenopodaceae | Herb | Leaves are used as vegetable |
| 160    | *Fagopyrum dibotrys* (D.Don.) Trev. Syn. *F. cymosum* | Hukku | Polygonaceae | Herb | Leaves are used as vegetable |
| 161    | *Fagopyrum esculentum* Moench. | Hukku, Hukkung | Polygonaceae | Herb | Leaves are used as vegetable |
| 162    | *Polygonum auriculatum* Meissn. Syn. *P. chinense* var. *ovalifolium* Meissn. | Torckumbuk | Polygonaceae | Herb | Fruits are edible |
| 163    | *Polygonum posumbu* Ham. | Namne Ao | Polygonaceae | Climber | Leaves are used as vegetable |
| 164    | *Polygonum runcinatum* Ham. | Puri | Polygonaceae | Herb | Leaves are used as vegetable |
| 165    | *Rumex nepalensis* Spring | Yalak Ao | Polygonaceae | Herb | Leaves are used as vegetable |
| 166    | *Piper betle* Linn. | Pan | Piperaceae | Climber | Leaves are eaten with Areca nut |
| 167    | *Piper nigrum* Linn. | Jaluk | Piperaceae | Shrub | Fruits are used as spice |
| 168    | *Piper pedicellatum* Wall. | Rer | Piperaceae | Shrub | Leaves are used as vegetable |
| 169    | *Houttuynia cordata* Thumb. | Checha Peya | Saururaceae | Herb | Raw leaves are used as vegetable and chatni |
| 170    | *Chloranthus glaber* (Thumb.) Makino Syn. *C. brachystachya* Blume. | Tupu Tal | Chloranthaceae | Shrub | Fruits are edible |
| 171    | *Cinnamomum tamala* (Buch-Ham.) Nees & Ebern. | Tesh patta | Lauraceae | Tree | Leaves are used as spice |
| 172    | *Cinnamomum zeylanicum* Brey. | Dalchini | Lauraceae | Tree | Bark is used as spice |
| 173    | *Litsea cubeba* (Lour) Pers. Syn. *L. citrata* Bl. | Teer, Tayir Schein | Lauraceae | Tree | Fruits are edible |
Table 2. Continued.

| S. No. | Botanical name                        | Local name | Family    | Habit | Uses                                           |
|--------|--------------------------------------|------------|-----------|-------|------------------------------------------------|
| 174    | *Litsea salicifolia* (Roxb. ex Nees) Hk.f. | Taor       | Lauraceae | Tree  | Fruits are edible                               |
| 175    | *Persea frutifera* Kost. Syn. *Machilus edulis* King ex Hk.f. | Te chir Shein | Lauraceae | Tree  | Fruits are edible                               |
| 176    | *Phoebe lanceolata* (Nees) Nees. | Sichir Shein | Lauraceae | Tree  | Fruits are edible                               |
| 177    | *Elaeagnus latifolia* Linn.           | Hari       | Elaeagnaceae | Shrub | Fruits with sour taste are eaten               |
| 178    | *Baccaurea sapida* (Roxb.) Muell.    | Bheri Aash | Euphorbiaceae | Tree  | Fruits are edible                               |
| 179    | *Baliosperum calycinum* Muell.Arg.   | -          | Euphorbiaceae | Tree  | Leaves are cooked as vegetable                 |
| 180    | *Baliosperum montanum* (Willd.) Muell.Arg. Syn. *B. axillana* Euphorbia hirta Linn. | Pririya    | Euphorbiaceae | Shrub | Leaves are used as vegetable                   |
| 181    | *Malltus roxburghii* Muell.          | Tamu Ao    | Euphorbiaceae | Herb  | Leaves are used as vegetable                   |
| 182    | *Manihot esculenta* Crantz.          | Tuy Tya    | Euphorbiaceae | Shrub | Fruits are edible                               |
| 183    | *Phyllanthus emblica* L. Hk. f.       | Sida Eighein | Euphorbiaceae | Shrub | Leaves and tubers are used as vegetable        |
| 184    |                                                   | Amlaki Schein | Euphorbiaceae | Tree  | Fruits are edible                               |
| 185    | *Elatostema platyphyllum* Wedd.       | Hoj Ao     | Urticaceae | Shrub | Leaves are used as vegetable                   |
| 186    | *Elatostema sessile* Frost.           | Jooke      | Urticaceae | Herb  | Leaves are used as vegetable                   |
| 187    | *Laportea crenulata* Gaud.           | Pud Raat, Raate | Urticaceae | Shrub | Young leaves used as vegetable                 |
| 188    | *Pilea bracteosa* Wedd.              | Guge       | Urticaceae | Herb  | Leaves used as vegetable                       |
| 189    | *Pilea glaberrima* Bl. Syn. *P. smilacifolia* Wedd. | Guge Ao    | Urticaceae | Herb  | Leaves used as vegetable                       |
| 190    | *Ponolzia bennetiana* Wight.         | Huyiek     | Urticaceae | Climber | Leaves are used as vegetable                   |
| 191    | *Ponolzia sanguine* (Bl.)Merr.       | Tanu       | Urticaceae | Shrub | Leaves are used as vegetable                   |
| 192    | *Ponolzia sanguine* (Bl.) Merr.var. fulgens (Wedd.) Syn. *P. viminea* Wedd. var. fulgens Wedd. | Tanu Ninya | Urticaceae | Tree  | Leaves are used as vegetable                   |
| 193    | *Bischofia javanica* Blume.          | Tag Schein | Bischofiaceae | Tree  | Young leaves are used as vegetable             |

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Table 2. Continued.

| S. No. | Botanical name | Local name | Family | Habit | Uses |
|--------|----------------|------------|--------|-------|------|
| 194    | *Artocarpus chama* Buch. Syn. *A. chaplasha* Roxb. | Tak Sam Shein | Moraceae | Tree | Fruits are edible |
| 195    | *Artocarpus heterophyllus* Lam. Syn. *A. integrifolius* non L. | Tak Bela | Moraceae | Tree | Fruits are edible |
| 196    | *Artocarpus lakoocha* Roxb. | Bela Ninye Schein | Moraceae | Tree | Fruits are edible. Bark is chewed with pan (Betel) Young tender leaves used as vegetable |
| 197    | *Conocephalus suaveolens* non Blume | Hogen Ao | Moraceae | Climber | |
| 198    | *Ficus auriculata* Lour. Syn. *F. roxburghii* Wall. | Takuk | Moraceae | Tree | Fruits are edible |
| 199    | *Ficus elastica* Roxb. | Sherak, Sangri | Moraceae | Tree | Fruits are edible |
| 200    | *Ficus fistulosa* Reinw. | Mobopu | Moraceae | Shrub | Fruits are edible |
| 201    | *Ficus squamosa* Roxb. Syn. *F. saemocarpa* Miq. | Talagi | Moraceae | Tree | Fruits are edible |
| 202    | *Morus alba* Linn. | Latek Schein | Moraceae | Tree | Fruits are edible |
| 203    | *Morus indica* Linn. | Latek | Moraceae | Tree | Fruits are edible |
| 204    | *Juglans regia* Linn. | Akrod | Juglanadaceae | Tree | Fruits are edible |
| 205    | *Castanopsis indica* (Roxb.) A. DC. | Hinguri | Fagaceae | Tree | Fruits are edible |
| 206    | *Castanopsis lancifolia* (Roxb.) Hockel & A. Camus. Syn. *C. lancifolia* | Tain | Fagaceae | Tree | Fruits are edible |
| 207    | *Castanopsis tribuloides* (Smith) A. DC. | Tain Tha | Fagaceae | Tree | Fruits are edible |
| 208    | *Quercus griffithii* Hook f. & Thoms. | Kra | Fagaceae | Tree | Fruits are edible |
| 209    | *Quercus lamellose* Smith. | Khora Niddum | Fagaceae | Tree | Fruits are edible |
| 210    | *Alpinia nigra* (Gaertn.) Burtt. Syn. *A. allughas* (Retz.) Rosc. | Doyak | Zingiberaceae | Herb | Fruits are edible |
| 211    | *Amomum aromaticum* Roxb. | Khobu Telli | Zingiberaceae | Herb | Seeds are used as spice |
| 212    | *Amomum subulatam* Roxb. | Mutum Khobu Telli | Zingiberaceae | Herb | Seeds are used as spice |
| 213    | *Curcuma longa* Linn. | Kaya Haldi | Zingiberaceae | Herb | Rhizomes are used as spice |
| 214    | *Hedychium coccineum* J.E. Smith. | Aemmi Pekchi | Zingiberaceae | Herb | Young tender stem is used as vegetable |
Table 2. Continued.

| S. No. | Botanical name                     | Local name | Family            | Habit  | Uses                                                                 |
|--------|------------------------------------|------------|-------------------|--------|---------------------------------------------------------------------|
| 215    | *Hedychium* spicatum Lodd.         | Telli      | Zingiberaceae     | Herb   | Fruits are edible                                                   |
| 216    | Zingiber officinale Rose.          | Take       | Zingiberaceae     | Herb   | Rhizomes are used as spice                                          |
| 217    | *Phrynium* capitatum Wild.         | Khokam     | Marantaceae       | Shrub  | Leaves used as packing material for preparation process of traditional drinks As above |
| 218    | *Phrynium* imbricatum Roxb.        | Kokam      | Marantaceae       | Shrub  | As above                                                            |
| 219    | *Ensete glaucum* (Roxb.) Syn. *Musa glauca* Roxb. | Kudum  | Musaceae          | Small tree | Fruits are edible                                                  |
| 220    | *Musa acuminata* Colla. Syn. *M. sanguinea* Hook. f. | Kulu      | Musaceae          | Small tree | Fruits are edible                                                  |
| 221    | *Musa bulbisiana* Colla. Syn. *M. sapientum auct non L.* | Kopa     | Musaceae          | Small tree | Fruits and inner soft stem are edible                              |
| 222    | *Musa paradisiacal* Linn.          | Nyepak Ao-Kopak Anye Kodok Kolok | Musaceae | Small Tree | Unripe fruits used as vegetable Roots and seeds are edible           |
| 223    | *Musa velutina* Wendl.             | Doyak      | Hypoxidaceae      | Herb   | Fruits are edible                                                   |
| 224    | Molineria recurvata Dryland. Syn. *Curculigo recurvata* Dryland. | Eghen Ngentak | Dioscoreaceae     | Climber | Tubers are edible                                                   |
| 225    | *Dioscorea alata* Linn.            | Eghen Ngencha | Dioscoreaceae    | Climber | Tubers are edible                                                   |
| 226    | *Dioscorea belophylla* (Prain) Voigt Linn. | Eghen Tabon | Dioscoreaceae    | Climber | Tubers are edible                                                   |
| 227    | *Dioscorea bulbifera* Linn.        | Helak      | Dioscoreaceae     | Climber | Tubers are edible                                                   |
| 228    | *Dioscorea deltoidea* Wall ex. Griseb Roxb. | Eghen Ngenki | Dioscoreaceae    | Climber | Tubers are edible                                                   |
| 229    | *Dioscorea glabra* Roxb.           | Eghen Ngentak | Dioscoreaceae    | Climber | Tubers are edible                                                   |
| 230    | *Dioscorea hamiltonii* Hook. f.    | Eghen Raad | Dioscoreaceae     | Climber | Tubers are edible                                                   |
| 231    | *Dioscorea laurifolia* Wall        | Eghen Ngegek | Dioscoreaceae    | Climber | Tubers are edible                                                   |
| 232    | *Dioscorea melanophylla*           | Hash       | Dioscoreaceae     | Climber | Tubers are editable                                                 |
| 233    | *Dioscorea oppositifolia* Linn.    | Eghen Take-Mare | Dioscoreaceae    | Climber | Tubers are editable                                                 |
| 234    | *Dioscorea orbiculata* Hook        | Eghen Yeb  | Dioscoreaceae     | Climber | Tubers are editable                                                 |
| 235    | *Dioscorea pentaphylla* Linn.      | Hill       | Dioscoreaceae     | Climber | Tubers are editable                                                 |
Table 2. Continued.

| S. No. | Botanical name                      | Local name | Family      | Habit | Uses                                      |
|--------|------------------------------------|------------|-------------|-------|-------------------------------------------|
| 236    | *Dioscorea purpurea* Roxb.         | Eghen      | Dioscoreaceae | Climber | Tubers are edible                         |
|        |                                    | Ngenchu    |             |       |                                           |
|        |                                    | Puyur      |             |       |                                           |
| 237    | *Dioscorea pyrifolia* Kunth        | Eghen      | Dioscoreaceae | Climber | Tubers are edible                         |
|        | *Dioscorea spicata* Roth           | Ngenchi    |             |       |                                           |
| 239    | *Dioscorea wallichii* Hook. f.     | Eghen      | Dioscoreaceae | Climber | Tubers are edible                         |
|        | *Dioscorea wightii* Hook. f.       | Ngeyuk     |             |       |                                           |
| 240    | *Allium cepa* Linn.                | Talap      | Liliaceae   | Herb  | Whole plant is used as spice             |
| 241    | *Allium hookeri* Thwaites.         | Nyishi Talap | Liliaceae | Herb  | Bulb is used as spice                    |
| 242    | *Allium sativum* Linn.             | Lohsum-    | Liliaceae   | Herb  | Bulb is used as spice                    |
| 243    | *Asparagus racemosus* Wild.        | -          | Liliaceae   | Shrub | Tuber and whole plant has diuretic and   |
|        |                                    |            |             |       | cooling properties                        |
| 244    | *Pollia hasskarlii* Rao Syn. *P. acilisa* Hassk. | Nipobapak | Commelinaceae | Herb  | Fruits are edible                         |
| 245    | *Areca catechu* Linn.              | Tamol      | Arecaeae    | Tree  | Fruits are used as masticator            |
| 246    | *Calamus erectus* Roxb.            | Tare       | Arecaeae    | Shrub | Young and soft stem is edible             |
| 247    | *Calamus flagellum* Griff.         | Tar Rame   | Arecaeae    | Cane  | Fruits are edible                         |
| 248    | *Calamus latifolius* Roxb.         | Takat      | Arecaeae    | Cane  | Fruits are edible                         |
| 249    | *Calamus temuis* Roxb.             | Ter Remme  | Arecaeae    | Cane  | Fruits are edible                         |
| 250    | *Daemonorops jeinkinsianus* Griff. | Raidang    | Arecaeae    | Cane  | Fruits are edible                         |
| 251    | *Livistona jenkinsiana* Griff.     | Taak       | Arecaeae    | Tree  | Fruits and tender stem are edible         |
| 252    | *Pinnanga gracilis* (Roxb.) Bl.    | Taecher    | Arecaeae    | Tree  | Fruits are edible                         |
| 253    | *Wallichia densiflora* Mart.       | Tache      | Arecaeae    | Tree  | Stem is used to extract a flour which is  |
|        |                                    |            |             |       | used as famine food                       |
| 254    | *Wallichia disticha* T. Anders     | Tali       | Arecaeae    | Tree  | Fruits are eaten                          |
| 255    | *Zalacca secunda* Griff            | Ra         | Arecaeae    | Tree  | Fruits are edible                         |
| 256    | *Colocasia antiquorum* Schott Melet| Takche Reba | Araceae    | Herb  | Tubers, stem and leaves are used as      |
| 257    | *Colocasia affinis* Schott         | Nyepop     | Araceae     | Herb  | vegetable                                 |
| 258    | *Colocasia fallax* Schott          | Nygek      | Araceae     | Herb  | As above                                  |

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Table 2. Continued.

| S. No. | Botanical name                | Local name | Family       | Habit  | Uses                                                   |
|--------|------------------------------|------------|--------------|--------|-------------------------------------------------------|
| 260    | *Colocasia esculenta*        | Nyepu yulu | Araceae      | Herb   | As above                                              |
| 261    | *Cyperus rotundus* Linn.      | Ei         | Cyperaceae   | Herb   | Roots are chewed by children due to sweet taste       |
|        |                              |            |              |        | Young tender shoots are eaten                         |
| 262    | *Dendrocalamus hamiltonii* Nees et Arn. | Ae          | Poaceae      | Bamboo | Young tender shoots are eaten                         |
| 263    | *Dendrocalamus giganteus* Munro | Ae Hatee   | Poaceae      | Bamboo | As above                                              |
| 264    | *Panicum milaceum* Linn.      | Tai        | Poaceae      | Herb   | Seeds are eaten                                       |
| 265    | *Saccharum spontaneum* Linn.  | Teppi      | Poaceae      | Shrub  | Young tender stem is eaten                            |
| 266    | *Setaria italic* Beav.        | Tayak      | Poaceae      | Herb   | Leaves used for making local beverage                |
|        |                              |            |              |        | Maize corns used as staple food and in local beverage |
| 267    | *Zea mays* Linn.              | Top        | Poaceae      | Tall   | Stem and leaves are used as vegetable                 |
| 268    | *Selaginella biformis* Br. ex Kuhn. | Husum Ao  | Selaginelaceae | Herb  | Fruits are edible                                     |
|        |                               |            |              |        |                                                       |
| 269    | *Dillenia indica* Linn        | Jampa      | Dillenaceae  | Tree   |                                                       |

From the ethno botanical survey, it was noted that tribes were consuming the edible plants in raw or cooked form. The plant parts used were fruits, leaves, tubers, whole plant, stem/bark, seeds and flowers in descending order (Figure 2). The fruits of 121 species are eaten as raw and sometimes made in to salads or pickles. Leaves of 84 species are used as vegetables.

Trees made the highest proportion of edible species followed by shrubs, herbs, climbers in descending order (Figure 3). The time and frequency of collecting various plants varied from plant to plant depending upon their availability. Sometimes more than one part of the species is edible like both leaves and fruits are edible in *Spondias pinnata*, *Luffa acutangula*; seeds and young leaves are edible in *Lathyrus sativus*; young leaves, pods and flowers are edible in *Bauhinia purpurea*, *B. variegata*; fruits, young leaf tendrils and flowers are eaten in *Cucurbita moschata*; leaves and tubers are edible in *Manihot esculenta*; tubers, stem and leaves are edible in *Colocasia antiquorum*.
Conclusion

The discussions with local people revealed that the wild edibles were being used as common household foods and make a substantial contribution to food security of the tribes of the region. Therefore necessary steps should be taken to assess the nutritional value of these plant species/parts to serve as a direct or indirect
source of food to the local people (Tiwari et al., 2010). There is ample scope for improving the growth forms of wild edible species by using latest agronomic research and experimental cytogenetical studies (Yesodharan and Sujana, 2007). It was commonly noticed during survey that many of the wild food may not be available in plenty as of now due to various reasons mainly over exploitation, habitat destruction, forest fires, encroachments and invasion of exotic plant species. Wherever possible, efforts should be made to bring some of them under cultivation in order to maintain regular supply. Therefore awareness must be created among the indigenous communities stressing the need of conserving rich biodiversity, especially plants of ethnobotanical importance. The Government agencies must support the conservation measures of biodiversity by the indigenous groups. The conservation policies should be based on the recognition of indigenous people’s right to conservation. The effective system of community right and benefit sharing mechanism are needed at local level, which will provide incentives for indigenous people for managing, conserving and using biological resources in sustainable manner.

Conflict of interest statement

Authors declare that they have no conflict of interests.

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