

Wild Food from Forest:
Nutrition Security of the Poor:

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Humans have spent *most part of their evolutionary history* as **HUNTERS AND GATHERERS** -

Since about 400,000 years ago till the Agricultural Revolution - 12,000 years ago.

There are **currently over 400** pure Hunter-Gatherer societies on the Continents of Asia, Australia, North America and South America.

In South Asia, most of the peasant farmers forage **wild plants and animals** for food.

Food Security

Not Confined to Agriculture Alone!

Forests, Grasslands and Wetlands are Important Sources for Food.

- Agroforestry in Periodically Cleared

Forest Patches

- Wild Food Gathering, Hunting, Fishing

What We Already Knew

- A Wide Range of Wild Foods Yield 10% to 50% of Nutrition to Indigenous Forest Dependent Societies (FAO 2009).
- In Southern Odisha, 98 kinds of Wild Food Constitute 12% to 24% by weight of All Foods Cooked in the Forest Households (Living Farms 2014).
- Forest Governance in the Hands of Forest People (CFM) Improves the Forest Ecological Status and Biomass (Conroy 2002; Cronkleton 2011).

A New Quantitative Study in 2 Districts of Odisha

1. District Rayagada:

- *Forest Area:* (a) Sikabanda (CFM) and
(b) Sindhupunka (Protected Forest) in Muniguda
Forest Range, Rayagada Division.

2. District Bolangir:

- Forest Area:* (a) Kutasingha (CFM) and
(b) Singjuri (Reserved Forest) in Loisinga
Forest Range, Bolangir Division.

Dual Comparisons

➤ Two Types of Forest :

* *Dry Deciduous vs Moist Deciduous*

➤ Two Types of Management & Governance:

* *(Informal) CFM vs Statutory Protection*

➤ Two Ethnic Compositions:

* *Tribal vs Caste Communities*

Diversity of Food Biota Harvested from Forests

Taxon	Food Items	Rayagada Forests	Balangir Forests	Total No. of Items
PLANTAE	Leaf & Stem	12	6	14
	Roots and Tubers	16	6	16
	Flowers	3	2	3
	Fruits	21	18	22
FUNGI	Mushrooms	7	4	9
ANIMALIA	Insects	2	1	2
	Fish	2	2	2
	Reptiles	2	0	2
	Birds	5	6	6
	Mammals	7	6	7
	<i>Total</i>	75	48	79



*Madhuca
latifolia:*



Flowers

Bauhinia purpurea
Flowers ►



Dioscorea glabra ▶



◀
Dioscorea bulbifera



Wild Mushrooms

***Indigofera cassioides* Flowers** ▶

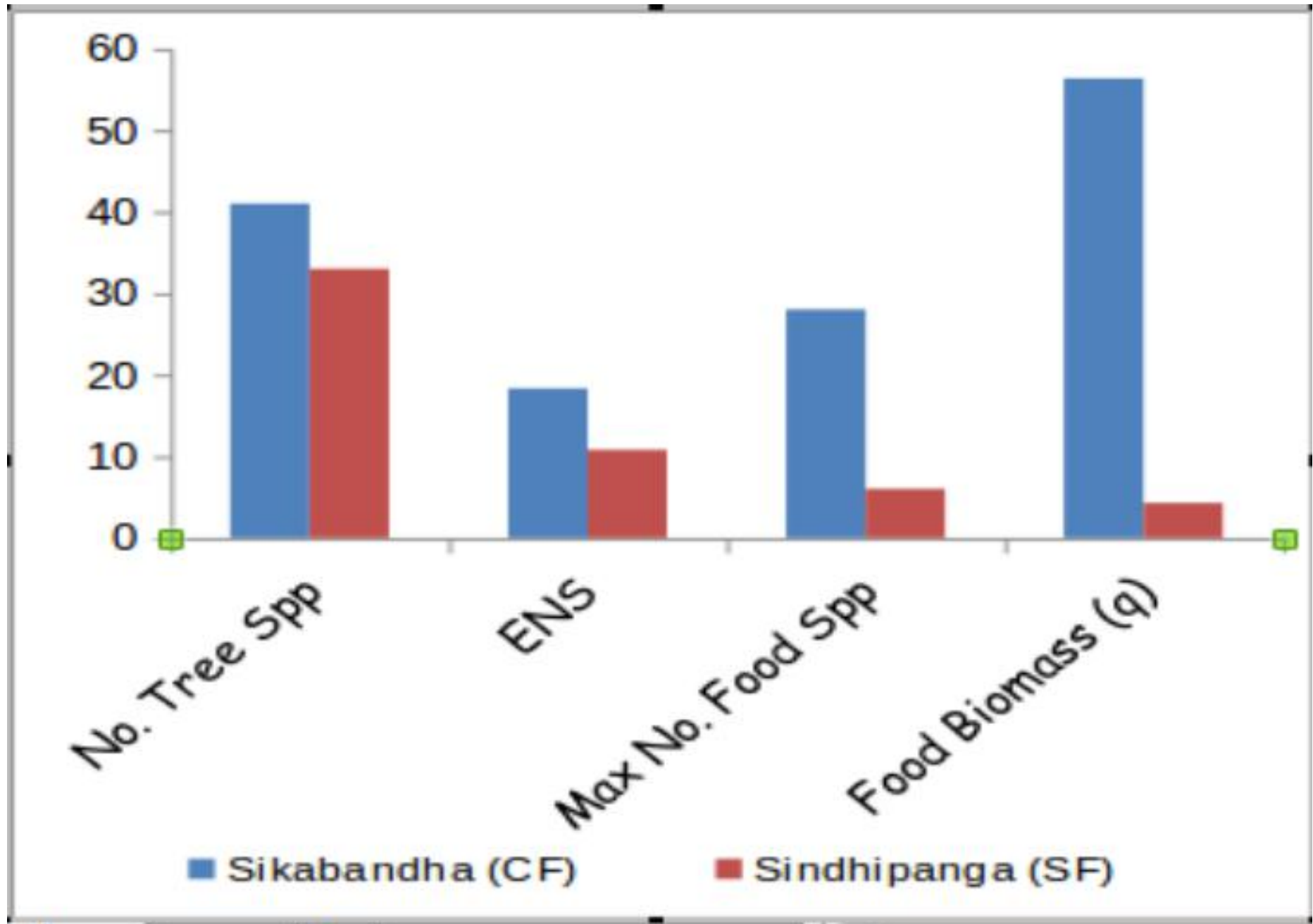


◀ ***Pterocarpus marsupium* Fruits**



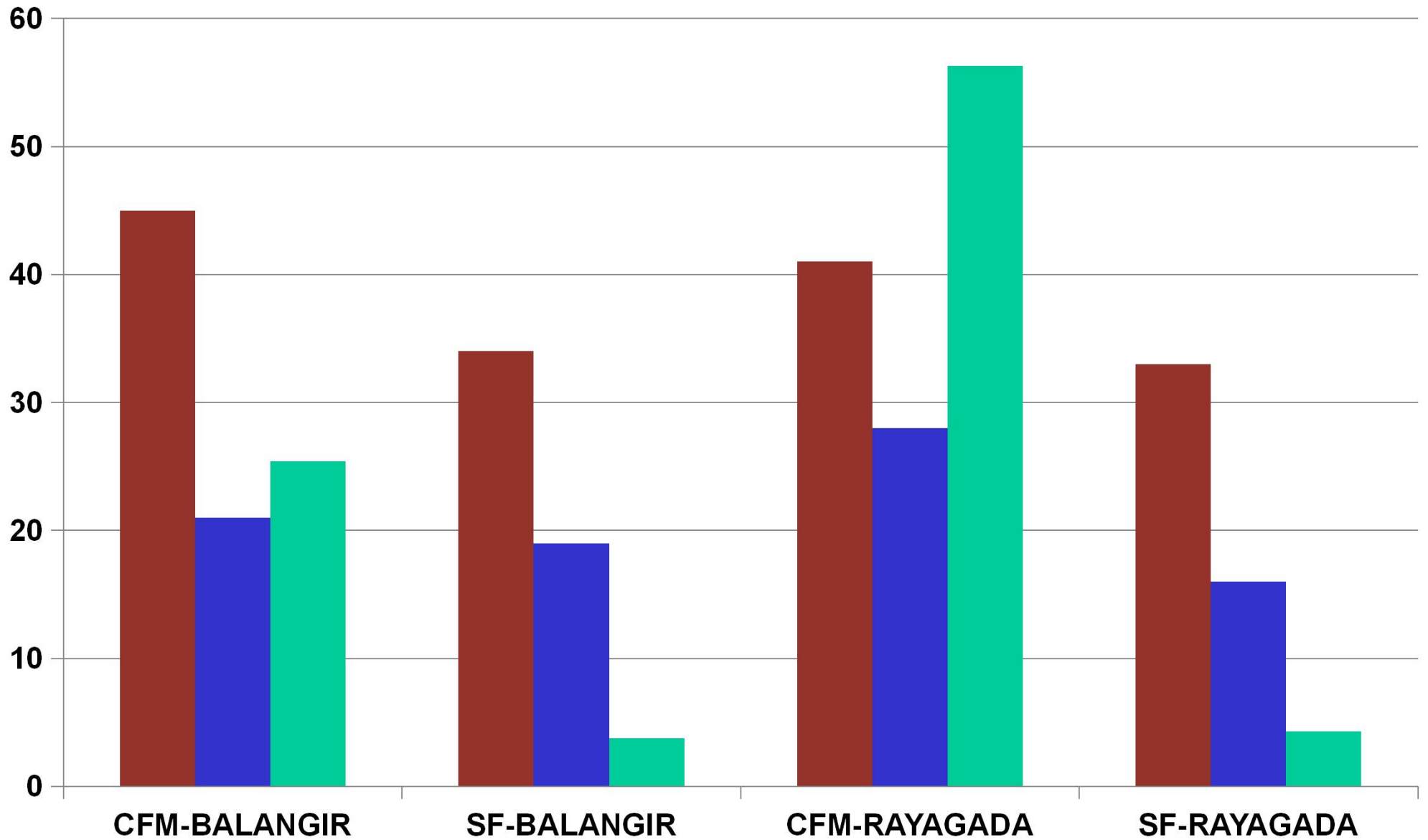
Oecophylla smaragdina:
Ants & eggs

The Ecological Drivers of Food Diversity & Abundances



Forest Governance Influencing Food Availability

■ Tree Spp ■ Edible Spp ■ Biomass (Qt/Year)



Wild Tubers

Name	% Starch	% Total Soluble Sugar	% Total Carbohydrate	% Soluble Protein	Total Lipid (mg/g)	Anti-oxidant activity IC50 (mg/ml)	Beta Carotene (µg/g)
<i>Dioscorea bellophylla</i> (Bhata kanda)	14.49	42.19	56.68	0.00	12.00	5.79	0.87
<i>Dioscorea wallichii</i> (Phalu kanda)	21.50	27.75	49.25	0.76	18.00	1.23	2.39
<i>Dioscorea hispida</i> (Reya kanda)	7.08	7.31	14.39	0.95	17.00	9.64	2.06
<i>Dioscorea glabra</i> (Hemi kanda)	13.22	56.20	69.42	3.13	22.00	5.73	6.82
<i>Dioscorea pentaphylla</i> (Mundi kanda)	8.64	7.69	16.33	0.10	7.00	1.12	2.28
<i>Dioscorea puber</i> (Napa kanda)	22.38	32.19	54.57	2.15	6.00	1.75	3.38
<i>Dioscorea hamiltonii</i> (Suta kanda)	8.60	36.89	45.49	0.00	44.00	10.01	1.08

Wild Mushrooms

Name	% Starch	% Total Soluble Sugar	% Total Carbohydrate	% Soluble Protein	Total Lipid (mg/g)	Anti-oxidant activity IC50 (mg/ml)	Beta Carotene (µg/g)
<i>Termitomyces microcarpus</i> (Basa chhatu)	1.85	1.01	2.86	4.70	20.00	13.80	7.27
<i>Termitomyces clypeatus</i> (Bhiden chhatu)	19.17	13.31	32.48	2.12	8.00	ND	2.43
<i>Russula cyanoxantha</i> (Jambo chhatu)	13.50	16.20	29.70	11.63	24.00	2.47	4.20
<i>Astaeus hygrometricus</i> (Putkel chhatu)	2.89	0.91	3.80	3.53	10.00	63.21	6.71

Leafy Vegetables

Name	% Starch	% Total Soluble Sugar	% Total Carbohydrate	% Soluble Protein	Total Lipid (mg/g)	Anti-oxidant activity IC50 (mg/ml)	Total Carotenoid ($\mu\text{g/g}$)
<i>Antidesma acidum</i> (Ambili shak)	6.33	4.55	10.87	2.64	74.00	21.31	0.43
<i>Bauhinia purpurea</i> (Barada shak)	3.33	0.92	4.25	2.33	14.00	6.60	0.11
<i>Oxalis scandens</i> (Gandhiri shak)	11.98	1.81	13.79	8.83	14.00	20.93	78.31
<i>Argemone sp.</i> (Phanji shak)	3.06	6.98	10.04	2.19	8.00	27.60	0.22
<i>Hydrophyllum auriculata</i> (Kanta shak)	8.13	5.13	13.25	1.29	6.00	29.07	4.70

Courtesy: Basudha Laboratory for Conservation, Kolkata

Wild Fruits

Name	% Starch	% Total Soluble Sugar	% Total Carbohydrate	% Soluble Protein	Total Lipid (mg/g)	Anti-oxidant activity IC50 (mg/ml)	Total Carotenoid (µg/g)
<i>Ficus glomerata</i> (Dimbiri)	25.33	5.32	27.02	0.81	100.00	9.65	3.71
<i>Diospyros melanoxylon</i> (Kendu)	15.71	3.34	16.05	2.21	16.00	3.94	0.11
<i>Phoenix acaulis</i> (Sindi khajur)	5.68	5.86	11.54	2.37	8.00	18.73	7.61
<i>Gardenia gummifera</i> (Kurudu)	6.15	4.10	10.25	1.52	18.00	4.44	0.22

B Vitamins

Name	B Vitamins (mg/100g)				
	B1	B2	B3	B5	B6
<i>Antidesma acidum</i> leaves	4.76	0.04	5.37	2.15	1.25
<i>Dioscorea hispida</i> tuber	0.00	0.00	0.05	2.96	0.00
<i>Olax scandens</i> leaves	0.65	0.00	0.27	0.00	0.00
<i>Hygrophyla auriculata</i> leaves	0.03	0.07	27.89	5.18	1.21
<i>Gardenia gummifera</i> fruit	0.00	0.32	66.91	0.87	0.00
<i>Termitomyces microcarpus</i> mushroom	0.00	0.10	0.00	0.00	3.99

Courtesy: IICB and Basudha Laboratory for Conservation, Kolkata

Metal Profiles

Name	Fe (ppm)	Zn (ppm)	Cu (ppm)
<i>Dioscorea pentaphylla</i> tuber	455.64	273.19	42.37
<i>Olax scandens</i> leaf	228.80	254.28	36.25
<i>Antidesma acidum</i> fruit	239.05	279.94	35.82
<i>Termitomyces microcarpus</i> mushroom	368.30	309.94	39.91
<i>Dioscorea puber</i> tuber	71.32	281.62	36.44
<i>Flacourtia jangomus</i> fruit	167.63	301.01	42.98
<i>Dioscorea hispida</i> tuber	42.29	267.07	41.16
<i>Dioscorea wallichii</i> tuber	44.19	288.13	48.02
<i>Cephadesa basifera</i> leaf	250.40	250.63	44.20

*** To Invest Public Money in Developing a Genetically Engineered Crop Plant as a Potential Solution to A Nutrition Deficit among the Rural Poor, while there is a Plethora of Zero-Cost Nutritious Foods Available from the Wild - is ECONOMICALLY WORTHLESS and SCIENTIFICALLY NONSENSICAL.**

*** A Food Policy that Fosters and Enhances Forest Biodiversity to Meet the Local Needs of Food is More INTELLIGENT and REASONABLE than a Policy that Promotes Monocultures in Agriculture and Forestry.**

For More Details :

Deb, D. (2018)

Food and Nutrition from Forest:

Relationships with Forest Ecological

Status and Management System.

Living Farms: Bhubaneswar.