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Review Article

BIODIVERSITY, RESOURCE UTILIZATION BY THE LOCAL VILLAGERS OF SOUTH WEST BENGAL, WEST BENGAL, INDIA

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A detailed study had been made in villages of South West Bengal where peoples are depended on biodiversity resources like *Fernonia limonia* L. (koet bel), *Ipomoea carnea* Jace. (kolmi), *Saccharum spontaneum* L. (chorkhori), *Spondias dulcis* L. (amra), *Juncellus innundetus* Clarke (Palashkhachi) etc. The annual turnover of total biodiversity resources utilized by those common people is near about 33 lakh and near about 600 families is directly involved in that business. Beside cultivation, this business and fishery provide the financial support for them.

Keywords: Biodiversity, Resource, South West Bengal, India

INTRODUCTION

The village economy is depended on mainly cultivation. The use of biodiversity and natural resources is often a large proportion of the livelihood and sustenance needs for a community. In Sub-Saharan Africa, a 30-50% range of reliance on non-farm income sources is common; in Southern Africa, the reliance increases to 80-90%. In South Asia approximately 60% of rural

House hold income comes from non-farm sources (Ellis, 1999). However, because of degraded

Biodiversity, over 60% of the world's poorest people live in ecologically vulnerable areas

(Angelsen, 1997). This degradation threatens not only the species and habitats within a region but contributes to furthering the poverty within the region. Much of the worlds' biodiversity exists in resource bases that are either managed as common Property resources or as open access resources. Examples of common property or open access resources that are threatened with over-exploitation and loss of biodiversity include habitats such as near-shore coastal areas, coral reefs, pastoral lands, wetlands, lakes, and forests, among others.

Side by side; local people utilize some biodiversity resources for their better financial aspect. They used plant, plant parts, medicinally

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important plants; some animals etc for different purposes. It is recognized that biodiversity is important for the functioning of all ecosystems, and that excessive loss of biodiversity imposes real costs on resource users (Heywood, 1995). It is therefore interesting to consider the problem of biodiversity loss not just in refugia, but in managed ecosystems. Some of these have direct financial benefit and other have indirect. Intensification affects the combination of crops, livestock, symbiotic, competitors and predators. I argue that a reduction in the diversity of species in the system due to intensification may, in some cases, make agro-ecosystems more susceptible to exogenous shocks or changes in environmental conditions, and that this effect is not captured in market prices (Perrings *et al.*, 1995; Conway, 1993). The costs of biodiversity loss turn out to be sensitive to the distribution of income and assets (Perrings *et al.*, 1994). The Brundtland Report (WCED 1987) may be best known for putting sustainability on to the international policy agenda, but amongst its key arguments was the assertion that poverty induces environmental degradation. Dasgupta, in a number of contributions, has since explored the connection between poverty, population growth and environmental change (Dasgupta, 1993, 1995, 1996). His arguments lend formal support to the Brundtland view. At the same time, however, there is a growing empirical literature on the so-called Environmental Kuznets Curve (reviewed in Barbier, 1997) which seems to suggest exactly the opposite conclusion. It finds that environmental degradation is induced not by poverty but by development, and that indicators of environmental quality tend to be highest in countries where per capita income is lowest. I want to consider both the empirical evidence for a relation

between indices of poverty and proxies for biodiversity loss, and the behavioral link between rural poverty and the underlying causes of biodiversity loss. More particularly, I want to ask how rural incomes may be related to the market failures, which drive biodiversity loss in low-income countries. They generally collect some plant (entire) or plant parts and make different things which have a definite market value. The villagers of Jankapoor Gram Panchayat under Dantan Block where people used some plants like koetbel, berakolmi, amra, chorkhori, palashkhachi etc for making different things. Those things have definite market value and villagers earn a good profit by marketing the products. Generally villagers collect koetbel during late autumn and bring it to their home. After extracting the inner mass, the rinds are kept for sun dried for one and a half week. The inner mass is generally used as fuel for home purposes. After drying rinds are polished well both outer and inner side and then packed in jute bag or in polythin bag for transport where it got proper shaped for making toys and flat furnishing equipments. Berakolmi generally found throughout the year and more or less every part of the village area. Villagers collect them from different part and stack them in their own house for few days. After, the bark remove and kept for sun drying. Sometimes the whole plant parts may splitted longitudinally into four parts or even more than that. Then they are bleached or colored by some artificial dye. Some time they make some design or transport them in same condition.

The other materials like amra, chorkhori, palashkhachi are collected in bucket and it sold when the demand is increased.

STUDY AREA

The study had been conducted in block of Dantan 2 including 20 villages which are Jankapur, Kurul, Santoshpur, panithupia, koria, kulida, mulida, Bamonda, Boropanchkonia, Panchkunia, Rongsatia, Gourda, Satia, Satpukhuria, Baruni, Purushottampur, Laluchowk, Shyamsundarpur, Parmichawk, Bindyageria.

MATERIALS AND METHODS

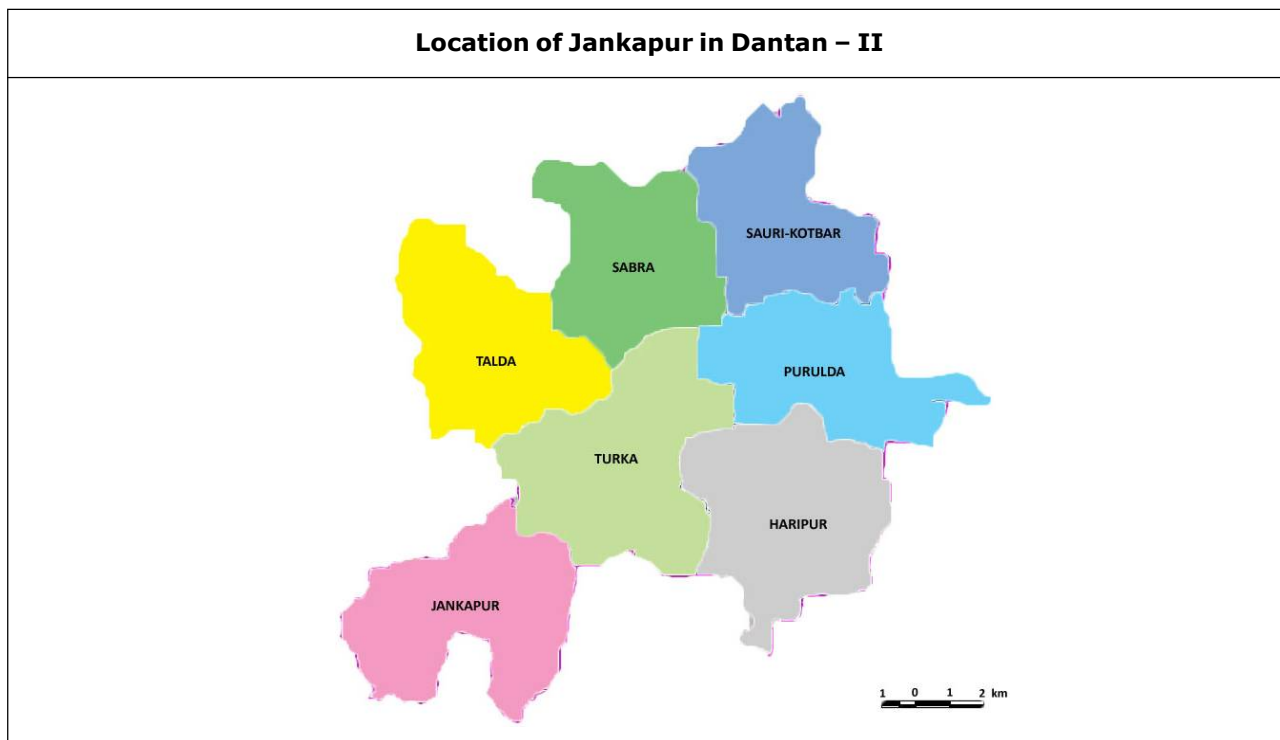
In survey, we choose all villages under Dantan Block, Medinipur where people involved in this business.

Feronia limonia L. is a deciduous, slow-growing, erect tree with a few upward-reaching branches bending outward near the summit where they are subdivided into slender branchlets drooping at the tips. Bark ridged, fissured and scaly; spines sharp, 2-5 cm long on some of the zigzag twigs. Leaves alternate, 7.5-12.5 cm long, dark-green, leathery, often minutely toothed, blunt

or notched at the apex, dotted with oil glands and slightly lemon-scented when crushed. Flowers dull-red or greenish, to 1.25 cm wide, borne in small, loose, terminal or lateral panicles. Fruit round to oval, 5-12.5 cm wide, with a hard, woody, greyish-white, scurfy rind about 6 mm thick, pulp brown, mealy, odorous, resinous, astringent, acid or sweetish, with numerous small, white seeds scattered through it. *Feronia* is a monotypic genus in the family Rutaceae. There are 2 forms, one with large, sweet fruits and the other with small, acid fruits.

In case of koetbel, per piece of koetbel is sold at 70-80 paise. Furnishing cost of per piece is varied from 30-40 paise. This 30-40 paise distributed to those people who are engaged in drying, rinding and coloring. The totals turn over in case of koetbel is near about 6 lakh per annum, total consumption near about 5 lakh pieces per annum and near about 150 families are directly attached with the business.

Location of Jankapur in Dantan – II



Ipomoea carnea Jace (Figure 1A) grows in water or on moist soil. Its stems are 2-3 metres (7-10 ft) or more long, rooting at the nodes, and they are hollow and can float. The leaves vary from typically sagittate (arrow head-shaped) to lanceolate, 5-15 centimetres (2-6 in) long and 2-8 centimetres (0.8-3 in) broad. The flowers are trumpet-shaped, 3-5 centimetres (1-2 in) diameter, usually white in colour with a mauve centre. The flowers can form seed pods which can be used for planting.

Figure 1A: *Ipomoea carnea* Jace.



In case of berakolmi (Figures 1B, 1C and 1D), these plants are collected from different places of the village and they are furnished by different way which cost varies from 30-40 paisa per pieces. Fresh stock kolmi is purchased from market is near about 2.50 paisa per pieces and after furnishing it is marketed as 3.20 paisa per pieces.

Saccharum spontaneum L. (Figures 2A and 2B) is a grass native to South Asia. It is a perennial grass, growing up to three meters in height, with spreading rhizomatous roots.

Figure 1B and 1C: People Working on *Ipomoea carnea*



Figure 1D: Final Product Prepared from *Ipomoea carnea*



Figure 2A: *Saccharum spontaneum* L.**Figure 2B: Cutting Pieces of *S. spontaneum***

In the Terai-Duar savanna and grasslands, a lowland ecoregion at the base of the Himalaya range in Nepal, India, Bangladesh and Bhutan, kans grass quickly colonises exposed silt plains created each year by the retreating monsoon floods, forming almost pure stands on the lowest portions of the floodplain. Kans grasslands are an important habitat for the Indian rhinoceros

(*Rhinoceros unicornis*). In Nepal, kans grass is harvested to thatch roofs or fence vegetable gardens.

Elsewhere, its ability to quickly colonize disturbed soil has allowed it to become an invasive species that takes over croplands and pasturelands.

Palashkhachi and chorkhori were collected from outside of the village and stock in bundle form and also marketed as same form when the market value is favorable.

Spondias dulcis L. has deciduous, pinnate leaves, 8 to 24 in (20-60 cm) in length, composed of 9 to 25 glossy, elliptic or obovate-oblong leaflets 2.5 to 4.0 in (6.25-10 cm) long, finely toothed toward the apex. The tree produces small, inconspicuous white flowers in terminal panicles, assorted male, and female. Its oval fruits, 2.5 to 3.5 in (6.25-9 cm) long, are long-stalked hard, turning golden-yellow as they ripen. According to Morton (1987), "some fruits in the South Sea Islands weigh over 1 lb (0.45 kg) each".

Juncellus inundates Clarke. (Figures 3A, 3B and 3C) is perennial, annual, glabrous herbs, leaves mostly towards the base of the stem. Stem with an umbellate inflorescence. Bracts are more leafy with bracteoles under the secondary divisions of the inflorescence; rachilla of spikelet persistent, not disarticulating towards the base. Glumes distichous, two lowers empty. Those above two sexual. All nearly equal deciduous from below upwards, the uppermost 1 or 2 sterile or empty; hypogynous scales or bristle 0. Stamen 1-2, anther linear or oblong, ovary ovoid, fruit plano-convex, dorsally compressed nut.

Amra are also stock in bucket and dried and then marketed it as same as previous.

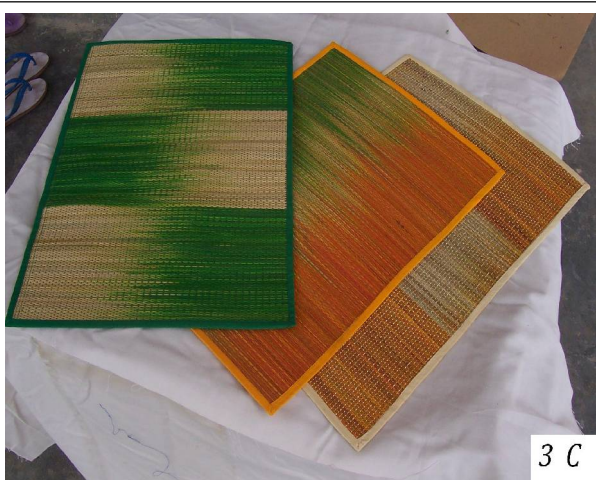
Figure 3A: *Juncellus innundatus* L.



Figure 3B: An Women Preparing Mat from *J. innunudatus*



Figure 3C: Mats Made from *J. innundatus*



RESULTS AND DISCUSSION

The total annual turnover is 33 lakhs per annum; 10 Business centers are spread throughout the villages of this block and near about 600 families are directly attached with this business of which 200 families main and only business is this and other have own land for cultivation.

Koetbel are Used for making soft toys and also for home interior decoration. There are three business centre based on this plant products and five lakhs pieces are consumed during a year. Kolmi are used for making decorating materials. The number of business centre is two, based on these plant materials. The total consumption is near about 7.5 lakhs pieces per year. The twigstock of palashkhachi are used for making different things for home work. There are two business centers are found based on this material. Total approximate 20 lakhs pieces per annum are consumed. Amra are used as seed stock for future marketing. Near about 12 lakhs are consumed per year as seed stock. Chorkhori are used for making mat which are generally export by cutting into pieces. The total consumption are approximate 15 lakh pieces per annum (Refer to Table 1, Figures 4 and 5).

The data calculated thoroughly and accumulated in following tabular form.

Different Species and Their Uses

The involvement of total families with these industry are 583 which include 150 families with koetbel industry, 400 families with kolmi industry, 20 families with palashkhachi industry, 12 families with amra industry and one family with chorkhori industry. The total annual business turnover are 33 lakhs of which koetbel share 18% (6 lakh), kolmi share maximum i.e. 73% (24 lakh), and palashkhachi, amra, chorkhori share 3% (1 lakh) each (Refer Table 2, Figure 6 and 7).

Economic Turnover

Table 1: The Table Shows Relative Consumption of Different Species with their Different Uses

S. No.	Local Name	Scientific Name	Family	Use	No of Business Centres	Consumption Volume
1.	KoetBel	<i>Fernonia limonia</i>	Rutaceae	Toys and Decorating	3	5 lakhs pieces per annum (approx.)
2.	Kolmi	<i>Ipomoea carnea</i>	Convolvulaceae	Decorating	2	7.5 lakhs pieces per annum (approx.)
3.	ChorKhor	<i>Saccharum spontaneum</i>	Papilionaceae	Twig Stock	2	20 lakhs pieces per annum (approx.)
4.	Amra	<i>Spondias dulcis</i>	Anacardiaceae	Seed Stock	2	12 lakhs pieces per annum (approx.)
5.	PalashKhachi	<i>Juncellus innundatus</i>	Cyperaceae	Mat	1	15 lakhs pieces per annum (approx.)

Figure 4: The Figure Shows Rate of Consumption of Different Species/Annum

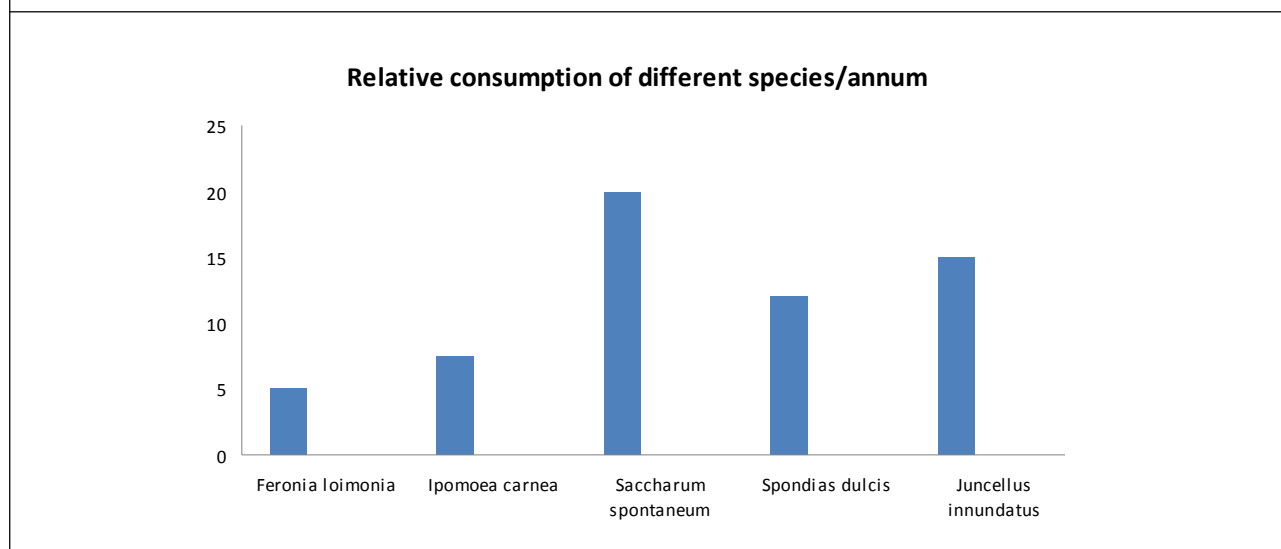


Figure 5: The Figure Shows Relative Consumption of Different Species/Annum

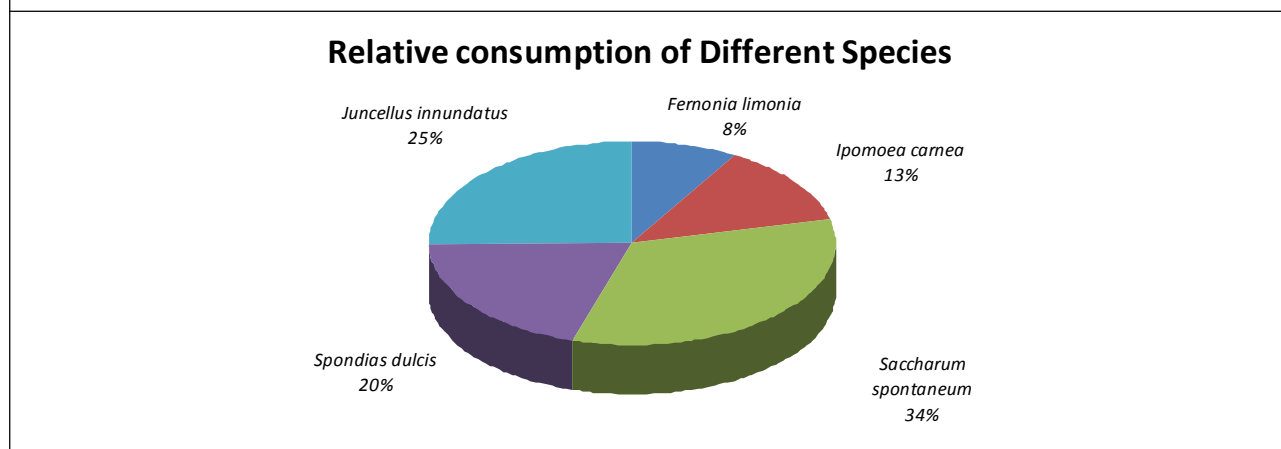


Table 2: The Table Shows Total Number of Attached Family and Annual Turnover

S. No.	Species	No. of Attached Families	Annual Turnover
1	<i>Feronia limonia</i> L. (KoetBel)	150	6 Lakhs
2	<i>Ipomoea carnea</i> Jace (Kolmi)	400	24 Lakhs
3	<i>Saccharum spontaneum</i> L. (ChorKhor)	20	1 Lakhs
4	<i>Spondias dulcis</i> L.(Amra)	12	1 Lakhs
5	<i>Juncellus inundatus</i> Clarke. (PalashKhachi)	1	1 Lakhs

Figure 6: The Graph Shows Relative Economic Turnover from Different Species/Annum

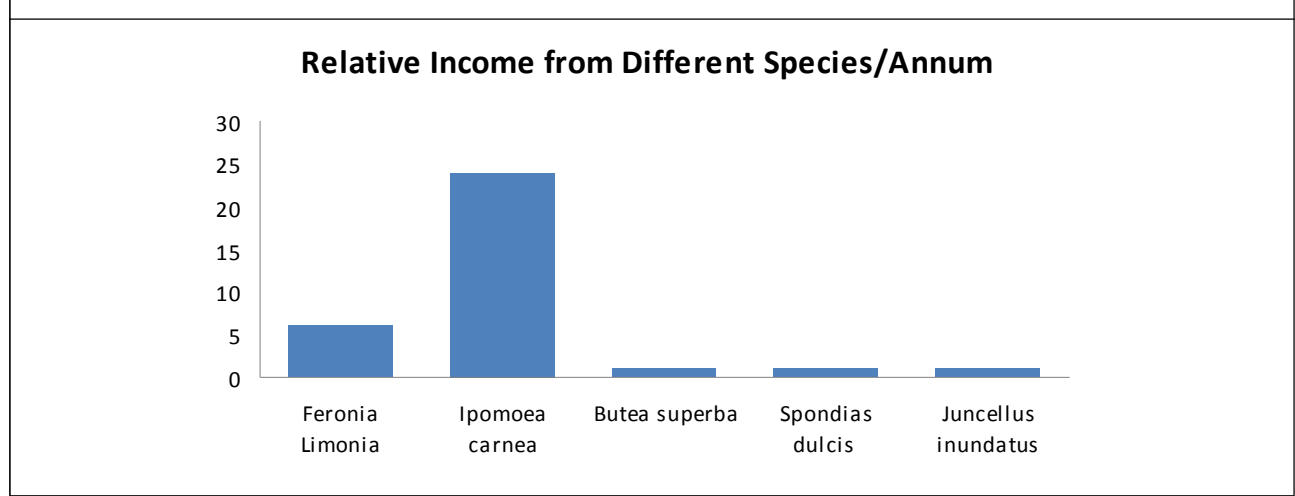
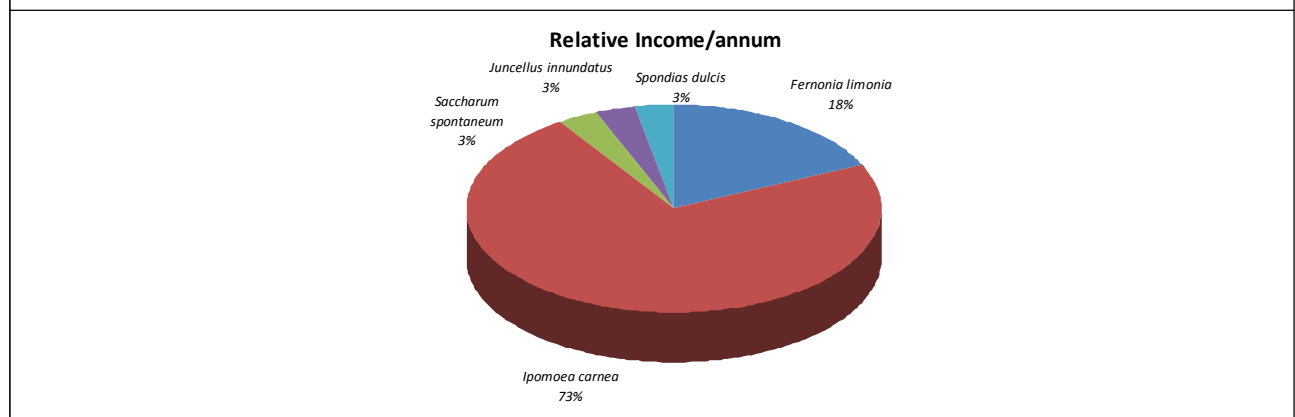


Figure 7: The Figure Shows Relative Income from Different Species/Annum



CONCLUSION

It can be summarized that 33 lakhs of total turnover mount comes from this biodiversity resource utilization and near about 2400 people directly attached with this business which is more

or less 15% of total population. So, if biodiversity is used properly it can provide good benefit to us.

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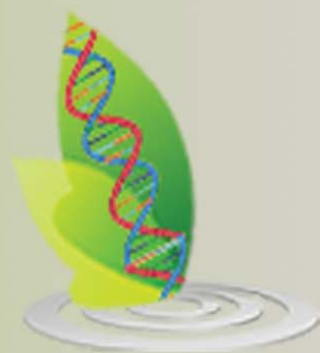
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