

Status of Environment & its Related Issues

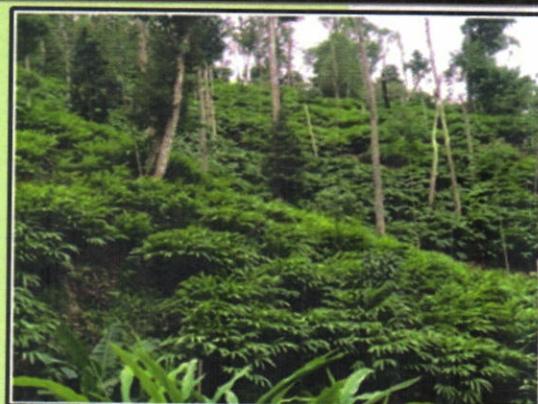
Sixth Edition Vol. 3 (2) Oct-March (Half Yearly Edition)



Above pic:- During Field visit at Cardamom Plantation, Potin by Dy. Director (Env) & ENVIS Coordinator, ENVIS Officials, CMS New Delhi alongwith media persons on 11-04-2018

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NOTES

Arunachal ENVIS Hub has put the best effort in publishing this Newsletter. In spite of all hard work & efforts there may be short coming and error of printing & incomplete data information or what so ever may be skipped out, regarding the published article (Newsletter). So, any suggestion & feedback will be heartily welcomed

About ENVIS

Environmental information plays a vital role not only in formulating environmental management policies but also in the decision making process aiming at environmental protection and improvement of environment for sustaining good quality of life for the living beings. Hence, management of environment is key component and thus plays an important role in effecting a balance between the demands and resources available for keeping the environmental quality at a satisfactory level. Realizing such need Ministry set up an Environmental Information System (ENVIS) in 1983 as a plan programme as a comprehensive network in environmental information collection, collation, storage, retrieval and dissemination to varying users, which include decision-makers, researchers, academicians, policy planners and research scientists, etc. ENVIS was conceived as a distributed information network with the subject-specific centers to carry out the mandates and to provide the relevant and timely information to all concerned. Further, association of the various State Governments/UTs was also felt necessary in promoting the ENVIS network to cover a wide range of subjects. The subject area for States/UTs ENVIS Centers was the status of environment and related issues. Thus, the network was expanded gradually with the involvement of thematic subject-areas and State Government/UT departments to make it a more comprehensive environmental information network. ENVIS network at present consists of a chain of 69 network partners out of which 40 are on subject-specific and 29 on State/UT related issues. These network partners are called ENVIS Centers and are located in the notable organizations/institutions/State/UT Government Departments/Universities throughout the country. The focal point of ENVIS is located in the Ministry and assists the Environment Information (EI) Division in coordinating the activities of all the ENVIS network partners by making ENVIS a web-enabled comprehensive information system.

1. LARGE CARDAMOM

Common names : Large cardamom, Badi elaichi, Hill cardamom, Indian cardamom, Nepal cardamom, Black or Brown cardamom.

Vernacular names : Badi elaichi (Hindi, Urdu), Boro elaichi (Bengali), Black cardamom (English), Elaa (Nepalese), Belak, Bebo, Tali or Taje and jacker (Arunachelee)

Scientific name : *Amomum subulatum* Roxb.

Kingdom : Plantae
Order : Zingiberales
Family : Zingiberaceae



Pix by ENVIS Programme Officer

**Fig : Large Cardamom Garden at Lower Subansiri District
Arunachal Pradesh**



Large cardamom is a perennial herbaceous spice made from the seeds of several plants in the genera *Elettaria* and *Amomum* belonging to the family Zingiberaceae also known as black cardamom. Both genera are native to the Indian subcontinent and Indonesia. It is a shade loving plant (Sciophyte) grown at an altitude ranging from 900-2000 above mean sea level with 3000-3500 mm/year rainfall spread for 200 days. The plant is a perennial herb with subterranean rhizomes with leafy shoots. Stem is a pseudo stem which is called tiller. Inflorescence is spike. Usually, 30 to 40 flowers are observed in a spike. Flowers are yellow, bisexual, zygomorphic and pollinated by bumble bees. There are three petals with a labellum which is mainly for attracting insects for pollination. Anthesis occurs in the morning hours. Ovary is inferior with ovules in axile placentation, stigma funnel shaped; fruit is a capsule, maroon in colour with seeds which are whitish in immature stage and dark brown to black in mature stage. The capsule size is about 4 to 6 times bigger than small cardamom and has an acceptable taste, flavor and aroma that stimulate the taste buds when used in rice and meat preparations, besides a wide range of beverages and sweets. Flowering usually starts at the month of May- July and fruiting in August- November. Propagation is raised artificially through seeds and suckers and harvested during August to October. In India, it is a popular ingredient of pan masala. The cardamom oil is a precious ingredient in food preparations, perfumery, foods, medicines and beverages.



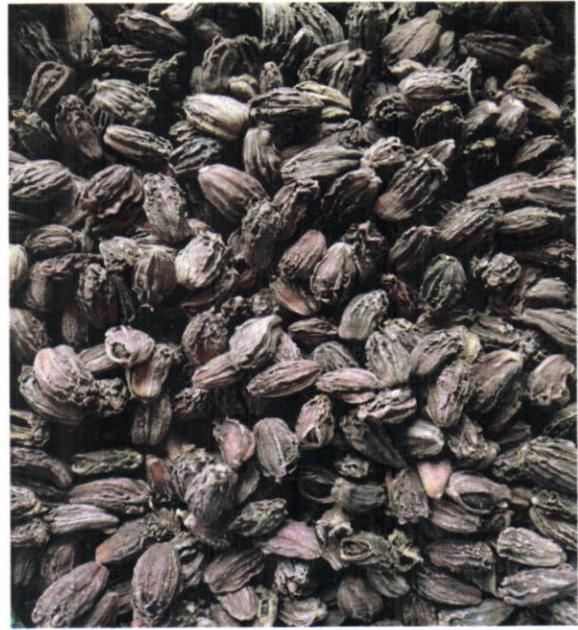
Pix by D. James ENVIS Programme Officer

Pic : Large Cardamom ready for harvesting

Pic : Large Cardamom before curing



In Palin, Kradadi District



Pix by D. James ENVIS Programme Officer

Fig : Cardamom Capsule after curing

Propagation & Planting :

Cardamom is propagated vegetatively by division of the suckers (rhizomes) or by seeds. For vegetative propagation, suckers from large clumps of growing plants are taken out, separated into small clumps and planted in prepared pits. Seeds may be collected from well ripened fruits from a healthy mature plant at least five years old. They may be washed and sown immediately or they can be mixed with ash and dried for a week before sowing. They can be sown in deep rich soil prepared with well rotted organic matter, on raised beds. The plant prefers loamy soils rich in organic matter, which are usually acidic in nature with a pH range of 5.0 to 6.5. It thrives best under moderate shade. The seeds germinate 5-7 weeks after sowing and are ready to be transplanted when they reach a height of 25-30 cm and develop a couple of leaves. Plant them 6-18 inches apart in small pits not too deep. Seedlings should be supported by stakes and mulched. Water to keep the beds moist, too much watering is not good. After plantation weeding, mulching, irrigation, shade regulation and gap-filling should be done at regular interval of time.





Pix by D. James, ENVIS Programme Officer in Palin, Kra Daadi Dist. Ar.P

Pic : Newly Planted large Cardamom Sapling

Weeding: Weed trashing is carried out twice a year, once during the onset of monsoons (May–June) and before harvesting.

Mulching: Mulching is done by covering fallen leaves around the collar region of the clumps during November–April.

Irrigation: Irrigation is necessary during summer months as large cardamom plants do not tolerate drought. Constant maintenance of optimum soil moisture level ensures early fruit bearing. Irrigations are done once in every 10 days during December–April. Drip irrigation or sprinkler irrigation is most efficient.

Shade regulation: Tall-growing trees are pruned regularly at a height of 4–5m to encourage spreading habit with renewed vegetative vigour to provide a uniform shade.

Gap-filling: Gap filling is done by removing the damaged and diseased plants and replacing them with healthy ones. This also helps maintain an effective plant population. The ideal time for gap filling is May–July.

Curing of Large Cardamom:

The fresh large-cardamom capsules contain about 70 –80% moisture (on wet basis) depending upon the maturity level of the capsule at the time of plucking. Unlike the practice in southern India, where only matured capsules are plucked,



the whole cardamom capsule bunch is plucked in Arunachal Pradesh. Later on, each capsule is separated from the bunch/flower and cleaned for drying. In order to achieve longer storage life and also to bring out its aroma, it has to be dried to reduce the moisture content to a level below 10% (on wet basis).

Drying: This is the most important part of the process as it affects the quality of the final product. It is important to dry the cardamom capsules as soon after harvest as possible to prevent the loss of flavour. It is also important that the drying process is as short as possible so that mould does not grow on the capsules and the bright green colour is retained. The drying temperature should not be above 50°C as this affects the colour and delicate flavour of the final product. In most places, cardamom capsules with a good green colour can be sold for a premium price. The moisture content of a fresh cardamom capsule is about 85%. This needs to be reduced to 10% in the dried product so the cardamom capsules can be stored. If the drying period is too long mould can start to grow on the cardamom. There are several options available to the small scale processor, depending upon the size of the business and the local weather conditions at the time of processing. Each method has different advantages and disadvantages:

Sun drying: Traditionally, cardamom capsules are spread on a concrete floor to dry using the natural heat from the sun. The capsules should be placed away from direct sunlight to preserve the green colour (strong sunlight will make the colour fade). This is the simplest and cheapest method, but does not produce the highest quality product. It is only successful in places where the climate is dry and hot. During the monsoon season for example, drying will be interrupted by rainfall which can cause mould to grow on the capsules. During drying, the capsules may be contaminated by dirt and dust from their surroundings.

Solar drying: The use of a solar dryer should improve the quality of the dried capsules as it is a cleaner, more controlled environment. However, it is not a popular choice as the green colour is lost during drying. The solar dryer is really only useful in dry hot sunny climates. The capsules should be placed in the dryer, out of direct sunlight, and dried until they have a final moisture content of 10%. In places with high humidity the solar dryer can only be used together with an extractor fan to remove the humid air.

Wood-fire dryer (local bhatti or rapki): In India, cardamom capsules are traditionally dried in curing houses, using wood to provide the heat. This



method puts a huge demand on firewood. The smoke from the fire can give the capsules an unpleasant smoked flavour. The processor must ensure that the capsules closest to the heat source are not burnt or scorched. Cardamom capsules dried by this method are not of the highest quality.

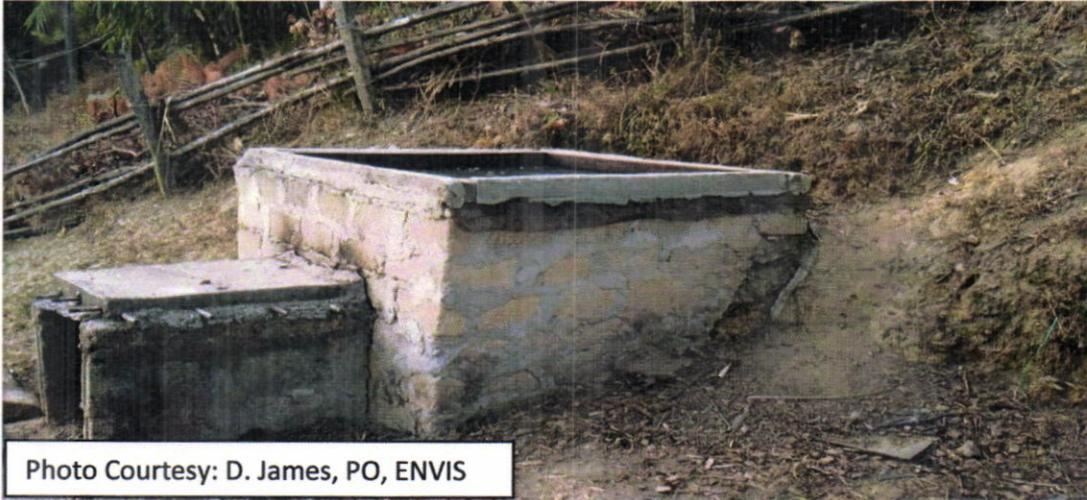


Photo Courtesy: D. James, PO, ENVIS

Pic: Traditional curing system or Bhatti System use for drying the Cardamom Capsules taken from Lower Subansiri Dist.



Photo Courtesy: D. James, PO, ENVIS

Pic : Traditional curing system or Bhatti System use for drying the Cardamom Capsules taken from Kra-Daadi Dist.



Distribution:

The crop is mainly grown in India, Nepal, Bhutan and Myanmar. India being the largest producer of large cardamom enjoys the status of monopoly in this spice. In India, the main production centers are the sub-Himalayan ranges of Arunachal Pradesh, part of Nagaland, Sikkim and Darjeeling district of West Bengal. The important large cardamom growing districts of Arunachal Pradesh are as under: Anjaw, Kurung Kumey, West Siang and Lower Subansiri districts. Recently other districts like West Kameng, East Kameng, Kra-Daadi, Upper Subansiri, Upper Siang, East Siang, Dibang Valley, Changlang, Tirap and Longding and other mountainous parts of Arunachal Pradesh also started cultivating large cardamom.



Photo Courtesy: D. James, PO, ENVIS

Fig : Dried Capsule ready for Packaging and Supply



Uses of Cardamom

Cardamom is used for digestion problems including heartburn, intestinal spasms, irritable bowel syndrome (IBS), diarrhoea, constipation, liver and gallbladder complaints, and loss of appetite. It is also used for common cold and other infections, cough, bronchitis, sore mouth and throat, urinary problems, epilepsy, headache, and high blood pressure. In foods, cardamom is used as a spice. It is also used in soaps, creams, and perfumes.

How does it work?

Cardamom contains chemicals that might treat intestinal spasms, kill some bacteria, reduce swelling, and help the immune system.

Uses & Effectiveness:

High blood pressure: Early research shows that taking cardamom by mouth might help reduce blood pressure in people with newly-diagnosed, untreated high blood pressure.

Nausea and vomiting that can occur after surgery: Early research shows that applying a mixture of ginger, cardamom, and tarragon essential oils to the neck after anesthesia and surgery may help relieve nausea and prevent vomiting for up to 30 minutes in some people. However, the effect seems to vary depending on the number of vomit-causing drugs that were given during anesthesia or as pain relievers during and/or after surgery. In other research, breathing in a mixture of cardamom, ginger, spearmint, and peppermint from a gauze pad after minor surgery reduces nausea and the amount of medicine needed to control it.

- ❖ **Bronchitis.**
- ❖ **Common cold and other infections.**
- ❖ **Constipation.**
- ❖ **Cough.**
- ❖ **Epilepsy.**
- ❖ **Gallbladder problems.**
- ❖ **Gas.**
- ❖ **Headache.**
- ❖ **Heartburn.**
- ❖ **Intestinal spasms.**
- ❖ **Irritable bowel syndrome (IBS).**
- ❖ **Liver problems.**



- ❖ **Loss of appetite.**
- ❖ **Sore mouth and throat.**
- ❖ **Urinary problems.**
- ❖ **Other conditions.**

Side Effects & Safety:

Cardamom is likely safe when taken by mouth in amounts commonly found in food. It is possibly safe when taken by mouth in medicinal amounts, or when the vapour from the oil is breathed in, but the potential side effects of cardamom are not known.

Special Precautions & Warnings:

- **Pregnancy and breast-feeding:** Cardamom is possibly unsafe when taken by mouth in medicinal amounts during pregnancy. There is concern that taking cardamom in amounts larger than food amounts might cause miscarriage. There is not enough reliable information about the safety of taking cardamom in medicinal amounts if you are breast-feeding. Stay on the safe side and stick to food amounts.
- **Gallstones:** Do not take cardamom in amounts greater than those typically found in food if you have gallstones. The cardamom seed can trigger gallstone colic (spasmodic pain).
- **Dosing:** The appropriate dose of cardamom for use as treatment depends on several factors such as the user's age, health, and several other conditions. At this time there is not enough scientific information to determine an appropriate range of doses for cardamom. Keep in mind that natural products are not always necessarily safe and dosages can be important. Be sure to follow relevant directions on product labels and consult your pharmacist or physician or other health professional before using.

Large Cardamom: Research updates and future scope:

Large cardamom is an important spice and a powerful flavouring agent. It has a vast potential to improve climatic condition and livelihoods of growers if scientific way of cultivation is adopted. Therefore it is essential to become updated with recent researches and to know about the thrust area where more research is required.



Post Harvesting processing:

- **Modern practice:** a simple appropriate low cost updraft gasifier system for drying large cardamom was developed and field tested in Sikkim. It has easy transportability in hilly areas and operates without electricity in remote areas. Major benefits observed, are substantial fuel saving (>60%); improved quality of dried cardamom (retaining natural reddish colour and 35% more volatile oil) (Mande et. al, 2003)
- **Traditional Practices:** Curing by small farmers using primitive curing (smoking methods was observed by Mande et.al.(1999) found that traditional bhattis used for drying large cardamom, operate with very low thermal efficiency of the order of 5-15% and produce very poor quality product (smoky appearance and loss of volatile oil content).
- **Medicinal Property:** Agnihotri and Wakode (2010) found that methanol extract of fruits shows remarkable antimicrobial activity against *Escherichia coli*, whereas in case of other microorganisms it was found inferior to the standard drug used. Methanol extract of rind showed good antimicrobial activity against *Staphylococcus aureus*. it was found that the essential oil is isolated was effective against majority of microorganisms.
- **Disease Management:** Gudade et.al (2013) reported that area, production and productivity under large cardamom have declined over the years in Sikkim. The major reasons for decline are menace of colleotrichum blight, chirke, foorkey, pest incidence, lack of improper planting materials, lack of irrigation and phytosanitary measures. This problem was overcome by establishment of large cardamom sucker nursery at Sikkim so as to increase the area under its cultivation.
- **Climate Change:** Large cardamom agro forestry is a mountain adaptive land management and production system that helps in conserving soil and water, maintain soil fertility and high rate of carbon sequestration than any other land use system in the region. The system is a major contributor of sustainable development in the mountain region by providing socio-ecological sustainability, watershed functions; and cultural, social and recreational values in addition to the employment opportunities in ecotourism. (Sharma et.al.,2009)



Important consideration for post harvest management:

- i) Harvest the crop at right maturity. Top capsules in a spike should be mature (black in colour).
- ii) Do not use pesticide / fertilizer bags for collection of capsules during harvest. Bamboo baskets are ideal structure to carry the capsule. To avoid contamination pesticides / fertilizers bags should not be used.
- iii) Do not delay removing capsules from the spikes after harvest. Delay in removing imparts blackish colour to the capsules.
- iv) Remove extraneous matter and wash thoroughly the harvested produce before drying.
- v) Adopt flue pipe system of curing to retain the original colour, aroma and flavour. Direct heating damages the colour of capsules.
- vi) Dry the capsules immediately after harvest to avoid discoloration.
- vii) Dried cardamom capsules should not contain more than 10% moisture for better shelf life.
- viii) Remove tails after drying.
- ix) Grade according to size and colour and store in moist proof containers.
- x) Use polythene lined gunny bags for storing. Store in dry places and in wooden boxes.
- xi) Take necessary precaution against rat and insect damages.
- xii) The cured cardamom may preferably be sold soon after drying provided the growers get remunerative price.

Prospects

- i) **Vast untapped areas with suitable agro ecosystem:** There are vast areas in Arunachal Pradesh which can be brought under large cardamom cultivation.
- ii) **Organic product:** In North East, large cardamom is mostly cultivated without applying any chemicals. There is a good scope for certifying large cardamom of this region as organic.
- iii) **Low cost of curing and available input (fire wood):** Lots of firewood is available in the cardamom growing areas. Firewood based curing system may be encouraged to reduce cost of curing.



- iv) **Long shelf life of cured product:** Properly cured capsules can be stored for longer period. There is no distress sale in large cardamom. Planters can sale the produce when the price is remunerative.
- v) **High value low volume crop:** Due to its high value low volume crop transportation of the produce is easy.
- vi) **Eco friendly crop:** It can be grown under forest cover without hampering the ecosystem. Due to less use of chemical pesticides it does not hamper quality of cured product as well as environment.
- vii) **Cultivation of unpermitted crop may be replaced with large cardamom:** Large cardamom is a suitable crop to replace many crops whose cultivation is not legally permitted in some areas of NE states. Proper post harvest management, value addition and establishment of market linkage may help employment generation.
- viii) **Strategic location :** NE states are located strategically in a suitable position for developing export market with Bangladesh and other South East Asian Countries .
- ix) **Sell counters:** There should be sale counters for different spices in all the district head quarters of large cardamom growing districts.

Future Research Needs:

Large cardamom production is declining for mainly three reasons:

- I. Biological (root rots, pests infestation, leaf blight, soil fungus, caterpillar, pollen theft, old age of orchards, and spread of disease from alder trees);
- II. Socio-economic (scarce labour, disintegration of joint family, farming as unattractive option for youngsters) and
- III. Inadequate extension activities and priority for cardamom research.

The value chain for large cardamom consists largely of traditional practices. Scientific improvement are needed in many postharvest steps and marketing. Also there is a requirement of some product innovation which could be more effective for varied personal use. More multiplication units are also required to produce disease free planting material.

Production is currently declining in most of the areas, and improved postharvest management would be one way to help ensure sustainability. improvement in postharvest [processing mainly curing, calyx cutting, packaging and storage, quality issues, and trade patterns; and research topic



that could contribute to increasing its quality and value; thereby protecting and promoting the livelihoods of several thousands of people in the value chain (Singh and Pothua, 2013).

Threats of Cardamom farming

- Intense Cultivation of cardamom has drastically change forest structure and species composition, leading to gradual degradation of biodiversity and ecosystem services.
- Apart from disturbing biodiversity, cardamom plantations affect water and soil quality in tropical forests, due to indiscriminate use of fertilizers and pesticides.
- As we know Cardamom grows best in the shade and humidity beneath tall trees in tropical forests. But planters may thin out the canopy and clear natural undergrowth to improve yields this basically affects the natural habitat.
- An insect called Chigger mite responsible for Scrub typhus disease is a major concern among many Cardamom workers in recent time.
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Conclusion

Though cardamom is a perennial crop, its growth behaviour resembles more to a biennial crop in the sense that vegetative phase (tillers) emerging in one year turns into reproductive phase during the second year and produce panicles, flowers and capsules. Cardamom, being cultivated as an undergrowth with shade trees, competition for inputs among them makes nutritional management an important practice in realizing optimal yield of the crop. Rise in cost of fertilizers makes necessary their use in an efficient and economic manner. Even though there exists greater demand for different spices produced through organic cultivation practices, the demand for organic cardamom is not much at present. However, production of cardamom through low input sustainable agriculture incorporating integrated nutrient management system involving use of various kinds of organic manures and bio-fertilizers should be aimed at in the present day context of preservation of natural ecosystem and environmental protection.



2. Local Environmental News

a. Floods devastated claim three lives, injure several, cause damages throughout Capital



Scenes of devastation



Scenes of devastation



Near Chandranagar petrol pump



On Hoj-Potin road

ITANAGAR, Sep 14: Floods triggered by torrential rain in the state capital Itanagar have claimed three lives and at least 55 houses were damaged by flood in Modirijo Colony in Itanagar during the wee hours, following night cloudburst. The water level of the river nearby rose and swept away the houses. According to an official report, around 18 houses were fully washed away and 37 houses were damaged partially in Modirijo. Joint teams of police, NDRF and SDRF personnel carried out the rescue operation of the deceased. Apart from Modirijo other areas like Donyi Polo Colony, the Lobby area, and near Rajiv Gandhi Polytechnic College in Itanagar, and in Press Colony/Kurung Pare in Naharlagun were also affected badly. Looking at the situation the DC issued an order directing the people residing in vulnerable areas to vacate to safer locations or temporary relief camps to avoid loss of lives and properties.



b. Villagers on elephant corridor replacing paddy with aromatic plants

On 15th September 2018 Dr. Nima D Namsa assistant professor, Molecular Biology & Biotechnology of Tezpur University told the people of Painaktang village of Kalaktang-Balemu tehsil of West Kameng district to Cultivate aromatic crops in place of paddy in elephant affected areas. As per the report from farmers of the village had been practicing irrigated paddy cultivation for many years. However, during the last 10 years, most of the farmers discontinued paddy cultivation due to repeated destruction of standing crops by wild elephants. As per research point of view the plantation of improved varieties of aromatic plants like lemongrass and citronella developed by the CIMAP was carried out in a seven-acre area of the village under the guidance of scientific staffers of the CSIR-CIMAP and Tezpur University. As these aromatic plants are non grazeble and also it will help farmers of Arunachal Pradesh in boosting their income through cultivation of high value aromatic crops like wise scented geranium, rose, lavender and salvia. In connection to this farmers of the village are ready to cooperate with CSIR-Aroma Mission staff to bring more areas under cultivation of such aromatic plants.

c. 171 species documented in Ziro Butterfly Meet



d. Proposal to make TWS a butterfly sanctuary

YAZALI, Sep 24: The fifth edition of the Ziro Butterfly Meet 2018 saw the documentation of 171 different species of butterflies from Yazali area of Lower Subansiri district. The two-day event, which concluded on Sunday, also witnessed the sighting of important species like the White Dragontail, Veined Jay, Bispot, Black Prince, Large Yeoman, Tiger Hopper, Red Base, Jezebel, Grey Pansy, and Chocolate Tiger. The meet came up with a set of recommendations, including submission of proposals to the government for designation of Kaiser-e-Hind as the state butterfly and Talle Wildlife Sanctuary (TWS) as a butterfly sanctuary. Two NGOs namely Ngunu Ziro and Panyor Solyoq were the organizer of the meet. Earlier, the participants from various parts of the country, including Kerala, Karnataka, Tamil Nadu, Maharashtra, West Bengal and Assam, dressed in their traditional attires, displayed their cultures. NgunuZiro has been organizing the Ziro Butterfly Meet every year in order to spread awareness about the importance of all creatures in the ecosystem and to promote their conservation. Tourism Assistant Director Bengia Mana Sonam, Ashoka Trust for Research in Ecology and Environment (ATREE) regional director Sarla Khaling and a host of senior leaders of Yazali area



attended the valedictory function. The fifth edition of the Ziro Butterfly Meet was sponsored by the tourism department as part of the Paryatan Parv being observed all over the country from 16 to 27 September. Other sponsors included Taba Apa, the State Foundation for Biodiversity Conservation, the ATREE, and the forests & environment department

e. **Papu-Yupia-Potin road contradicts govt's promise of Good highways.**

ITANAGAR, Jul 29: The Papu-Yupia-Potin stretch of the Trans-Arunachal Highway (TAH) is in a dilapidated condition. This stretch of the TAH was inaugurated by Union Road, Transport & Highways Minister Nitin Gadkari in January 2017, in the presence of MoS Home Kiren Rijiju and Chief Minister Pema Khandu. Along the 54 km stretch of the road, debris of landslides has accumulated in several areas, making the highway dangerous for the motorists. Not removing the debris has further caused massive damage to the road.



Pic:- Papu-Yupia-Potin TAH

The road has been washed away in some portions, and it has become extremely dangerous to travel on, especially at night. The situation is so bad that recently, the Papum Pare district administration issued an advisory note to the public to avoid using the Papu-Yupia-Potin highway during nighttime on rainy days. The dilapidated condition of highway has also led to an increase in travel time. "Just a year ago, it used to take only around 50 minutes to reach Potin from Doimukh. Now it takes much longer, and road is also not safe. In the evening, after 5 pm, hardly anyone uses this road. Also, we fail to understand why the highway authorities are not removing the debris from the road. PWD highway has miserably failed to maintain the once beautiful Papu-Yupia-Potin TAH," said a regular user of the road. Talking to this daily, a senior official of the PWD highway department informed that they are aware of the problem. "The highway has been handed over to the department and, as per the contract agreement, we cannot



With Best Compliments from...

Arunachal ENVIS Hub, Deptt. of Environment & Forests, GoAP, Itanagar

2019 ENVIRONMENTAL DAYS

FEBRUARY

World Wetlands Day - 2

MARCH

World Wildlife Day - 3
National Water Week (date not confirmed)
International Day of Forests - 21
World Water Day - 22
UN World Meteorological Day - 23
Earth Hour - 30

APRIL

Earth Day - 22
World Day for Safety and Health at Work - 28

MAY

Energy Month - 1-31
International Day for Biological Diversity - 22

JUNE

National Environment Month - 1-30
World Environment Day - 5
World Oceans Day - 8
World Day to Combat Desertification and Drought - 17

JULY

World Population Day - 17

SEPTEMBER

Arbor Day - 1
Clean up the World - 15
International Day for the Preservation of the Ozone Layer - 16
Clean-up and Recycle Week (date not confirmed)
World Water Monitoring Day - 18
Zero Emissions Day - 21
World Environmental Health Day - 26
World Rivers Day - 29

OCTOBER

National Transport Month - 1-31
World Habitat Day - 1
International Day for Natural Disaster Reduction - 13
World Food Day - 16

1. JANUARY

S	M	T	W	T	F	S
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2. FEBRUARY

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World Wetlands Day

3. MARCH

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31						

World Wildlife Day
National Water Week
International Day of Forests
World Water Day
UN World Meteorological Day
Earth Hour

4. APRIL

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Earth Day
World Day for Safety and Health at Work

5. MAY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Energy Month
International Day for Biological Diversity

6. JUNE

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

National Environment Month
World Environment Day
World Oceans Day
World Day to Combat Desertification and Drought

7. JULY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

World Population Day

8. AUGUST

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

9. SEPTEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Arbor Day
Clean up the World
International Day for the Preservation of the Ozone Layer
Clean-up and Recycle Week
World Water Monitoring Day
Zero Emissions Day
World Environmental Health Day
World Rivers Day

10. OCTOBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

National Transport Month
World Habitat Day
International Day for Natural Disaster Reduction
World Food Day

11. NOVEMBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

12. DECEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				





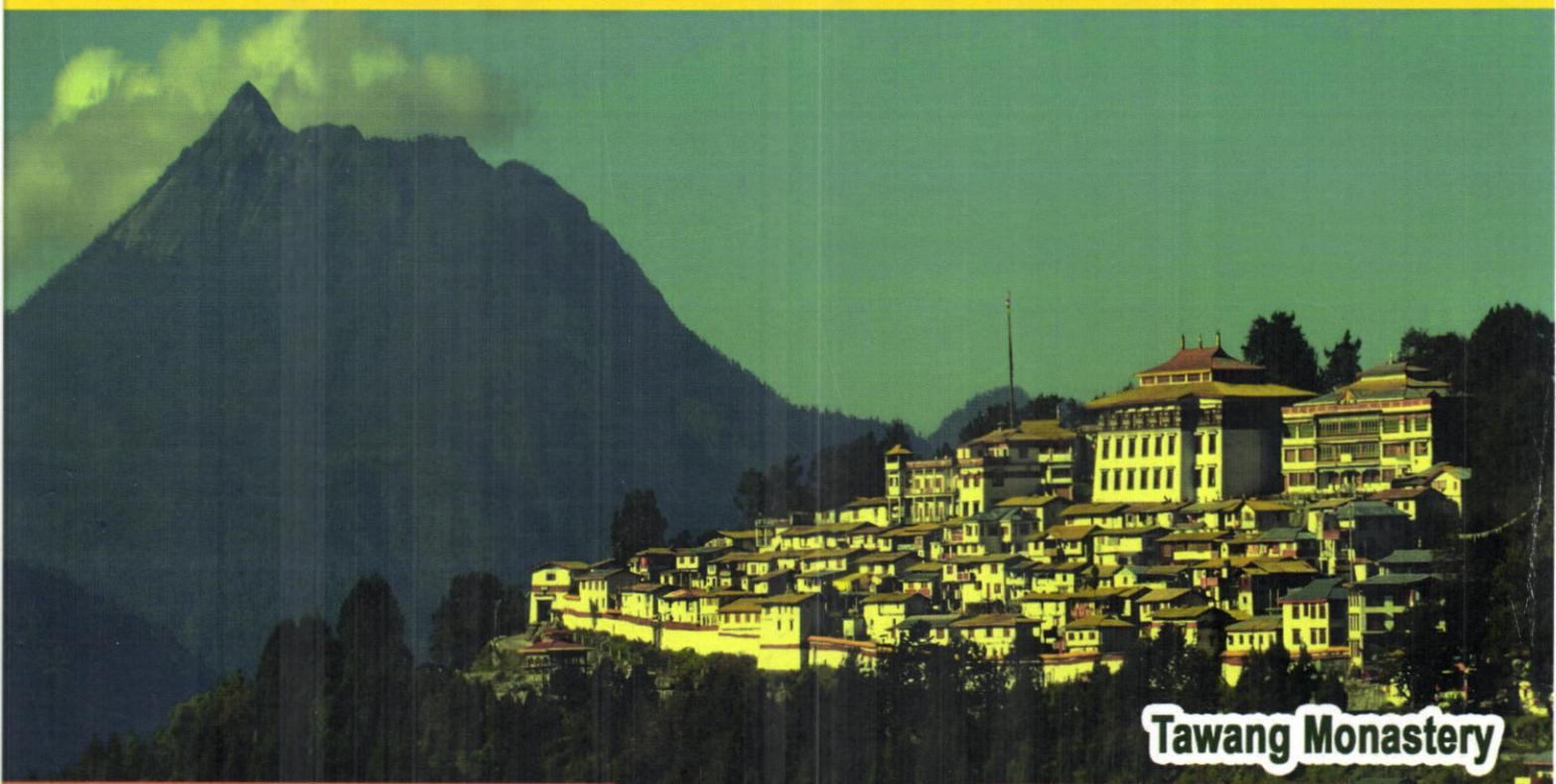
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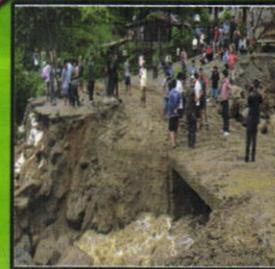
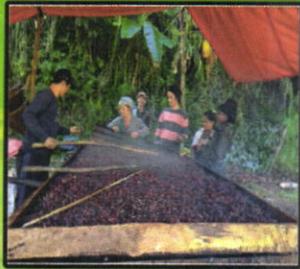
Newsletter

Status of Environment & its Related Issues

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Tawang Monastery



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