

Annexure- 2

Statement of Case

Naga Tree Tomato

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1. Background

Nagaland emerged as a separate State, carved out of the Naga Hills districts of Assam and North Eastern Frontier Agency (NEFA) province in 1963. The State has a population of 19.89 lakh with an area of 16,579 sq. km as per the 2001 census. About 82.26% population in Nagaland lives in rural area, and the population density is low at 120 per sq. km. Agriculture is the main occupation of the people of Nagaland and about 65% of the population depends on agriculture as per 2001 census.

Forest Cover ⁸	
Dense Forest	5137 Sq. Km
Open Forest	9027 Sq. Km
Scrub Land	14 Sq. Km
Non-Forest	2401 Sq. Km

Till recently, for most farmers horticulture has been mainly a backyard activity as they are generally busy throughout the year in cultivation of food crops and have little time for development of horticultural crops on a commercial basis. Besides, due to the long gestation period involved in plantation and horticulture crops, the cultivation of these crops has been generally confined to small backyard gardens developed by almost every household. It is only in the past decade that there has been a more focused attention to the development of horticulture in the State. The plantation and horticulture sector plays an important role in the development of the rural economy of the State. The diverse agroclimatic conditions, varied soil types and abundant rainfall prevailing in the State enables the cultivation of several plantation and horticultural crops covering fruits, vegetables, spices, flowers, mushrooms and medicinal and aromatic plants. The geographical conditions offer tremendous scope for horticulture development in the State.

Sub Region	Rainfall(in mm)	Soil
Himalayan Hills	2441	Brown Hills
North-East Hills	3528	Red sandy laterite
Upper Brahmaputra	2809	Alluvial, red loamy

Southern Hills	2052	Acidic soils
Lower Brahmaputra	1840	Alluvial, red loamy, tarai soils

The total area covered by horticulture crops has been estimated at 36177 ha (2006-07) which represents 9.95% of the gross cropped area (3.63 lakh ha). The State produces 1.57 lakh MT of fruits, 1.40 lakh MT of vegetables and 0.08 lakh MT of plantation crops. The State has about 58370 ha. under cultivable wasteland and 157210 ha. under permanent fallow of which an estimated 29000 ha could be developed under horticultural crops. In addition to this, with proper exploitation of potential surface water resources, about 10% of the additional area brought under irrigation could be devoted to high value horticultural crops, vegetables, etc. Based on the elevation, both sub-tropical fruits have potential for exploitation. ⁵

Nagaland has heavy rainfall but lacks adequate water storage facilities. Although it is blessed with good soil and Agro climatic condition is suitable for growing of various fruits and vegetables ranging from temperate to tropical crops under rainfed conditions, this infrastructure limitation leads to greater challenges in bringing more areas under irrigation. The average net area irrigated to total crop area is low at 43% and for the rest of 57% of area agriculture is being carried out under rain-fed irrigation condition.

Shifting (Jhum) and terrace cultivation remain the dominant form of the land use pattern of the State. Jhum cultivation has been devised over generations and terraced rice cultivation has been practiced for decades. Rice cultivation is mostly done in the plain area of Dimapur, Wokha, Mokokchung and Mon districts. Government of Nagaland has promoted terracing as an alternative to jhum cultivation. Use of technological innovations in terms of improved seeds, fertilizers and better implements has been limited. The level of fertilizer consumption in Nagaland was 4 kg/ha of net sown area. This practice of harmonizing with nature and influence of environment has enabled Nagaland to experience and explore organic farming practices. ⁵

1.1. Naga Tree Tomato

Naga Tree tomato is a fruit that grows on trees and has a close resemblance with tomato; this is how it got the name "Tree Tomato". The fruits are oval and egg shaped that grows in clusters. It is grown widely throughout the state of Nagaland and locally known as "Si Binyano" and "Khwüdi".

Naga Tree Tomato is an essential ingredient of Naga cuisine and widely used as a substitute of tomato, especially in winter season when tomato is not available in the market. It is generally a backyard crop but commercial cultivation is rapidly gaining ground owing to the high market

demand and climatic suitability. This gaining popularity ushers that it is high time to strengthen the market linkages and promotion through infrastructure development and GI registration.

2. Applicant organization

North Eastern Regional Agricultural Marketing Corporation Ltd (NERAMAC) has been assigned the responsibility of registration and supervision of GI by North East Council, Ministry of Development of North Eastern Region (DoNER) in consultation with the Directorate of Horticulture, Government of Nagaland.

North Eastern Regional Agricultural Marketing Corporation Ltd (NERAMAC) was incorporated at 31st March 1982 to support farmers/producers of north east getting remunerative prices for their produce and thereby bridge the gap between the farmers and the market and also to enhance the agricultural, procurement, processing and marketing infrastructure of the North eastern Region of India.

The Authorised Capital of the Corporation is Rs.10.00 Cr and the Paid-up Capital is Rupees Rs 7.62 Cr. Presently it is under the administrative control of the Ministry of Development of North Eastern Region (DoNER), Government of India, New Delhi, with its registered office at 9 Rajbari Path, Ganeshguri, Guwahati.

2.1. The Objectives of NERAMAC

- To undertake development and marketing of horticultural products within and outside the north eastern region and the supply of inputs, tools, equipment etc. required for the development of horticulture and agro-based industries whether own or run by the Government, statutory body, company, firm, co-operative or individual.
- To undertake, establish, acquire, purchase, sell and manage the projects for the development of horticultural products such as establishment of nurseries and commercial orchards, seed stations etc. and function as agent for the distribution of seeds, plants, processed food and other such products connected with the development of horticultural products.
- To manage, promote, aid and expedite the export of raw and finished horticultural produce and equipment and also to import raw and finished horticultural produce and equipment in furtherance of the company's business

Following is the constitution and list of directors of NERAMAC:

Name of Individual	Designations at NERAMAC and other govt. organizations
Shri Arvind Madhav Singh, IFS	Joint Secretary, Ministry of Development of North Eastern Region & Chairman, NERAMAC Ltd.
Shri Vinod H Kalbande	Managing Director, NERAMAC Ltd.
Prof. Charu Lata Mahanta	Professor Department of Food Processing Technology, Tezpur University & Director NERAMAC Ltd.
Shri Rohtash Singh	Director, Ministry of Development of North Eastern Region & Director NERAMAC Ltd.
Dr. Bidyut Chandra Deka	Joint Director, ICAR, Jharnapani (Nagaland) & Director NERAMAC Ltd.
Shri Rajen Lohia	Businessman, Dibrugarh (Assam) & Director NERAMAC Ltd.
Shri R. P. Gurug	CEO, Ecotourism & Conservation Society of Sikkim Gangtok (Sikkim) & Director NERAMAC Ltd.
Shri Hage Kojeen	Commissioner (Agriculture) Government of Arunachal Pradesh & Director NERAMAC Ltd.
Shri I. Meitei	Advisor (Horticulture), North Eastern Council & Director NERAMAC Ltd.
Shri Samuel Rosanglura	Director (Horticulture), Dept. of Agriculture, Govt. of Mizoram & Director NERAMAC Ltd.

NERAMAC is offering helping hand in sourcing and procuring cash crops of the producers by intervening in the market and provide them remunerative prices. It also helps processing units by providing raw materials and arranging packaging materials. NERAMAC has a few retail outlets within the North East region which directly sell various processed and value added products produced locally in the region. GI registration is a historical initiative to preserve and promote the

bio diversity of region and one more step to help the farmers of geographical location to secure better remuneration.

In line with the set organizational objective, NERAMAC established a branch office at **Nagaland** located at **C/o Joshua Chang Kija, Duncan Basti, House No. 302, Fellowship Colony , Dimapur, Nagaland - 797 112** and has been working for the betterment of local farming community.

We are committed to create better marketing opportunities and linkages for various stake holders in the value chain.

NERAMAC at a glance

<p>Incorporation: 31st March 1982</p> <p>Promoter: North Eastern Council, Govt. of India, Shillong-793 001</p>	<p>Administrative Ministry:</p> <p>Ministry of Development of North Eastern Region (DoNER),</p> <p>Govt. Of India, Vigyan Bhavan Annexe</p> <p>Maulana Azad Road, New Delhi – 110 011</p>
<p>Registered/Head Office:</p> <p>9 Rajbari Path, Ganeshguri</p> <p>G S Road, Guwahati – 781 005</p> <p>Phone: (0361) 2341427/28</p> <p>Fax: (0361) 2341428</p> <p>Email: neramac@gmail.com; info@neramac.com</p>	<p>Zonal Offices:</p> <ul style="list-style-type: none"> • Arunachal Pradesh • Assam • Manipur • Meghalaya • Mizoram • Nagaland

3. Specification

Naga Tree tomato is a fruit that grows on trees and has a close resemblance with tomato; this is how it got the name "Tree Tomato". It is grown widely throughout the state of Nagaland and locally known as "Si Binyano" and "Khwüdi". The fruits of the tree are oval and egg shaped that grows in clusters.

Given below are the specific characteristics of Naga Tree Tomato.

- Plant height : 10 to 18 ft
- Fruit bearing : In clusters of 3 - 12
- Shape : Oval / smooth egg-shaped fruit, pointed at both ends
- Fruit weight : 100 -150 grms
- Fruit Colour : Red to red / dark red
- Fruit Skin : Thin but hard and bitter in taste
- Leaves type : Evergreen and alternate
- Leaves size : Heart shaped at base, ovate and pointed at apex.

4. Description of Goods

Family: Solanaceae,

Genus: *Solanum*,

Botanical Name: *Solanum betaceum* (syn. *Cyphomandra betacea*)

Naga Tree Tomato fruits have a long stalk and borne singly or in cluster of 3-12. They are smooth, egg-shaped with a thin skin and a soft flesh during ripening and usually weighs about 100-150 gms. The colours may differ from red to orange/yellow to purple. Even the inside colours – when you cut them open – may differ. The taste too may range from sour to sweet. The fruits closely resemble a tomato; but although it looks almost like a medium sized tomato, but tree tomato is not a true tomato. The seeds are thin, flat, circular and relatively hard and bitter in taste. The fruits also have resinous aroma.³

The plant is stout, erect, small, somewhat tree like semi-woody shrub. It grows to a height of 10 to 18 ft. (rarely as much as 25 ft.). The evergreen leaves are alternate, heart shaped at the base, ovate and pointed at the apex. The leaves are pubescent.³

Although, Naga Tree Tomato can tolerate a few degrees of frost, they perform best and develop superior quality under frost-free conditions. The plant cannot tolerate long periods of drought but it also needs good drainage and needs protection from strong winds. It is generally considered as pest-free.¹

The fruit is rich in vitamins A and C as well as an excellent source of calcium, iron, potassium, phosphorous and magnesium.¹

5. Origin and Historical References

Naga Tree Tomato has been a traditional food item of the Naga people since time immemorial it is known locally as "Si Binyano". This tomato is used like any other tomato in preparation of food. A lot of people, however, prefer to have it as part of their "chutney" or pickle which usually accompanied a Naga meal. What is interesting is that this vegetable fruit goes very well as a combination with the Naga King Chilli. The fruit is believed to be brought here at a very early date as it is well established and distributed all over the Naga Hills. Some Nagas also call it Khwüdi.¹

Naga Tree Tomato is said to have been grown quite "early" in the Nilgiri hills and in the hills of Assam – Nagaland was earlier known as Naga Hills District of Assam.¹

Tree Tomato is a perennial vegetable which is very popular in Nagaland because of not only for its nutritive value but also its bearing habit and availability throughout the year. The reason of its popularity in Nagaland is that when common Tomato is not available during winter season tree tomato can be made available in place of common tomato to meet the local demand in the market. During winter common tomato is not available in Nagaland add the price of tomato become very expensive because they are brought from outside the state. One advantage of this crop is that it has an excellent keeping quality even at room temperature for several days without deteriorating its quality.²

6. Geographical Area of Production

6.1. Production

Naga Tree Tomato is grown in entire Nagaland although the scale of production is low. The production of Naga Tree Tomato in the year 2008-09 was estimated around 745 MT from about 100 ha of area, although the actual figure is suppose to be significantly higher because this crop is

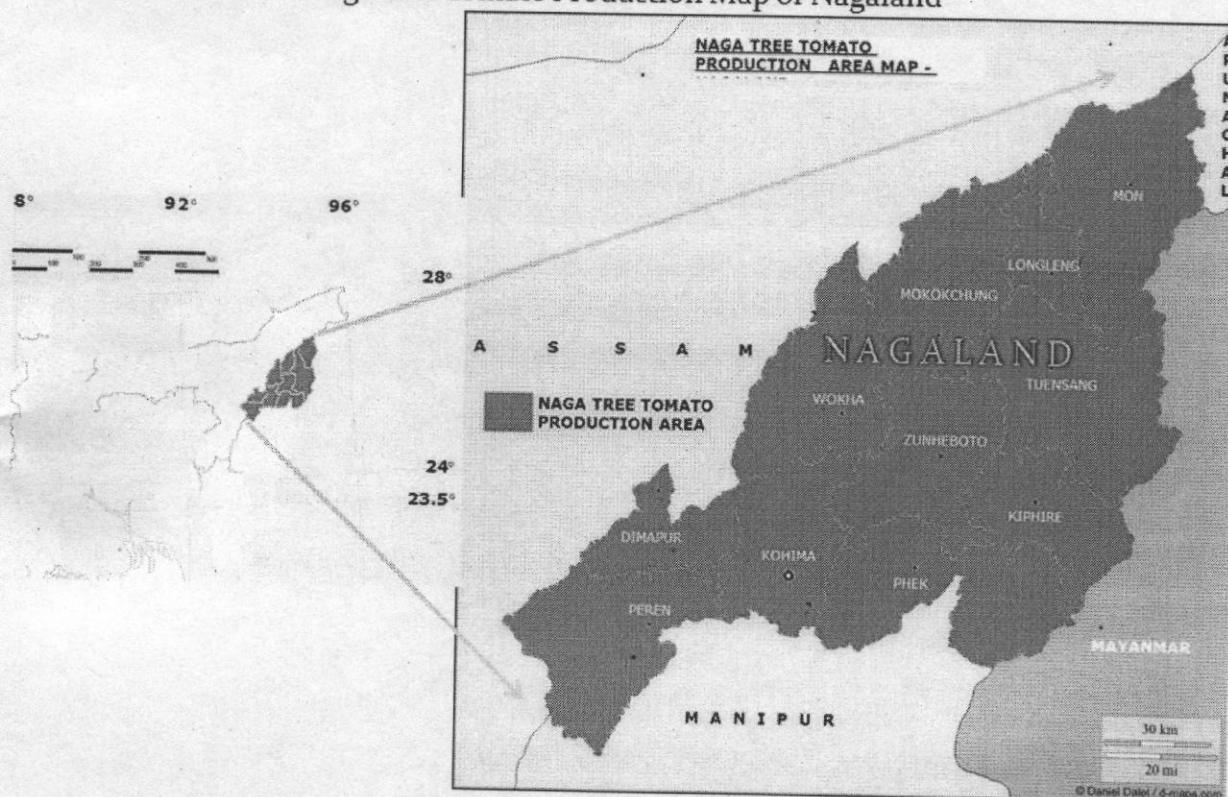
mainly a backyard crop for which collecting exact data is quite difficult. This area of production lies between 25° 60' North to 27° 40' North Latitude and 93° 20' East to 95° 15' East Longitude

District wise Area and Production of Tree Tomato, 2006-2007 to 2008-2009:													
(Area in Hectare / Production in M.T.)													
Year	Areas & Production	Kohima	Phek	Mokok chung	Wokha	Zunhe boto	Tuensang	Mon	Dimapur	Long leng	Kiphire	Peren	Nagaland
2008 -09	Area	10	10	10	10	10	15	10	-	5	5	15	100
	Production	80	75	75	40	80	120	65	-	40	40	130	745
2007 -08	Area	20	5	20	20	5	5	5	10	5	5	20	120
	Production	80	30	80	85	20	25	20	50	25	25	60	500
2006 -07	Area	10	15	10	10	5	10	10	-	5	5	15	95
	Production	80	120	75	75	40	80	65	-	40	45	130	750

Source : Statistical Hand Book of Nagaland 2009

6.2. Geographical Area of Production

Naga Tree Tomato Production Map of Nagaland



Naga Tree Tomato area lies between 25° 60' North to 27° 40' North Latitude and 93° 20' East to 95° 15' East Longitude

7. Methods of Production

7.1. Soil

It can be grown in all types of soil provided the soil is rich in organic matter water logged area is not suitable

7.2. Climate

Tree tomato is suitable in a cooler climate. It can be planted during May to September.

7.3. Raising of Seedlings

Prepare raised beds each of 25 ft length and 4 ft width and 10 cm height. Apply 15 to 20 kgs decomposed compost to each bed and mix it well with the soil. Treat the seeds with organo – mercurial dry at the rate of $\frac{1}{2}$ gram with about 500 grams of seeds in a seed treating drum or shake them well in a closed vessel. Sow the seeds in rows or broadcast thinly in the beds and cover them with a thin layer of soil. Mulch it and water the beds regularly if necessary. Seedlings will be ready for transplanting in about 4 weeks.²

7.4. Transplanting

The seedlings should be planted in a pot of $\frac{3}{4}$ inch x $\frac{3}{4}$ x $\frac{3}{4}$ at a distance of 5 to 7 ft. depending on the fertility of the soil. Apply few kg of farm yard manure to each pit before planting.²

7.5. Irrigation

Rainfall in Nagaland is very high and spread throughout the year, that is why the water requirement of the plants gets fulfilled by rain water and irrigation is not usually required.

7.6. Manures and Fertilizers

So far there is no much record where experiment is conducted on tree tomato. However, the following fertilizers may be applied safely:-²

- 10 to 15 grams of sulphate or NPK in each pit on the following year of planting
- The above dosage may be increased every year by 50% till its bearing stage
- About 50 to 80 grams, may be applied to each bearing tree annually

7.7. Insects and Diseases

No serious insect pests and diseases are noticed, however for any attack of insect pests or diseases, the matter should be reported to concern department for help.

7.8. Harvesting and Yield

The tree tomato may start bearing after 3 years of planting and continue to bear for several years depending on the maintenance and fertility of the soil. A good standing crop may bear more than 50 fruits per tree annually. Therefore, the yield of tree tomato per acre will be 60,000 to 65,000 fruits which will be about 4000 to 6000 kg per acre. ²

8. **Specialties of Naga Tree Tomato**

In Nagaland, because of long history of cultivation of tree tomato several specific characteristics and local land races have evolved which carry uniqueness in themselves. The fruit weight of Naga tree tomato is usually 100 to 150 gm and the colour is red to dark red. Naga Tree Tomato contains special organoleptic qualities which is remarkably different from ordinary tomato. The bitter sweet taste of Naga is sweet and delicious and it goes well with Naga Chill in various Naga cuisines. Other than this tree tomato has a relatively thicker outer skin in comparison to normal tomato, which enables it to get a shelf life of about one month even at room temperature.

The crop here in Nagaland is cultivated on a pure organic basis; the usage to chemical fertilizers and pesticides is almost absent. The conditions of Nagaland also help to maintain such speciality as the land is fertile without and do not need too much of external inputs and secondly the climatic conditions are such that there is not much incidence of pest attack ever observed.

9. **Impact of Climatic conditions and Human Skills**

The diverse agro-climatic conditions, varied soil types and abundant rainfall prevailing in the State enables the cultivation of several plantation and horticultural crops covering fruits, vegetables, spices, flowers, mushrooms and medicinal and aromatic plants. The geographical conditions offer tremendous scope for horticulture development in the State.

The average annual rainfall in Nagaland is more than 2,000 mm and the temperature in the State vary from 30° C in summer and minimum of 5° C in winter. Rainfall and soil type in Nagaland:

Sub Region	Rainfall(in mm)	Soil
Himalayan Hills	2441	Brown Hills
North-East Hills	3528	Red sandy laterite
Upper Brahmaputra	2809	Alluvial, red loamy
Southern Hills	2052	Acidic soils
Lower Brahmaputra	1840	Alluvial, red loamy, tarai soils

Naga Tree tomato is suitable in a cooler climate and the mild summers of Nagaland with moderate cool winters helps in fruit setting and continuous availability of fruit almost throughout the year.

The level of fertilizer consumption in Nagaland was 4 kg/ha of net sown area. This practice of harmonizing with nature and influence of environment has enabled Nagaland to experience and explore organic farming practices. The soil in the state is very fertile and high in terms of organic content that support the crop even without fertilizer application.

10. Marketing System Study

The production of Naga Tree Tomato is spread all over the state and as the scale of production is not high enough to generate large volume of marketable surplus the produce is generally consumed locally. As per traditional practice either the grower himself takes the produce to market for selling to else small traders collect the produce from them and takes it to local vegetable market. Recently some SHG has also been former for production and marketing of Naga Tree Tomato. The current average selling price in market is about Rs. 70/ Kg and as per seasonal variation the prices are highest during winter season when tomato is unavailable in local market.

As per the information provided by horticulture department, very small quantity of produce is sold outside the states, if any.

11. Future Potential and Scope of GI for Naga Tree Tomato

11.1. Export

GI registration of Naga Tree Tomato is set to open the gateway to international market for it. Recently after the finding to high pungency of Naga Chilli followed by its GI registration has introduced Nagaland on the global agriculture map and the state has emerged as a brand for diversity and uniqueness in horticulture produce. There is a lot of scope of building upon the potential and target international market for more such unique produces including Naga Tree Tomato. Some more advantages regarding export has been listed below

- Proximity to China, which has emerged as the largest trading partner for India
- Proximity to Southeast Asian countries which have become important players in India's overall trade and investment relations
- Bordering countries, Myanmar and neighbouring Bangladesh, which have potential to become important trading partners for NER

- Look East Policy of the Government of India, in order to diversify the geographical spread of India's international trade

11.2. Promotion of Organic Farming

In recent years, global awareness of health and environmental issues in agriculture has been spreading rapidly, especially in the developed countries of European Union, United States and Japan. As a result, sustainability in production of crops has become the prime concern in agriculture development.

The global organic food market grew by 10.9 percent in 2007 to reach a value of US\$ 43.5 billion and is forecast to reach US\$ 67 billion by 2012. Within this, sales of fruit and vegetables account for 35 percent of the markets value, i.e. US\$ 8 billion. This gives Nagaland a lot of leeway, particularly in the international market, which has not yet been exploited. The fact that a large share of the global organic market comprises fresh horticulture products presents an even more lucrative opportunity for the state.

Nagaland has a potential in organic farming since the extent of chemical consumption in farming is far less than the national average. In fact, the use of fertilizer and pesticides in agriculture and horticulture fields in Nagaland is almost non-existing. While the national average consumption of fertiliser is over 95 kg per hectare, it is only around 04 kg per hectare in Nagaland.

11.3. Processing

The lack of post-harvest technology and storage facilities; inadequate transport and communication and absence of proper marketing and infrastructure facilities has further hampered the growth of this potential sector. These factors often result in localized gluts and consequent price falls/ distress sales by growers. There is a need to develop a multi-product based processing facility in the state.

The only existing State run fruit canning factory located at Longnak, Mokokchung district has a capacity of processing 1 MT of fruits daily. Similar units need to be established in areas with high fruit production.

11.4. SWOT Analysis for Nagaland With respect to GI Registration of Naga Tree Tomato

STRENGTHS	WEAKNESS
<ul style="list-style-type: none"> • Availability of a good quality of Naga Tree Tomato, which has a longer shelf life and availability through the year • Availability of vast area of potential cropland for increasing of production • History of organic farming by default (through minimal chemical inputs) for cultivation resulting in maintenance of rich soil nutrients. • Emphasis on horticulture and floriculture by government to develop sustainable and 	<ul style="list-style-type: none"> • Lack of proper branding and marketing at national and international platform about high quality Naga Tree Tomato • Low volume of production resulting into lack of marketable surplus • Inadequate infrastructure, and communication for marketing, lack of infrastructure for post-harvest management, processing and value addition. • Non availability of airport and rail network for bulk transport of products implying that the only alternative mode of transport is by road.
OPPORTUNITY	THREATS
<ul style="list-style-type: none"> • Opportunity of GI registration and marketing the quality produce to get better share of value chain for the farmers. • The sloping marginal lands could be suitably diversified for increasing the production of Naga Tree Tomato to meet the farmers' requirement and sustainable environment, avoiding soil degradation and soil erosion. • Increasing international demand for organic products. • "Look East Policy" of the Government of India along with the various Regional Trade Agreement with countries of Southeast Asia 	<ul style="list-style-type: none"> • Heavy rainfall during monsoon season results in landslide in several part of the State, which hampers transportation for marketing. Many times the horticultural crops like off season vegetables grown in the interior areas cannot be marketed and the farmers suffer heavy loss. • Price fluctuations during the glut-season forced farmers to sell their produce at low prices. • The National Insurance Scheme is yet to provide insurance for horticultural crops.

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