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THE GEOGRAPHICAL INDICATIONS OF GOODS
(REGISTRATION AND PROTECTION) ACT, 1999

FORM GI - 1

1103
20/9/06

C A single application for the registration of a geographical indication Part A of the Register for goods falling in different classes Section 11(3), rule 23(5)

1. Application is hereby made by^a for the registration in Part A of the Registrar of the accompanying geographical indication furnishing the following particulars:

a) **Name of the Applicant:** Patent Information Centre, Assam
b) **Address:** Assam Science Technology and Environment Council
3rd Floor, City Co-operative Building
U. N. B. Road, Silpukhuri
Guwahati - 781 003
Assam, India

c) **List of association of persons/ Producers/ organization/authority:**
To be provided on request.

d) **Type of goods:** Class 23 - Raw silk yarn.
Class 24 - Textile and Textile goods including Sarees, Mekhela-Chadar.
Class 25 - Readymade Garments, Made ups, Ties.

e) **Specification:**

Particulars	Muga
Colours of cocoons	Brown
Colours of yarn	Golden Yellow (Reelable)
Shape of cocoon	Oval (with rudimentary peduncle)
Size of cocoon	4.5-5.5 cm (L) x 2.1-2.7 cm (B)
Wt. of single cocoon with pupa	2.35-3.0 gms
Nos of co- coon require to produce 1 kg Silk yarn	4500-6500 nos.
Single cocoon filament length	350-500 mtr.
Thickness of single cocoon filament	4.5-5.0 Denier
Ultra-violet ray absorption capacity	78.8%(smooth piece of muga cloth) 85.8%(rough piece of muga cloth).

GOVT. OF INDIA
Geographical Indication Registry
20 JUL 2006
DY No. 418
CHENNAI.

100% Muga Silk Mekehla-Chadar with decoration or design using traditional Assamese motives or without decoration/design (i.e. plain). Muga Silk Mekhela is a loin cloth. Muga Chadar with design/decoration on both ends or pallu or "Achal". The borders are decorated with "patties". The ends/pallu/Achal are decorated with frills.

100% Muga Silk Sarees decorated/designed with traditional Assamese motives with border in both sides but decoration in one end or pallu/Achal and frills.

100% Muga Silk plain fabrics of different widths.

f) Name of the geographical indication [and particulars]:

Muga Silk

Muga the golden-yellow silk produced by *Antheraea assama* is found only in the Brahmaputra Valley of India. This species of silkworm is semi-domesticated in that the rearers collect the worms that crawl down at the end of their larval period. They are allowed to spin cocoons in the rearer's houses.

g) Description of the goods:

Silk is a protein fibre produced by silkworm for spinning cocoon. The purpose of the cocoon is to provide a protective casing to the silk worm during the most critical period of its life i.e. the pupal stage. Basically there are two proteins, which form the silk fibre i.e. "fibroin" which constitutes the core of the fibre and "Sericin" a waxy substance that encases the fibroin. These proteins are synthesized by the silk worm from the leaf it feeds on during its larval period.

There are three types of silkworm found in Assam, particularly mulberry, eri and muga silk. The muga silk is golden-yellow in colour. Muga possesses the highest tensile strength among all the natural textile fibres. Muga cloth has 85.8% absorption capacity of ultra-violet ray of sunlight.

Muga Silk Mekhela-Chadar is a traditional dress for Assamese women. *Men* Mekhela is a loin cloth of length 2.5m and width 80 cm to 90 cm. Chadar is a wrapper cloth of width 100 cm and length 2.75 m to 3 m.

Muga Silk saree of length 5.5 m and 6.25 m in case of saree with blouse. The width of the saree is 115 cm.

Muga Silk plain fabric of different width ranging from 45 cm to 115 cm for making garments, furnishing materials and decorative items.

h) Proof of origin [Historical records]:

The tribals inhabiting the region of Assam have carried on the production of muga silk as it is called as a tradition. Based upon the historical record available,

people of Assam have been using muga silk since 321 B.C. The scientific name of Muga silk (*Antheraea assama*) itself shows its originate.

Kautilya mentioned in the Arthashastra, 321 B.C.[1], that the varieties of textile commodities known as dukula, [2], was the product of the country Suvarnakudya (Sankudhia [2], Assam) which was as red as sun (batarkaprabhan), as soft as the surface of gem, being oven while the threads were very wet (manishingdha dake vanam), of uniform (coturasra) or mixed texture (vyamisravana). Kautilya also referred to the varieties of silk garments known as patrona and remarked that the textile commodities produced in the country Suvarnakudya (Assam) were the best. All three varieties of silks Pat silk, Eri silk and Muga silk were specially associated with Assam and Assamese culture and tradition. The name Pat (Pattaja), Endi (Erenda) no doubt originated from sanaskrit, but Muga seems to be characteristically and linguistically an Assamese name. The name was said to be derived from the amber colour of the silk.

Gait [3], Barua [5], mentioned that Assam enjoyed a high reputation for producing natural silk of fine texture. They proved that the Assam is the homeland for Muga silk. They mentioned that Muga was stouter and more durable fabrics than pat silk. Assam silk, especially Muga silk was very much demanding Europe and it formed a trade of the East India company during the 18th through early 19th centuries. Gait [3], also mentioned that the custome house at Haida opposite Goalpara, fixed a duty fees of 10% according to the terms of commercial treaty executed with Gaurinath Singh by Captain Welsh on behalf of East India company in 1793 A. D. He reported that 224 mounds of Muga silk thread were exported and the value was placed at Rs. 53899.00 during that period.

The first official records of Muga worm and Muga silk culture appeared in 1662. The culture of silkworm could be traced out from the notes of great writer. Shihabuddin tallish, who was accompanied by Mirjumla at the time of invasion of Assam.(Guwahati was occupied on 4th Feb, 1662). There was mention in his describing on the dresses, the people of Assam used. The official records of 1662 was that "the silk are good but the people produce little more than they require for use" was attributed to famous traveler J. B. Tavernier[6], who made special mention on silkworm variety from Assam that remained on trees all the round, meaning nothing but the conventional outdoor rearing of Muga worm even today.

Barua[5], stated that Bhaskarverma sent to Harshabardhan through Hamsabhega, about 1300 years ago (mentioned in Harchacharit)," silk cloths, while as autumn moonlight loin cloths smooth as the birch bark, which included all the specimens of Eri, Pat and Muga silk."

Proof of Historical evidence:

- 1) "Koutilly's Arthashastra" Book II, Chapter 11, sloke 104.
- 2) "Ksauma, Dukula and Patrona", Studies in the early History of Assam by Kanak Lal Barua, page 232 - 235.

- 3) "A History of Assam" by Sir Edwar Gait, page 271- 273, 275.
- 4) "The History of Civilisation of the people of Assam to the Twelfth Century A.D.", a Ph. D. thesis of P. C. Choudhury, page 330.
- 5) "A Cultural History of Assam (Early Period)" by B. K. Barua, Vol. 1 page 103 – 104.
- 6) "Travels in India by J.B. Tavernier" by V. Ball, page 220.
- 7) "Muga Silk Industry" of S. N. Chowdhury, published by Directorate of Sericulture, Govt. of Assam, page 4 - 5.
- 8) "Silk Production, Processing and Marketing", by Mahesh Nanavaty, page 107 – 108.
- 9) "The nutritional biology of Muga cultutre and seed cocoon preservation in Assam" a Ph.D. thesis of Iswar Sarma Bharali, page 16, 17, 19.
- 10) "Hand Book of Assam, 1976" published by Directorate of Information and Public Relations, Govt. of Assam, page 77.

i) **Geographical area of production and map:** Map as shown in page no. 13

Geographical Position:

North Latitude: Between 24°15'00" to 28°00'00"
East Longitude: Between 89°30'00" to 96°06'00"
Area: 78,438 Square kilometers.
Population: 26,638,407
Density: 340 persons per square kilometers.
Literacy rate: 64.28%
Maximum Temperature: 38°C
Minimum Temperature: 6°C

j) **Method of Production:**

Soil:

Muga silk food plants can be grown successfully in flat or slightly sloppy, fertile, porous, loamy, sandy loam or clay loam soils. Muga food plants grows slightly acidic soil whose pH is in the range of 6 – 7. Soil testing is to be done prior to establishment of garden. Flood the plot with good quality of water and remove out the water through the channel or trench after few days. Areas with atmospheric temperature of 20⁰ C – 30⁰ C and 50 mm rainfall once in fortnight and a sunshine hour of 9 to 13 hours a day are ideal for good growth of muga food plants.

Climate:

The climate of Assam is sub-tropical with moderate temperature. Details furnished below

Particular	Spring	Summer	Autumn	Winter
1. Temperature (Degree Celsius)	15-28	23-38	18-26	7-20
2. Relative humidity (%)	65-80	75-98	70-80	60-70
3. Rainfall / year (mm)	1000	2900	400	0
4. Sunshine hours (hr)	12-13	13-14	11-12.5	10-11

Muga Food plants:

Name of Silkworm	Sl. No	Name of host plants
Muga Silkworm (Antheraea assamensis) Family: Saturniidae.	i.	Primary host plants a) Som (Machilus bombysina) b) Soalu (L. polyantha)
	ii.	Secondary host plants a) Mezankari (L. Citrata Blume) b) Dighloti (L.Salicifolia Rexb)

Stages of Muga Silk worm and textual description of production:

Sl. No.	Different Stages of silk worms	Muga	
		Summer (Minimum days)	Winter (Maximum days)
1	Egg stage Diapuse eggs	7	14
2	Larval stage	22	45
3	Spinning stage	3	7
4	Pupal stage	14	35
5	Moth stage	4	6
Total Days		50	107

The golden-yellow silk produced by *Antheraea assama* is found only in the Brahmaputra Valley of India. This species of silkworm is semi-domesticated in that the rearers collect the worms, which crawl down at the end of their larval period. They are allowed to spin cocoons in the rearer's houses.

The muga worm is fed on the leaves of food plants, particularly on som (*Machilus odoratissima*) and soalu (*Teranthera monopetala*). A som or soalu tree is considered fit for rearing of silkworms only after it is four year old. The muga

silkworm gives five broods a year corresponding to the different seasons, "katiya" (autumn crop), "jarua" (winter crop), "jethua" (summer crop), "aherua" (early monsoon crop), and bhadia (late monsoon crop). The following characteristics are observed in different broods:

Brood or crop	Month of rearing	Quality of cocoon	Silk from 1000 cocoons	Purpose of brood	Remarks
1. Katiya (Autumn)	Oct.-Nov.	Best cocoon, good reeling property. 612 metres thread per cocoon	250 grams reeled silk and 125 grams of silk waste	Mainly for silk. Rearing through out the state	Most important brood for commercial cocoon. Rearing period most suitable.
2. Jarua (winter)	Dec. - Feb.	Poorest cocoon. 265 metres thread per cocoon	150 grams reeled silk	Mainly for seed	Important for seed. Rearing hazardous.
3. Jethua (Summer)	May-June	Good cocoon. Next to Katiya in quality. 546 metres thread per cocoon	200 grams reeled silk	Mainly for silk. Rearing in upper assam	Next important brood for commercial cocoon.
4. Aherua (early monsoon)	Jun-Jul	Inferior cocoon. Difficult rearing. 460 metres thread per cocoon.	Less than spring brood. 180 grams of silk	Seed	Rearing mainly in Kamrup District for Katiya brood of Upper Assam.
5. Bhadia (late monsoon)	Aug-Sept.	Reeling difficult. Silk inferior. 448 metres thread per cocoon	150 grams of raw silk	Seed	Rearing in Kamrup District for Katiya brood of Upper Assam.

The bulk of the cocoons come from the autumn crop that is considered more prolific than other crops. A single female moth of muga lays 150-200 eggs after copulating with the male for 6-8 hrs. Usually, the female is tied to a 'kharika' for laying eggs. Such kharikas are hung on a frame in the house. When the eggs hatch on the eighth day during summer, the tiny worms along with kharika are suspended on the twigs of a young tree, inaccessible to ants and other insects. Soon these grubs begin to crawl on the leaves and feed on them. The muga worms moult four

times before they mature, and select their own food according to their stages of growth. A tree will feed 1,000-1,500 worms at time. If during the rearing their leafy food is exhausted, the worms' crawls down the trunk. The rearer puts a coil of straw rope or a band of plantain leaves around to tree to serve as a barrier. The rearer promptly gathers them, puts them on a triangular bamboo sieve and suspends it on another tree. After the last moult, the worms feed with great voracity and begin to grow rapidly. Unlike other wild worms, when they mature muga worms crawl down the tree during the night. The watching rearers pick them on a bundle of dry leafy twigs called "Jali".

The worms are moved inside the hutments when they begin to spin. The cocoon is completed within three to eight days. After the worms pupate and cocoon formation is complete, the cocoons are removed from the jali (cocoonage), The best cocoons are sorted out and kept apart as seed cocoons for further propagation and the rest are stifled to kill the inside pupae. The cocoons are dried in the sun for a few days and stored for reeling. Muga rearing is a very risky job. A vigilant watch us kept by the rearers while the worms feed on trees. The worms' chief enemies are ants, wasps, hornets, birds and the house sparrows. A kind of wasp known as, dinkana is most deadly. For protection against pests, a straw band smeared with a lot of sand or ash is tied a round the tree at a height of about three feet.

The cocoon has a very weak peduncle and is golden-yellow. The cocoons are boiled in soap and soda solution and are reeled on an appliance called "bhir". The fibre is isolated from the silkworm cocoons. A major portion of the cocoon viz. the pupae is wasted after extraction of the fibre. Pupae constitute about 60% of the dry cocoon weight. The pupae are composed of proteins, fats and lipids. It is expected that a large quantity of dry pupae will be available every year. Besides dry pupae, deformed cocoons stained cocoons; dead pupae etc. are also available as bio waste from sericulture industry among others. The waste and damaged pupae and stained cocoons are the two main sources of protein. Silkworm pupae have 30% fat and 50% protein. It is a tradition in Assam to raise *muga* silk.

Optimum Temperature and humidity requirement:

Different activities require certain range of temperature and humidity to complete the life cycles of Muga silk worms as furnished below

Sl. No	Different Stages / activities	Muga	
		Summer Temp. °C	Winter% humidity
1	Incubation of eggs	25-26	80-85
2	Larval stage	24-26	75-80
3	Spinning of cocoon	24-25	75-80
4	Storage of seed cocoon / emergence	25-28	70-80
5	Pairing Of moths	25-28	75-80

Starching:

The Muga Silk 'warp' yarn in hank form is treated with starch of "Sagu" or "Maida" for strengthening and smoothing the yarn.

Winding:

This is the process where the starched Muga Silk yarn is transferred on to the bobbins.

Warping:

Warping is the process where the warp ends are wound on to the weaving beam so as to facilitate the weaving process. The yarn from bobbins are taken in sections and wound on to the warping beam as per required numbers of threads.

Weaving:

At weaving both warp and weft interlacement takes place. The yarn from the warp beam is drawn through the heels and reels in two sheets and between the two sheets weft yarn is introduced.

At the weaving stage for designed or decorative Mekhela-Chadar or Sarees the border, body and the pallu/Achal are decorated as per requirements.

Starching of fabric:

As per the requirement of users of Muga Silk fabric the starch of 'Sagu' or 'Maida' is applied on the fabric during weaving to get the finishing.

Drying:

The fabric after weaving a definite length is cut away from the loom and kept under the strong sun light for drying.

Finishing:

The fabric after drying is folded and kept under heavy weight for 24 to 48 hours instead of ironing.

k) Uniqueness:

"Muga" is a purely Assamese word that represents a particular colour like Golden Yellow or Brown. As this Silk is Golden Yellow it was named as "Muga Silk".

Muga is popular for its natural colour of spun gold, glossy texture and durability. The gold colour and shine of a muga textile increases with every wash, in sharp contrast to the natural law of decay of shine in fabrics with time. Muga possesses the highest tensile strength among all the natural textile fibres and is comfortable to wear in both summer and winter. Muga is also believed to have medicinal properties and is apparently used as a skin whitener.

l) Inspection Body:

Department of Sericulture, Govt. of Assam, Central Silk board, Govt. of India. }

(c) The territory:

The golden-yellow silk produced by Muga Silk worm (*Antheraea assama*) is found only in the Brahmaputra Valley of India.

(d) The particulars of appearance: Golden-yellow

(e) Particulars of producers: To be provided on request.

(f) The standard benchmark or other characteristics of the geographical indication:

Particulars	Muga
Colours of cocoons	Brown
Colours of yarn	Golden Yellow (Reelable)
Shape of cocoon	Oval (with rudimentary peduncle)
Size of cocoon	4.5-5.5 cm (L) x 2.1-2.7 cm (B)
Wt. of single cocoon with pupa	2.35-3.0 gms
Nos of co- coon require to produce 1 kg Silk yarn	4500-6500 nos.
Single cocoon filament length	350-500 mtr.
Thickness of single cocoon filament	4.5-5.0 Denier

(g) The particulars of the special Characteristics:

Ultra-violet ray absorption capacity	78.8%(smooth piece of muga cloth) 85.8%(rough piece of muga cloth)
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(h) Textual description of the proposed boundary:

- North :** Bhutan, Arunachal Pradesh
- East:** Arunachal Pradesh, Nagaland, Manipur
- South :** Mizoram, Tripura, Meghalaya, Bangladesh
- West :** West Bangal, Bangladesh

Geographical Position:

- North Latitude:** Between 24°15'00" to 28°00'00"
- East Longitude:** Between 89°30'00" to 96°06'00"
- Area:** 78,438 Square kilometers.
- Population:** 26,638,407
- Density:** 340 persons per square kilometers.
- Literacy rate:** 64.28%
- Maximum Temperature:** 38° C
- Minimum Temperature:** 6° C

- (i) Certified copies of the map of the territory as shown in the page no. 13
- (j) Special human skill involved, if any:

Starching:

The Muga Silk 'warp' yarn in hank form is treated with starch of "Sagu" or "Maida" for strengthening and smoothing the yarn.

Winding:

This is the process where the starched Muga Silk yarn is transferred on to the bobbins.

Warping:

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Weaving:

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At the weaving stage for designed or decorative Mekhela-Chadar or Sarees the border, body and the pallu/Achal are decorated as per requirements.

Starching of fabric:

As per the requirement of users of Muga Silk fabric the starch of 'Sagu' or 'Maida' is applied on the fabric during weaving to get the finishing.

Drying:

The fabric after weaving a definite length is cut away from the loom and kept under the strong sun light for drying.

Finishing:

The fabric after drying is folded and kept under heavy weight for 24 to 48 hours instead of ironing.

- (k) Number of producers: To be provided on request.
- (l) Particulars of inspection structures, if any, to regulate the use of geographical indication:

Department of Sericulture, Govt. of Assam, Central Silk board, Govt. of India.

3. All communications relating to this application may sent to the following

**Registrar, Geographical Indications
Geographical Indications Registry
IPO Building, Industrial Estate
G.S.T. Road, Guindy
Chennai – 600 032**

4. In the case of an application from a convention country the following additional particulars shall also be furnished.

Not applicable

(a) Designation of the country of origin of the Geographical Indication.

Not applicable

(b) Evidence as to the existing protection of the Geographical Indication in its country of origin, such as the title and the date of the relevant legislative or administrative provisions, the judicial decisions or the date and number of the registration, and copies, of such documentation.

Not applicable



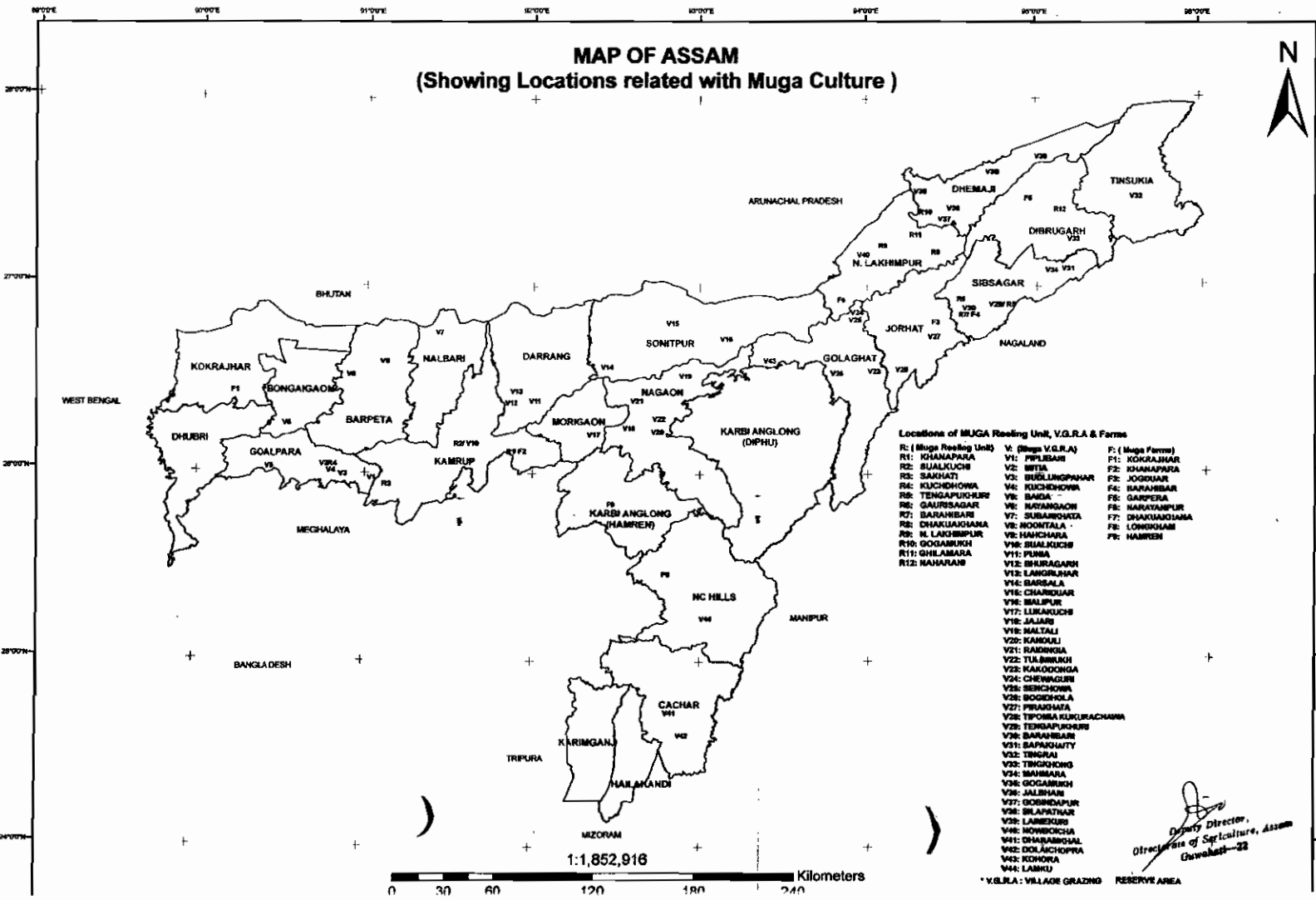
°SIGNATURE

ASWANI KUMAR BARUWA

NAME OF THE SIGNATORY
(IN BLOCK LETTERS)

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MAP OF ASSAM (Showing Locations related with Muga Culture)



Locations of MUGA Reeling Unit, V.G.R.A & Farms

- | | | |
|------------------------|------------------------|-----------------|
| R: (Muga Reeling Unit) | V: (Muga V.G.R.A) | F: (Muga Farms) |
| R1: IGANAPARA | V1: PIPLEBARI | F1: KOKRAJHAR |
| R2: BUALKUCHE | V2: BETA | F2: BHAHAPARA |
| R3: SAKHATI | V3: BUDLINGPAHAR | F3: JOGGUAR |
| R4: KUCHEHOWA | V4: KUCHEHOWA | F4: BARAHIBAR |
| R5: TENGAPURUBRI | V5: BAGA | F5: GARPERA |
| R6: GAURESAGAR | V6: RUYANGACHA | F6: NARAYANPUR |
| R7: BARAHIBAR | V7: SUBANGACHA | F7: DHAKUAGUANA |
| R8: DHAKUAGUANA | V8: MOHTALA | F8: LONGHOM |
| R9: N. LAKHIMPUR | V9: HANCHARA | F9: HAMBREN |
| R10: GOGAMUKH | V10: BUALKUCHE | |
| R11: GHLAMARA | V11: PIRBA | |
| R12: NAHARAB | V12: SHIRAGARI | |
| | V13: LANGOLNAR | |
| | V14: BARSALA | |
| | V15: CHARBOWAR | |
| | V16: BALIPUR | |
| | V17: LIKAKUCHE | |
| | V18: JAJAR | |
| | V19: KALTALI | |
| | V20: KAKOLI | |
| | V21: RADONGA | |
| | V22: TU BIRUKH | |
| | V23: KAKODONGA | |
| | V24: CHEWAGUR | |
| | V25: BECHOWA | |
| | V26: BOGDEHOLA | |
| | V27: PIRAGHATA | |
| | V28: TIPOMA KURKACHAMA | |
| | V29: TENGAPURUBRI | |
| | V30: BARAHIBAR | |
| | V31: BAPAGHATTY | |
| | V32: TINGRAJ | |
| | V33: TINGRONG | |
| | V34: BARMALA | |
| | V35: GOGAMUKH | |
| | V36: JALIBHAN | |
| | V37: BOBIDAPUR | |
| | V38: SILAPATHAR | |
| | V39: LAMBIGUR | |
| | V40: HOWKICHA | |
| | V41: SHARANSAL | |
| | V42: DOLACHOPRA | |
| | V43: KIDHORA | |
| | V44: LABRU | |

* V.G.R.A: VILLAGE GRAZING RESERVE AREA

*Deputy Director,
Directorate of Sericulture, Assam
Gowahati-22*

1:1,852,916
Kilometers
0 30 60 120 180 240