Chapter 5

IMPACT OF EARTHQUAKES ON ECONOMY
Earthquakes are known for their unfathomable devastating potential. The devastation out of this calamity occasionally goes beyond general human perception. Certain natural calamities like flood, earthquake, draught etc. still lack predictability regarding their specific occurrence in respect of place, time and size. However, history in association with the existing knowledge of science could very nearly identify the zones (on the global map) which are prone to these natural calamities. Thus, after a thorough survey of both historical and instrumental records of earthquakes in the region (as detailed in the last two chapters of this work) the region could very rightly be identified to be a very high intensity earthquake prone area. Two great earthquakes of 1897 and 1950 along with those series of large earthquakes of Ahom period should be sufficient to place the region
as one among the severe most seismic zones of the world but without
the depiction of their damaging impact on the economy of the region,
earthquake's role in shaping the history of North East India would
remain grossly incomplete. The various associated aspects in this
regard such as loss in property, communication and agriculture as
well as the impact on the economy of the region in particular are
discussed hereunder in this chapter.

LOSS OF PROPERTY DURING COLONIAL PERIOD

Earthquakes prior to Cachar Earthquake of 1869 i.e., during
1800-1869

With the advent of the colonial period, nature as well as method of
earthquake record-keeping improved. Accordingly, record of
earthquakes in the region are available since 1810 though are not in
a great detail. The earthquake of 22\textsuperscript{nd} January, 1819 while shaking
Barpetah had also left the record of causing a few cracks in the walls
of a new house belonging to Mr P K Hoggson, at Barpetah.\textsuperscript{1} On the
same day there was one more shock felt at Barpetah, which made the
timbers of the house crack and it also rattled the doors and windows
fearfully.\textsuperscript{2} In another shock of 6\textsuperscript{th} April, 1843 Dibrugarh was shaken
severely affecting those houses which had posts built up by walls.\textsuperscript{3}
Thereafter till 10\textsuperscript{th} January, 1869 Cachar earthquake, though there

\textsuperscript{1} Bulter, Jenkin, 'Earthquakes in Assam' communicated by Major Jinkins, Agent to
\textsuperscript{2} Ibid.
\textsuperscript{3} Baird Smith, R, 'Register of Indian and Asiatic Earthquake for the year 1843',
were a number of shocks including those of 1860 but reported
damage of property appears very little

**Cachar Earthquake (10th January 1869)**

Major loss of property due to this earthquake was at Silchar and in
Manipur Valley - particularly at Imphal. Following the extension of tea
gardens in the districts of Cachar a township was being gradually
developed at Silchar. A number of official construction as well as
bazaar had already come into being by that time. So the shaking
resulted out of the earthquake could find a number of structures to
demolish.

Silchar suffered extensively and was in ruin. The high outer
wall of the jail, which was located at the south end of the Bazar, got
flattened. The small hospital attached to the native infantry housed in
a building of 80 feet long containing certain rooms and veranda on the
three sides was a perfect ruin. The house of the Deputy
Commissioner had suffered considerable damage. It is evident from
T Oldham's account*, the Bazar (market) suffered most in the town.

He informs us,

> The bazar itself presented one almost unbroken scene
> of ruin. It had been chiefly composed of bamboo and
> mat structures, which in other places, had remained
> undisturbed, yielding sufficiently to the wave by their
> elasticity, and quickly recovering themselves. With
> these there were a few pucka or masonry structure –

---


* T Oldham, the Superintending Geologist of the Geological Survey of India, who
visited the affected area on the request of Lt. Governor of Bengal.
some with flat-terraced roofs. But here all were in ruins. The views I have given, all taken from Mr Pearson's photographs and therefore accurate and detailed representations of the facts, will convey a much better idea of the place than the most detailed description.⁵

The inspection bungalow at Panchgram was thrown down. At Sealtec Bazar houses sank.

After Cachar it was Manipur Valley where the shock was fatal. Robert Brown, the British Political Agent, in Manipur had recorded his feelings about the onset of this event there at Imphal in a vivid manner

...the vibrations increasing however, I made at once for the door of exit. I experienced some difficulty in making my way through the front room. The ground at this time undulating so strongly that walking was a difficult matter. Arrived at the outside of the house, the ground was in such a violent motion, that I found it impossible to proceed more than a few paces, when I either was thrown down or sank down involuntarily, my face turned towards the house and on my hands and knees. At this time the motion of the ground was most remarkable; it seemed to rise and fall in waves of about three feet in height. A very short experience of this worry motion sufficed to settle the fate of my house, after swaying about, and cracking and groaning for a brief span the upper story, built of wood and bamboo, settle down with a crash on the lower walls which fortunately although much fissured and well out of the perpendicular, withstood the pressure.⁶

The earthquake was all pervasive in the Manipur Valley as well as in the hill and had suffered much damage. But Raja's (King's) loss in property was very great. Raja's two storyed brick house, a substantial ornamental building, which was constructed only five years ago, was smashed to the ground.

⁵ ibid., p. 13.
⁶ Memoirs of T Oldham, pp. 28-29.
The Raja's loss in property is very great and is yet fully known; he is especially sorry about his muskets, numbers of which, but recently received from Government, have been irretrievably destroyed.\textsuperscript{7}

There were only two \textit{pucca} dwelling houses belonging to the Raja and to the British agent Brown. Both of them collapsed. The houses belonging to the indigenous population made of wood and bamboo escaped the shock unaffected.

Some part of the \textit{maidan} (field) within the boundary of the royal house was ruptured and large quantity of muddy water oozed out and later on the fissures closed with fine mud. The earthquake had its miserable impact all over the valley extending up to the hill areas.

Full particulars from all the outlying districts and thanas have not yet been received but so far as I can ascertain, the earthquake has been universal all over the valley and in every direction in the hills and much damage has been done, but, so far as I can hear, without loss of life.

The steeple of the church in Sylhet was shattered by the Cachar earthquake. The two pinnacles fell and two were shifted on impact. In the town, court house and circuit bungalow heavily cracked; Pendulum clocks were stopped, vessels of water had their contents thrown out, a large looking glass in circuit house was thrown from the table and broken into pieces.\textsuperscript{8}

Similarly, Shillong was rocked leading to the development of a number of cracks in the overseer's bungalow. Nowgong suffered quite extensively by this earthquake. Furniture in the houses were

\textsuperscript{7} Ibid.
\textsuperscript{8} Executive Engineer, Sylhet was quoted in \textit{Memoirs of T Oldham}, pp. 16-17.
thrown out, the river water rose and fell 2 to 3 feet; boats were torn from their moorings. Office of the Executive Engineer brought to the ground. Walls of the Cutchery were demolished and the whole edifice shaken beyond repair. The jail wall and the hospital cracked; the church was cracked from top to bottom, and other brick buildings much shaken or destroyed.  

Similarly, Guwahati, too, suffered a lot and almost all brick made buildings suffered by and large. At Jail, the east and west wall had developed horizontal cracks, verticality lost, wicket damaged, slight cracks in arches and one side of the grave yard porch-roof slipped down. The native infantry hospital got a bad crack. But there was no sufferings to the houses in the bazaar.

Sibsagar, Jaipur (Assam), Dibrugarh and Lakhimpur all were affected by this earthquake. At Sibsagar Cutcherry cracked in the crown and at the east end several of smaller arches similarly cracked. During the very first shock retaining even one’s standing position at Jeypur was very difficult.

Interestingly at Dibrugarh in one house, out of the three clocks, one stood the shock but other two - handles in one stood south-west and north-east and in the other handles stood south-east and north-west - were stopped by the first shock. However, no damage was done except a few cracks in a pucca house of the station. A crack in

---

9 Major Livyed, Deputy Commissioner, Nowgong was quoted in Memoirs of T Oldham.
10 Memoirs of T Oldham
11 Assistant Commissioner Peel was quoted in Memoirs of T Oldham.
the church produced by an earthquake fifteen years ago was reopened whereas other public buildings remained safe.

Towards northwest the earthquake had been felt also at Goalpara - the western most fringe of the North Eastern Region. Many brick buildings were partially damaged. Similar loud rumbling sound was also heard. The quake had affected the area up to Goalpara as it is obvious from the failure of structure there and hence the loss. However, it was felt at Jalpaiguri, Cooch Behar, Boxa (Cooch Behar), Mynagoree, Rohimganj, Darjiling, Karsiang, Purneah, Dinajpur, Maldah, Bograh, Pubnah, Dacca, Naddea, Meherpore, Berhampore, Barasat, Barrackpore, Ishapore, Calcutta, Ranijang, Munghyr, Patna, Hazaribagh, Midnapore, Hidgellee, Kurssilong.  

After that devastating Cachar Earthquake of 1869 it seems as if suddenly the region became extra active. Recording of earthquakes also improved. The records took a tabular form with an additional column of corresponding damage details. Similar reports for subsequent years till 1880 have brought to light many a shocks which also deserve mention for their damaging role in the region.  

Another earthquake took place on 3rd September in 1875. The shock which took place in the morning around 9-00 am was recorded

---

12 Memoirs of T Oldham, pp. 29-34.  
13 Keatinge, R H, Chief Commissioner, 'Records of the Occurrence of Earthquakes in Assam during the years 1874, 1875, 1876', Journal of Asiatic Society, no. 3, 1877, pp. 294-309.  
14 Ibid., for 1877, 1878, 1879, 1880.
to be the severest shock since 1869 (i.e., Cachar Earthquake) so far as the Nowgong was concerned. At Barpeta in the Kamrup district, several cracks of the arches of the court house, and three places in walls were found. The pucca temple in the Kirtanghar compound also cracked. Buildings over the ghat were partly demolished. All the public buildings were more or less damaged with the exception of the Treasury and Post Office. This shock in the Mangaldai subdivision of the Darrang district was very severe. Private room of the officer in the cutcherry was damaged, walls were cracked in 2 or 3 places. The private bungalow of the SDO was very much damaged. The shock was reported to be violent.

Shock was felt throughout the K & J Hills causing damage to several houses at Shillong. At Gauhati (present Guwahati) southwest Jail wall collapsed, and almost all other public buildings were more or less affected. At Tezpur all brick buildings were damaged, some severely. From all place like North Lakhimpur, Dibrugarh, Golaghat, there were reports of cracks in the walls of SDO buildings, treasury, fort tower wall along with loosening of plaster etc.

In another shock of 5th September, 1875 there were more cracks in the walls of Cutcherry and much plaster had been dislodged.

---

16 Ibid., p. 297.
17 Ibid.
18 Ibid.
19 Ibid.
Record office, Post office and a school house were cracked though slightly.  

On 18th November 1875 a shock was felt very severely at Lakhimpur as well as Jaipur. It was strong enough to crack an arch in the cutcherry. The shock felt at K & J Hills on 26th January, 1876 did result cracks in a few houses at Shillong. The earthquake that took place on 7th December, 1877 in Darrang caused substantial damage at Tezpur cutcherry south wall cracked and broken down. Northern wall cracked, Treasury walls cracked in several places. DC’s bungalow on the hill suffered most, chimney fell in, causing loss of valuable property. An earthquake on 3rd January 1879 caused some damage at Lakhimpur. One shock on 11th September 1880 in this region recorded cracks at four places in the outer wall of the treasury building at Golaghat. Similarly on 22nd August, 1880 at Garo Hills one shock was so strong that there was a lateral shake sufficient to make the house post crack.

On 24th July 1885 a very strong shock was reported from Tura, Garo Hills, which completely levelled the stone built treasury and police quarters.

---

20 Ibid., p. 301.
21 Ibid., p. 305.
22 Ibid., p. 306.
23 Ibid., no. 1, pp. 8-9.
24 List of Earthquakes recorded in Assam during the years 1879 and 1880 by the Government of Assam.
25 Maxwell, H St P, "Report by officiating Commissioner, Assam Valley Districts, no. 1873."
GREAT SHILLONG EARTHQUAKE OF 12TH JUNE 1897

After a lapse of over ten years - keeping apart that one of 1891 which had least damaging impact - the region was rocked by one of the greatest of earth tremors since historical time. The great earthquake had its centre of origin (epicentre) in the Khasi and Jaintia Hills, therefore, the district suffered most.

To quote here W H Nightingle, Contemporary Superintending Engineer, Assam:

This division* suffered worst of all. Every pucca building in the division was levelled to the ground and those of a semi-permanent nature so badly injured that they will have to be dismantled and rebuilt.26

Shillong reportedly it was a scene of complete destruction. Stone buildings along with most of the bridges in and around Shillong collapsed absolutely. Church buildings made of stone were the worst victims. They became heaps of ruins after the earthquake.

Ekra-built buildings, the second type of structure in the town, a wooden frame work, with walls of san grass covered with plaster also suffered heavily but not like those of stone buildings. Fifty per cent of them could survive the shock; however, chimneys in all cases being made of stone had to fall down. Some of the new larger buildings of this type would also have escaped, but for the stone chimneys, which in every case wrecked the houses.

26 Nightingle, W H, 'Report. dated the 3rd August 1897 by the Superintending Engineer, Assam, on the damage done to roads and buildings by the earthquake of the 12th June, 1897, Appendix - I, in Gait's Report, p. 1, of the Appendix – X, part.
* K&J Hills Division also includes Kamrup district. (The symbol within the quotation above has been used by this author)
The plank buildings, the third type of construction resting unattached to the ground suffered least. In every case they have escaped untouched, except where the supporting stone work had been shaken away.  

There was a water supply network in Shillong before the great earthquake. These water works were damaged by the earthquake and the supply was completely destroyed and in subsequent many days the people of Shillong had to live on small streams and springs for both drinking and bath. In the words of the administrative head of the district:

Day revealed the fact that Shillong was without a water supply and that it was cut off from communication with outer world. Water from the pipes for drinking purposes was not to be expected, and could not be laid on for some days. But even the water in numerous open channels throughout the station had disappeared.

Looking at the huge destruction caused by this quake there was a recommendation by the Deputy Commissioner of K&J Hills for relocation of the capital at a place 5 miles away towards upper Shillong. The Deputy Commissioner wrote to the government that the damage to the government property in the district was enormous, but the damage to private property everywhere and particularly in Shillong was more and the station of Shillong had been entirely destroyed.

28 Stephen, A, Surgeon Colonel, Principal Medical Officer and Sanitary Commissioner, Assam, 'Note to the Secretary to the Chief Commissioner, Assam', proceedings of the Chief Commissioner of Assam, Home, March 1898, (hereafter referred as Stephen's Report).
So before any steps were taken to rebuild the station or to spend lakhs on re-erecting Government buildings, the Government must very seriously consider whether the new station should be erected at the 5 mile on the extensive plateau, the place where it was originally intended to be established.\textsuperscript{30}

Cherrapunji too had similar devastations, where all \textit{pucca} houses were destroyed in Cherra village, and the mission school, church, the excellent hospital, and the missionaries houses also faced similar fate. The massive statue of David Scott, Agent to the Governor General in the North Eastern Frontier, who died in 1831, a structure some 50 feet in height, had lost its top, though the blocks of stone were riveted together with iron bars.

The loss incurred by the Welsh Mission in the Khasi and Jaintia Hills was enormous. The Missionaries’ house, the schools and churches at all Mission stations, as well as their admirable hospitals at Jowai and Cherrapunji, had been entirely destroyed.

The total loss has been estimated at from £ 10,000 to £ 11,000, and I do not believe that the amount is overstated. The Mission Church in Shillong cost from Rs. 13,000 to Rs. 14,000 the schools in Shillong Rs. 10,000, while the three Mission bungalows cost some Rs. 18,000. At Cherrapunji, the Mission buildings must have cost between Rs. 45,000 and Rs. 50,000... At Jowai, the buildings are estimated to have cost Rs. 30,000, there was a very fine hospital and a large Church, also school buildings and two bungalows.\textsuperscript{31}

The other villages which deserve mention so far the damages were concerned were Sohiong, Mairang, Normai, Nongkhlaw and the

\textsuperscript{30} \textit{ibid.}, p. 31.
\textsuperscript{31} \textit{ibid.}, p. 32.
adjacent villages 40 or 50 miles west and north-west of Shillong. The loss of life was small, but the damage done to roads bridges and all *pucca* houses was great. The mission stations and Churches at Maoflang and Mairang were destroyed, also the houses of the Syiem of Nongkhlaw at Mairang and Nongkhlaw. All the rest houses between Maoglang and Nongkhlaw and Nongstoin were also destroyed.\(^{32}\) Jowai subdivision had suffered little so far as loss of life was concerned. At Jowai the Government dak bungalow could only stand the shock and rest all Government constructions such as court building, military block house and police lines collapsed entirely. The mission chapel, mission bungalow, school, the fine dispensary also collapsed. The missionary buildings at Shangpang and Raliang 12 and 15 miles north-east of Jowai were damaged.\(^{33}\)

The northern part of Sylhet and Sunamganj were also effected heavily.\(^{34}\) Damage to property in the district was mainly due to the failure of structure during the shock.

Buildings in the Sylhet town were the worst victim and suffered almost uniformly.

The following government buildings in Sylhet station were either demolished or were partly damaged.

- The Old Collectorate
- The New Collectorate
- The Judge's Court
- The Police and Department of Public Works office
- The Forest Office
- The Honorary Magistrate's Court House
- The Church

---


\(^{34}\) O'Brien, P H, *op. cit.*, pp. 52-53.
The Government School  
The Circuit House  
The Deputy Commissioner’s Residence  
The Jail  
The Post Office  
The Telegraph Office  
The Dak Bungalow  

Among the non-Governmental buildings, the charitable dispensary and the Town Hall were levelled to the ground.  

Here, it may be noted that the church building had also been taken as a part of the Government building. In Sunamganj the new cutcherry which was being constructed was thrown down. The old cutcherry, Subdivisional Officer’s residence were badly shaken. Eighty-four pucca buildings of this subdivision were reported to be completely broken. The rest buildings were more or less damaged. Very few buildings escaped unhurt.  

In Habiganj, the Subdivisional Officer’s residence was ruined. The cutcherry was somewhat damaged, and the dispensary – a small pucca building also suffered to some extent. At Maulabi Bazar and Karimganj there were no loss of public buildings. The cultivators - residence of thatched house type were part of general destruction.  

Impact of this earthquake on Kamrup was significant. As has already been mentioned construction at Gauhati faced the same fate as that of K&J Hills.  

At Gauhati there were general collapse of Government structures. Here record room was destroyed. Associated rain

---

35 Ibid.  
damaged the records partially. All European bungalows destroyed. It was only such buildings were which were supported by strong wooden or bamboo posts, with ekra walls which escaped without serious injury. The jail wall was completely demolished. Two long chang building within the Jail area made of kutcha walls with pucca pillars were completely unhurt. Structures with iron post suffered least. Homeless Europeans took shelter in the mail steamer. The continuous after shocks on the night following the major event made the people so much apprehensive that in absence of proper habitation they passed the night in the open air or in half covered places.\(^{37}\)

Hindu temples in the immediate neighbourhood of Gauhati suffered a lot. The Kamakhya temple, on the hills adjacent to Guwahati, escaped the shock with slight damage. Its spire with a golden Kalsi (jar) had fallen down. The nat mandir cracked, the walls around the temple had fallen, and some of the rooms attached to the temple were also more or less damaged. The Bhubaneswari temple, situated on the top of the hillock suffered a complete collapse by this earthquake. The other minor temples also cracked but were all standing.\(^{38}\) On the river island of Brahmaputra previously known as Peacock Island quite close to the town of Guwahati there was a temple, inscription of which reveals that this had been built by Garhganya Handikai Bar Phukan during the reign of Raja Godadhar


\(^{38}\) Ibid., p. 18.
Singh, in saka 1616. The temple itself cracked, but stood erect, however, its spire fell. The surrounding wall destroyed. Aswaklanta temple consisting two buildings on the northern bank of Brahmaputra, opposite Guwahati, built by Taruna Duara Barphukan in saka 1642 in the reign of Raja Siva Singha was completely demolished, and the other buildings lower down had been cracked, and its spire had fallen down. The Madhava temple at Hazo which was built in Saka 1672 had also been destroyed.

The flooding of the river immediately after the earthquake made the thing worse at Barpeta which submerged the whole town. People had to stand in water or to take shelter in boats. All the villages around Barpeta were submerged, and the flood continued to rise till the 19th of June and thus intensified the distress.

The inundation at Barpeta suddenly rose to the highest recorded flood level the day after the earthquake, and reached its maximum on the 14th of September, when it is said to be 6 feet above any previous record. The condition of the people, who are living on platforms and in boats, is much to be commiserated. Most of the cattle have been sent for safety to neighbouring hills, but those that remain are perishing from starvation, and dead bodies are floating about. Dogs and ponies are also skeletons. I have had exceptional experience of inundations in Lower Bengal, but this is the worst I have ever seen.

There was a Silsako (in local language it means bridge made of rock), at Mauri village in Patidararang Tahsil in Kamrup. That

---

39 Ibid.
40 Gurdon, P R T, op. cit., p. 17.
earthquake, had broke down it.\textsuperscript{42} It is said that Bakhtiar Khilgi built it in 1203 AD. It was respected as a monument of ancient date.

Garo Hills was distinctly divided into two zones, one hilly portion, where Tura, the district headquarters was situated and the other was the plains portion. The government buildings at Tura were the prime victim. The houses of the Deputy Commissioner, District Superintendent of Police, Forest Officer and Sub-Engineer, the inspection bungalow, \textit{cutcherry} were the construction mainly suffered and among these DC’s and DSP’s bungalows were effected most. In the forest officer’s bungalow walls were badly damaged and also the posts, floor and roof to a smaller extent. Walls of Inspection Bungalow and \textit{Cutcherry} had been destroyed, when posts, floor, roof were left in fair condition.\textsuperscript{43}

The house of Civil Surgeon, the charitable dispensary, the post office, the treasury and some shops in the bazaar having stone and cement plinth —had cracked and broken up in a remarkable fashion.

Strikingly house of the American Baptist Mission belonging to the same class of buildings at Tura withstood the shock with comparative immunity and the reason ascribed to the difference was that these Mission buildings were rested on stones almost flush with the earth or flat on the earth itself whereas others were deeply drown into the ground.

\textsuperscript{42} Gurdon, P R T, \textit{op. cit.}
\textsuperscript{43} \textit{Ibid.}, p. 48.
Among the third class of buildings with the ground for the floor - timber or bamboo frames, walls of mat or reeds lightly plastered over, and roofs of thatch or corrugated iron were reduced to ruins when others such as police barracks, clerk’s quarters, and the majority of houses in the bazaar could withstand the shock well.\footnote{Ibid., p. 49.}

The traditional Garo houses may be called as another type with a raised floor and built entirely of wood, bamboo, cane and thatch had completely escaped any damage. But unfortunately many of these houses were built on steep hills side or at the base of cliffs, and so were either dragged down or buried by the landslips.\footnote{Ibid., pp. 48-49.}

In the down plains of the Garo hills district many houses were sank into the ground badly, the roof alone being visible. Several village remained submerged for a considerable period of time.\footnote{Ibid., p. 49.}

The Goalpara district lying next to Garo hills suffered to a great extent and loss of property was quite exorbitant. Dhubri, Goalpara, Gosaigaon, Gauripur, Sukhchar, Mankachar, Bijni all places were virtually wrecked by earthquake of 1897.

The cutcherry was standing with injured walls; so are the dak bungalow and the dispensary. The new jail, which was approaching completion, had been thrown down so also the post office and high school.\footnote{Hallifox, A G, ‘Report from the Deputy Commissioner, Goalpara,’ Enclosure to the Appendix – III in Gait’s Report, pp. 8-9.}
The treasury, Jeswett's house, Jolly's house, the dak bungalow, the Bijni Hall, two large houses at the immigration depots, the liquor shop in the bazaar, and the Mahamedan musjid and my house still stand, but are dangerous to enter and must all be dismantled.\textsuperscript{48}

The church, the temple, the newly built magazine, the seven newly built houses in the dispensary ground were all down flat.\textsuperscript{49}

The subdivisional station at Goalpara had suffered severely. The treasury was destroyed. The circuit house, to which cutcherry was attached, fell flat, burying the records. The subdivisional officer's bungalow was a complete ruin. The post office, the telegraph office and the school, all were thrown down, parts of the bazaar were half buried.\textsuperscript{50} Assistant Commissioner's bungalow situated on the crest of a ridge had entirely fallen. The cemetery placed on the south-south-east slope of the ridge suffered and the tomb of Mrs Somons' fell without breaking.\textsuperscript{51}

The zamindar's pucca buildings at Gouripur suffered very badly.\textsuperscript{52} Uniform reports received from all the thanas. Buildings damaged or demolished, land gone down, sand thrown up, floods causing damage. Many villages all over the district were rendered homeless.\textsuperscript{53}

\begin{flushright}
\textsuperscript{48} Dobson, E F H, 'Demi-official note by Surgeon-Major of his experience during the earthquake at Jamadarhat in the Goalpara district, Appendix - V in Gait's Report, p. 22.  \\
\textsuperscript{49} Ibid., p. 22.  \\
\textsuperscript{50} Hallifox, A G, op. cit., p. 9.  \\
\textsuperscript{51} Latouche, T D, op. cit., pp. 261-262.  \\
\textsuperscript{52} Hallifax, A G, op. cit., p. 9.  \\
\textsuperscript{53} IL,d., p. 9.
\end{flushright}
In Darrang district damages were less. The listed damaged buildings comprise the cutcherry, treasury, church, jail, and two private buildings in the town of Tezpur.\textsuperscript{54} Church\textsuperscript{55} and jail\textsuperscript{56} were worst sufferers. Kutcha buildings had escaped altogether. Masonry houses such as DC’s bungalow and the planters’ ‘Chummary’ club house suffered very severely.\textsuperscript{57} Damage to public buildings had been more serious at Mangaldai. The residence of SDO fell, so also the walls of cutcherry and treasury, but the roofs of those low constructions, being supported on timber posts, were still standing. The dak bungalow was demolished beyond repair. Injury to the hospital ward was also considerable.\textsuperscript{58} In the town of Nowgong, Government buildings such as the cutcherry, the jail, the Deputy Commissioner’s residence were in complete wreck and was suggested to be pulled down. In the Kaya Patti several masonry shops and store houses collapsed and so was the case in Dacca Patti also. Places around Kallang were so destroyed that the Deputy Commissioner, Nogwong was very upset and so he recommended the shifting of district headquarters. The masjid behind the dak bungalow

\textsuperscript{54} Mazwell, H S T P, ‘Inspection note by the Commissioner of the Assam Valley divisions, on the effects of the earthquake at Tezpur’, Appendix — II in Gait’s Report, p. 3.
\textsuperscript{55} Gait’s Report, p. 5.
\textsuperscript{57} Ibid., p. 12.
\textsuperscript{58} Ibid., p. 13.
fell. All the wells were choked with mud and several tanks were also filled with mud. Post and telegraph office was damaged slightly.  

At Silchar the old cutcherry building cracked slightly in several places, no noticeable harm was caused to any other buildings. At Hailakandi, the sub-divisional officer’s residence built on pillars was completely ruined; the minor walls of the dak bungalow and one side wall of the local board office fell down completely. The circuit bungalow was little damaged. At Haflong, the SDO’s bungalow and the dak bungalow were completely wrecked.

So far the private property was concerned, it was in the Katigora tahsil of Cachar, that a large quantity of land, both cultivation and village land, with houses on it, mostly lying along side the Barak river, had slipped into the river. In all three tahsils but mostly in Sadar and Katigora, much land was damaged and crops destroyed by deep and extensive cracks and sand thrown out from them in streams.

The loss sustained by the people in the district of Cachar as estimated by the tahsildars were as follows:

Table 5.1 Loss in the district of Cachar

<table>
<thead>
<tr>
<th>Area</th>
<th>Value (Rs)</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land thrown into the river</td>
<td>42 Keyar 3</td>
<td></td>
</tr>
</tbody>
</table>

60 Newboutt, B B, 'Report from the Deputy Commissioner of Cachar on the effects of the earthquake in his district', Enclosure to the Appendix – IX in Galt's Report, p. 58.
61 ibid.
Houses thrown into the river | 146
---|---
Land damaged by sand | 149 3 2
Crops damaged by sand or earthquake | 229 2 2
Houses thrown on to the ground | 649
Other property destroyed | 5389

| 420 7 3 5389 757 |
---|---|---|---|---|

The above report was, however, treated as exaggerated by the then Deputy Commissioner of the district, while agreeing to the severe damage done at Katigora tahasil.62

In a number of tea gardens at Cachar either manager’s bungalow or the tea house or the tea machine was damaged and in few cases destroyed. Serious damage had been done at the Haticherra Tea Estate by the bursting of a bund, which was constructed to form a large lake to work a turbine.63

The estimated cost of repairing the damages in the Cachar division including the districts of Cachar and North Lushai Hills was RS. 4,000/- for buildings and Rs. 8,000/- for roads. Since, there was no damage in the Lushai Hills as per the report of W H Nightingale, SE, Assam,64 the estimated cost was primarily for the district of Cachar.

63 Ibid.
Beyond Nowgong impact of the shock in upper Assam area was quite minor so far as the loss of property and lives were concerned. However, the shock was felt as far as Dibrugarh quite prominently. The shock was not very severe in those areas but felt over a spell. So, loss was also little.\textsuperscript{65} This observation of the DC, Lakhimpur was from Dibrugarh. A few \textit{pucca} buildings at Kaya Patti were slightly affected. No loss of state or any private building. However, a leaf house at Romai tea estate collapsed, which was being constructed. Damage done to North Lakhimpur was negligible. There the walls of treasury, \textit{cutcherry} and dak bungalow a part of masonry structure were cracked in several places, but to a little extent. Tea gardens almost escaped without any loss. The undulations affect at Sibsagar district due to the shock was described as fully of being like a ship on the sea.\textsuperscript{66} Treasury was cracked, SDO's bungalow was badly shaken but not severely injured. Considerable damage was reported from Khumtai, Missamara, Rangamati, Badlipar, Halmira, Hantly tea gardens. Slight damages were reported in Nigritting, Socklatenga, Dooria, Barkathani, and Golaghat Gardens.\textsuperscript{67}

State buildings were shaken substantially at Jorhat and large quantities of plaster also fell when the treasury buildings remained unhurt. Only a small shed in the jail was affected. Two \textit{pucca}

\textsuperscript{65} Henniker, C C, 'Report from the Deputy Commissioner, Lakhimpur', Enclosure to the Appendix – III in Gait's Report, p. 15.
\textsuperscript{66} Gait's Report, 'Return from the Deputy Commissioner, Sibsagar', p. 71.
buildings at bazaar suffered very badly and were about to subside at any moment. In the Dacca Patti area the earth opened and quantities of sand and water were discharged, the drains by the side of road were also filled up by the sand to a depth of 2 to 3 feet. To the north of Jorhat at Domgaon there were cracks in all direction on the roads and courtyards of the houses. The tea gardens around suffered to a considerable extent. At Gotonga tea estate, the Superintendent’s bungalow was severely injured, while at Parbatia tea estate, 5 miles west of Jorhat, one of the walls of the manager’s bungalow fell in. At Kaliapani tea estate leaf-house was thrown down.\(^{68}\)

At Kohima the shock was quite severe and it was impossible to stand without support. Only masonry structure whatever were there suffered more or less, other \(\textit{ekra}\) constructions supported on wooden posts escaped with little damage. Immediately after the earthquake, three explosions were heard from the direction of the Pulebadzi hill, 3 miles south-west of Kohima but the cause of the same could not be ascertained.\(^{69}\)

The cart roads were unhurt but considerable damage was done on the road between Dimapur and Golaghat. At Borpathar, 19 miles from Golaghat, the old masonry block house was wrecked. At Deopani, the bridge was destroyed. The iron garder bridge over the

\(^{68}\) Allen, B C, 'Report from the SDO, Jorhat', Enclosure to the Appendix – III in Gait’s Report, p. 15.

Noajan was badly damaged, the piles at other end sank considerably. The sand bank at the Dhansiri at Dimapur sank 2 feet.\textsuperscript{70}

While the shock was felt distinctly in Lushai hills (present Mizoram) but the damage done was very little. At Aizawl a few slight cracks developed on the stone buildings but no serious damage was reported.\textsuperscript{71}

Though the shock was quite strong and was felt for a longer duration. There was no damage in Manipur. The damage was confined to only a few \textit{kutcha} buildings.\textsuperscript{72}

**Srimangal Earthquake of 1918**

As expected the epicentral zone happened to be the worst sufferer of this shock of 8\textsuperscript{th} July, 1918 and Srimangal being the centre of that zone borne the brunt to its maximum (here, the names of places, valley, river, \textit{mauza}, \textit{thana} etc. as these were at the time of the shock). In the Balisera Valley and Part of Doloi Valley, the effect was most severe.\textsuperscript{73}

With few exceptions all brick buildings were found to be destroyed within this area. Coolie lines on the tea estates, built mostly of sundried mud, and thatched roofs, were levelled to the ground. The usual type of planters bungalow built of poorly burnt bricks and very

\textsuperscript{70} \textit{Ibid.}, p. 59.
\textsuperscript{71} Shakespeare, J, 'Report from the Political Officer, North Lushai Hills, on the effects of the earthquake', Appendix – XII in \textit{Gait’s Report}, p. 61.
\textsuperscript{72} Cole, H W D, ‘Report from the Political Agent in Manipur and Superintendent of the state on the effects of the earthquake in Manipur and enclosure (letter from the Officer Commanding Manipur to the Deputy Assistant Adjutant General, Assam District)’, Appendix – XI, p. 59.
\textsuperscript{73} Sturat, M, ‘The Srimangal Earthquake of 8\textsuperscript{th} July, 1918’, \textit{G T S I : Memoir}, vol. 46, p. 7.
thick, exceedingly heavy thatched roofs, also collapsed in almost every case. Tea factories and certain bungalows having steel girders frames were left standing, but the brick work in them was either thrown down or left in a shattered and tottering condition in almost every case. The tea estates visited by me in the Balisera Valley were the Phulchera, Kalighat, Lakhichera, Kajuricha, Rajghat, Puttricherra and Sisal Baria. At the Phulchera estate the Manager's bungalow was levelled to the ground, practically every leaf house was down. The Assistant Manager's bungalow had only one shattered room standing, and the factory, which had a steel girder frame, was left in a tottering condition. The factory boiler shifted, owing to the fracturing of its brickwork foundations, and two of the heavy drying machines were loosened from their beds. The general direction of fall was towards the south...area.\textsuperscript{74}

On the western part of Balisera impact was slightly less intense.

At Satgaon tea estates four iron columns help up the roof of the tea house and prevented it from falling, when the walls were shattered and most of them down. Wall collapse was the general pattern in this part and the bungalows having thatched roofs without iron columns were levelled to the ground. Only Bharaura tea estate was an exception which escaped and was being sheltered by the adjacent hills.\textsuperscript{75}

The Patrakhala tea estate in the Doloi Valley suffered badly. When the leaf house being built entirely of iron was intact, the wall of the fermenting house fell towards the east. There was an interesting observation at Rasidpur – two stations west of Srimangal – by a planter, while the planter was standing at the side of the railway line,

\textsuperscript{74} Ibid., p. 9.
\textsuperscript{75} Ibid., pp. 11-12.
"...he heard a loud noise coming down the railway cutting which is situated between Sathgaon and Rasidpur. He concluded at first that it was the afternoon down train coming at great speed, but on looking in that direction he saw the railway line moving in waves, which travelled towards him. When the wave reached him he felt the ground shaking violently, and saw the tea factory and other buildings falling. The wave movements passed under him and he watched them recede down the line towards Shaistaganj in other words from east to west."

Other than the tea estate the only place of any importance situated within the epicentral area was Srimangal, where many houses were struck down in the bazaar and the station buildings damaged and partially thrown down. The direction of fall in this case was north and south. The railway line in this zone did not suffer that excessively. Between Srimangal and Satgoan, the bridges and line though shaken badly, the alignment was disturbed little. In Udna and Bilash bridges abutment sank and closed in.

Doloi and Laksharpore Valley to Habiganj and Maulavi Bazar area although little less effected than the epicentral area, here also practically every brick or masonry building was damaged and many were thrown down. In the valley, the Doloi tea estates suffered considerably and most of the leaf houses were levelled with the ground, factory wall fell, manger’s bungalow cracked. Similar was the

---

76 Ibid., p. 12.
77 Ibid.
78 Ibid.
case with the Kumarcharra, the Champarai, the Madhabpur tea estates of the valley.\textsuperscript{79}

The earthquake was distinctly felt in the entire North East Region of today but loss of property or anything else was mostly concentrated in the erstwhile Sylhet district of Assam. The Civil Surgeon's bungalow at Aizawl, a stone building was seriously damaged when other masonry houses showed only few cracks.

**DHUBRI EARTHQUAKE OF 1930**

At Dhubri, brick masonry, one and two storey buildings very few could escape the shock of 3\textsuperscript{rd} July 1930 undamaged. Majority of them were badly cracked and were partially collapsed, whilst in at least one instance almost total collapse of the structure took place immediately after the main shock. Of the semi-\textit{pucca} buildings, a number were more or less badly affected, though in the case of a few recently constructed well built houses, including the Girls' High School, situated on a more stable ground, practically no damage resulted. Of the other two types of structures - such as, (i) structures of split bamboo or \textit{ekra}, covered with mud plasters, and supported on a wooden frame with parts driven into the masonry plinth or alluvial foundations and (ii) structures like semi-\textit{pucca} or the \textit{ekra} with mud plasters type with framework merely resting on a masonry plinth so that the structure was free to move as a whole - in most instances,

\textsuperscript{79} Ibid.
where the supporting posts had been carried down into the plinth or into the ground, the structures were severely effected, whereas the few buildings in which the wooden framework merely rested on the plinth, were undamaged, with the exception of slight plaster cracks.\(^{60}\)

A massive white marble statue of Queen Victoria about 16 \(\frac{1}{2}\) feet height (including the marble pedestal) which face south, was overthrown in a north-by-west direction, whilst the Shiva temple a cone shaped brick-masonry structure over 20 feet high cracked across within a few feet of the ground and toppled over in a N 70°E direction.\(^{61}\)

Here also, like other places the earthquake had similar effects in case of all buildings located on made ground, infilled tracks, ditches, etc. which suffered very badly. In several instances, where the structures were founded partly on the natural alluvium and partly on old excavations that had been refilled with earth, a large crack occurred along the junction of the infilling and the alluvium, and that portion of the building which was located on the former subsided to the extent of over a foot.\(^{62}\)

At Gauripur, railway station was seriously effected by the main shock, the ground upheaved in the vicinity of the booking office, resulting in large cracks in the floor and walls of the building. In the village a number of buildings were severely damaged. Out of the


\(^{61}\) Ibid., p. 9.

\(^{62}\) Ibid., pp. 9-10.
several concrete houses at Gauripur, the newer structures escaped almost in tact.\textsuperscript{83}

At Bilasipara, about 28 miles from Dhubri on the Gorang river, the subdivisional town of Bilasipara was badly shaken. Of the few brick building which were in existence, the front portion of one was reported to have partially collapsed whilst others were badly cracked. Wells became filled with sand whilst water and silt were discharged from the fissures in the ground. At Bogribari, six miles from Bilasipara, more pucca buildings were said to have been badly damaged.\textsuperscript{84}

The effect of the earthquake was quite severe at Tura. The Civil Surgeon’s, the Sub-Deputy Collector’s and the Extra Assistant Commissioner’s bungalow were very badly effected. From the DC’s bungalow large plaster fell, fissure in the subsoil traversed the upper slopes in front of the bungalow. In the cutcherry and other light structures a number of cracks across the floor developed and there were fall of plasters from the wall. The jail had been affected by the slipping of the subsoil and the underlying decomposed sandstone down the valley slope. This subsidence also affected certain masonry structures within the jail. The jail kitchen including a big chula collapsed during the main shock. PWD boundary pillar was displaced and a second pillar was shattered. American Mission, this time also

\textsuperscript{83} Ibid.
\textsuperscript{84} Ibid., pp. 20-21.
escaped with comparatively little material injury. At the cemetery certain displacement of stones were observed.\textsuperscript{85}

At the western foot of Garo Hills, in the vicinity of the Brahmaputra, a number of cracks were observed on the alluvium from where sand and water had previously spouted. A few \textit{pucca} buildings which existed at Rowmari and Mankachar were badly damaged. Of this, the Rowmari Police building incurred many large cracks from floor to the roof. The PWD rest house at Rangapani built of \textit{ekra} and founded on a sandstone spar, suffered only fall of plaster.\textsuperscript{86}

At Goalpara the damages occurred in the circuit house, \textit{cutcherry}, post office and subdivisional officer's bungalow, where there were mainly fall of plasters and the \textit{ekra}. In SDO's bungalow bricks were dislodged from certain panels near the base of the building. The brick masonry wall of the jail was cracked vertically in a few places and the brick quarters within the jail compound also cracked. Cemetery wall’s large portion had collapsed and certain grave stones were damaged around the edges. No ground fissures were reported in the vicinity of Goalpara.\textsuperscript{87} Floor of the high school building was cracked. All the inspection bungalow and subordinate staying huts in this subdivision were badly damaged.\textsuperscript{88}

Both the judicial and revenue records rooms were badly damaged in Gauhati. The jail wall was damaged. The main buildings

\textsuperscript{85} ibid., pp. 23-26.
\textsuperscript{86} ibid., p. 27.
\textsuperscript{87} ibid., p. 29.
\textsuperscript{88} ibid.
of the town were constructed by ekra covered with plaster, though a number of the semi-pucca type with brick masonry below were also there. These, except in the case of old structure either escaped without damage or there were only fall of plasters.⁹⁹

At Shillong, the constructions following the last great earthquake of 1897 were so made that though vibrations this time were not that insignificant but still it had little impact on the buildings in general. However, in case of a few old structures fall of plasters took place, whilst at the Parsonage, cracks were formed near the corners of the masonry plinth.⁹⁰

At Cherrapunji the effects were not much, other than fall of plasters from some buildings. Only three monuments were damaged and two rectangular shaped masonry grave stones were affected.⁹¹

In Tezpur, Nowgong and Silghat in the vicinity of Brahmaputra river, the earthquake was reported to be severe, though no material damage resulted. At Sibsagar, loose objects were reported to have been over thrown and a rumbling noise 'like motor car' was said to have accompanied the main shocks. Information received from Digboi indicated that earthquake was sufficient to rattle doors, windows etc. At places like Margherita, Ledo, the observers were awakened by the main shock. At Tirap Colliery the earthquake caused the collapse of the roof of a part of the mine. Reports from Dibrugarh and Sadiya

⁸⁹ Ibid., pp. 30-31.
⁹⁰ Ibid., pp. 32-33.
⁹¹ Ibid., p. 33.
were similar to Digboi. At Aizawl, Maipur and Kohima the people
awoke, caused doors etc. to rattle but resulted no damage.92

LOSS OF PROPERTY DURING POST-COLONIAL PERIOD

Great Assam Earthquake

15th August, 1950 was a dreadful day of unbelievable ground
vibration. The earthquake that took place on that very day was
described as one of the biggest of human history.

On the evening of the 15th August, 1950, about 40
minutes past seven, an earthquake of catastrophic
violence occurred of the north-east border of Assam.
The earthquake was recorded by the seismological
observatories all over the world as a very great
earthquake and various adjectives such as
‘tremendous, very violent, unprecedented, biggest
ever recorded’ have been used to describe the
magnitude of the earthquake. It is one of the biggest
ever recorded.93

As has already been stated in Chapter 2, how within a gap of 53 years
following that of 1897 North Eastern India was once again rocked by
another great shock and to be precise, there were hardly two shocks
larger than that of 15th August shock of Assam, those occurred on the
globe in between 1856 to 1956 as per the list revised and published
by Gutenberg in 1956 (Annexure 2).94 Then, it was natural as put by
Richter, "This shock was more damaging in Assam, in terms of
property loss, than the earthquake of 1897".95 A trapped Botanist

92 Ibid., pp. 43-44.
94 Richter, C C, Elementary Seismology, pp. 709-715.
95 Ibid., p. 63.
working in the area very close to the epicentre records his feelings at the commencement of the great shock.

Suddenly a most extraordinary rumbling noise broke out, and the earth began to shudder violently. Shattering the dead silence of the night in that remote mountain retreat, the ominous rumble swelled to a deafening roar. It was as though the Keystone had fallen out of the universe and the arch of the sky were collapsing. ⁹⁶

In Assam particular construction suffered most.

Most of the buildings in the towns and villages of Assam are ‘lath and plaster’ type in which the walls are constructed of split bamboos or reeds held together in a wooden frame and coated with mud or sand and cement plaster. Such buildings did not suffer much from the earthquake. Brick buildings with good cement plaster were also hardly affected, but the brick buildings with lime plaster were seriously damaged. The walls had developed long open cracks and there were several cases of partial and a few of entire collapse of such buildings. But, “if a building happened to be on the line of a fissure or subsidence then it invariably suffered serious damage regardless of the type of building”. ⁹⁷

At Dibrugarh heavy damages were caused to the court buildings, jail, Assistant Commissioner’s residence, hospital building, PWD godown, Executive Engineer's residence, of these court building and Executive Engineer’s residence were unsafe for occupation. Several other government buildings suffered minor damages. Practically all pucca buildings, private or Government, in the town suffered damages and in some cases very badly. Thana building at Doom Dooma was very severely damaged and was unsafe for occupation. At Sadiya proper, many buildings were severely

⁹⁶ Kingdon-Ward, F, op. cit.
damaged. Part of Saikhowa bazaar including one rice mill subsided. The dispensary, the doctor's house and inspection bungalow all were severely damaged. 35 Military Barracks were very badly damaged demanding reconstruction. Several tube wells in the bazaar were reported to have been clean-out- at a depth of about 20 ft. below the ground. In the town of Sibsagar, jail buildings, high school buildings and police lock-up suffered heavy damage. The town was under water for 3 to 4 days due to a breach in the right bund of Dikhu just below the bazaar. But a large number of private buildings in the town and some surrounding villages were completely destroyed, some badly damaged. A large number of tanks and ponds were filled up with sand, causing difficulty in supply of drinking water. At Jorhat Government buildings suffered least. North Lakhimpur town was affected where PWD office godown, overseer's quarters, thana buildings and a portion of the jail compound suffered damage. Private buildings in the whole town were hit badly. Due to subsidence of the ground many people were rendered homeless.

In Abor Hills at Pashighat practically all new and old central and state government buildings were more or less damaged. Even temporary sheds completely collapsed. Military main buildings, school and boarding houses were very badly damaged, Assistant Political Officer's bungalow was washed away by flood,
Commandant's Bungalow and Inspection Bungalow were threatened by erosion.\(^9\)

Damage caused by the 1950 earthquake was multilateral and as recorded in a Arunachal Pradesh Gazetteer:

In some areas, the old tracks were obliterated by a chaotic jumble of granite slabs piled one above the other and many bridges collapsed, or were swept away by the floods. Some villages were buried or extinct a great part of the flourishing town of Sadia was destroyed and many neighbouring villages of the area were washed away leaving no trace behind.\(^9\)

Siang District Gazetteer of Arunachal Pradesh has recorded the damage of 1950 earthquake in the Himalayan Boundary of the Northeastern Region as below:

The areas worst hit by the earthquake were the Abor and Mismi Hills Districts and Northern portions of Upper Assam... Due to landslides in the hilly areas, destruction of 70 villages and death of 156 people was reported in the Abor Hills. Landslides were responsible for formation of natural damps in the upper reaches of the rivers and almost everyone of the tributaries of Brahmaputra was thus affected. The damp across Subansiri burst after 4 days of the earthquake and a wave of 20 fit high swept away villages and caused 532 deaths.\(^10\)

Communication

The earthquake of 1869 in Cachar disrupted largely the surface communication in the Barak Valley. On the west bank of Pola river the 4ft. high road sank down to the level of the land surface. Similarly

\[^{9}\text{Dutta, G.N., }\text{Damage caused by Earthquake of the 15th Aug. 1950 in Assam, }\text{No. gems }\text{Compilation on 1950 Earthquake.}\]
\[^{9\text{Dutta Chowdhury, S. (Ed.), }\text{Lohit District Gazetteer (1978), p.}\]
\[^{10\text{Dutta Chowdhury, S. (Ed.), }\text{East Siang and West Siang District Gazetteer (1994), p. 11-12.}\]
the earthquakes of 1897 and 1950 too had disrupted the communication tremendously in several districts of the region.

After Shillong Earthquake of 1897, all communication with the world remained snapped for several days. The disruption was largely of surface means of communication, but the telegraphic communication, too got disrupted for 4 days and could be re-established on 16th June. A large bridge over Umukrah river situated at 1 ½ miles away from Shillong got severely damaged. The effects of earthquake on the surface communication in K&J Hills, particularly, existing major road links to Shillong had been described by Arbuthnott. According to him the station of Shillong was accessible by cart-road from Guwahati 63 miles distant, on the Brahmaputra; secondly, from the Sylhet district by a car road, which extended as far as Cherra, 33 miles distant, whence Therraighat at the foot of the hill, 10 miles distant, was reached by a paved bridle path. From Therria to Companyganj, where boat carriage was available throughout the year, a distance of 8 miles was or rather was covered by the Companyganj-Therria State Railway. Thirdly, from Jaintiapur in Sylhet to Jowai, 25 miles, and there to Shillong, 33, total 58 miles not communicable by carts. The records inform us that all the three surface communication links were badly damaged. The contemporary report of the Superintending Engineer, Nightingle specifically mentions that the bridle path from Therriaghata to Cherrapunji was completely

destroyed and would require reconstruction. The road of Shillong to Cherra, 33 miles long was virtually destroyed beyond the 6th mile from Shillong, the portions between the 17th and 24th and the 29th and 32nd miles slipped down from the hillside and great chasms, 30 feet deep, had opened out between the 24th and 29th miles. Similarly, the road from Shillong to Gauhati, 63 miles in length too was extremely damaged due to landslips and fissures in between Shillong and Nongpoh. Almost all the bridges of this route had collapsed except for Burnihat and Barapani. The bridle path from Shillong to Jaintiapur via Jowai was also considerably damaged. The Assam Trunk Road, on the south bank of Brahmaputra, and running through the Kamrup district was very badly damaged, the road having subsided and cracked in many places, and most of the bridges were destroyed. The North Trunk Road was also damaged considerably.

The Cherra – Companyganj Railway running on the bank of the river sank in many places and the rails got twisted. The station buildings were also damaged, and traffic could not be restored till August, 1897.102

The damage was seen elsewhere as well as the bridge on the bridle path to Nongstoin and Nongkhlaw via Mairang had also collapsed and the path was filled up of land slides mud. The old Cherra road via Maoflong collapsed badly on both sides of the Bogapani (Shella river). The road joins the Cherra cart road at 23rd

mile. On the Cherra cart road the only bride standing was the stone arch bridge at the 10th miles from Shillong which rests on a solid rock, and was probably the largest bridge of its kind in Assam.\textsuperscript{103}

Interestingly, the total loss incurred by K&J Hills division (which also included Kamrup district) due to the failure of structures and communication under imperial and provincial head was estimated to Rs. 19,61,241 (Annexure – III) by the Executive Engineer and as forwarded to the Office of the Chief Commissioner, Assam by the Superintending Engineer of Assam, W H Nightingale.\textsuperscript{104} Obviously, the loss estimated was confined to state owned property and communication.

The Sunamganj – Pagla – Govindganj road in Sylhet district, which was mostly running on high river bank through low country had been very severely damaged.\textsuperscript{105} Five iron bridges and one masonry bridge on the Sylhet – Companyganj road and iron bridge on the Sylhet – Fechuganj road could not withstand the impact and officials suggested reconstruction. The officials suggested repair and reconstruction of many buildings and road and estimated a cost of approximately Rs. 4.62 lakh for building and Rs. 68,000 for roads, thus the expected expenditure for the purpose was pegged up at Rs. 5.30 lakhs for the district.\textsuperscript{106}

\footnotesize
\begin{itemize}
\item \textsuperscript{103} Arbuthnott, J C, op. cit., p. 31.
\item \textsuperscript{104} Nightingale, W H, op. cit., pp. 2-3.
\item \textsuperscript{105} O’Brien, P H, op. cit., p. 54.
\item \textsuperscript{106} Nightingale, W H, op. cit., pp. 1-3.
\end{itemize}
Although such estimate for the destruction in Sylhet district is not available but the correspondence of the Deputy Commissioner, Sylhet indicate that the railway line was seriously damaged throughout its length, and that it was practically obliterated where it was crossing the Juri Valley.\textsuperscript{107}

The Assam Trunk Road of the south bank of Brahmaputra, which passed through the Kamrup district, was also damaged. The road cracked and sank at many places and all the bridges had collapsed. The North Trunk Road was also considerably damaged. The river Kalbhog providing irrigational and drinking water was stopped because of the blockade caused by earthquake.\textsuperscript{108} At Gauhati roads throughout the town cracked in many places, in the west end strand road also subsided in several places. In the Fancy Bazar springs of water and a very fine kind of sand, resembling the colour of Portland Cement bubbled up and the bubbling lasted for about 24 hours, causing heaps of sand to be deposited.\textsuperscript{109} The Barpeta town was under water for a considerable period after the earthquake as testified by Mr Cotton, Chief Commissioner of Assam who was accorded guest of honour at the roof top of a boat on 16\textsuperscript{th} September 1897. The boat had served as a treasury, jail and guard room.\textsuperscript{110} Obviously, the surface communication was completely

\begin{flushleft}
\textsuperscript{107} O'brien, P H, \textit{op. cit.}, p. 54.  \\
\textsuperscript{108} Sukul's Report, Chapter VII, para, 49-50.  \\
\textsuperscript{109} Gurdon, P R T, \textit{op. cit.}, p. 16.  \\
\textsuperscript{110} Cotton, H J S, 'Diary of the Chief Commissioner on Tour, August and September 1897', p. 7.
\end{flushleft}
shattered in Barpeta town. The estimated loss in terms of rupee due to collapse of buildings and communication in the district is available (Annexure – III).

In Tura, roads and bridges were also destroyed. The road beyond DSP’s quarter sank altogether, another road from the jail was covered by a landslip. Though the bridle path to Rongrengiri and Salmaara for the first 3 miles from Tura remain unhurt, the cart roads to Dalu and Mankachar were blocked with landslips right up to Tura for several weeks making movement almost impossible. At the 22nd miles of the Mankachar road a timber bridge, 80 feet long, was heaved up to a height of 8 feet above its proper level. In the hill this road suffered landslips and in the plains embankments sunk 2 or 3 feet for long distances, breaches were frequent and bridge had subsided more or less. The estimated cost for restoring the building and repairing roads was prepared by the officials which available in Annexure – III along with Goalpara district.

At Goalpara, postal and telegraphic communications as well as the surface communications were snapped. The road had been breached at many places and bridges were destroyed. The Assam Trunk Road, crossing the Goalpara subdivision, was badly damaged, and nearly all the bridges including an iron bridge of span of 80 feet, 2 spans of 60 feet, and 2 of 22 feet, over the Krishnai river in the 74th

---

mile were destroyed. But roads running on the north of the Brahmaputra were not damaged severely.\textsuperscript{113}

The parts of Tezpur – Balipara Tramway suffered and most severely lied in between Sessa and Rangapara. At Rangapara the upheavals and lateral throes of the low-lying land had thrown the permanent way which was shaken in all direction, and had even twisted the iron rails into various curious shapes.\textsuperscript{114} The Executive Engineer had estimated the total loss of building and roads in central Assam division as Rs. 1,84,000\textcurrency. The division was comprised of Nowgong and Darrang districts. In Darrang, Mangaldai subdivision was the worst sufferer. The road in between Patharughat to Sonapur which was also known as Siali Kuchi road was actually based on a bund. The portion of the bund sank under the impact which had disrupted communication. Falling in of banks with trees affected the boat traffic also.\textsuperscript{115} Under the immediate impact of the earthquake, telegraphic communication of Nowgong snapped. The Strand Road disappeared in parts.\textsuperscript{116} The road in general in the district became fissured, sunken or displaced.\textsuperscript{117}

The portions of the railway which were most seriously affected by the earthquake of 1897 were the Gauhati Branch and the line through South Sylhet and its branch to Silchar.

\textsuperscript{113} Nightingale, W H, \textit{op. cit.}, p. 2.
\textsuperscript{114} Gray, M A, \textit{op. cit.}, p. 13.
\textsuperscript{115} Sukul's Report, \textit{op. cit.}, Chapter – V, para 30.
\textsuperscript{116} Kennedy, C G M, \textit{op. cit.}, p. 13.
\textsuperscript{117} \textit{Ibid.}
The Gauhati branch line was functional for all classes of traffic upto Jamunamukh till the earthquake had disrupted this railway communication by destroying a number of bridges. On this line, the Titamari bridge, a high bridge having a span of 100 feet and two spans of 40 feet over a navigable channel, the Kopili bridge of 3 spans 100 feet and 18 spans 60 feet and all minor bridges and culverts on the line were destroyed. All the station buildings and staff quarters on the whole 75 miles line were razed to the grounds. The damage was so much so that it was intimated by the railway authority that everything might be restored to its former condition by the end of the next working season.\textsuperscript{118}

The segment of the railway lying in between south Sylhet and Badarpur was disrupted due to the failure of the culverts and large bridges, which required extensive repair. A section of the line leading to Karimganj was opened within short time with enormous precaution and rest of section up to Badarpur was expected to be opened by 1\textsuperscript{st} November, 1897.\textsuperscript{119} Grims informs us that on the unopened section of the railway between Badarpur and Silchar the damage was very severe, especially to the bridges. In the case of the bridge over Bara Khal the piers had fallen right into the river and had disappeared entirely. Before the earthquake this bridge had eleven standing piers, each with 9000 cubic feet of masonry, there were three spans of 60 feet and six spans of 40 feet, but after the shock only two pier on each

\textsuperscript{118} Mr Way, quoted in Gait's Report, p. 7.
\textsuperscript{119} Ibid.
bank were left standing and the intermediate span was quite blank.\textsuperscript{120} Owing to these damages the opening of the Silchar line was delayed and it was feared that two season of work i.e., two more year would be required to set these things right.\textsuperscript{121}

The Tezpur – Salipara Tramway considerably suffered but was also got repaired quickly. The state railway in Sylhet from Therraighat to Companyganj was more seriously damaged, and the cost of repairing was estimated to be Rs. 10,000/-\textsuperscript{122}

The 1930 Dhubri earthquake had affected railway lines very seriously around Dhubri and Gauripur. Cracks were also formed in the masonry culverts and bridges. Eastern Bengal Railway line was considerably damaged. The displacement and subsidence of the piers and abutments of a large number of bridges and culverts often took place. At places fissures also distorted the line. However, between Golakganj and Sapotgram no damage resulted.\textsuperscript{123} The railways and public roads had sank at many places. The damage to the Bengal Dooars railway line was also serious leading to the suspension of train services from Lalmanirhat and the passenger train between Lakmanirhat and Amingaon was stopped for that night on

\textsuperscript{120} Grims, G E, Appendix – A in Oldham’s Memoir, p. 295.
\textsuperscript{121} Gait’s Report, p. 7.
\textsuperscript{122} Ibid.
account of damages to the line on the Golakganj – Dhubri section of the Eastern Bengal Railway.\textsuperscript{124}

The Singra Bridge as well as bridge no. 44/3 on the Assam Trunk Road within Gauhati subdivision were affected by this shock. In Goalpara subdivision the abutments of the bridge no. 72/1 on Assam Trunk Road West had cracked. Timber bridge no. 95/1 badly damaged due to continual shocks.\textsuperscript{125}

The Great Assam Earthquake of 1950 had its severe impact on the communication of the region. Though the Assam Trunk Road from Gauhati to mile 257/7 was practically unaffected except for some damage near Jorhat and Sibsagar towns, the portion in between 257/7 mile to 259/7 was, however, seriously damaged by subsidence, fissures and heavy surface corrugations and submergence by the water from the Dehing river at several places. The portions between the miles 258/1 and 258/3 had a big gap and boats had to be arranged for passing the traffic. At Doom Dooma, the screw pile bridge of 7 spans of 40 feet each at 317 miles was severely damaged needing reconstruction. Beyond Doom Dooma for some length it was unaffected until it reached Talagu Railway Station from where again the gravel portion of the road fissured all over and subsided in mile 324/7, below mile 325/4, below mile 325/4 and 327/4, 327/6 and 328/1 and for two furlongs in mile 330. The approaches of the bridge mile

\textsuperscript{124} Dow, T M, was quoted in the Memoirs of the Geological Survey of India, vol. 65, Calcutta, 1934, p. 16.
\textsuperscript{125} Gee, E R, \textit{op. cit.}, p. 13.
324/7 had subsided leaving the bridge as if on a hum. The timber bridge on Dholla river at mile 330 was totally wrecked and was recommended for reconstruction.\textsuperscript{126}

The worst affected part of the Assam Trunk Road was in Sadiya between Dholla and Sessinighat via Saikhowaghat. All bridges collapsed, the road cracked and subsided at several places. The length of 3 miles between Saikhowa and Sessinighat was completely gone.\textsuperscript{127}

Similarly the Saikhowa – Rongdoi Road was very severely damaged and half the road was under water. All timber bridges collapsed, many channels silted up. There were a large number of subsidences and cracks on the road. The length beyond 6\textsuperscript{th} mile was under water because the whole country side subsided, 2 feet to 3 feet due to the earthquake. Saikhowa – Dirakmukh Road and Rongdoi – Laikajan Road had also been seriously damaged.\textsuperscript{128}

Lohit Valley Road and Sadiya – Nizamghat Road were severely damaged and communications between several stations were cut off.\textsuperscript{129}

Jagan Nath Barua Road to Kokilamuka in Jorhat was badly damaged at places.\textsuperscript{130} Desangmukh Road at Sibsagar subsided at two places in 5\textsuperscript{th} mile and an abutment of the screw pile bridge (known

\textsuperscript{126} GArg, G R, \textit{op. cit.}, p. 69.
\textsuperscript{127} Dutta, G N, \textit{op. cit.}, pp. 73-74.
\textsuperscript{128} \textit{Ibid.}, p. 74.
\textsuperscript{129} \textit{Ibid.}
\textsuperscript{130} Garg, G R, \textit{op. cit.}, p. 70.
as Dehihi bridge) at the 4th mile settled down.\textsuperscript{131} Kobo – Pasighat Road damaged between miles 6 and 14.\textsuperscript{132} Gajjan – Markongse!ek Road was also badly damaged.\textsuperscript{133}

North Trunk Road between Narainpur and North Lakhimpur town, a length of 29 miles was badly cracked and sank in many places. The first class metalled road between 120th to 129th mile was so much damaged that a length of seven miles warranted complete reconstruction. The Ranganadi bridge in the 125th mile, a steel bridge of 1040 feet in length, the then largest bridge of Assam, constructed in June 1936 at a cost of Rs. 2,45,000/- totally collapsed.\textsuperscript{134}

The North Trunk Road from North Lakhimpur to Chaldhowa, a distance of 22 miles passing through Pathalipar and Ananda Tea Gardens was totally damaged and in some places the road sank below the surround ground level. All the timber bridges on this section, totalling 2,810 rft. in length, were damaged badly by the earthquake and many were bodily washed away to a great distance by the subsequent Subansiri floods.\textsuperscript{135}

The Garamur Road (Kamalbari Road) the main link about 25 miles connecting North Lakhimpur to the south bank was very badly damaged needing complete reconstruction for many miles.\textsuperscript{136}

Immediately after the earthquake, four sectors of the Assam Railways were suspended. (1) Mariani and

\textsuperscript{131} Ibid., p. 7.
\textsuperscript{132} Ibid.
\textsuperscript{133} Ibid.
\textsuperscript{134} Dutta, D N, \textit{op. cit.}, p. 74.
\textsuperscript{135} Ibid., pp. 74-75.
\textsuperscript{136} Ibid., p. 75.
Duklingia on the Jorhat Section, (2) Simulguri and Tinsukia, (3) Margherita and Ledo and (4) Makum Junction and Saikhoaghat. Excepting the last one where the damage was extensive, the remaining communications were restored within a very short time. Besides damages to Dihing and Tingrai bridges over the Tinsukia – Simulguri section, most of the railway bridges from Makum Junction to Saikhoaghat were badly damaged. The naturalist E P Gee puts it this way: "The Assam Railway from Mariani eastwards suffered greatly, rail tracks being torn up and twisted into snake-like patterns.\textsuperscript{137}

The floods following the bursting of the dams due to earthquake carried vast quantities of silt and debris and all the river channels even that of the Brahmaputra became blocked. After August 1950 river steamers could no longer navigate as far as Dibrugarh, but were forced to terminate their journey at Desangmukh.\textsuperscript{138}

**Agriculture**

As has already been discussed, for sustenance the region was primarily dependent on agrarian production. Since Ahom period wet cultivation had been the means of producing surplus. With the arrival of colonial rule, the region did not change much so far as the agrarian production was concerned. Other than the exploitation of the local mineral resources, the only industry which was established during the colonial rule in the region was tea industry which was only a part of agro-industry. Accordingly for the entire study period (1228-1960) agriculture remained the basic source of production in the region.

\textsuperscript{137} Gee, E P. 'The Assam Earthquake of 1950', *Journal of Bombay Natural History Society*, vol. 50, no. 3, p. 630.

\textsuperscript{138} Ibid., pp. 631-32.
Land is the primary requirement for agriculture and the land as well as the other associated geological features happened to be the obvious victims of earthquakes. Thus agricultural products were threatened by earthquakes.

Records speak a lot about this for both colonial and post-colonial period. Impact of earthquake on agriculture of this region with particular reference to agricultural loss is discussed hereafter.

Cachar Earthquake records though are not explicit regarding the loss in agriculture but the reported amount of fissures on the land could not keep the Surma Valley completely free of this particular loss in agriculture. However, the region suffered a huge loss in agriculture by the 1897 great Shiilong Earthquake, which was further compounded by the flood that almost accompanied the event.

Earthquake caused ejection of sand through sand springs in the plain areas, more so in the open cultivable fields - the amount of sand being substantially large. In hill areas destruction were made through land slides. Losses are described district wise as far as possible in terms of both quality and quantity.

Since, there were two floods led by the great earthquake of 1897, their impacts on the ground were superimposed in the district. Large chunk of sand was ejected through the fissures caused by the earthquake. The sands were then deposited over the crops thereby destroying a huge quantity of ahu and bao crops in the district. The deposits of sand were most extensive in the mauzas of both banks of
Brahmaputra belonging to the district where the fluctuating cultivation of ahu and mustard were carried on. Dakhin Sarubangsar, Pub Chamaria, Paschim Chamaria on the south bank of Brahmaputra were the mauzas which were severely affected and Dakhin Barkhetri, Chunga, Barpeta, Bagribari, Rupasis, Bhananipur, Sarukhetri and Paka were on the north bank. This earthquake was almost accompanied by heavy rainfall, resulting in the rise of water from the rivers and bils which had been partly filled up by the sand ejected due to the earthquake. Many villages especially in the Barpeta subdivision near the Chalkhowa and other rivers were inundated. The water decreased somewhat in a few days but with the commencement of the rains towards the end of June, again the rivers rose, and a large tract remained under water continuously until October. Thus, the damage done by the floods which followed the earthquake was much greater than that caused directly by the earthquake.\footnote{Report by Mr D H Less, ICS on the circumstances of the raiyats of Kamrup and Nowgong district, \textit{Proceedings of the Chief Commissioner of Assam, Revenue and Agriculture}, June, 1898, p. 4.} This findings was however, contradicted later on.

The statement below (Table 5.2) shows the area on which crops were destroyed by deposits of sand and floods, separate figures have been given for those mauzas where the loss was great. The table does not speak of Sali crop, as the loss was very small, amounting only one percent of the total crop.\footnote{Ibid., p. 5.}
Table 5.2 Crops destroyed in Kamrup

<table>
<thead>
<tr>
<th>Mauza</th>
<th>Area on which crop was sown (bighas)</th>
<th>Area on which crop was destroyed (bighas)</th>
<th>Proportion of crop destroyed (annas)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ahu</td>
<td>Bao</td>
<td>Ahu</td>
</tr>
<tr>
<td>Baribari</td>
<td>14973</td>
<td>794</td>
<td>12633</td>
</tr>
<tr>
<td>Barpeta</td>
<td>13661</td>
<td>726</td>
<td>5841</td>
</tr>
<tr>
<td>Chenga</td>
<td>9138</td>
<td>1060</td>
<td>2093</td>
</tr>
<tr>
<td>Paka</td>
<td>10648</td>
<td>5947</td>
<td>5661</td>
</tr>
<tr>
<td>Sarukhetri</td>
<td>15725</td>
<td>3046</td>
<td>9408</td>
</tr>
<tr>
<td>Bhabanipur</td>
<td>11555</td>
<td>136</td>
<td>5237</td>
</tr>
<tr>
<td>Rupasi</td>
<td>7545</td>
<td>206</td>
<td>2707</td>
</tr>
<tr>
<td>Total mauzas</td>
<td>83245</td>
<td>11915</td>
<td>43582</td>
</tr>
<tr>
<td>Total Barpeta subdivision</td>
<td>164713</td>
<td>22664</td>
<td>44867</td>
</tr>
<tr>
<td>Uttar Sarubangsar</td>
<td>22657</td>
<td>11129</td>
<td>8679</td>
</tr>
<tr>
<td>Hajo</td>
<td>13237</td>
<td>20706</td>
<td>4050</td>
</tr>
<tr>
<td>Ramdia</td>
<td>9016</td>
<td>1115</td>
<td>7193</td>
</tr>
<tr>
<td>Uttar Barkhetri</td>
<td>9819</td>
<td>9724</td>
<td>8323</td>
</tr>
<tr>
<td>Dakhin Barkhetri</td>
<td>16374</td>
<td>908</td>
<td>11361</td>
</tr>
<tr>
<td>Dakhin Sarubangsar</td>
<td>21137</td>
<td>8847</td>
<td>9633</td>
</tr>
<tr>
<td>Dharmapur</td>
<td>29927</td>
<td>40623</td>
<td>7970</td>
</tr>
<tr>
<td>Pakoa</td>
<td>5924</td>
<td>23041</td>
<td>737</td>
</tr>
<tr>
<td>Total mauzas</td>
<td>128091</td>
<td>116093</td>
<td>57946</td>
</tr>
<tr>
<td>Total sadar subdivision</td>
<td>390601</td>
<td>214792</td>
<td>95480</td>
</tr>
<tr>
<td>Total Kamrup District</td>
<td>555314</td>
<td>236856</td>
<td>140347</td>
</tr>
</tbody>
</table>

In the Nowgong district Mr. Lees reports that, of the ahu crop about one-sixteenth, of the bao crop about five-sixteenths, and of the Sali crop about two-sixteenth were destroyed, but he also mentioned that 'the greatest destruction of crops was caused by a flood of the Kopili river which happened at the same time as the second Brahmapura flood in September, and was due to exceptionally heavy rains in the hills
(vide paragraph 3 or his report)'. This destruction is not, therefore, prima facie attributable to the earthquake...\(^{141}\)

But when this observation of F C Henniker, the then Director, Department of Land Records and Agriculture, Assam is seen vis-à-vis his own later deductions –

Practically, therefore, the damage was only caused in two ways, but it is generally alleged that the earthquake was directly or indirectly the cause of both in the year 1897.\(^{142}\)

the picture becomes different. The mauzas where loss of crops occurred by the 2\(^{nd}\) flood in the district were Jamunamukh, Namati, Garubat, Kamrup, all the mauzas of the Roha Tahsil, Tetelia, Myang, and Gobha. In the Chapori tract there was some loss of the ahu and bao crops, but this was not great except in mauzas Gerua, Bokoni, and a part of Myan, near the Brahmaputra. The statement prepared from the returns of the Mandal placed in Table 5.3 below shows the extent to which crops was reported to have been destroyed in Nowgong.\(^{143}\)

**Table 5.3 Crops destroyed in Nowgong**

<table>
<thead>
<tr>
<th>Crop sown</th>
<th>Area sown or transplanted (bighas)</th>
<th>Area on which crop was destroyed (bighas)</th>
<th>Area on which Sali could not be transplanted</th>
<th>Proportion of crop destroyed (annas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahu</td>
<td>162,226</td>
<td>12,006</td>
<td>...</td>
<td>1</td>
</tr>
<tr>
<td>Bao</td>
<td>90,141</td>
<td>27,512</td>
<td>...</td>
<td>5 (approx)</td>
</tr>
<tr>
<td>Sali</td>
<td>203,940</td>
<td>27,230</td>
<td>36,374</td>
<td>2</td>
</tr>
</tbody>
</table>

\(^{141}\) Henniker, F C, ‘Report by Mr D H Lees, ICS, on the circumstances of the raiyats of Kamrup and Nowgong district’, *Proceedings of the Chief Commissioner of Assam, Revenue and Agriculture*, June, 1898.

\(^{142}\) Ibid., pp. 2.

\(^{143}\) Ibid., pp. 5.
In Kamrup district, a large area, especially in Barpeta subdivision and in some villages around Hajo, was under water at sowing time, which in turn affected the cultivation of pulses, til and mustard. Pulses and til required to be sown even earlier than mustard, were affected much.

The extent to which these crops cultivation was reduced in area due to sand deposits and non-subsidence of the floods in the effected year in comparison with that with earlier year is available at Table 3.\(^{144}\)

<table>
<thead>
<tr>
<th></th>
<th>Mustard</th>
<th>Pulses</th>
<th>Til</th>
<th>Gram &amp; c.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1896-97</td>
<td>273,397</td>
<td>77,743</td>
<td>21,651</td>
<td>63</td>
<td>372,854</td>
</tr>
<tr>
<td>1897-98</td>
<td>206,217</td>
<td>40,978</td>
<td>2,888</td>
<td>54</td>
<td>250,137</td>
</tr>
<tr>
<td>Decrease</td>
<td>67,180</td>
<td>36,765</td>
<td>18,763</td>
<td>9</td>
<td>122,717</td>
</tr>
</tbody>
</table>

There was a decrease of 32 percent area-wise under cold-weather crops in 1897-98 as compared with 1896-97.

The mustard crop was poor. In the sadar subdivision great damage was done by caterpillars and insects. The mustard sown on land covered with sand deposits withered and died. The outturn of mustard in the whole district may be estimated to be at 9 annas of an average crop.\(^{145}\)

\(^{144}\) Ibid., pp. 6.
\(^{145}\) Ibid., pp. 6.
The loss of cattle owing to the floods was very great in Kamrup. The mortality of cattle was chiefly due to want of fodder, or disease arising from the cattle grazing on grass which had become half rotten owing to submergence. The floods caused quite a great damage to paddy stored in granaries. The raiyats, expecting an ordinary flood, did not at first take out the paddy from their granaries and afterwards were unable to do so.\footnote{Ibid., pp. 6.}

Mr F C Henniker, ICS, Officiating Director, Department of Land Records and Agriculture, Assam while forwarding Mr Lees report to the Secretary to the Chief Commissioner of Assam made his stand clear regarding the comparison, whether the damages to crops were because of earthquake or flood.

4. The actual damage attributed to the earthquake directly or indirectly is of various kinds. They were:

(i) Deposits of sand ejected from fissures in the earth at the time of the actual earthquake (worse in Kamrup than in Nowgong).

(ii) Floods which actually destroyed or damaged crops, cattle and granaries. These floods are said to have been higher than before (vide for instance paragraph 4 of Mr Lees' report). The cause apparently was destruction of river banks and the elevation of river beds, causing rivers to quit their beds and wander over the country side. This was especially the case with the Pagladia in North Kamrup and the Kopili in Nowgong, besides the Brahmaputra itself.

(iii) Deposits of sand left by the floods referred to Mr Lees remarks, in paragraph 3 of his report, that it is often impossible to distinguish between sand so deposited and that ejected
from the soil by the earthquake. I gather, however, that generally the floods deposited the greater quantity. The point, however, is not material. The effect upon the land is the same in either case. Practically, therefore, the damage was only caused in two ways, but it is generally alleged that the earthquake was directly or indirectly the cause of both in the year 1897.\textsuperscript{147}

Director, Department of Land Records and Agriculture, Assam Mr Henniker on another scrutiny wanted to rectify his stand taken vide his letter dated 18\textsuperscript{th} May 1898. The changed opinion was expressed through a communication made through a letter dated 27\textsuperscript{th} May, 1898. Hereby in supersession of earlier recommendation, the new recommendation had an exact list of enclosure bearing the name of mauza and the quantity of Rupit land in bigha which had been rendered uncultivable in the district of Kamrup. As per new list, the total Rupit land affected in Kamrup had been reduced to 23,768 bighas. So, accordingly on conversion of Rupit to Faringati the maximum loss of revenue cannot exceed Rs. 5942, since, maximum difference in revenue cannot exceed 4 annas i.e., one fourth. The referred list is given below (Table 5.5)\textsuperscript{148}

\textsuperscript{147} Henniker, F C, \textit{op cit.}, pp. 1.

\textsuperscript{148} Henniker, F C, 'R. 44-45. Circumstances of riyats of Kamrup and Nowgong as affected by earthquake, No. 2535, dated Shillong, the 27\textsuperscript{th} May, 1898, Assam Secretariat Proceedings, June, 1898.
Table 5.5  The recommended list of mauzas for Kamrup District

<table>
<thead>
<tr>
<th>Mauza</th>
<th>Area of rupit land rendered uncultivable owing to earthquake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td><strong>Sadar subdivision</strong></td>
<td></td>
</tr>
<tr>
<td>Uparbarbhag</td>
<td>935</td>
</tr>
<tr>
<td>Hajo</td>
<td>541</td>
</tr>
<tr>
<td>Uttar barkhetri</td>
<td>1957</td>
</tr>
<tr>
<td>Uttar sarabangsar</td>
<td>193</td>
</tr>
<tr>
<td>Defeli</td>
<td>264</td>
</tr>
<tr>
<td>Nambarbhag</td>
<td>726</td>
</tr>
<tr>
<td>Pub chamaria</td>
<td>334</td>
</tr>
<tr>
<td>Bakali</td>
<td>898</td>
</tr>
<tr>
<td>Kharia bako</td>
<td>1288</td>
</tr>
<tr>
<td>Laki</td>
<td>163</td>
</tr>
<tr>
<td>Daramapur</td>
<td>5042</td>
</tr>
<tr>
<td>Khata</td>
<td>453</td>
</tr>
<tr>
<td>Batasgita</td>
<td>1231</td>
</tr>
<tr>
<td>Natkamo</td>
<td>514</td>
</tr>
<tr>
<td>Pakoa</td>
<td>1032</td>
</tr>
<tr>
<td>Pati darrang</td>
<td>1261</td>
</tr>
<tr>
<td>Parbapar</td>
<td>111</td>
</tr>
<tr>
<td>Madartola</td>
<td>129</td>
</tr>
<tr>
<td>Barbangsar</td>
<td>320</td>
</tr>
<tr>
<td><strong>Total sadar subdivision</strong></td>
<td>17401</td>
</tr>
<tr>
<td><strong>Barpeta subdivision</strong></td>
<td></td>
</tr>
<tr>
<td>Bagribari</td>
<td>510</td>
</tr>
<tr>
<td>Rpari</td>
<td>397</td>
</tr>
<tr>
<td>Danka chakabansi</td>
<td>1689</td>
</tr>
<tr>
<td>Sariha</td>
<td>266</td>
</tr>
<tr>
<td>Dakhin bajali</td>
<td>1160</td>
</tr>
<tr>
<td>Uttar bajali</td>
<td>456</td>
</tr>
<tr>
<td>Hartinapur</td>
<td>260</td>
</tr>
<tr>
<td>Bijní</td>
<td>348</td>
</tr>
<tr>
<td>Paka</td>
<td>1277</td>
</tr>
<tr>
<td><strong>Total Barpeta subdivision</strong></td>
<td>6367</td>
</tr>
<tr>
<td><strong>Total Kamrup district</strong></td>
<td>23768</td>
</tr>
</tbody>
</table>

Landslips were other hazard as already mentioned to cause danger to crops in many ways.

In the hills landslips have caused a great deal of damage, granaries have been wrecked, and much grain lost. The cultivated slopes of the hills have cracked so as to injure the crop, and in some places
the earth has been so severely shaken as to destroy it.\(^{149}\)

In Gauripur area the loss of crop due to sand cover was estimated at about one fourth. Similarly, at Sukhchar also crops were very seriously damaged by the associated floods.\(^{150}\) Eye witness accounts at Jamadarhat provides a vivid picture:

It seemed as though death from drowning must have been the end of everyone near me. Although shocks went on being repeated incessantly at intervals of a few minutes, the rise in the water ceased after half an hour, and then the idea present to one’s eye was that the country on either side of the road was nothing more than innumerable sand chars of different sizes, such as are met with in the Brahmaputra. This meant, of course, that crops were considerably covered by this sand.\(^{151}\)

The roads sank following the earthquake, thereby making free passage for the flood water to flow and damage the crops. The Sialikushi road from Patharughat to Sonapur sank in many places and owing to this crops in most of the villages of Rainakuchi, Lokrai and Sonapur mauzas were badly damaged by the subsequent floods.\(^{152}\)

From the 11\(^{th}\) to the 8\(^{th}\) mile of Kalaigaon-Mangaldai road which runs along the left bank of Noa nadi sank almost to the ground level after the earthquake and the country to the east of this road was submerged by the flood water. About 12,7000 bighas of land in the district of Darrang was under the water of Nonai, the Diggaj, the Kulshi and the Noa nadi. At Patharughat tahsil, 10,000 bighas, at

\(^{149}\) Howell, A A, *op. cit.*, p. 50.
\(^{150}\) Hallifox, A G, *op. cit.*
\(^{152}\) *Suku’s Report*, chapter V, para. 30.
Mangaldai 1,700 *bighas* and at Kalaigaon the amount of land under water was 1,000 *bighas*. This loss of crops over cultivated land due to flood was the indirect impact of this earthquake only.

In the district of Sylhet the crops were mainly destroyed by the subsidence of the riparian land. However, the reported loss of crops in the district was found to be much exaggerated, which in reality was much less, as during that time the harvested crop was *Ahu* or early rice crop which was not a variety extensively cultivated in the district. But, it was also true that cracking of the soil and ejection of sandy matters through the cracks and subsequent spreading of the same to the field had also partly destroyed the crops.

The total loss due to the these causes is, however, infinitesimal throughout the greater part of the district, though in the west of Sunamganj, where the land is apparently still imperfectly consolidated, some limited areas are reported to have been rendered unfertile by sand deposit, or to have collapsed altogether into the water. As, however, the *Aus* is not an important crop in this district, and least of all in Sunamganj, the loss of crop caused by the earthquake can hardly be said to have been felt by the people at large.

As per the estimate of SDO, Sunamganj the loss was about one eighth of the standing crops.

In the district of Cachar a good amount of cultivable land was destroyed by the 1897 earthquake. It was reported that much land was damaged and crops destroyed by deep and extensive cracks and

---

155 Mag, J B, *op. cit.*, p. 56.
sand thrown out from them. Destructions as estimated below were mostly from Katigora and Sadar of the district.\textsuperscript{156}

Table 5.6 Crops damaged in Cachar

<table>
<thead>
<tr>
<th>Area</th>
<th>Hal</th>
<th>Keyar</th>
<th>Poua</th>
<th>Rs.</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crops damaged by sand or earthquake</td>
<td>229</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

So crops in an area of 229 Hal were damaged.

Assam Earthquake of 1950 caused landslips of a very great dimension. As has already been seen that the volume of debris which had slide down the hills would be at least of the order of 60,000 million cubic yards more probably several times this figure.\textsuperscript{157} This entire volume of debris was carried by the river and this volume being of a very great dimension bringing down huge quantities of sand, silt and snags (logs of timber) much beyond the carrying capacity of the rivers caused extensive silting up of the river beds.

Those huge landslips had effected the river system of Assam and hence cultivation in two ways – direct effect and long term indirect effect.

\textsuperscript{156} Newbould, B B, 'Report from the Deputy Commissioner, Cachar, on the effects of the earthquake in his district', Appendix – iX in 'Gait's Report', p. 57.
\textsuperscript{157} Mathur, L P, 'The Assam Earthquake of 15\textsuperscript{th} August, 1950', \textit{The Central Board of Geophysics}, publication no. 1, Compilation of papers on Assam Earthquake of August 15, 1950, compiled by M B Ramachandra Rao, 1953, p. 100.
**Direct Effect**: The river Subansiri was blocked by landslips, logs etc. But the block could not remain so for a longer period and had to burst. After bursting of the block in a length of 15-20 miles, it flooded an extensive area along the north bank to a width of about 3 miles on the right and 2 miles on the left. Thereby a large part of the flooded area was silted up by the sand deposit rendering it unfit for cultivation.

**Indirect Effect**: "Raising of river beds of most of the rivers of the upper Assam and than of Brahmaputra would certainly warrant floods of bigger dimension by next few years." As was apprehended, the very next year i.e., in 1951 there was a devastating flood of record dimension in June-July followed by another of similar size which took place in September of the same year. Two distinct reason – rapid runoff of water from the mutilated hills and incompetence of river to hold more water in absence of any depth in the river. These two floods of 1951 along with that one of 1950 had destroyed the agricultural crops and so the produce of the region to their extreme.

It has been discussed in the Chapter 3 how the rivers of N E India were affected by the great earthquake of 1950. Opinion of the experts about the future role of those rivers including that of mighty Brahmaputra in the region have also been summarised, at places

---

158 Gee, E P, op. cit., p. 1 et seq.
exact opinions are quoted to highlight the great importance that they carry. One opinion was that:

He also records that in his view, flooding will not occur in the Debrugarh or Jorhat area but will occur further down the river.\textsuperscript{159}

If vis-à-vis this the extent of 1951 flood of Assam is seen, the strength of this opinion becomes evident.

This flood of June-July moved slowly down to Brahmaputra Valley of Assam inundating the north and south banks as it went. Travelling by air from Dibrugarh to Gauhati on July 20th I observed that the flood had receded in Upper Assam, but in Nowgong and Kamrup districts the whole plain from the Himalayan foothills in the north to the Khasi and Jayantia Hill in the south appeared to be a continuous sheet of water, with only trees and the roof of houses showing.\textsuperscript{160}

Thus it could be seen that at least for one flood after a year of that great earthquake, theatre of the flood had been shifted towards lower Assam. What is important in this respect is that if the expert opinion be partially also true, it would have a great impact so far as the loss of agriculture was concerned. Agrarian field being much wider as it run from upper to lower Assam, the loss of agriculture in 1950 itself was quite huge. Flood, another very known calamity of Brahmaputra Valley of the region thus seems to have a close relationship with the earthquake of the region. Earthquakes of the region thereby became more devastating for the people of the region in the long run.


\textsuperscript{160} Gee, E P, op. cit., p. 194.
Tea Industries

As has already been discussed and is known that with the entry of colonial rule tea plantation and hence, tea industry made its beginning in the region. This industry being very much a part of agro-industry its loss due to earthquake here in the region should also obviously constitutes a part of the overall loss in agriculture in the region.

Though the loss was much lower than the apprehension, so far as the tea gardens were concerned still a number of tea gardens both in the Surma as well as Brahmaputra Valley suffered owing to the great shock of 12th June, 1897. At Cachar in a number of tea gardens either manager’s bungalow or the tea house or the tea machine was damaged and in some cases destroyed. Hanchherr Tea Estate was very severely damaged. The damage was caused when the earthquake burst bund constructed to form a large lake to run a turbine. The garden around Jorhat in the Sibsagar district had also fallen prey to this earthquake. At Gotonga Tea Estate, prime victim was Superintendent’s bungalow, which was severely injured. In Managers bungalow of Parbatia Tea Estate, 5 miles west of Jorhat, one well collapsed when at Kaliapani Tea Estate leaf house was thrown down.

In 1918 Srimangal Earthquake Balisera and part of Doloi Valley of Sylhet district were the worst sufferers. There both the valley area

---

161 Newbould, B B, op. cit., p. 57.
were infested with tea gardens and so the losses were primarily to those tea gardens only. All the units of a tea garden such as leaf house, factory, manager’s bungalow, tea house, none could escape the devastation. In one garden if leaf house had fallen then in other’s manager’s bungalow suffered very badly. Though, however, collapse of manager’s bungalow was more or less universal in the said valley. Tea garden clubs also suffered the same loss. Affected tea gardens in the Balissera Valley were Phulcherra, Kalighat, Lakhichera, Kagrichera, Rajghat, Putticherra and Sisal Baria.\footnote{Stuart, M, ‘The Srimangal Earthquake of 8th July, 1918’, \textit{Memoirs of Geological Survey of India}, vol. 46, Calcutta, 1920, p. 7.}

It was during 1950 great earthquake the tea gardens of upper Assam incurred a great loss. Here not only the structures associated with the tea gardens even plantation had to suffer. In the Berdeopani Tea Estate, 126 acres out of its total plantation area of 342 acres were affected by the accumulation of silt about 3 ft deep after the earthquake. Withering houses, factories and other buildings of some of the tea gardens suffered considerably.\footnote{Gorg, G R, ‘Earthquake of August 15th and its effect on the topography, the regions of the rivers in North East Assam and damage to roads’.} A preliminary estimate of damage incurred by three tea companies was worked out to be £1,84,000.\footnote{Tillotson, E, ‘The Great Assam Earthquake of August 15, 1950’, \textit{Nature}, January 27, 1951, no. 167, p. 130.}

\textbf{Economy}

Over the subsections of this chapter, it could be seen that beyond loss of lives, earthquakes are happened to be the potential threat to the
entire developmental process of the region. The immediate loss it causes to the infrastructure, communication, health care and in certain cases even to agriculture in almost no time seems to be irreparable. Its blow particularly to the urban centres as has been revealed during the course of this study period can in no way be ignored.

In the Ahom period royal palaces, temples as well as embankments were the recorded victims. Ejection of sand during any major earthquake was more or less a part of general observation of that period. Though no direct evidences could be traced as yet regarding the destruction of agriculture by the spreading of sand or upheaval of river beds and thereby enhancing the cause of flood but if the district records of the colonial period has any co-relational significance in that regard their possibility of recurrence during Ahom period cannot be nullified. The overall loss of the Ahom state due to this calamity could also not be traced in monetary terms.

Colonial period has left certain records regarding their estimated loss in monetary terms for at least that great shock of 1897. As has been seen churches in general more or less collapsed in the region due to those major seismic events. Oil and tea companies suffered substantially. Coal mines though were not that affected but could not escape the events without loss. This loss in monetary terms is given below in a summarised form.
The Administration

While estimating the loss due to 1897 earthquake the entire infrastructural loss by the state was categorised under a number of heads against both imperial and provincial accounts which also included miscellaneous public improvements though for only one division, i.e., for Khasi and Jaintia Hills. The total estimated amount was Rs. 35,50,375/- (Annexure – III). The amount was for restoration of both the communication and the infrastructure.

Welsh Missionaries

These missionaries incurred an enormous loss. Their stone structures in the K&J Hills were almost completely in ruin. Their loss was duly acknowledged by the Deputy Commissioner. Their estimated loss at

- For churches in Shillong: Rs. 13,000 to Rs. 14,000
- For school in Shillong: Rs. 10,000
- For three mission bungalows at Shillong: Rs. 18,000
- Mission building at Cherra: Rs. 45,000 to Rs. 50,000
- Mission building at Jowai: Rs. 30,000
- Including one beautiful Hospital

Thus the total estimated loss lies in between £ 10,000 to £ 11,000.

As it has been seen Srimangal Earthquake of 1918 had caused a substantial loss to a number of tea gardens in and around Srimangal. Regarding the loss in economic terms owing to the shattering earthquake of 1950 its location played a very important
role. Its place of origin, being very closer to oil town Digboi, series of tea gardens in upper Assam the earthquake played an havoc to the economy of Assam. Estimated cost of the total damaged property of the oil company was Rs. 11,00,000/-*. Tea companies loss altogether was up to £ 1,84,000. Another estimate was made for the overall loss of Assam due to that earthquake and the accompanied flood. The Assam’s total loss was thus worked out to be £ 20,000,000/-**. The 1950’s figure of loss included a loss figure towards the collapse of a bridge worth of Rs. 2,45,000/-*** and that too as per the construction cost of 1936 when the bridge was made.

It may further be mentioned that estimated loss of 1897 earthquake in terms of cost as was prepared by the state was not inclusive of the loss of public property. However, a comment in that respect from none other than the Deputy Commissioner, K&J Hills, the worst effected district may through some light in that respect.

The damage done to Government property throughout the district is enormous, while the damage to private property everywhere, and in Shillong in particular, is incalculable. It is no exaggeration to say that the station of Shillong has been entirely destroyed, so much so that, in my opinion, before any steps are taken to rebuild it, or to spend lakhs on reconstructing Government buildings, it is a question for most serious consideration whether the new station should not be erected on the extensive plateau which commences at the 5th mile on the Cherrapunji road, and where it was originally intended to be placed.165

---

165 Arbathnott, J C, op. cit., p. 31.
* Corps, E V, 'Assam Earthquake of 15th August 1950, as experienced at Digboi, Upper Assam', Rao's compilation on 1950 earthquake, p. 44.
** Tillotson, E, op. cit., p. 96.
*** Dutta, G N, op. cit., p. 74.
Barpeta subdivision of the Kamrup district was one among the worst sufferers. Loss of private properties at Barpeta was also enormous.

The Subdivisional Officer estimates the loss of the beparis and Marwari merchants to be nearly Rs. 50,000.\textsuperscript{166}

The amount was no less in contemporary scale.

Similar was the case during 1869 Cachar Earthquake. As per record entire Silchar main bazaar was in ruin after the shock and here most of the loss incurred were of public only. In Manipur Valley, however, the King was the prime looser so far as the properties are concerned.

The direct monetary loss, however, enormous may it be but this cannot throw proper light on its impact on the over all economy of this region, unless it is being associated with the natural setting and over all production dynamics of the origin. For a deep gorge and terrain trodden hilly land locked region like the North East any failure of surface communication and that too by the collapse of bridges innumerable in number means a deadly blow to its economy for a considerable period. The tremor of the size of 1897 and 1950 may just throw open a dozen of bridge of almost any strength in a minute but setting them right would require not years, may even decades. So, it is but natural that no economic development programme for the region by any agency can ignore this very important seismic aspect of the region, while chalking out their plan of development for the region.

\textsuperscript{166} Gordon, P R T, op. cit., p. 20.