Land and River Boundaries Demarcation and Maintenance – Malaysia’s Experience

by

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MALAYSIA

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Introduction

Geographical Location
Outline of Presentation

- Legal Aspects
- Organizational Aspects
- Technical Aspects
- Issues and Challenges
- Conclusion
1909 Treaty: Commencing from the most seaward point of the northern bank of the estuary of the Perlis River and thence north to the range of hills which is the watershed between the Perlis River on the one side and the Pujoh River on the other; then following the watershed formed by the said range of hills until it reaches the main watershed or dividing line between those rivers which flow into the Gulf of Siam on the one side and into the Indian Ocean on the other; following this main watershed so as to pass the sources of the Sungai Patani, Sungai Telubin and Sungai Perak, to a point which is the source of Sungai Pergau; then leaving the main watershed and going along the watershed separating the waters of the Sungai Pergau from the Sungai Telubin to the hill called Bukit Jeli or the source of the main stream of the Sungai Golok.

1909 Treaty: ... thence the frontier follows the thalweg of the main stream of the Sungai Golok to the sea at a place called Kuala Tabar.
1891 BOUNDARY CONVENTION (ARTICLE IV)

From 4° 10’ north latitude on the east coast the boundary-line shall be continued eastward along that parallel across, the Island of Sebittik: that portion of the island situated to the north of that parallel shall belong unreservedly to the British North Borneo Company, and the portion south of that parallel to the Netherlands.
1. Agreement between the Government of Brunei and the Government of Sarawak relating to the Pandaruan River and District signed by G.E. Cator (British Resident Brunei) and H.S.B. Johnson (Resident Fifth Division, Sarawak) dated the 4th of February, 1920, covering a distance of 78.0 km.

2. Agreement between the Government of Brunei and the Government of Sarawak regarding the boundary between the States of Brunei and Sarawak, between the Belait and the Baram rivers from the sea coast to the Pagalayan Canal, signed by the British Resident, Brunei and H.D. Aplin (Resident, Fourth Division, Sarawak) dated the 25th of August, 1931, covering a distance of 29.7 km.

3. Agreement between the Government of Brunei and the Government of Sarawak regarding the boundary between the States of Brunei and Sarawak, between Trusan and Temburong from the Coast to Bukit Sagan, signed by the British Resident, Brunei and the Resident, Fifth Division, Sarawak dated the 31st of October, 1931, covering a distance of 19.0 km.

4. Agreement between the Government of Brunei and the Government of Sarawak regarding the boundary between the States of Brunei and Sarawak, between Limbang and Brunei from the Coast to a point west of Bukit Gadong, signed by the British Resident, Brunei and the Resident, Fifth Division, Sarawak dated the 24th of February, 1933, covering a distance of 37.0 km.

5. Agreement regarding the boundary between the State of Brunei and the State of Sarawak from the Pagalayan Canal to the Teraja Hills, signed by the British Resident, Brunei and the Resident, Fourth division, Sarawak, dated the 4th of November, 1939, covering a distance of 43.6 km.
Memorandum of Understanding (MOU)

- Contents / Elements:
  - ✓ Organization of Joint Committees
  - ✓ Establishment of Priority Areas
  - ✓ Survey Procedures
  - ✓ Phasing of Operations
  - ✓ Finance
  - ✓ Security arrangements
  - ✓ Logistics and communication
  - ✓ Immigration and customs clearance
  - ✓ Etc.
Organisational Aspects

Malaysia - Thailand

- MOU signed on 8 September 1972 for the purpose of undertaking the joint demarcation and survey of the international boundary, involving:

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land boundary</td>
<td>551.5 km</td>
<td>Nineteen (19)</td>
</tr>
<tr>
<td>River boundary</td>
<td>95.0 km</td>
<td>Four (4)</td>
</tr>
</tbody>
</table>

Malaysia - Indonesia

- MOU signed on 26 November 1973 for the purpose of undertaking the joint demarcation and survey of the international boundary, involving:

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>Priority Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land boundary</td>
<td>2020 km</td>
<td>Nineteen (19)</td>
</tr>
</tbody>
</table>
Joint Committees

Established to oversee appropriate tasks being carried out successfully, with clear terms & scope of responsibilities.

<table>
<thead>
<tr>
<th>Joint Committees</th>
<th>Chairman (Malaysian side)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Boundary Committee</td>
<td>Secretary General</td>
</tr>
<tr>
<td></td>
<td>Ministry of Natural Resources</td>
</tr>
<tr>
<td></td>
<td>and Environment (NRE)</td>
</tr>
<tr>
<td>Technical Committee</td>
<td>Director General</td>
</tr>
<tr>
<td></td>
<td>Dept. of Survey and Mapping</td>
</tr>
<tr>
<td>Co-Project Director</td>
<td>Director of Topography</td>
</tr>
<tr>
<td></td>
<td>Dept. of Survey and Mapping</td>
</tr>
</tbody>
</table>
Organisational Aspects

Joint Committees

Malaysia - Thailand
- Joint Malaysia - Thailand Land Boundary Committee
- Joint Technical Committee on the Joint Malaysia - Thailand Land Boundary Demarcation and Survey
- Co-Project Directors on the Joint Malaysia - Thailand Land Boundary Demarcation and Survey

Malaysia - Indonesia
- Joint Malaysia - Indonesia Boundary Committee
- Joint Malaysia - Indonesia Boundary Technical Committee
- Co-Project Directors for Sabah - Kalimantan Timur
- Co-Project Directors for Sarawak - Kalimantan Barat
Organisational Aspects

Sub-Committees / Working Groups

Established from time to time, when there is a need to address specific issues or undertake joint projects for the benefit of both countries

- Joint Sub-Committee on Terms of Reference (TOR) for the Construction and Maintenance of a Single Barrier along the Malaysia - Thailand International Boundary
- Joint Working Group for the Common Border Datum Reference Frame (CBDRF) and Joint Border Mapping between Malaysia and Indonesia
Organisational Aspects

Malaysia – Thailand / Indonesia

Joint Survey Team:
- Joint Survey Teams established to conduct the various type of surveys

<table>
<thead>
<tr>
<th>Composition of Joint Survey Team</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(from each country)</td>
<td></td>
</tr>
<tr>
<td>Team Leader</td>
<td>1</td>
</tr>
<tr>
<td>Assistant Team Leader</td>
<td>1</td>
</tr>
<tr>
<td>Observers</td>
<td>2</td>
</tr>
<tr>
<td>Bookers and Plotters</td>
<td>2</td>
</tr>
<tr>
<td>Labourers</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20</td>
</tr>
</tbody>
</table>

Slide 12
## Organisational Aspects

### Malaysia - Thailand

#### Joint Land Survey Teams:
Two (2) Joint Survey Teams established from both sides to conduct the various type of surveys

<table>
<thead>
<tr>
<th>Role</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Leader</td>
<td>1</td>
</tr>
<tr>
<td>Assistant Team Leader</td>
<td>1</td>
</tr>
<tr>
<td>Traverse and levelling officers</td>
<td>4</td>
</tr>
<tr>
<td>Reconnaissance survey officers</td>
<td>2</td>
</tr>
<tr>
<td>Plotters and Recorders</td>
<td>2</td>
</tr>
<tr>
<td>Communication operator</td>
<td>1</td>
</tr>
<tr>
<td>Drivers</td>
<td>1</td>
</tr>
<tr>
<td>Labourers</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

#### Joint Hydrographic Team:
One (1) Joint Hydrographic Team established from both sides to conduct the hydrographic survey in determining the deepest part of Sungai/River Golok (thalweg)

<table>
<thead>
<tr>
<th>Role</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Leader</td>
<td>1</td>
</tr>
<tr>
<td>Assistant Team Leader</td>
<td>1</td>
</tr>
<tr>
<td>Hydrographic observers</td>
<td>6</td>
</tr>
<tr>
<td>Labourers</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>
Joint Demarcation and Survey of Land Boundary

- **Malaysia-Thailand**: Joint demarcation and survey of land boundary commenced on 6 July 1973 and was completed on 26 September 1985. Joint demarcation and survey of the fixed and permanent international boundary along Sungai Golok (Kolok River) commenced on 1 November 2000 and has yet to be completed.

- **Malaysia-Indonesia**: Joint demarcation and survey of land boundary commenced on 9 September 1975 and was completed on February 2000.

- **Malaysia-Brunei**: Not yet started
Malaysia - Thailand

- To date, a total of eleven (11) MOU with maps attached, covering a land distance of 543 km that had been demarcated and surveyed, were signed.
- The remaining land distance of 8.5 km (Bukit Jeli area) is yet to be signed due to differences of opinion on the alignment of the international boundary.

Malaysia - Indonesia

- To date, a total of nineteen (19) MOU with twenty-eight (28) maps attached, covering a distance of 1822.3 km that had been demarcated and surveyed, were signed.
Standards of Accuracy:
- Angles read and finalised to nearest 0.1” and 1” respectively
- Misclose is 1.25’ of arc with maximum error of ± 5” per station
- Distance measured to nearest 0.001m
- Permissible error is 1:8000
Technical Aspects

Types of Boundary Pillars / Markers (Land Boundary)

TYPE A

TYPE B

TYPE C

TYPE D
Technical Aspects

Survey Procedures for Demarcation & Survey
Malaysia - Indonesia

Intervals
Type D-not more than 100m, if follow straight line boundary
or not more than 200m, if follow watershed boundary

Note:
• Straight Line Boundary
  - in developed areas
  - in areas where watershed is not clear
• Areas for use of straight line boundary
  initially predefined and agreed upon

Standards of Accuracy

- Long lines (>100m): angular misclose ±75” at ±3” per station, 1:15000
- Short lines (<100m): angular misclose ±75” at ±5” per station, 1:8000
THE DEMARCATION AND SURVEY OF SUNGAI / RIVER GOLOK

LEGEND
- BRP Type A
- BRP Type B
- ARM
- GPS Station
- Cross-Section Line

MALAYSIA

Kolok River

THAILAND
Boundary

- according to thalweg positions at the time of survey
- straight lines joining the agreed thalweg points
Joint Maintenance Survey

- Follows the principle of continuous joint maintenance and care of boundary pillars and markers along the common border
  - Restoration of boundary pillars and markers which are found missing, damaged or out of position due to either man-made or natural events
  - Emplacement of additional markers at closer intervals, particularly in developed areas

- **Malaysia-Thailand**: Joint survey started on 22 October 1993 and the progress to date is about 62.8%

- **Malaysia-Indonesia**: Joint survey started on 18 August 2000 and 28 February 2004 and the progress to date is 53% and 3.4% for Sabah/Kalimantan Timur and Sarawak/Kalimantan Barat respectively
Issues & Challenges

Security Situation

Booby trap incident during the Joint Demarcation and Survey of the International Boundary between Malaysia-Thailand

Booby Trap found and defused
Hazardous working conditions

Helicopter crash during the process of logistic support for the Joint Demarcation and Survey of the International Boundary between Malaysia-Thailand
Issues & Challenges

Hazardous working conditions
Issues & Challenges

Encroachment

Malaysian security fence into Thai territory
Issues & Challenges

Encroachment

- Thai rubber estate into Malaysian side
**Issues & Challenges**

**Encroachment**
- Thai Temples and Complex into Malaysian territory

** áreas**
- Area given to Thailand
- Security fence
- Security wall
- Watershed boundary

**Total**
- 2144.03 m²

**Maps**
- Thai Temples and Complex into Malaysian territory
- Chinese Temple
- Open Space
- Buddhist Temple

**Measurements**
- 571.84 m²
- 1500.24 m²
- 71.95 m²
Issues & Challenges

Encroachment

Solution – Exchange of equal area

- Area given to Malaysia
- Security fence
- Security wall
- Watershed boundary

Chinese temple (Thai)

Area given to Malaysia

2144.04 m²
Issues & Challenges

- Encroachments
- Smuggling
- Other illegal activities
Encroachment – Malaysia / Indonesia

Use of beacon
Use of thalweg to define river boundary

LEGEND
- BRP Type A
- BRP Type B
- ARM
- ‘Thalweg’
- Alternative Boundary
- Cross-Section Line
Conclusion

- Well-defined international boundary lines allow neighbouring countries to enjoy good relations as well as facilitate enforcement of their respective laws and regulations.

- Through the spirit of goodwill, understanding and close cooperation, Malaysia’s border problems to a certain extent had been resolved amicably through negotiations.
Organisational Aspects

MOU between Malaysia-Thailand

KUALA LUMPUR
MEMORANDUM OF UNDERSTANDING
1985

Pursuant to the Memorandum of Understanding relating to the joint demarcation and survey of the common land boundary between the Kingdom of Thailand and Malaysia signed at Bangkok on the 26th of September, 1979 and in accordance with the Boundary Protocol annexed to the Treaty between Great Britain and Siam signed at Bangkok on the 18th of March, 1909 the Joint Thailand-Malaysia Land Boundary Committee hereby agrees to the following:

1. The areas that have been demarcated and surveyed by the Joint Thailand-Malaysia Survey Team are Areas XIV and XIIIB comprised in Phases 1, 2 and 4 as indicated in Map No. 10 attached hereto as Annex 1. The terminal boundary pillars/markers for the said Areas XIV and XIIIB are:

<table>
<thead>
<tr>
<th>Area</th>
<th>Boundary pillars/markers</th>
</tr>
</thead>
<tbody>
<tr>
<td>XIV</td>
<td>54A to 54B</td>
</tr>
<tr>
<td>XIIIB</td>
<td>37 to 43A</td>
</tr>
</tbody>
</table>

2. The Field Plans referred to and tabulated in Annex 1 are the Field Plans which have been approved and signed, on the part of Thailand, by the Thai Co-Project Director and the Director of Survey of the Royal Thai Survey Department of Thailand, and on the part of Malaysia, by the Malaysian Co-Project Director and the Director-General of Survey and Mapping, Malaysia. These Field Plans are hereby certified to be correct.

3. All the boundary pillars/markers including the above-mentioned terminal boundary pillars/markers as demarcated and surveyed in the said Areas XIV and XIIIB are shown in the said Field Plans and their co-ordinates are listed in the table attached hereto as Annex 2.

Done in duplicate at Kuala Lumpur, Malaysia
on the 2nd day of July, 1985

For Thailand

For Malaysia
Organisational Aspects

Map attached to the MOU between Malaysia-Thailand
Technical Aspects

Survey Procedures for Demarcation & Survey

Malaysia – Thailand

- Terms of Reference and Master Plan for the Joint Demarcation and Survey of the International Boundary between Malaysia and Thailand - 1977

- Field Observation and Computation Procedures for the Joint Investigation, Refixation and Maintenance Survey - 1993

- Terms of Reference and Master Plan on the Joint Demarcation and Survey of the Fixed and Permanent International Boundary between Malaysia - Thailand along Sungai Golok (Kolok River) – 1999

Malaysia – Indonesia

- Revised Survey Procedures of 1989
Boundary pillars and markers are in their original positions if:
- plumb line falls within radius of Type D markers (10.2cm), or
- $\delta X$ and $\delta Y$ coordinates are within $\pm 0.05m$
- Also when bearings and distances do not exceed 1’ and 0.015m respectively for lines not more than 40m, and 30” in bearing and 0.006m per 20m with a maximum of 0.03m in length

Accuracy of linear ratio is 1:5000 for short line traverse
Issues & Challenges

Demarcated & surveyed boundary by British-Dutch not on exact latitude

~24 km
Types of Boundary Pillars / Markers (River Boundary)

- **Boundary Reference Pillar Type A**
  - Not more than 1km apart

- **Boundary Reference Pillar Type B**
  - Not more than 100 metres apart

- **Auxiliary Reference Marker**