

## 別添資料 11.1 PDM (Ver. 0.1)



Project Design Matrix (PDM)

協力期間: 2009~2012年(3年間)  
 ターゲットグループ: バングラデシュ測量局(SOB)

実施機関: バングラデシュ国測量局(SOB)/JICA  
 対象地域: ダッカ市

Ver.: 0.1  
 作成日: 2008年11月24日

プロジェクトの要約	指標	入手手段	外部条件
<b>上位目標</b> 1. SOBが進めるデジタル地図作成事業(全土 1/25,000、主要5都市 1/5,000)が完了する	1. デジタル地図作成事業により作成された地図および地図データが他政府機関および民間へと提供される	- SOBが進めるデジタル地図作成事業 (IDMSプロジェクト)の報告書	- SOBIにデジタル地図作成にかかる予算が毎年度確保される
<b>プロジェクト目標</b> 1. SOBが進める地図作成事業(全土 1/25,000、主要5都市 1/5,000)において、対象分野でSOB職員が自立して作業を行える技術レベルに到達する	1. 作業規程に則って作業のできるSOB職員数が全体の70%を占める	- プロジェクト報告書 - 技術運営ミーティング月報	- 技術移転対象外分野においてもSOBの進めるデジタル地図作成事業を遂行するために十分な技術レベルを有する
<b>成果</b> 1. SOB内においてデジタル地図作成にかかる作業規程が策定される	1-1. デジタル地図作成にかかる作業規程が策定される 1-2. 策定された作業規程がSOB内で周知される	- 策定された作業規程 - プロジェクト報告書	- プロジェクト期間中は技術を習得したSOB職員の異動が行われない
2. SOB職員が正確なジオイドモデル手法を理解する。	2-1. ジオイドモデル補正のプログラムと作業手順書が策定される。 2-2. ジオイドモデル補正のプログラムと作業手順書が他部署へ紹介される。	- ジオイドモデル補正のプログラムと作業手順書	
3. SOB職員が空中三角測量技術にかかる能力を習得する	3-1. 空中三角測量にかかる作業手順書が策定される 3-2. 空中三角測量技術にかかる研修の実施計画書が策定される 3-3. 空中三角測量技術にかかる研修が実施され、70%の職員が手帳書を理解する 3-4. 空中三角測量担当職員の70%にOJTが実施される	- プロジェクト報告書 - 研修報告書 - 研修教材 - 作業手順書	
4. SOB職員がオルソ画像作成技術にかかる能力を習得する	4-1. オルソ画像作成技術にかかる研修の実施計画書が策定される 4-2. オルソ画像作成技術にかかる作業手順書が策定される 4-3. オルソ画像作成技術にかかる研修が実施され70%以上の職員が手順書を理解する 4-4. オルソ画像作成担当職員の70%にOJTが実施される	- プロジェクト報告書 - 研修報告書 - 研修教材 - 作業手順書	
5. SOB職員がDEM作成技術にかかる能力を習得する	5-1. DEM作成技術にかかる研修の実施計画書が策定される 5-2. DEM作成技術にかかる作業手順書が策定される 5-3. DEM作成技術にかかる研修が実施され70%以上の職員が作業手順書を理解する 5-4. DEM作成担当職員の70%にOJTが実施される	- プロジェクト報告書 - 研修報告書 - 研修教材 - 作業手順書	
6. SOB職員がデジタル図形化技術にかかる能力を習得する	6-1. デジタル図形化技術にかかる作業手順書が策定される 6-2. デジタル図形化技術にかかる研修の実施計画書が策定される 6-3. デジタル図形化技術にかかる研修が実施され70%の職員が手順書を理解する 6-4. デジタル図形化担当職員の70%にOJTが実施される	- プロジェクト報告書 - 研修報告書 - 研修教材 - 作業手順書	
7. SOB職員がデジタル編集技術にかかる能力を習得する	7-1. デジタル編集技術にかかる作業手順書が策定される 7-2. デジタル編集技術にかかる研修の実施計画書が策定される 7-3. デジタル編集技術にかかる研修が実施され70%以上の職員が手順書を理解する 7-4. デジタル編集担当職員の70%にOJTが実施される	- プロジェクト報告書 - 研修報告書 - 研修教材 - 作業手順書	
8. SOB職員がGISデータ構築技術にかかる能力を習得する	8-1. GISデータ構築技術にかかる研修の実施計画書が策定される 8-2. GISデータ構築技術にかかる研修が実施され70%以上の職員が手順書を理解する 8-3. GISデータ構築技術にかかる作業手順書が策定される 8-4. GISデータ構築担当職員の70%にOJTが実施される	- プロジェクト報告書 - 研修報告書 - 研修教材 - 作業手順書	
9-1. SOB職員の印刷技術が向上する	9-1-1. 印刷技術にかかる研修の実施計画書が策定される 9-1-2. 印刷技術にかかる作業手順書が策定される 9-1-3. 印刷技術にかかる研修が実施され70%以上の職員が手順書を理解する 9-1-4. 印刷担当職員の70%にOJTが実施される	- プロジェクト報告書 - 研修報告書 - 研修教材 - 作業手順書	
9-2. 印刷機械の状態が整備される	9-2-1. 印刷機械メンテナンス計画書が策定される 9-2-2. プロジェクトに必要な印刷機械がメンテナンス整備される	- 印刷機械メンテナンス計画書 - 印刷機械メンテナンス記録	
<b>活動</b>	<b>投入</b>		- SOBの進めるデジタル地図作成に必要な機材の調達計画が計画通りに行われる - 航空写真撮影が予定通り行われる - 適切な数のC/P人員が任命される
1-1. JICA技術協力プロジェクト活動に係る全体管理と技術的支援の実施	バングラデシュ側	日本側	
1-2. デジタル地図作成にかかる作業規程の策定 2. ジオイドモデル補正のプログラムと作業手順書の策定 3-1. 空中三角測量技術に関する研修の実施 3-2. 空中三角測量技術に関するOJTの実施 3-3. 空中三角測量技術の作業手順書の策定 4-1. オルソ画像作成技術に関する研修の実施 4-2. オルソ画像作成技術に関するOJTの実施 4-3. オルソ画像作成技術の作業手順書の策定 5-1. DEM作成技術に関する研修の実施 5-2. DEM作成技術に関するOJTの実施 5-3. DEM作成技術の作業手順書の策定 6-1. デジタル図形化技術に関する研修の実施 6-2. デジタル図形化技術に関するOJTの実施 6-3. デジタル図形化技術の作業手順書の策定 7-1. デジタル編集技術に関する研修の実施 7-2. デジタル編集技術に関するOJTの実施 7-3. デジタル編集技術の作業手順書の策定 8-1. GISデータ構築技術に関する研修の実施 8-2. GISデータ構築技術に関するOJTの実施 8-3. GISデータ構築技術の作業手順書の策定 9-1. 印刷機械のメンテナンス計画の策定 9-2. 印刷技術向上のための研修の実施 9-3. 印刷技術向上のためのOJTの実施 9-4. 印刷業務の作業手順書の策定	1. C/P人員の任命 - プロジェクトマネージャー - 空中三角測量 - オルソ画像 - DEM - デジタル図形化 - デジタル編集 - GIS地図データ作成 - 印刷及びメンテナンス - ジオイドモデル補正  2. 施設 - 日本人専門家用オフィス - 電話線及びインターネット設備	1. 日本人専門家の任命 - 業務主任 - 作業規程の策定 - 空中三角測量 - オルソ画像 - DEM - デジタル図形化 - デジタル編集 - GIS地図データ作成 - 印刷技術及び印刷機材メンテナンス - ジオイドモデル補正  2. 研修 - 地図作成管理 - 地図の利活用	
			<b>前提条件</b>



### 添付資料3 Project Design Matrix (PDM)

Cooperation Period : July 2009 - 2011.(3years)

Implementation Agency : Survey of Bangladesh (SOB)

Target Group: SOB

Working Area : Dhaka

Made on Nov 24th, 2008, Ver. 0.1

Narratives Summary	Indicators	Means of Verification	Important Assumptions
<p><b>Overall Goal</b></p> <p>SOB implements the project of "Improvement of Digital Mapping System of Survey of Bangladesh" (IDMS project)</p>	<p>1. SOB will provides 1:25000 and 1:5000 scale topographic map and database to government and private users.</p>	<p>- Project report of IDMS project</p>	<p>- Necessary budget to produce digital map and database will be continuously allocated to SOB.</p>
<p><b>Project Purpose</b></p> <p>Technical staffs of SOB will develop their skills enough to implement the digital mapping in the scale of 1/5,000 and 1/25,000.</p>	<p>1. 70% of SOB technical staffs have a right understanding of Specification and can work following the instruction of it.</p>	<p>- Project Report - Minutes of the Monthly Technical Coordination Meeting</p>	<p>- The other technical areas which are not subjects of JICA technology transfer project also have enough ability to conduct the IDMS project.</p>
<p><b>Outputs</b></p> <p>1. SOB has the Specification of the process of digital mapping.</p>	<p>1-1. Specification of process and product of the digital mapping is determined. 1-2. Specification of process and product digital map is introduced to all relative departments of SOB.</p>	<p>- Copy of the Specification - Project report</p>	<p>- Trained staffs of SOB are retained in their department during the project implementation.</p>
<p>2. SOB technical staffs understand about methodology to correct geoid model.</p>	<p>2-1. Program and manual of geoid model correction is made. 2-2. Program and manual of geoid model correction is introduced to relative departments.</p>	<p>- Program and manual of Geoid model correction.</p>	
<p>3. Technical staffs of SOB acquire essential technology of aerial triangulation.</p>	<p>3-1. Operation manual of aerial triangulation is made. 3-2. Plan of training of aerial triangulation is made. 3-3. Training of aerial triangulation is conducted and at least 70% of SOB technical staffs in the respective field understand about the operation manual. 3-4. OJT of Aerial triangulation is conducted to at least 70% of SOB technical staffs in the respective field.</p>	<p>- Project report - Training report - Training materials - Operation manual</p>	
<p>4. Technical staffs of SOB acquire essential technology of ortho photo making.</p>	<p>4-1. Operation manual of ortho photo making is made. 4-2. Training plan of ortho photo making is made. 4-3. Training of ortho photo making is conducted and at least 70% of SOB technical staffs in the respective field understand about the operation manual. 4-4. OJT of ortho photo making is conducted to at least 70% of SOB technical staffs in the respective field.</p>	<p>- Project report - Training report - Training materials - Operation manual</p>	
<p>5. Technical staffs of SOB acquire essential technology of DEM making.</p>	<p>5-1. Operation manual of DEM making is made. 5-2. Training plan of DEM making is made. 5-3. Training of DEM making is conducted and at least 70% of SOB technical staffs in the respective field understand about the operation manual. 5-4. OJT of DEM making is conducted to at least 70% of SOB technical staffs in the respective field.</p>	<p>- Project report - Training report - Training materials - Operation manual</p>	
<p>6. Technical staffs of SOB acquire essential technology of digital plotting.</p>	<p>6-1. Operation manual of Digital Plotting is made. 6-2. Training plan of Digital Plotting is made. 6-3. Training of Digital Plotting is conducted and at least 70% of SOB technical staffs in the respective field understand about the operation manual. 6-4. OJT of Digital Plotting is conducted to at least 70% of SOB technical staffs in the respective field.</p>	<p>- Project report - Training report - Training materials - Operation manual</p>	
<p>7. Technical staffs of SOB acquire essential technology of digital compilation</p>	<p>7-1. Operation manual of digital compilation is made. 7-2. Training plan of digital compilation is made. 7-3. Training of digital compilation is conducted and at least 70% of SOB technical staffs in the respective field understand about the operation manual. 7-4. OJT of digital compilation is conducted to at least 70% of SOB technical staffs in the respective field.</p>	<p>- Project report - Training report - Training materials - Operation manual</p>	
<p>8. Technical staffs of SOB acquire essential technology about construction and management of GIS database.</p>	<p>8-1-1. Operation manual of construction and management GIS database is made. 8-1-2. Training plan of construction and management GIS database is made. 8-1-3. Training of construction and management GIS database is conducted and at least 70% of SOB technical staffs in the respective field understand about the operation manual. 8-1-4. OJT of construction and management GIS database is conducted to at least 70% of SOB technical staffs in the respective field .</p>	<p>- Project report - Training report - Training materials - Operation manual</p>	

9-1. Technical staffs of SOB improve their skills in printing map.	9-1-1. Operation manual of printing map is made. 9-1-2. Training plan of printing map is made. 9-1-3. Training of printing map is conducted and at least 70% of SOB technical staffs in the respective field understand about the operation manual. 9-1-4. OJT of printing is conducted to at least 70% of SOB technical staffs in the respective field .	<ul style="list-style-type: none"> <li>- Project report</li> <li>- Training report</li> <li>- Training materials</li> <li>- Operation manual</li> </ul>	
9-2. Printing equipment of SOB is operational with a good condition.	9-2-1. Maintenance plan is determined 9-2-2. All units of printing equipments which the IDMS project requires are well maintained.	<ul style="list-style-type: none"> <li>- Maintenance plan</li> <li>- Maintenance record</li> </ul>	
<b>Activities</b>	<b>Input</b>		
	<b>Bangladeshi Side</b>	<b>Japanese Side</b>	
<p>1-1. To provide supervision and technical support to activities of the JICA technical transfer project.</p> <p>1-2. To make Specification for Digital Mapping</p> <p>2. To make program and manual of geoid model correction.</p> <p>3-1. To conduct training about Aerial triangulation technique</p> <p>3-2. To conduct OJT about Aerial triangulation technique</p> <p>3-3. To make operation manual about Aerial triangulation</p> <p>4-1. To conduct training about ortho photo making technique</p> <p>4-2. To conduct OJT about ortho photo making technique</p> <p>4-3. To make operation manual about ortho photo making</p> <p>5-1. To conduct training about DEM making technique.</p> <p>5-2. To conduct OJT about DEM making technique.</p> <p>5-3. To make operation manual about DEM making.</p> <p>6-1. To conduct training about digital plotting technique.</p> <p>6-2. To conduct OJT about digital plotting technique.</p> <p>6-3. To make operation manual about digital plotting.</p> <p>7-1. To conduct training about digital compilation technique.</p> <p>7-2. To conduct OJT about digital compilation technique.</p> <p>7-3. To make operation manual about digital compilation technique.</p> <p>8-1. To conduct training about GIS map data making technique.</p> <p>8-2. To conduct OJT about GIS map data making technique.</p> <p>8-3. To make operation manual about GIS map data making.</p> <p>9-1. To conduct training about printing technique.</p> <p>9-2. To conduct OJT about printing technique.</p> <p>9-3. To make operation manual about printing technique.</p> <p>9-4. To make maintenance plan of printing machine.</p>	<p>1. Assignment of counterparts personnel</p> <ul style="list-style-type: none"> <li>- Project manager</li> <li>- Aerial triangulation</li> <li>- Ortho image</li> <li>- DEM</li> <li>- Digital plotting</li> <li>- Digital compilation</li> <li>- GIS map data</li> <li>- Printing</li> <li>- Geoid model correction</li> </ul> <p>2. Facilities</p> <ul style="list-style-type: none"> <li>- Office room for Japanese experts</li> <li>- Telephone line and internet connection</li> </ul>	<p>1. Assignment of Japanese experts;</p> <ul style="list-style-type: none"> <li>- Team Leader</li> <li>- Specifications</li> <li>- Aerial triangulation</li> <li>- Ortho photo</li> <li>- DEM</li> <li>- Digital plotting</li> <li>- Digital compilation</li> <li>- GIS database</li> <li>- Printing</li> <li>- Geoid model correction</li> </ul> <p>2. Training</p> <ul style="list-style-type: none"> <li>- Mapping management</li> <li>- Map utilization</li> </ul>	<p>- Procurement of necessary equipment is done according to schedule by SOB.</p> <p>- Aerial photo is taken according to schedule by SOB.</p> <p>- Adequate number of technical staffs of SOB will be assigned.</p> <p><b>Precondition</b></p>

## 別添資料 11.2 PDM (Ver. 2.0)





Project Design Matrix (PDM)

協力期間: 2009年~2012年(3年間)  
 ターゲットグループ: バングラデシュ国測量局(SOB)

実施機関: バングラデシュ国測量局(SOB)/JICA  
 対象地域: ダッカ市

2009年8月6日作成 Ver.2.0

プロジェクトの要約	指標	入手手段	外部条件
<b>上位目標</b> 1. SOBが進めるデジタル地図作成事業(全土1:25,000、主要都市1:5,000)が完了する。	1. デジタル地図作成事業により作成された地図及び地図データが他政府機関及び民間へと提供される。	- プロジェクト事業進捗報告書 - SOBの地図提供記録	- SOBにデジタル地図作成にかかる予算が毎年度確保される。
<b>プロジェクトの目標</b> 1. SOBが進める地図作成事業(全土1:25,000、主要5都市1:5,000)において、対象分野でSOB職員が自立して作業を行える技術レベルに達し、IDMSプロジェクトが計画通りに実施される。	1. 作業規定に則って作業のできるSOB職員数が全体の70%以上を占める。 2. IDMSプロジェクトが作業規定、作業手順書に従って、計画通りに実施される。	- プロジェクト事業進捗報告書 - 各年次の作業の進捗状況 - アンケート調査	- 技術移転対象外分野においてもSOBの進めるデジタル地図作成事業を遂行するために十分な技術レベルを有する。
<b>成果</b> 1. SOB内においてデジタル地図作成にかかる作業規定が策定される。	1-1 デジタル地図作成にかかる作業規定が策定される。 1-2 策定された作業規定がSOB内で周知される。	- 策定された作業規定 - プロジェクト事業進捗報告書 - アンケート調査	- プロジェクト期間中は技術を得得したSOB職員の移動が行われない。
2. SOB職員が写真測量/空中三角測量の理論を理解する。	2-1 写真測量理論に関する研修が実施され、研修参加者の70%以上の職員が理論を理解する。 2-2 空中三角測量理論に関する研修が実施され、研修参加者の70%以上の職員が理論を理解する。	- プロジェクト事業進捗報告書 - 研修テキスト - 研修記録 - アンケート調査	
3. SOB職員が空中三角測量技術にかかる能力を得得する。	3-1 空中三角測量にかかる作業手順書が策定される。 3-2 空中三角測量技術にかかる研修の実施計画書が策定される。 3-3 空中三角測量技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 3-4 空中三角測量担当職員の70%以上にOJTが実施される。	- プロジェクト事業進捗報告書 - 作成された作業手順書 - 研修の実施計画書 - 研修記録 - 実技テスト - 筆記テスト - アンケート調査	
4. SOB職員がオルソ画像作成技術にかかる能力を得得する。	4-1 オルソ画像作成技術にかかる作業手順書が策定される。 4-2 オルソ画像作成技術にかかる研修の実施計画書が策定される。 4-3 オルソ画像作成技術にかかる研修が実施され、研修参加者の70%以上の職員が作業手順書を理解する。 4-4 オルソ画像作成担当職員の70%以上にOJTが実施される。		
5. SOB職員がDEM作成技術にかかる能力を得得する。	5-1 DEM作成技術にかかる作業手順書が策定される。 5-2 DEM作成技術にかかる研修の実施計画書が策定される。 5-3 DEM作成技術にかかる研修が実施され、研修参加者の70%以上の職員が作業手順書を理解する。 5-4 DEM作成担当職員の70%以上にOJTが実施される。		
6. SOB職員がデジタル図化技術にかかる能力を得得する。	6-1 デジタル図化技術にかかる作業手順書が策定される。 6-2 デジタル図化技術にかかる研修の実施計画書が策定される。 6-3 デジタル図化技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 6-4 デジタル図化担当職員の70%以上にOJTが実施される。		
7. SOB職員がデジタル編集技術にかかる能力を得得する。	7-1 デジタル編集技術にかかる作業手順書が策定される。 7-2 デジタル編集技術にかかる研修の実施計画書が策定される。 7-3 デジタル編集技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 7-4 デジタル編集担当職員の70%以上にOJTが実施される。		
8. SOB職員がGISデータ構築技術にかかる能力を得得する。	8-1 GISデータ構築技術にかかる作業手順書が策定される。 8-2 GISデータ構築技術にかかる研修の実施計画書が策定される。 8-3 GISデータ構築技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 8-4 GISデータ構築担当職員の70%以上にOJTが実施される。		
9-1 SOB職員の印刷技術が向上する。	9-1-1 印刷技術にかかる作業手順書が策定される。 9-1-2 印刷技術にかかる研修の実施計画書が策定される。 9-1-3 印刷技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 9-1-4 印刷担当職員の70%以上にOJTが実施される。		
9-2 印刷機械の状況が整備される。	9-2-1 印刷機械のメンテナンス計画書が策定される。 9-2-2 プロジェクトに必要な印刷機械がメンテナンス整備される。	- 印刷機械メンテナンス計画書 - 印刷機械メンテナンス記録	
10. SOB職員がジオイドモデル作成技術にかかる能力を得得する。	10-1 ジオイドモデル作成にかかる作業手順書が策定される。 10-2 バングラデシュ国のジオイドモデルが作成される。 10-3 ジオイドモデル作成にかかる研修が実施され、研修参加者の70%以上の職員が作業手順書を理解する。 10-4 ジオイドモデル作成担当職員の70%以上にOJTが実施される。	- 作成された作業手順書 - 作成されたジオイドモデル - 研修記録 - アンケート調査	
<b>活動</b>	<b>投入</b>		
	<b>バングラデシュ側</b>	<b>日本側</b>	
1-1 デジタル地図作成にかかる作業規定の策定 1-2 作業規定のベンガル語化 1-3 IDMSプロジェクト全体の技術的支援 1-4 IDMSプロジェクト運営に関する支援 2-1 写真測量理論研修の実施 2-2 空中三角測量理論研修の実施 3-1 空中三角測量技術に関する研修の実施計画の策定 3-2 空中三角測量技術に関する研修・OJTの実施 3-3 精度管理・工程管理に関する研修・OJTの実施 3-4 空中三角測量技術の作業手順書の策定 3-5 作業手順書のベンガル語化 4-1 オルソ画像作成技術に関する研修の実施計画の策定 4-2 オルソ画像作成技術に関する研修・OJTの実施 4-3 精度管理・工程管理に関する研修・OJTの実施 4-4 オルソ画像作成技術の作業手順書の策定 4-5 作業手順書のベンガル語化 5-1 DEM作成技術に関する研修の実施計画の策定 5-2 DEM作成技術に関する研修・OJTの実施 5-3 精度管理・工程管理に関する研修・OJTの実施 5-4 DEM作成技術の作業手順書の策定 5-5 作業手順書のベンガル語化 6-1 デジタル図化技術に関する研修の実施計画の策定 6-2 デジタル図化技術に関する研修・OJTの実施 6-3 精度管理・工程管理に関する研修・OJTの実施 6-4 デジタル図化技術の作業手順書の策定 6-5 作業手順書のベンガル語化 7-1 デジタル編集技術に関する研修の実施計画の策定 7-2 デジタル編集技術に関する研修・OJTの実施 7-3 精度管理・工程管理に関する研修・OJTの実施 7-4 デジタル編集技術の作業手順書の策定 7-5 作業手順書のベンガル語化 8-1 GISデータ構築技術に関する研修の実施計画の策定 8-2 GISデータ構築技術に関する研修・OJTの実施 8-3 精度管理・工程管理に関する研修・OJTの実施 8-4 GISデータ構築技術の作業手順書の策定 8-5 作業手順書のベンガル語化 9-1 印刷機械のメンテナンス計画の策定 9-2 印刷技術向上のための研修の実施計画の作成 9-3 印刷技術向上のための研修・OJTの実施 9-4 精度管理・工程管理に関する研修・OJTの実施 9-5 印刷業務の作業手順書の策定 9-6 作業手順書のベンガル語化 10-1 ジオイドモデル作成に関する研修の実施計画の策定 10-2 ジオイドモデル作成に関する研修・OJTの実施 10-3 ジオイドモデルの作成 10-4 ジオイドモデル作成のための作業手順書の策定 10-5 作業手順書のベンガル語化	1. 日本人専門家の任命 - プロジェクトリーダー - 空中三角測量 - オルソ画像 - DEM作成 - デジタル図化 - デジタル編集 - GISデータ作成 - 印刷及びメンテナンス - ジオイドモデル作成  2. 施設 - 日本人専門家用オフィス - 電話線及びインターネット	1. 日本人専門家の任命 - プロジェクトリーダー - 業務主任/測量作業規定作成 - 写真測量/空中三角測量理論 - 空中三角測量、オルソ作成及びDEM作成(1) - 空中三角測量、オルソ作成及びDEM作成(2) - デジタル図化 - デジタル編集 - GIS管理 - 印刷 - ジオイドモデル作成  2. 日本国内における研修 - 地図作成とデータ管理の研修 - 地図とデータの利活用の研修	- SOBが進めるデジタル地図作成に必要な機材の調達が行われる。 - 航空写真撮影が予定通り行われる。 - 適切な数のC/P人員が任命される。
			<b>前提条件</b>



**添付資料2 Project Design Matrix (PDM)**

Cooperation Period: July 2009 - 2011 (3 years)

Implementation Agency: Survey of Bangladesh (SOB)

Target Group: SOB

Working Area: Dhaka

Made on Aug. 6th, 2009, Ver. 2.0

Narratives Summary	Indicators	Means of Verification	Important Assumptions
<b>Overall Goal</b> 1. SOB implements the project of "Improvement of Digital Mapping System of Survey of Bangladesh" (IDMS project).	1. SOB will provides 1:25,000 and 1:5,000 scale topographic maps and database to government and private users.	<ul style="list-style-type: none"> <li>- Project report</li> <li>- Delivery record of topographic maps and data</li> </ul>	<ul style="list-style-type: none"> <li>- Necessary budget to produce digital map and database will be continuously allocated to SOB.</li> </ul>
<b>Project Purpose</b> 1. Technical staff of SOB will develop their skills enough to implement the digital mapping in the scale of 1:5,000 and 1:25,000, and actual work of IDMS Project is implemented correctly and smoothly.	1-1 70% of SOB technical staff have a right understanding of Specifications and can work following the 1-2 The actual mapping works of IDMS Project will be implemented on schedule based on the Operation Manual and Specifications	<ul style="list-style-type: none"> <li>- Project report</li> <li>- Actual work progress of IDMS Project</li> <li>- Questionnaire survey</li> </ul>	<ul style="list-style-type: none"> <li>- The other technical areas which are not subjects of JICA technical transfer project also have enough ability to conduct the IDMS project.</li> </ul>
<b>Outputs</b> 1. SOB has the specifications of the process and products of digital mapping	1-1 Specifications of process and product of the digital mapping is determined. 1-2 Specifications of process and product digital map is introduced to all relative department of SOB	<ul style="list-style-type: none"> <li>- Copy of the Specifications</li> <li>- Project report</li> <li>- Questionnaire survey</li> </ul>	<ul style="list-style-type: none"> <li>- Trained staff of SOB are retained in their department during the project implementation.</li> </ul>
2. Technical staff of SOB understand the theory of photogrammetry and aerial triangulation.	2-1 Training of photogrammetry is conducted and at least 70 % of participants to the training understand the theory of photogrammetry. 2-2 Training of aerial triangulation is conducted and at least 70% of the participants to the training understand the theory of aerial triangulation.	<ul style="list-style-type: none"> <li>- Project report</li> <li>- Training materials</li> <li>- Training record</li> <li>- Questionnaire survey</li> </ul>	
3. Technical staffs of SOB acquire essential technology of aerial triangulation.	3-1 Operation manual of aerial triangulation is made. 3-2 Plan of training of aerial triangulation is made. 3-3 Training of aerial triangulation is conducted and at least 70% of the participants of the training understand about the operational manual. 3-4 OJT of aerial triangulation is conducted to at least 70% of SOB technical staffs in the respective field.	<ul style="list-style-type: none"> <li>- Project report</li> <li>- Operational manual</li> <li>- Training plan</li> <li>- Training record</li> <li>- Practical examination</li> <li>- Paper examination</li> <li>- Questionnaire survey</li> </ul>	
4. Technical staffs of SOB acquire essential technology of orthophoto making.	4-1 Operation manual of orthophoto making is made. 4-2 Plan of training of orthophoto making is made. 4-3 Training of orthophoto making is conducted and at least 70% of the participants of the training understand about the operation manual. 4-4 OJT of orthophoto making is conducted to at least 70% of SOB technical staffs in the respective field.		
5. Technical staffs of SOB acquire essential technology of DEM making.	5-1 Operation manual of DEM making is made. 5-2 Training plan of DEM making is made. 5-3 Training of DEM making is conducted and at least 70% of the participants of the training understand about the operation manual. 5-4 OJT of DEM making is conducted to at least 70% of SOB technical staffs in the respective field.		

6. Technical staffs of SOB acquire essential technology of digital plotting.	6-1 Operation manual of digital plotting is made. 6-2 Training plan of digital plotting is made. 6-3 Training of digital plotting is conducted and at least 70% of the participants of the training understand about the operation manual. 6-4 OJT of digital plotting is conducted to at least 70% of SOB technical staffs in the respective field.	
7. Technical staffs of SOB acquire essential technology of digital compilation.	7-1 Operation manual of digital compilation is made. 7-2 Training plan of digital compilation is made. 7-3 Training of digital compilation is conducted and at least 70% of the participants of the training understand about the operation manual. 7-4 OJT of digital compilation is conducted to at least 70% of SOB technical staffs in the respective field.	
8. Technical staffs of SOB acquire essential technology about construction and management of GIS database.	8-1 Operation manual of construction and management of GIS database is made. 8-2 Training plan of construction and management of GIS database is made. 8-3 Training of construction and management of GIS database is conducted and at least 70% of the participants of the training understand about the 8-4 OJT of construction and management of GIS database is conducted to at least 70% of SOB technical staffs in the respective field.	
9-1 Technical staffs of SOB improve their skills in printing map.	9-1-1 Operation manual of printing map is made. 9-1-2 Training plan of printing map is made. 9-1-3 Training of printing map is conducted and at least 70% of the participants of the training understand about the operation manual. 9-1-4 OJT of printing is conducted to at least 70% of technical staffs in the respective field.	
9-2 Printing equipment of SOB is operational with a good condition	9-2-1 Maintenance plan is determined. 9-2-2 All units of printing equipments which the IDMS project requires are well maintained.	<ul style="list-style-type: none"> <li>- Maintenance plan</li> <li>- Maintenance record</li> </ul>
10. Technical staffs of SOB acquire essential technology about geoid model creation.	10-1 Operation manual of geoid model is made. 10-2 Geoid model is made. 10-3 Training of geoid model creation is conducted and at least of 70% of the participants of the training understand about the operation manual 10-4 OJT of geoid model creation is conducted to at least 70% of SOB technical staffs in the respective field.	<ul style="list-style-type: none"> <li>- Operational manual</li> <li>- Created Geoid model</li> <li>- Training record</li> <li>- Questionnaire survey</li> </ul>

Activities	Input		
	Bangladesh Side	Japanese Side	
1-1 To make Specifications for digital mapping	<b>1. Assignment of counterparts personnel</b> - Project manager - Aerial triangulation - Ortho image - DEM - Digital plotting - Digital compilation - GIS map data - Printing - Geoid model	<b>1. Assignment of Japanese experts</b> - Project leader - Chief / Technical specifications - Photogrammetry / Aerial triangulation Theory - Aerial triangulation, Orthophoto making and DEM making (1) - Aerial triangulation, Orthophoto making and DEM making (2) - Digital mapping - Digital compilation - GIS database - Printing - Geoid model	- Procurement of necessary equipment is done according to the schedule by SOB. - Aerial photo is taken according to the schedule by SOB. - Adequate number of technical staff of SOB will be assigned.
1-2 To translate Specifications into Bengalee			
1-3 To provide overall technical support to IDMS project			
1-4 To provide overall management support to IDMS project			
2-1 To conduct lecture of photogrammetry theory			
2-2 To conduct lecture of aerial triangulation theory			
3-1 To make a training plan of aerial triangulation technique			
3-2 To conduct technical training of aerial triangulation technique			
3-3 To conduct training of quality and schedule control			
3-4 To make Operation Manual of aerial triangulation			
3-5 To translate Operation Manual into Bengalee			
4-1 To make a training plan for orthophoto making technique	<b>2. Facilities</b> - Office room for Japanese experts - Telephone line and internet connection	<b>2. Training in Japan</b> - Topographic maps and data management - Topographic maps and data utilization	<b>Precondition</b>
4-2 To conduct technical training of orthophoto making technique			
4-3 To conduct training of quality and schedule control			
4-4 To make Operation Manual about orthophoto making technique			
4-5 To translate Operation Manual into Bengalee			
5-1 To make a training plan of DEM making technique			
5-2 To conduct technical training of DEM making technique			
5-3 To conduct training of quality and schedule control			
5-4 To make Operation Manual of DEM making technique			
5-5 To translate Operation Manual into Bengalee			
6-1 To make a training plan of digital plotting technique	<b>2. Facilities</b> - Office room for Japanese experts - Telephone line and internet connection	<b>2. Training in Japan</b> - Topographic maps and data management - Topographic maps and data utilization	<b>Precondition</b>
6-2 To conduct technical training of digital plotting technique			
6-3 To conduct training of quality and schedule control			
6-4 To make Operation Manual of digital plotting technique			
6-5 To translate Operation Manual into Bengalee			
7-1 To make a training plan of digital compilation technique			
7-2 To conduct technical training of digital compilation technique			
7-3 To conduct training of quality and schedule control			
7-4 To make Operation Manual of digital compilation technique			
7-5 To translate Operation Manual into Bengalee			
8-1 To make a training plan of construction and management of GIS database	<b>2. Facilities</b> - Office room for Japanese experts - Telephone line and internet connection	<b>2. Training in Japan</b> - Topographic maps and data management - Topographic maps and data utilization	<b>Precondition</b>
8-2 To conduct technical training of construction and management of GIS database			
8-3 To conduct training of quality and schedule control			
8-4 To make Operation Manual of construction and management of GIS database			
8-5 To translate Operation Manual into Bengalee			
9-1 To make Maintenance Plan of of printing machine			
9-2 To make a training plan of printing technique			
9-3 To conduct technical training of printing technique			
9-4 To conduct training of quality and schedule control			
9-5 To make Operation Manual of printing technique			
9-6 To translate Operation Manual into Bengalee			
10-1 To make a training plan of geoid model creation technique	<b>2. Facilities</b> - Office room for Japanese experts - Telephone line and internet connection	<b>2. Training in Japan</b> - Topographic maps and data management - Topographic maps and data utilization	<b>Precondition</b>
10-2 To conduct technical training of geoid model creation technique			
10-3 To create geoid model			
10-4 To make Operation manual of geoid model creation			
10-5 To translate Operation Manual into Bengalee			



### 別添資料 11.3 PDM (Ver. 3.0)





プロジェクト・デザイン・マトリックス (PDM)

協力期間: 2009年~2012年(3年間)  
 ターゲットグループ: バングラデシュ国測量局(SOB)

実施機関: バングラデシュ国測量局(SOB)/JICA  
 対象地域: ダッカ市

2011年11月23日作成 Ver3.0

プロジェクトの要約	指標	入手手段	外部条件
<b>上位目標</b> 1. SOBが進めるデジタル地図作成事業(全土1:25,000、主要都市1:5,000)が完了する。	1. デジタル地図作成事業により作成された地図及び地図データが他政府機関及び民間へと提供される。	- プロジェクト事業進捗報告書 - SOBの地図提供記録	- SOBにデジタル地図作成にかかる予算が毎年度確保される。
<b>プロジェクトの目標</b> 1. SOBが進めるデジタル地図作成事業(全土1:25,000、主要都市1:5,000)において、対象分野でSOB職員が自立して作業を行える技術レベルに達し、IDMSプロジェクトが計画通りに	1. 作業規定に則って作業のできるSOB職員数が全体の70%以上を占める。 2. IDMSプロジェクトが作業規定、作業手順書に従って、計画通りに実施される。	- プロジェクト事業進捗報告書 - 各年次の作業の進捗状況 - アンケート調査	- 技術移転対象外分野においてもSOBの進めるデジタル地図作成事業を遂行するために十分な技術レベルを有する。
<b>成果</b> 1. SOB内においてデジタル地図作成にかかる作業規定が策定される。 2. SOB職員が写真測量/空中三角測量の理論を理解する。 3. SOB職員が空中三角測量技術にかかる能力を習得する。 4. SOB職員がオルソ画像作成技術にかかる能力を習得する。 5. SOB職員がDEM作成技術にかかる能力を習得する。 6. SOB職員がデジタル図化技術にかかる能力を習得する。 7. SOB職員がデジタル編集技術にかかる能力を習得する。 8. SOB職員がGISデータ構築技術にかかる能力を習得する。	1-1 デジタル地図作成にかかる作業規定が策定される。 1-2 策定された作業規定がSOB内で周知される。 2-1 写真測量理論に関する研修が実施され、研修参加者の70%以上の職員が理論を理解する。 2-2 空中三角測量理論に関する研修が実施され、研修参加者の70%以上の職員が理論を理解する。 3-1 空中三角測量にかかる作業手順書が策定される。 3-2 空中三角測量技術にかかる研修の実施計画書が策定される。 3-3 空中三角測量技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 3-4 航空三角測量担当職員の70%以上にOJTが実施される。 4-1 オルソ画像作成技術にかかる作業手順書が策定される。 4-2 オルソ画像作成技術にかかる研修の実施計画書が策定される。 4-3 オルソ画像作成技術にかかる研修が実施され、研修参加者の70%以上の職員が作業手順書を理解する。 4-4 オルソ画像作成担当職員の70%以上にOJTが実施される。 5-1 DEM作成技術にかかる作業手順書が策定される。 5-2 DEM作成技術にかかる研修の実施計画書が策定される。 5-3 DEM作成技術にかかる研修が実施され、研修参加者の70%以上の職員が作業手順書を理解する。 5-4 DEM作成担当職員の70%以上にOJTが実施される。 6-1 デジタル図化技術にかかる作業手順書が策定される。 6-2 デジタル図化技術にかかる研修の実施計画書が策定される。 6-3 デジタル図化技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 6-4 デジタル図化担当職員の70%以上にOJTが実施される。 7-1 デジタル編集技術にかかる作業手順書が策定される。 7-2 デジタル編集技術にかかる研修の実施計画書が策定される。 7-3 デジタル編集技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 7-4 デジタル編集担当職員の70%以上にOJTが実施される。 8-1 GISデータ構築技術にかかる作業手順書が策定される。 8-2 GISデータ構築技術にかかる研修の実施計画書が策定される。 8-3 GISデータ構築技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 8-4 GISデータ構築担当職員の70%以上にOJTが実施される。	- 策定された作業規定 - プロジェクト事業進捗報告書 - アンケート調査 - プロジェクト事業進捗報告書 - 研修テキスト - 研修記録 - アンケート調査 - プロジェクト事業進捗報告書 - 作成された作業手順書 - 研修の実施計画書 - 研修記録 - 実技テスト - 筆記テスト - アンケート調査	- プロジェクト期間中は技術を習得したSOB職員の移動が行われない。
9-1 SOB職員の印刷技術が向上する。 9-2 印刷機械の状況が整備される。	9-1-1 印刷技術にかかる作業手順書が策定される。 9-1-2 印刷技術にかかる研修の実施計画書が策定される。 9-1-3 印刷技術にかかる研修が実施され、研修参加者の70%以上の職員が手順書を理解する。 9-1-4 印刷担当職員の70%以上にOJTが実施される。 9-2-1 印刷機械のメンテナンス計画書が策定される。 9-2-2 プロジェクトに必要な印刷機械がメンテナンス整備される。	- 印刷機械メンテナンス計画書 - 印刷機械メンテナンス記録	
10. SOB職員がジオイドモデル作成技術にかかる能力を習得する。	10-1 ジオイドモデル作成にかかる作業手順書が策定される。 10-2 バングラデシュ国のジオイドモデルが作成される。 10-3 ジオイドモデル作成にかかる研修が実施され、研修参加者の70%以上の職員が作業手順書を理解する。 10-4 ジオイドモデル作成担当職員の70%以上にOJTが実施される。	- 作成された作業手順書 - 作成されたジオイドモデル - 研修記録 - アンケート調査	
11. SOB職員がIDMSプロジェクトを遂行するための計画立案・運営管理、トラブルシューティングに必要な技術/能力を習得する。	11-1 デジタル地形図の誤差数が減少される。 11-2 SOB職員がEVM方法を用いてIDMSプロジェクトを管理できるようになる。	- 準備されたプロジェクト計画 - 研修記録 - OJT記録 - QC記録 - スジューズ管理記録	
12. IDMSプロジェクトとそのデジタル地図が広く認識され、効率的に普及されるための体制が構築される。	12-1 広報セミナーを少なくとも年に1回実施する。 12-2 セミナーの内容に対し、セミナー参加者の70%が満足すプロジェクトの成果物の利活用について関係機関と技術的なミーティングを開催する。 12-3 デジタル地図に関する情報をWEBや冊子を通して定期的に更新する。	- セミナーの実施記録 - 成果品の入手方法 - 関係機関に対するヒアリング	
<b>活動</b>	<b>投入</b>		
1-1 デジタル地図作成にかかる作業規定の策定 1-2 作業規定のベンガル語化 1-3 IDMSプロジェクト全体の技術的支援 1-4 IDMSプロジェクト運営に関する支援 2-1 写真測量理論研修の実施 2-2 空中三角測量理論研修の実施 3-1 空中三角測量技術に関する研修の実施計画の策定 3-2 空中三角測量技術に関する研修・OJTの実施 3-3 精度管理・工程管理に関する研修・OJTの実施 3-4 空中三角測量技術の作業手順書の策定 3-5 作業手順書のベンガル語化 4-1 オルソ画像作成技術に関する研修の実施計画の策定 4-2 オルソ画像作成技術に関する研修・OJTの実施 4-3 精度管理・工程管理に関する研修・OJTの実施 4-4 オルソ画像作成技術の作業手順書の策定 4-5 作業手順書のベンガル語化 5-1 DEM作成技術に関する研修の実施計画の策定 5-2 DEM作成技術に関する研修・OJTの実施 5-3 精度管理・工程管理に関する研修・OJTの実施 5-4 DEM作成技術の作業手順書の策定 5-5 作業手順書のベンガル語化 6-1 デジタル図化技術に関する研修の実施計画の策定 6-2 デジタル図化技術に関する研修・OJTの実施 6-3 精度管理・工程管理に関する研修・OJTの実施 6-4 デジタル図化技術の作業手順書の策定 6-5 作業手順書のベンガル語化 7-1 デジタル編集技術に関する研修の実施計画の策定 7-2 デジタル編集技術に関する研修・OJTの実施 7-3 精度管理・工程管理に関する研修・OJTの実施 7-4 デジタル編集技術の作業手順書の策定 7-5 作業手順書のベンガル語化 8-1 GISデータ構築技術に関する研修の実施計画の策定 8-2 GISデータ構築技術に関する研修・OJTの実施 8-3 精度管理・工程管理に関する研修・OJTの実施 8-4 GISデータ構築技術の作業手順書の策定 8-5 作業手順書のベンガル語化 9-1 印刷機械のメンテナンス計画の策定 9-2 印刷技術向上のための研修の実施計画の作成 9-3 印刷技術向上のための研修・OJTの実施 9-4 精度管理・工程管理に関する研修・OJTの実施 9-5 印刷業務の作業手順書の策定 9-6 作業手順書のベンガル語化 10-1 ジオイドモデル作成に関する研修の実施計画の策定 10-2 ジオイドモデル作成に関する研修・OJTの実施 10-3 ジオイドモデルの作成 10-4 ジオイドモデル作成のための作業手順書の策定 10-5 作業手順書のベンガル語化 11-1 デジタル地図作成の実施計画作成に関するOJTの実施 11-2 デジタル地図作成のためのプロジェクトマネジメントに関する研修の実施 11-3 デジタル地図作成のためのトラブルシューティングに関するOJTの実施 11-4 デジタル地図作成のための精度管理に関するOJTの実施 11-5 デジタル地図作成のためのスケジュール管理に関するOJTの実施 12-1 関係機関や関係者へのセミナーの開催 12-2 成果物としての情報、サンプルデータ及び技術的サポートの提供について関係機関との協力関係の促進 12-3 出版や再販の方法、提供体制の構築についてSOBへのアドバイスの実施	<b>バングラデシュ側</b> 1. C/P人員の任命 - プロジェクトマネージャー - 空中三角測量 - オルソ画像 - DEM作成 - デジタル図化 - デジタル編集 - GISデータ作成 - 印刷及びメンテナンス - ジオイドモデル作成  2. 施設 - 日本人専門家用オフィス - 電話線及びインターネット  (参考) 3. IDMSプロジェクト - 写真測量関係機材の購入 - 航空写真撮影の実施 - 人工衛星画像の購入 - 作業スペースの改修 - 現地作業の実施 - 室内作業の実施 - セミナーの開催	<b>日本側</b> 1. 日本人専門家の任命 - プロジェクトリーダー - 業務主任/測量作業規定作成 - 写真測量/航空三角測量理論 - 空中三角測量、オルソ作成及びDEM作成(1) - 空中三角測量、オルソ作成及びDEM作成(2) - デジタル図化 - デジタル編集 - GIS管理 - 印刷 - ジオイドモデル作成  2. 日本国内における研修 - 地図作成とデータ管理の研修 - 地図とデータの利活用の研修	- SOBが進めるデジタル地図作成に必要な機材の調達計画が計画通り行われる。 - 航空写真撮影が予定通り行われる。 - 適切な数のC/P人員が任命される。
			<b>前提条件</b>



## 添付資料4 Project Design Matrix (PDM)

Cooperation Period: July 2009 - March 2011  
Target Group: SOB

Implementation Agency: Survey of Bangladesh (SOB)  
Working Area: Dhaka

Made on Dec. 6th, 2011, Ver 3.0

Narratives Summary	Indicators	Means of Verification	Important Assumptions
<b>Overall Goal</b> 1. SOB implements the project of "Improvement of Digital Mapping System of Survey of Bangladesh" (IDMS project).	1. SOB will provides 1:25,000 and 1:5,000 scale topographic maps and database to government and private users.	- Project report - Delivery record of topographic maps and data	- Necessary budget to produce digital map and database will be continuously allocated to SOB.
<b>Project Purpose</b> 1. Technical staff of SOB will develop their skills enough to implement the digital mapping in the scale of 1:5,000 and 1:25,000, and actual work of IDMS Project is implemented correctly and smoothly.	1-1 70% of SOB technical staff have a right understanding of Specifications and can work following the 1-2 The actual mapping works of IDMS Project will be implemented on schedule based on the Operation Manual and Specifications	- Project report - Actual work progress of IDMS Project - Questionnaire survey	- The other technical areas which are not subjects of JICA technical transfer project also have enough ability to conduct the IDMS project.
<b>Outputs</b> 1. SOB has the specifications of the process and products of digital mapping	1-1 Specifications of process and product of the digital mapping is determined. 1-2 Specifications of process and product digital map is introduced to all relative department of SOB	- Copy of the Specifications - Project report - Questionnaire survey	- Trained staff of SOB are retained in their department during the project implementation.
2. Technical staff of SOB understand the theory of photogrammetry and aerial triangulation.	2-1 Training of photogrammetry is conducted and at least 70% of participants to the training understand the theory of photogrammetry. 2-2 Training of aerial triangulation is conducted and at least 70% of the participants to the training understand the theory of aerial triangulation.	- Project report - Training materials - Training record - Questionnaire survey	
3. Technical staffs of SOB acquire essential technology of aerial triangulation.	3-1 Operation manual of aerial triangulation is made. 3-2 Plan of training of aerial triangulation is made. 3-3 Training of aerial triangulation is conducted and at least 70% of the participants of the training understand about the operational manual. 3-4 OJT of aerial triangulation is conducted to at least 70% of SOB technical staffs in the respective field.	- Project report - Operational manual - Training plan - Training record - Practical examination - Paper examination - Questionnaire survey	
4. Technical staffs of SOB acquire essential technology of orthophoto making.	4-1 Operation manual of orthophoto making is made. 4-2 Plan of training of orthophoto making is made. 4-3 Training of orthophoto making is conducted and at least 70% of the participants of the training understand about the operation manual. 4-4 OJT of orthophoto making is conducted to at least 70% of SOB technical staffs in the respective field.		
5. Technical staffs of SOB acquire essential technology of DEM making.	5-1 Operation manual of DEM making is made. 5-2 Training plan of DEM making is made. 5-3 Training of DEM making is conducted and at least 70% of the participants of the training understand about the operation manual. 5-4 OJT of DEM making is conducted to at least 70% of SOB technical staffs in the respective field.		

6. Technical staffs of SOB acquire essential technology of digital plotting.	6-1 Operation manual of digital plotting is made. 6-2 Training plan of digital plotting is made. 6-3 Training of digital plotting is conducted and at least 70% of the participants of the training understand about the operation manual. 6-4 OJT of digital plotting is conducted to at least 70% of SOB technical staffs in the respective field.	
7. Technical staffs of SOB acquire essential technology of digital compilation.	7-1 Operation manual of digital compilation is made. 7-2 Training plan of digital compilation is made. 7-3 Training of digital compilation is conducted and at least 70% of the participants of the training understand about the operation manual. 7-4 OJT of digital compilation is conducted to at least 70% of SOB technical staffs in the respective field.	
8. Technical staffs of SOB acquire essential technology about construction and management of GIS database.	8-1 Operation manual of construction and management of GIS database is made. 8-2 Training plan of construction and management of GIS database is made. 8-3 Training of construction and management of GIS database is conducted and at least 70% of the participants of the training understand about the operation manual. 8-4 OJT of construction and management of GIS database is conducted to at least 70% of SOB technical staffs in the respective field.	
<del>9-1 Technical staffs of SOB improve their skills in printing map.</del>	<del>9-1-1 Operation manual of printing map is made. 9-1-2 Training plan of printing map is made. 9-1-3 Training of printing map is conducted and at least 70% of the participants of the training understand about the operation manual. 9-1-4 OJT of printing is conducted to at least 70% of technical staffs in the respective field.</del>	
<del>9-2 Printing equipment of SOB is operational with a good condition</del>	<del>9-2-1 Maintenance plan is determined. 9-2-2 All units of printing equipments which the IDMS project requires are well maintained.</del>	<del>- Maintenance plan - Maintenance record</del>
10. Technical staffs of SOB acquire essential technology about geoid model creation.	10-1 Operation manual of geoid model is made. 10-2 Geoid model is made. 10-3 Training of geoid model creation is conducted and at least of 70% of the participants of the training understand about the operation manual 10-4 OJT of geoid model creation is conducted to at least 70% of SOB technical staffs in the respective field.	- Operational manual - Created Geoid model - Training record - Questionnaire survey
11. Technical staffs of SOB acquire essential technology of project planning, project management and trouble shooting for the implementation of IDMS.	11-1 Number of errors of Digital Topographic data is decreased. 11-2 The staffs of SOB are able to manage the IDMS Project by using EVM method.	- Prepared project plan - Training record - OJT record - Quality control record - Schedule management record
12. IDMS project of SOB and digital maps/digital Data are recognized, and system for using effectively by users is established.	12-1 Dissemination seminar is held at least once a year. 12-2 70 % of participants satisfaction to the contents of 12-3 Technical meeting with the related organization for utilization of project product is held. 12-4 The information of digital map is updated periodically such as web site, brochure, etc.	- Seminar record - Procurement Method - Interviews for related organization

Activities	Input		
	Bangladesh Side	Japanese Side	
1-1 To make Specifications for digital mapping	<b>1. Assignment of counterparts personnel</b> - Project manager - Aerial triangulation - Ortho image - DEM - Digital plotting - Digital compilation - GIS map data - Printing - Geoid model  <b>2. Facilities</b> - Office room for Japanese experts - Telephone line and internet connection  (Reference) <b>3. IDMS Project</b> - Procurement of photogrammetric equipment - Conduct of aerial photography - Purchase of satellite image - Renovation of working space - Conduct of field works - Conduct of indoor works - Hold of Seminar	<b>1. Assignment of Japanese experts</b> - Project leader - Chief / Technical specifications - Photogrammetry / Aerial triangulation Theory - Aerial triangulation, Orthophoto making and DEM making (1) - Aerial triangulation, Orthophoto making and DEM making (2) - Digital mapping - Digital compilation - GIS database - Printing - Geoid model  <b>2. Training in Japan</b> - Topographic maps and data management - Topographic maps and data utilization	- Procurement of necessary equipment is done according to the schedule by SOB. - Aerial photo is taken according to the schedule by SOB. - Adequate number of technical staff of SOB will be assigned.
1-2 To translate Specifications into Bengalee			
1-3 To provide overall technical support to IDMS project			
1-4 To provide overall management support to IDMS project			
2-1 To conduct lecture of photogrammetry theory			
2-2 To conduct lecture of aerial triangulation theory			
3-1 To make a training plan of aerial triangulation technique			
3-2 To conduct technical training of aerial triangulation technique			
3-3 To conduct training of quality and schedule control			
3-4 To make Operation Manual of aerial triangulation			
<del>3-5 To translate Operation Manual into Bengalee</del>			
4-1 To make a training plan for orthophoto making technique			
4-2 To conduct technical training of orthophoto making technique			
4-3 To conduct training of quality and schedule control			
4-4 To make Operation Manual about orthophoto making technique			
<del>4-5 To translate Operation Manual into Bengalee</del>			
5-1 To make a training plan of DEM making technique			
5-2 To conduct technical training of DEM making technique			
5-3 To conduct training of quality and schedule control			
5-4 To make Operation Manual of DEM making technique			
<del>5-5 To translate Operation Manual into Bengalee</del>			
6-1 To make a training plan of digital plotting technique			
6-2 To conduct technical training of digital plotting technique			
6-3 To conduct training of quality and schedule control			
6-4 To make Operation Manual of digital plotting technique			
<del>6-5 To translate Operation Manual into Bengalee</del>			
7-1 To make a training plan of digital compilation technique			
7-2 To conduct technical training of digital compilation technique			
7-3 To conduct training of quality and schedule control			
7-4 To make Operation Manual of digital compilation technique			
<del>7-5 To translate Operation Manual into Bengalee</del>			
8-1 To make a training plan of construction and management of GIS database			
8-2 To conduct technical training of construction and management of GIS database			
8-3 To conduct training of quality and schedule control			
8-4 To make Operation Manual of construction and management of GIS database			
<del>8-5 To translate Operation Manual into Bengalee</del>			
<del>9-1 To make Maintenance Plan of printing machine</del>			
<del>9-2 To make a training plan of printing technique</del>			
<del>9-3 To conduct technical training of printing technique</del>			
<del>9-4 To conduct training of quality and schedule control</del>			
<del>9-5 To make Operation Manual of printing technique</del>			
<del>9-6 To translate Operation Manual into Bengalee</del>			
			<b>Precondition</b>

<p>10-1 To make a training plan of geoid model creation technique  10-2 To conduct technical training of geoid model creation technique  10-3 To create geoid model  10-4 To make Operation manual of geoid model creation  <del>10-5 To translate Operation Manual into Bengalee</del></p>			
<p>11-1 To conduct OJT for project planning of digital mapping  11-2 To conduct lecture of project management for digital mapping  11-3 To conduct OJT for trouble shooting of digital mapping  11-4 To conduct OJT for quality control of digital mapping  11-5 To conduct schedule control of digital mapping</p>			
<p>12-1 To hold seminars for related organizations and stake holders  12-2 To promote cooperation with related organizations by provision of product information, sample data, and technical support.  12-3 To advise SOB about establishment of publishing and reselling methods and provision system.</p>			

**別添資料 13.1 Minutes of Meeting on Inception Report of Bangladesh  
 Digital Mapping Assistance Project**





MINUTES OF MEETING  
ON  
INCEPTION REPORT  
FOR  
BANGLADESH DIGITAL MAPPING ASSISTANCE PROJECT  
(1<sup>ST</sup> YEAR)

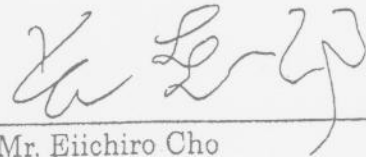
AGREED UPON BETWEEN

SURVEY OF BANGLADESH  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Dhaka, October 22, 2009



Brig. Gen. Md. Mominul Haque afws, psc  
Surveyor General  
Survey of Bangladesh



Mr. Eiichiro Cho  
Senior Representative  
Japan International Cooperation Agency  
Bangladesh Office



Colonel Mahmudun Nabi, psc  
Director  
Survey of Bangladesh



Mr. Toru Watanabe  
Leader of the JICA Expert Team

The Team for Bangladesh Digital Mapping Assistance Project (hereinafter referred to as "BDMAP" and "The Team" organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA" arrived at Dhaka, The People's Republic of Bangladesh on 31 August 2009 for the first year's work in Bangladesh.

The Team submitted twenty (20) copies of Inception Report (Draft) to Survey of Bangladesh (hereinafter referred to "SOB").

A series of meetings on Inception Report and the Project of Improvement of Digital Mapping System of Survey of Bangladesh (hereinafter referred to as "IDMS Project") which will be executed by SOB from the beginning of September. A list of participants is attached in Annex 1.

Inception Report was basically accepted by SOB and during the meetings, the following points were confirmed among the parties.

- 1) The Team explained the activities of each experts, overall goal, project purpose and outputs of BDMAP and SOB basically agreed them.
- 2) The Team explained the revised Project Design Matrix (PDM) of BDMAP and SOB agreed it.
- 3) The Team explained the plan of counterparts training in Japan and requested SOB to select the suitable persons for counterparts training in Japan and also the request for contents of training in Japan. SOB agreed to select the suitable persons for counterparts training in Japan and also inform the Team about the request concerning the contents of training in Japan.
- 4) The Team requested SOB to assign several counterparts necessary for the implementation planning of IDMS Project and SOB agreed it.
- 5) The Team explained the Work Breakdown Structure (WBS) of BDMAP and pointed out that the procurement of equipment, aerial photography and renovation of working space for IDMS Project which will be executed by SOB are the crucial points for the smooth implementation of not only IDMS Project, but also BDMAP. Therefore, the Team requested SOB to take necessary procedures to be able to execute the IDMS Project smoothly as much as possible and SOB agreed it.
- 6) SOB explained that every endeavor has been made to execute the IDMS Project smoothly, such as the schedule of procurement of equipment and aerial photography. However, SOB requested the Team that the assignment schedule of the Team and the contents of technical training to be modified according to the actual work progress of IDMS Project if unavoidable circumstances or/and delay arise and the Team agreed it.

## List of Participants

### Survey of Bangladesh

#### The Team

- |   |                  |
|---|------------------|
| 1. Colonel Mahmud-Un-Nabi<br>Director, Defense Survey Directorate                         | President        |
| 2. Major Md. Murul Amin Chowdhury<br>Project Manager, Surveyor General Office             | Member           |
| 3. Major Md. Anisur Rahman<br>Officer in charge, No.-1 Cartographic Office                | Member           |
| 4. Mr. Md. Abdur Rouf Haolader<br>Office in charge, No-2 Cartographic Office              | Member           |
| 5. Major Md. Zamil Hossain Munshi<br>Project Officer (Technical), Surveyor General Office | Member           |
| 6. Major Sarfaraz Ahmed<br>Project Officer, Surveyor General Office                       | Member           |
| 7. Mr. S.M. Nasir Haider<br>Officer in charge, Photogrammetric Office                     | Member           |
| 8. Nayan Chandra Sarker<br>Asst. Superintendent of Survey, Geodetic Detachment            |                  |
| 9. Mohammad Hossain Bhuiyan, T.A.(F)  |                  |
| 10. Md. Ashraf Hossain, Syr.Gr.-1   |                  |
| 11. Ganesh Chandra Roy<br>In charge, Geodetic Detachment                                  | Member Secretary |

### Japanese side

#### The Team

- |                             |   |
|-----------------------------|---|
| 1. Mr. Toru Watanabe        | Team Leader/Technical Specifications      |
| 2. Mr. Takashi Harada       | Aerial Triangulation/Orthophoto & DEM (1) |
| 3. Mr. Yoshiteru Matsushita | Digital Compilation                       |
| 4. Mr. Shigeru Ono          | GIS Management                            |
| 5. Ms. Michi Hayashi        | Administrative Support (1)                |

### JICA Expert

- |                     |                                   |
|---------------------|-----------------------------------|
| 1. Mr. Bokuro Urabe | JICA Expert, Survey of Bangladesh |
|---------------------|-----------------------------------|



**別添資料 13.2 Minutes of Meeting on Plan of Operation for Bangladesh Digital Mapping Assistance Project (2<sup>nd</sup> Year)**



MINUTES OF MEETING  
ON  
PLAN OF OPERATION  
FOR  
BANGLADESH DIGITAL MAPPING ASSISTANCE PROJECT  
(2<sup>ND</sup> YEAR)

AGREED UPON BETWEEN

SURVEY OF BANGLADESH

AND

THE JAPAN INTERNATIONAL COOPERATION AGENCY

Dhaka, May 31, 2010



Brig. Gen. Md. Mominul Haque, afwc, psc  
Surveyor General  
Survey of Bangladesh



Mr. Shigeki Furuta  
Senior Representative  
Japan International Cooperation Agency  
Bangladesh Office



Colonel Mahmudun Nabi, psc  
Director, Defense Survey Directorate  
Survey of Bangladesh



Mr. Toru Watanabe  
Leader of the JICA Project Team



Colonel Md. Ashfakul Islam  
Ministry of Defense  
Witness


List of Participants

Bangladesh side

Survey of Bangladesh

1. Brig. Gen. Md. Mominul Haque, afwc, psc  
Surveyor General
2. Colonel Mahmudun Nabi, psc  
Director, Defense Survey Directorate
3. Major Md. Nurul Amin Chowdhury  
Project Manager, Surveyor General Office
4. Major Md. Anisur Rahman  
In charge Photogrammetry Unit
5. Mr. Md. Abdur Rouf Haolader  
Officer in charge, No.-2 Cartographic Office
6. Major Md. Zamil Hossain Munshi  
Project Officer (Technical), Surveyor General Office

Ministry of Finance

1. Ms. Nasreen Akhtar Chowdhury   
Deputy Secretary, Economic Relation Division

Ministry of Defense

1. Colonel Md. Ashfakul Islam

Japanese side

The Project Team

- |                             |                                |
|-----------------------------|--------------------------------|
| 1. Mr. Toru Watanabe        | Leader/Technical Specification |
| 2. Mr. Yoshiteru Matsushita | Digital compilation            |
| 3. Mr. Koji Yamazaki        | Orthophoto/DEM (2)             |
| 4. Ms. Michi Hayashi        | Administrative support (1)     |

JICA Expert

1. Mr. Bokuro Urabe JICA Expert, Survey of Bangladesh





The Team for Bangladesh Digital Mapping Assistance Project (BDMAP) (2<sup>nd</sup> Year) (hereinafter referred to as "the Project Team" arrived at Dhaka, the People's Republic of Bangladesh on 11 May 2010 for the second year's activities of BDMAP.

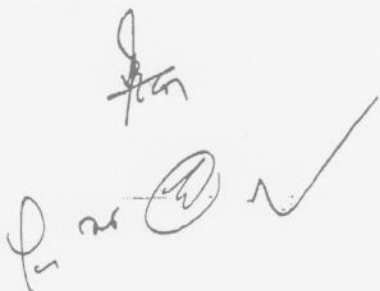
Due to the reason of the delay of the procurement of photogrammetric equipment and software of IDMS by the final decision of the Ministry of Defense as fresh tender, the Project Team has a series of discussion concerning the schedule and contents of activities of the 2<sup>nd</sup> year of BDMAP with Survey of Bangladesh.

Based on the discussion, the Project Team prepared the Revised Plan of Operation (2<sup>nd</sup> year) of BDMAP and submitted and explained to SOB.

The meeting on Revised Plan of Operation (2<sup>nd</sup> year) was held on 25 May 2010 between the Project Team and SOB.

Revised Plan of Operation was basically accepted by SOB. During the meeting, following points were confirmed between the both parties.

- 1) The Project Team requested SOB to execute fresh tender process of photogrammetric equipment and software according to the new schedule of fresh tender. The Project Team also expressed if the schedule of fresh tender is delayed more, it is impossible to start the actual digital topographic mapping work of IDMS from the around May 2011 and the schedule of IDMS will be delayed more than one year from the original schedule of IDMS and SOB agreed it.
- 2) The Project Team also requested SOB to execute the process of contract of aerial photography to be able to start the actual work of aerial photography from this dry season (approximately October 2010 up to March 2011) and SOB agreed it.
- 3) Considering the efficient and smooth technical training to the staff of SOB and also to minimize the influence by the delay of procurement of photogrammetric equipment and software to the technical training program to the staff of SOB, the Project Team decided to increase 4 more sets of digital plotting system (supplied free of cost from the Project Team, total 12 sets) which will be used for technical training in 2<sup>nd</sup> year.
- 4) SOB explained that every endeavor has been made to execute the IDMS Project smoothly, such as the schedule of procurement of equipment and aerial photography. However, SOB requested the Project Team that assignment schedule of the Project Team and the contents of technical training to be modified according to the actual work progress of IDMS Project if unavoidable circumstances and/or delay arise and the Team agreed it.

The bottom of the page contains several handwritten signatures and initials. There is a signature that appears to be 'J. Khan' at the top left. Below it, there are several other initials and signatures, including one that looks like 'P. M.' and another that is a large, stylized signature.



**別添資料 13.3 Minutes of Meeting on Plan of Operation for Bangladesh Digital  
 Mapping Assistance Project (3<sup>rd</sup> Year)**



MINUTES OF MEETING  
ON  
PLAN OF OPERATION  
FOR  
BANGLADESH DIGITAL MAPPING ASSISTANCE PROJECT  
(3<sup>RD</sup> YEAR)

AGREED UPON BETWEEN

SURVEY OF BANGLADESH  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Dhaka, June 2, 2011



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Colonel Mahmudun Nabi, psc  
Director, Defense Survey Directorate  
Survey of Bangladesh



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Mr. Toru Watanabe  
Leader of the JICA Project Team

The Team for Bangladesh Digital Mapping Assistance Project (BDMAP)(3<sup>rd</sup> Year) (hereinafter referred to as "The Project Team" arrived at Dhaka, the People's Republic of Bangladesh on 30 May 2011 for the third year's activities of BDMAP.

The Project Team submitted the Plan of Operation of BDMAP (3<sup>rd</sup> year) to Survey of Bangladesh and explained the outline of the 3<sup>rd</sup> year's activities of BDMAP.

Both parties basically agreed the Plan of Operation of BDMAP (3<sup>rd</sup> year) submitted by The Project Team.

**別添資料 13.4 Record of Discussion on 8 December 2009**





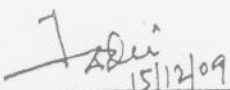
## Record of Discussion


Based on the change of the procurement schedule of software and hardware for photogrammetric mapping aerial photography by SOB, the Project Team and Survey of Bangladesh discussed about the technical training program for the staff of SOB which will be executed on the 1<sup>st</sup> year's work and the contents of the final products of the 1<sup>st</sup> year's work of BDMAP.

Concerning the above-mentioned items, both parties agreed as follows.

1. The Project Team will prepare 4 sets of alternative digital plotting system for the technical training to the staff of SOB and bring them to Bangladesh from Japan with necessary accessories. The technical training of aerial triangulation and digital plotting will be executed by using this digital plotting system.
2. The operation of orthophoto making and DEM making are fully depend of the software. Therefore, the technical training for orthophoto making and DEM making were decided to be executed on the 2<sup>nd</sup> year's work of BDMAP, after available of the software and hardware which will be procured by SOB.
3. The technical training of digital compilation, which is planned on the 2<sup>nd</sup> year's work, will be started from the 1<sup>st</sup> year's work of BDMAP.
4. The final products of the 1<sup>st</sup> year's work of BDMAP will be modified as shown on the attached paper considering the change of the procurement schedule of software and hardware for photogrammetric mapping and aerial photography by SOB.

8 December 2009

  
15/12/09  
Col. Mahmudun Nabi, psc  
Director of Defense Survey  
Survey of Bangladesh

  
Mr. Toru Watanabe  
Leader/Technical Specification  
JICA Project Team

Modification of the technical training and final products of the 1st year's work due to the change of equipment procurement schedule

	Final Products of 1st Year's Work	Original Plan	Present Situation	Revised Plan
1	Report			
	Inception Report		Already submitted to SOB.	No change
	Project Progress Report (1)	20 sets (English)		No change
	Specifications and Operation Manual	20 sets (English)		
	Specifications of the process and products of digital mapping (Draft)	each 10 sets (English, Bengali)	On going with the staff of SOB.	No change
	Operation manual of aerial triangulation (Draft)	each 10 sets (English, Bengali)	It is difficult to make an operation manual due to the delay of procurement of software and equipment by SOB.	Tentative operation manual will be made based on the alternative software which will be used for technical training. Final operation manual will be made after the software become available to use and translation into Bengali will be executed on the 2nd year's work.
	Operation manual of orthophoto making	each 10 sets (English, Bengali)	It is difficult to make an operation manual due to the delay of procurement of software and equipment by SOB.	Technical training will be executed on the 2nd year's work. Operation manual will be prepared on the 2nd year's work.
	Operation manual of DEM making (Draft)	each 10 sets (English, Bengali)	It is difficult to make an operation manual due to the delay of procurement of software and equipment by SOB.	Technical training will be executed on the 2nd year's work. Operation manual will be prepared on the 2nd year's work.
	Operation manual of digital plotting (Draft)	each 10 sets (English, Bengali)	It is difficult to make an operation manual due to the delay of procurement of software and equipment by SOB.	Technical training will be executed on the 2nd year's work. Operation manual will be prepared on the 2nd year's work.
	Other Products			Tentative operation manual will be made based on the alternative software which will be used for technical training. Final operation manual will be made after the software become available to use and translation into Bengali will be executed on the 2nd year's work.
3	Marginal information (Draft)	each 10 sets (English, Bengali)	On going with the staff of SOB.	No change
	Map symbols and application rules (Draft)	each 10 sets (English, Bengali)	On going with the staff of SOB.	No change
	Sample map	5 sets (English)	On going with the staff of SOB.	No change
	Sheet index plan and sheet number plan	5 sets (English)	On going with the staff of SOB.	No change
	Training plan	5 sets (English)	Due to the change of the situation, it is necessary to make a new training plan.	No change
4	Note	Draft will be revised based on the issues and solutions which will be arisen through the implementation of the actual works of IDMS Project, and will be finalized by the end of BDMAP.	Due to the reason of re-tender of procurement of equipment and software, it is estimated that the software and equipment will be available on around June, 2010. Therefore, it was decided that technical training of aerial triangulation and digital plotting will be executed based on the other software.	The operation of orthophoto making and DEM making are fully depend on the software. Therefore, technical training of orthophoto making and DEM making were decided to be executed on the 2nd year's work. However, the training of digital compilation, which is planned on the 2nd year's work, will be started from the 1st year's work.

**別添資料 13.5 Minutes of Meeting on Draft Final Report for Bangladesh  
 Digital Mapping Assistance Project (BDMAP)**



**MINUTES OF MEETING  
ON  
DRAFT FINAL REPORT  
FOR  
BANGLADESH DIGITAL MAPPING ASSISTANCE PROJECT  
(BDMAP)**

The project Team for Bangladesh Digital Mapping Assistance Project (hereinafter referred to as "The Project Team") arrived Dhaka, the People's Republic of Bangladesh on 30 May 2011 for the third year's activities of BDMAP.

At the end of the activities of the 3<sup>rd</sup> year of BDMAP, the Project Team submitted the Draft Final Report summarizing the whole activities of BDMAP (from 1<sup>st</sup> year to 3<sup>rd</sup> year) to Survey of Bangladesh and several meetings on the Draft Final Report were held between SOB and the Project Team.

The Draft Final Report was basically accepted by SOB. Some minor correction on the Draft Final Report was pointed out by SOB and the Project Team agreed to correct them at the time of the preparation of the Final Report.

Dhaka, 8 March 2012



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Colonel Mahmudun Nabi, psc  
Director  
Survey of Bangladesh



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Mr. Toru Watanabe  
Leader  
Bangladesh Digital Mapping Assistance  
Project (BDMAP)