MINUTES OF DISCUSSIONS ON THE BASIC DESIGN STUDY ON "THE PROJECT FOR IMPROVEMENT OF THE METEOROLOGICAL RADAR SYSTEM IN THE PHILIPPINES" (EXPLANATION OF DRAFT REPORT)

From June to August 2008, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Improvement of the Meteorological Radar System in the Philippines (hereinafter referred to as "the Project") to the Republic of the Philippines (hereinafter referred to as "the Philippines"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and consult with the concerned officials of the Government of the Philippines (hereinafter referred to as "the GOP") on the components of the draft report, JICA sent the Draft Report Explanation Team (hereinafter referred to as "the Team"), headed by Mr. Satoru MIMURA, Director of Disaster Management Division I, Water Resources and Disaster Management Group, Global Environment Department JICA, from 28th October to 5th November 2008.

As a result of the discussions, both parties confirmed the main items described on the attached sheets.

Quezon City, 4th November 2008

三村 悟

Mr. Satoru MIMURA
Team Leader
Draft Report Explanation Team
Japan International Cooperation Agency

Dr. Graciano P. YUMUL, Jr.
Undersecretary for Research and Development
Department of Science and Technology (DOST)
Republic of the Philippines

Dr. Prisco D. NILO
Director
Philippine Atmospheric, Geophysical and Astronomical Services Administration
(DOST-PAGASA)

D-1303

ATTACHMENT

1. Components of the Draft Report

The Philippine side agreed and accepted in principle the components of the Draft Report explained by the Team.

2. Japan's Grant Aid scheme

The Philippine side understands Japan's Grant Aid Scheme and the necessary measures to be taken by the GOP as explained by the Team and described in Annex 4-1 and Annex 4-2 of the Minutes of Discussions signed by both sides on 9th July, 2008 (hereinafter referred to as "the Previous M/D").

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the GOP by the end of December 2008.

4. Confidentiality of the Project

4.1 Detailed Specifications

Both sides confirmed all the information related to the Project including detailed specifications of the facilities, equipment and other technical information shall not be released to any other party(ies) before the signing of all the Contract(s) for the Project.

4.2 Project Cost Estimate

The Team explained to the Philippine side the estimated project cost to be borne by the Government of Japan (hereinafter referred to as "the GOJ") as attached in Annex -1(A). Both sides agreed that the Project Cost Estimate should never be duplicated in any form nor disclosed to any other party(ies) before the signing of all the Contract(s) for the Project. This confidentiality of the estimated project cost is necessary to ensure fairness of tender procedure.

5. Other relevant issues

5.1 Components of the Project

The Philippine side agreed that the components of the Project will be determined by the GOJ based on the result of the study after the discussion with the GOP.

5.2 Procurement of VSAT

The Philippine side explained that due to the budgetary procedures of the GOP, they cannot assure the provision of VSAT in FY2010 until late 2009. They also expressed their anxiety about compatibility and suitability of VSAT with Radar System if it is procured and installed independently.

Therefore, they strongly requested the GOJ for the inclusion of VSAT in the Project.

The Team replied that they will consult the situation of the GOP with the relevant officials of the GOJ and reply the result accordingly.

5.3 Approval of the Investment Coordination Committee (ICC)

DOST-PAGASA shall obtain ICC approval for the implementation of the Project. The GOP is fully aware that the approval of ICC is a precondition for the Exchange of Notes.

5.4 Operation and Maintenance Arrangement

The Team explained the estimated cost for management, operation and maintenance of the facilities as described in Annex -2. The Philippine side is requested to allocate sufficient budget and qualified staff for proper and effective operation and maintenance of the equipment procured under the Project.

5.5 Training

The Philippine side requested to carry out technical trainings in relation to the Grant Aid Project. The Team replied that the GOP should submit requests for training under technical cooperation.

5.6 Undertakings of the Philippines side

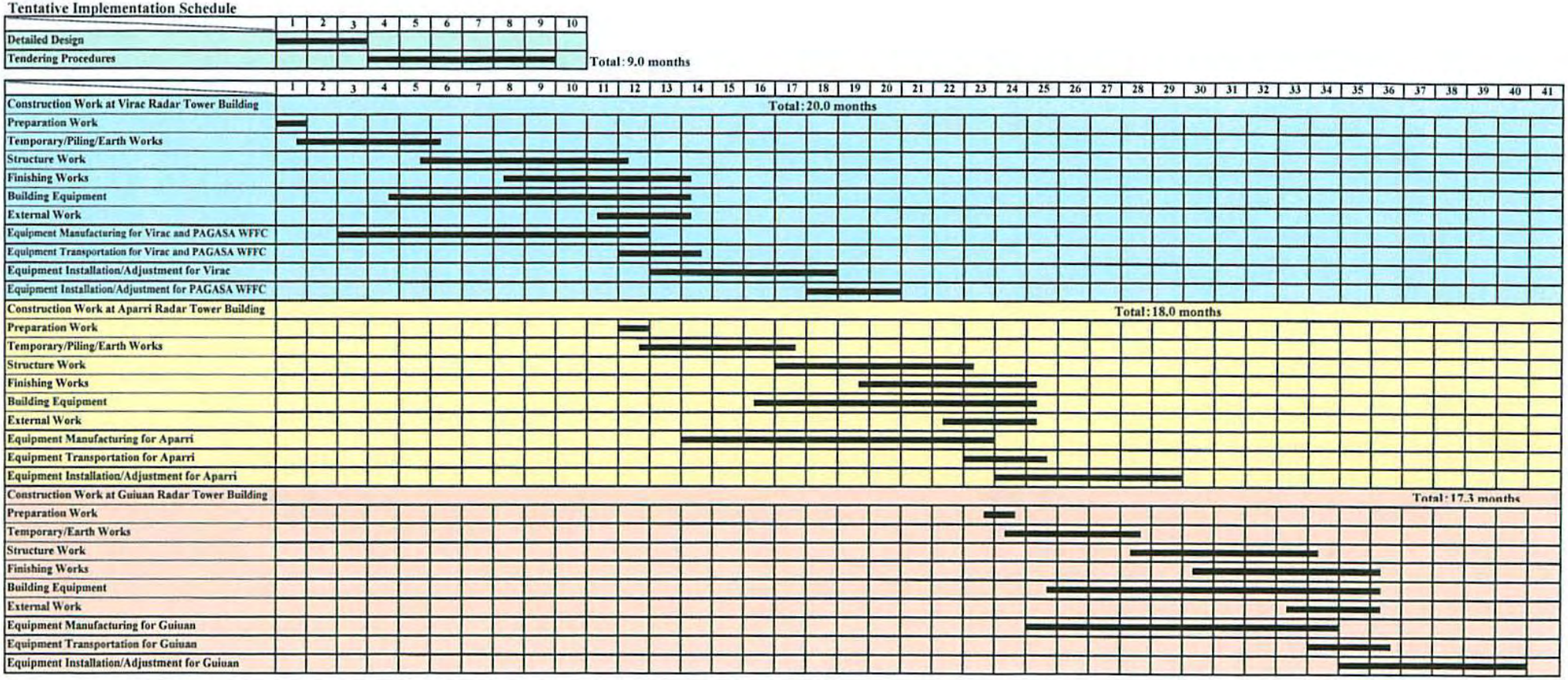
Both sides confirmed that the GOP will carry out the following in accordance with the implementation schedule of the Project:

- Improvement of the access road for Guiuan radar station prior to commencement of the Project implementation at the site
- Partial demolition and renovation of the existing radar tower buildings according to the construction schedule
- Secure written confirmation of non-interference between radar system and the mobile phone communication facility at Virac radar station during the detailed design stage
- Operation of two radar systems during implementation of the Project
- Secure the required budget for Value Added Tax (VAT) and Customs duties
- Provision of adequate security for the equipment at the proposed project sites
- Secure the required permits and clearances as described in Annex -4

Annex -1	Tentative Implementation Schedule
Annex -2	Estimate of Project Cost and Capital Cost
Annex -3	Required Items for Investment Coordinating Council (ICC) Approval
Annex -4	Required Permits and Clearances for the Project

Annex -1

Tentative Implementation Schedule



Annex -2

Estimate of Project Cost and Capital Cost

The Project cost to be financed by the Japan's Grant Aid Assistance and the required capital cost for the Project to be borne by PAGASA have been estimated and are shown in the following tables. However, the Project cost estimates are provisional and would be further examined by the Government of Japan for the approval of the Grant.

Project Cost Estimates of the Japan's Grant Aid

Total Project Cost Estimate: 3,295 Million JP Yen

Table1: Project Cost Estimate

Items		Estimate (JP Yen)	
Construction	Virac Radar Tower Building	JPY490Million	JPY3,065Million
	Aparri Radar Tower Building	JPY478Million	
	Guiuan Radar Tower Building	JPY450Million	
Equipment	Meteorological Radar System Meteorological Radar Data Display System Emergency Power Backup Apparatus for Meteorological Data Satellite Communication	JPY1,647Million	
Consulting Services (Detailed Design, Supervision, Technical Guidance, etc.)		JPY230Million	
Total		JPY3,295Million	

Project Cost to be borne by the GOP

Total Project Cost: 251,604,000 Peso +3 Million JP Yen (approx. 656 Million JP Yen)

Estimated Capital Cost: 21,721,000 Peso x 1.12 (VAT) = 24,328,000 Peso (approx. 63 Million JP Yen)
Estimated VAT for Construction Works: 65,452,000 Peso (approx. 170 Million JP Yen)
Estimated VAT & Import Tax for Equipment: 115,117,000 Peso (approx. 299 Million JP Yen)
Estimated Equipment Procurement and Installation Work Cost for the Meteorological Data Satellite Communication System (VSAT): 46,657,000 Peso (approx. 121 Million JP Yen)*
Banking Arrangement: 3 Million JP Yen

*Inclusion of VSAT in the Grant is requested by the GOP.

Estimated Capital Cost to be borne by PAGASA

Table2 : Estimated Capital Cost to be borne by PAGASA

Estimated Capital Cost of PAGASA for Virac Radar Observation Station for 2010 (Philippine Peso)

Items	Capital Cost
Partial demolition of the existing building including disposal of debris material 4,800 Peso/m^2 x (3.3 x 3.3 x 3.14 x 3) x 1.2 =	590,000
Renovation of the existing buildings for establishing a new Staff Quarter 8,000 Peso/m^2 x (8.7 x 8.7 x 3.14 x 2 + 288) x 1.1 =	6,717,000
Removal of the existing radar system Heavy Equipment: 360,000 Peso + Scaffolding: 65,000 Peso + Wooden Box: 30,000 Peso + Manpower: 179,000 Peso + Accommodation & Transportation for Manpower: 53,000 Peso=	687,000
Shifting the existing observation field and instruments	20,000
Repairing the existing boundary wall or fence and gate	140,000
Repairing the existing concrete pavement	50,000
Furniture for the Staff Quarter	120,000
Installation of step-down transformer(s) for 150kVA power supply for the Radar Tower Building	420,000
Procurement of a 25kVA engine generator for the Staff Quarter	550,000
Total	9,294,000

Estimated Capital Cost of PAGASA for Aparri Radar Observation Station for 2011 (Philippine Peso)

Items	Capital Cost
Demolition of the existing facilities which may obstruct during construction of the new Radar Tower Building 3,500 Peso/m^2 x (60 + 5.5 + 2) x 1.2 =	284,000
Renovation of the existing building for the Staff Quarter 8,000 Peso/m^2 x (49 x 4 + 10) x 1.1 =	1,813,000
Removal of the existing radar system Heavy Equipment: 360,000 Peso + Scaffolding: 65,000 Peso + Wooden Box: 30,000 Peso + Manpower: 179,000 Peso + Accommodation & Transportation for Manpower: 53,000 Peso=	687,000
Shifting the existing observation field and instruments	20,000
Repair of the existing boundary wall or fence and gate	350,000
Repair of the existing concrete pavement	40,000
Furniture for the Staff Quarter	120,000
Installation of step-down transformer(s) for 150kVA power supply for the Radar Tower Building	420,000
Procurement of a 25kVA engine generator for the Staff Quarter	550,000
Total	4,284,000

Estimated Capital Cost of PAGASA for Guiuan Radar Observation Station for 2012 (Philippine Peso)

Items	Capital Cost
Renovation of the existing building for the Staff Quarter 8,000 Peso/m^2 x (65 x 2) x 1.1 =	1,144,000
Removal of the existing radar system Heavy Equipment: 360,000 Peso + Scaffolding: 65,000 Peso + Wooden Box: 30,000 Peso + Manpower: 179,000 Peso + Accommodation & Transportation for Manpower: 53,000 Peso=	687,000
Shifting the existing observation field and instruments (steel pole for anemometer)	50,000
Repair of the existing boundary wall or fence and gate	70,000
Construction of an access road 2,900 Peso/m^2 x 856.9 m^2 x 1.2 =	2,982,000
Repair of the existing concrete pavement	20,000
Furniture for the Staff Quarter	120,000
Installation of step-down transformer(s) for 150kVA power supply for the Radar Tower Building	420,000
Cabling for 3 Phase Commercial Power Supply for the Radar Tower Building	2,100,000
Procurement of a 25kVA engine generator for the Staff Quarter	550,000
Total	8,143,000
Ground Total *VAT is excluded in the Capital Costs indicated in the above table	21,721,000

Banking Arrangement	(Japanese Yen)
Bank Commissions (0.1% of the Project Cost to be granted)	3,295,000

Table3: Estimated VAT for Construction Works to be paid by PAGASA (Peso)

Construction Work	VAT (12%)
Construction of Virac Meteorological Radar Tower Building	22,618,000
Construction of Aparri Meteorological Radar Tower Building	22,064,000
Construction of Guiuan Meteorological Radar Tower Building	20,770,000
VAT Total	65,452,000

Table4: Estimated VAT & Import Tax for Equipment to be paid by PAGASA (Peso)

Equipment	Import Tax (10%)	VAT (12%)
Virac Meteorological Radar Observation Station	16,908,000	20,289,000
Aparri Meteorological Radar Observation Station	16,908,000	20,289,000
Guiuan Meteorological Radar Observation Station	16,908,000	20,289,000
PAGASA Head Office, WFFC	1,603,000	1,923,000
VAT & Import Tax Total	52,327,000	62,790,000

Table5: Estimated Equipment Procurement and Installation Work Cost for the Meteorological Data Satellite Communication System (VSAT)* to be paid by PAGASA (Peso)

Equipment	Equipment Procurement and Cost (including Import Tax and VAT)	Installation Work Cost	Sub Total
Virac Meteorological Radar Observation Station	5,726,000	1,204,000	6,930,000
Aparri Meteorological Radar Observation Station	5,726,000	1,216,000	6,942,000
Guiuan Meteorological Radar Observation Station	5,726,000	1,215,000	6,941,000
PAGASA Head Office, WFFC	24,330,000	1,514,000	25,844,000
Total	41,508,000	5,149,000	46,657,000

Applied Exchange Rate: US$ 1 = 105.80 JP Yen, 1 Peso = 2.60 JP Yen

*Inclusion of VSAT in the Grant is requested by the GOP.

Annex -3 Required Items for Investment Coordinating Council (ICC) Approval

	Required Items	Remarks
1	Feasibility Study Report	Instead of the Feasibility Study Report, the Draft Basic Design Study Report will be provided. The Report must highlight the following; 1) Historical Background 2) Sectoral Program Context 3) Regional Spatial Context 4) Objectives 5) Description 6) Cost and Financing 7) Institutional Arrangement 8) Implementation Schedule 9) Technical/Market/Environmental Analysis 10) Financial Analysis 11) Economic Analysis 12) Social Analysis 13) Issues 14) Recommendations
2	Accomplished ICC PE Forms	The Form must be prepared according to NEDA's instructions/format.
3	Regional Development Council (RDC) endorsements for regional, municipal and local projects	Virac, Aparri and Guiuan
4	Endorsement from other concerned agencies	Endorsement of the Department of Science and Technology (DOST) for submission of the ICC PE Form
5	Local map	-
6	DBM certification of budget cover availability for the project	DBM certification of budget strategy covering the whole project implementation period
7	EIS/ECC/CNC	Certificate of Non-Coverage (CNC) issued on May 26, 2008

Annex -4 Required Permits and Clearances for the Project

Table 1: Before start of the Detailed Design

Requirements	Concerned Agencies	Weather and Flood Forecasting Center (WFFC)	Virac Meteorological Radar Observation Station	Aparri Meteorological Radar Observation Station	Guiuan Meteorological Radar Observation Station
Certificate of Non-Coverage (CNC)	Environmental Management Bureau (EMB)	-	Certificate issued on May 26, 2008	Certificate issued on May 26, 2008	Certificate issued on May 26, 2008
Certificate of the Meteorological Radar Frequency (2,850MHz ±10Mhz)	National Telecommunications Commission (NTC)	-	O	O	O
Radiation Influence Permit	Department of Health (DOH)	-	O	O	O
Height Clearance Permit	Civil Aviation Authority of the Philippines (CAAP)	-	O (Virac Airport)	O (Tuguegarao Airport)	O (Guiuan Airport)

Table 2: During the Project Implementation

Requirements	Concerned Agencies	Weather and Flood Forecasting Center (WFFC)	Virac Meteorological Radar Observation Station	Aparri Meteorological Radar Observation Station	Guiuan Meteorological Radar Observation Station
VSAT User License	National Telecommunications Commission (NTC)	O	O	O	O
Transponder Lease Agreement with the Satellite Operator	MEASAT III	O	O	O	O
Building Permit (for Construction of a new Radar Tower Building)	Municipality (Municipal Planning and Development Office)	-	O (Bato Municipality)	O (Aparri Municipality)	O (Guiuan Municipality)

資料 5. 事業事前計画表(基本設計時)

1 案件名

フィリピン共和国 気象レーダーシステム整備計画

2 要請の背景(協力の必要性・位置付け)

(1) フィリピン共和国（以下、「フィ」国）の太平洋東部の台風監視責任地域（Philippine Area of Responsibility: PAR）では、2006 年から過去 60 年間で台風が毎年 19～20 個程度発生し、内 8～9 個の台風が上陸し「フィ」国各地で甚大な被害をもたらしている。1998 年から 2007 年の 10 年間に台風による死者、負傷者、行方不明者の総数は約 1 万 2 千人、被災者数は約 4,900 万人、被害額は 770 億ペソ（約 2,000 億円）にものぼる。

(2) 毎年発生する台風災害による「フィ」国の人的・経済的被害は甚大であり、農業生産・物流等の社会資本への度重なる被害は経済活動へ深刻かつ長期的な影響を与えており、台風・暴風雨による被害が、「フィ」国全体の自然災害被害の 92.5%を占めている。また国の基幹産業の 1 つである農業を支えている貧困層の生活をより苦しいものとしている。

(3) 先進国の気象機関では、安定して継続的な観測を維持するために、経年変化によって支障を来たす前に、気象レーダー及び周辺システムは設置後 10～12 年程度で更新されるのが通例である。台風監視に最も重要な位置にあるビラク、アパリ及びギウアンの気象レーダーは、我が国の円借款プロジェクトにより 1994 年に完成してから約 15 年の歳月が経過した。その間老朽化が進みレーダー画像の乱れが酷く画像の解読ができない等の問題が発生し、台風の監視業務の遂行が困難な状況となっている。そのためフィリピン気象天文庁（PAGASA）は、太平洋上の台風を監視し、毎時間刻々と変化する台風の強さ、中心位置、方向を正確に知ることができない状況である。

(4) ビラク、アパリ及びギウアンの既設気象レーダー塔施設は老朽化が酷く、防水層破損による雨漏り、コンクリート構造躯体のクラック、クラックから進入した水と潮風による鉄筋の腐食、内壁・外壁の剥離、金属部及び建築設備機器の塩害による損傷等が著しく、今後継続使用することは危険な状況である。

(5) 2004 年-2010 年までの中期「フィ」国開発計画では「人命や財産の損失を防ぐために、自然災害の発生を減少させること」が明記されている。また「フィ」国政府の 4 つの災害対策実行計画では、1) PAGASA の予報能力向上、2) 公共に対する災害管理情報普及、3) 災害脆弱地域の地方政府の能力向上、及び 4) 政府と民間の救助と復旧に関する協力体制の強化が謳われている。国家科学技術計画 2002 年-2020 年においては、2020 年までの「フィ」国における科学技術開発の方向性を定めており、その中で優先度が高いものとして自然災害軽減が挙げられており、本プロジェクトの早急な実施が強く望まれている。

(6) このような状況下、自国の資金と技術不足により自力による施設建設及び機材調達が困難であることから、我が国の無償資金協力による実施を我が国に要請してきた。

3 プロジェクト全体計画概要

※無償資金協力案件を投入の 1 つとする相手国政府によるプロジェクト全体計画

(1) プロジェクト全体計画の目標(裨益対象の範囲及び規模)

「フィ」国の太平洋側から襲来する台風の監視能力を向上させることで、精度の高い台風警報シグナルと台風情報を適時に地域住民や防災関係者機関に伝達することで台風災害の軽減を図る。

＜裨益対象の範囲及び規模について＞

「フィ」国の台風被害の危険がある地域に居住する 72,729,150 人（「フィ」国全人口の約 81%）

(2) プロジェクト全体計画の成果

ア 3 ヶ所の気象レーダー施設／気象機材が整備・調達される。

イ 新設気象レーダーシステムにより台風監視のための気象レーダー観測網が整備される。

ウ より精度の高い台風シグナルの発令ができるようになる。

(3) プロジェクト全体計画の主要活動

ア　以下の機材を調達する。

・気象レーダーシステム　:3 ヶ所

・気象レーダーデータ表示システム　:4 ヶ所

・気象データ衛星通信システム（VSAT）　:4 ヶ所

イ　以下の施設を建設する。

・気象レーダー塔施設　:3 ヶ所

ウ　気象レーダーの運用維持管理のための電子技術者を補充する。

エ　予報官、技術者への研修を継続的に実施する。

オ　気象機材・施設の運用維持管理を行う。

(4) 投入（インプット）

ア　日本側（＝本案件）：無償資金協力　34.06 億円

イ　相手国側

（ア）プロジェクト実施に必要な人員（電子技術者等）

（イ）建設用地の確保

（ウ）機材据付、施設建設に係る負担額（5.55 億円）及びその他運営･維持管理経費（0.08 億円）

(5) 実施体制

主管官庁：科学技術省

実施機関：科学技術省フィリピン気象天文庁

4　無償資金協力案件の内容

(1) サイト

マニラ、ビラク、アパリ、ギウアン

(2) 概要

- 気象レーダーシステム：3 ヶ所（ビラク気象レーダー観測所、アパリ気象レーダー観測所、ギウアン気象レーダー観測所）
- 気象レーダーデータ表示システム：4 ヵ所（気象天文庁本部 気象・洪水予報センター、ビラク気象レーダー観測所、アパリ気象レーダー観測所、ギウアン気象レーダー観測所）
- 気象データ衛星通信システム（VSAT）：4 ヶ所（気象天文庁本部 気象・洪水予報センター、ビラク気象レーダー観測所、アパリ気象レーダー観測所、ギウアン気象レーダー観測所）
- 気象レーダー塔施設：3 ヶ所（ビラク気象レーダー観測所、アパリ気象レーダー観測所、ギウアン気象レーダー観測所）

(3) 相手国側負担事項：建設用地の確保、VSAT 用通信衛星回線の確保、電気敷設工事、気象レーダー観測業務を適切に行うために必要人員の配置。

(4) 概算事業費 39.61 億円（日本側 34.06 億円　　「フィ」国側負担　5.55 億円）

(5) 工期

詳細設計･入札期間を含め約 50 ヶ月（予定）

(6) 貧困、ジェンダー、環境及び社会面の配慮

特になし。

5　外部要因リスク（プロジェクト全体計画の目標の達成に関するもの）

特になし。

6　過去の類似案件からの教訓の活用

特になし。

7　プロジェクト全体計画の事後評価に係る提案

(1) プロジェクト全体計画の目標達成を示す成果指標

指標	現状（ベースライン）	目標値	備考
台風監視能力の向上	雨量強度 1mm/h 以上の降雨探知距離が半径 300km	雨量強度 1mm/h 以上の降雨探知距離が半径 450km	プロジェクト完了時
	台風の強風監視が不可能	半径 200km 内の最大 75m/秒までの風速が観測可能	
	降雨の移動方向が観測不可能	半径 200km 内の降雨の移動方向が観測可能	
PAGASA の台風警報シグナル発令能力の向上	台風が 36 時間以内に「フィ」国に影響を及ぼすことが予想される場合：台風警報シグナル発令が 1 日 4 回（6 時間毎）	台風がレーダー観測範囲内に入った場合：台風警報シグナルと台風情報（台風の勢力、位置及び経路）の毎時間発令	プロジェクト完了より 1 年後

(2) その他の成果指標：特になし

(3) 評価のタイミング：2014 年 3 月以降（完了後 1 年経過後）

資料 6. 参考資料／入手資料リスト

調査名：フィリピン国気象レーダーシステム整備計画基本設計調査

番号	名　　称	形態 図書・ビデオ 地図・写真等	ｵﾘｼﾞﾅﾙ ／ｺﾋﾟｰ	発行機関	発行年
1	P.C.G.S. 2516 LEGAZPI CITY 1:250,000	地図	ｵﾘｼﾞﾅﾙ	National Mapping and Resource Information Authority	1954 年
2	P.C.G.S. 2525 ORMOC CITY 1:250,000	地図	ｵﾘｼﾞﾅﾙ	National Mapping and Resource Information Authority	1954 年
3	Sheet 4153 III GUIUAN 1:50,000	地図	ｵﾘｼﾞﾅﾙ	National Mapping and Resource Information Authority	1956 年
4	Sheet 2504 APARRI 1:250,000	地図	ｵﾘｼﾞﾅﾙ	National Mapping and Resource Information Authority	1982 年
5	Sheet 7379 IV APARRI 1:50,000	地図	ｵﾘｼﾞﾅﾙ	National Mapping and Resource Information Authority	1990 年
6	Sheet 3860 I NAGUMBUAYA POINT 1:50,000	地図	ｵﾘｼﾞﾅﾙ	National Mapping and Resource Information Authority	2006 年
7	National Structural Code of the Philippines 2001	図書	ｵﾘｼﾞﾅﾙ	Association of Structural Engineers of the Philippines	2001 年
8	Strategy Planning Matrices for the Medium-Term Philippine Development Plan 2004 - 2010	図書	ｵﾘｼﾞﾅﾙ	National Economic and Development Authority	2004 年
9	Atlas of the Philippines and the World for Home and Office	図書	ｵﾘｼﾞﾅﾙ	National Book Store	2006 年
10	2006 Philippine Statistical Yearbook	図書	ｵﾘｼﾞﾅﾙ	National Statistical Coordination Board	2006 年
11	The National Building Code	図書	ｵﾘｼﾞﾅﾙ	Vicente B. Foz	2007 年
12	Fire Code of the Philippines	図書	ｵﾘｼﾞﾅﾙ	A.V.B. Printing Press	2008 年