PRIORITY ACTIONS FOR UPGRADING THE NATIONAL EARLY WARNING SYSTEM (EWS)

PR-T1216

CERTIFICATION

I hereby certify that this operation was approved for financing under the Japan Special Fund (JSF) through a communication dated May 19, 2016 and signed by. Also, I certify that resources from said fund are available for up to US$200,000 in order to finance the activities described and budgeted in this document. This certification reserves resource for the referenced project for a period of four (4) calendar months counted from the date of eligibility from the funding source. If the project is not approved by the IDB within that period, the reserve of resources will be cancelled, except in the case a new certification is granted. The commitment and disbursement of these resources shall be made only by the Bank in US dollars. The same currency shall be used to stipulate the remuneration and payments to consultants, except in the case of local consultants working in their own borrowing member country who shall have their remuneration defined and paid in the currency of such country. No resources of the Fund shall be made available to cover amounts greater than the amount certified herein above for the implementation of this operation. Amounts greater than the certified amount may arise from commitments on contracts denominated in a currency other than the Fund currency, resulting in currency exchange rate differences, i.e. represent a risk that will not be absorbed by the Fund.

ORIGINAL SIGNED — 7/14/2016

Sonia M. Rivera
Chief
Grants and Co-Financing Management Unit
ORP/GCM

Date

Approved: OORIGINAL SIGNED — 7/18/2016

Pedro Martel
Division Chief
Environment, Rural Development and Disaster Risk Management Division
CSD/RND

Date

TC Document

I. Basic Information for TC

▪ Country/Region:	Paraguay
▪ TC Name:	Priority Actions for Upgrading the National Early Warning System (EWS)
▪ TC Number:	PR-T1216
▪ Team Leader/Members:	Alvaro Garcia Negro, (RND/CPR) Team leader; Hori Tsuneki (CSD/RND) Alternate Team Leader; Maria Retana (CSD/RND); Alberto de Egea Perez (FMP/CPR); Raúl Lozano (FMP/CPR); Rodolfo Graham (LEG/SGO); Carolina Vera (CSC/CPR); and Elizabeth Chavez (CSD/RND).
▪ Date of TC Abstract authorization:	May 19, 2016 (IDBDOCS: 40290868)
▪ Beneficiary:	(i) National Government of Paraguay, specifically the National Emergency Secretariat (SEN) and (ii) Communities vulnerable to natural hazards.
▪ Executing Agency and contact name:	IDB – Alvaro Garcia (RND/CPR) and Tsuneki Hori (CSD/RND).
▪ Donors providing funding:	Japan Special Fund
▪ IDB Funding Requested:	US$200,000
▪ Local counterpart funding, if any:	US$52,000
▪ Disbursement period (which includes Execution period):	24 months
▪ Required start date:	July - 2016
▪ Types of consultants:	Firm and Individual consultants
▪ Prepared by Unit:	CSD/RND
▪ Unit of Disbursement Responsibility:	RND/CPR
▪ TC Included in Country Strategy (y/n): ▪ TC included in CPD (y/n):	No Yes
▪ GCI-9 Sector Priority:	Addressing climate change, renewable energy, environmental sustainability and food security.

II. Objectives and Justification of the TC

2.1 The general objective of this TC is to provide technical support to the National Government of Paraguay for the design and implementation of priority actions to upgrade their National Early Warning System (EWS).

2.2 **Background.** The country's vulnerability to climate-hazard events (floods, storms, thunderstorms and droughts) is significant[1]. From 1980 to 2015, the country has experienced more than 1,600 climate-related disasters that affected more than 1.1 million citizens in total[2]. In recent years, the country was affected by severe and

[1] In combination with the two reasons: (i) geographical location - Paraguay is located in Subtropical South America (SSA) - a region susceptible to the world's most intense thunderstorm complexes and their resultant heavy precipitation events; and (ii) physical, institutional and social vulnerability to hazardous impacts.

[2] According to the results of DesInventar database.

repeated floods, the latest (2015) had more than 17,000 families, mainly in Asuncion, being evacuated especially people living in/near the Paraguay river basin area (one of the largest river basin area). In fact, the frequency and intensity of extreme flood events is increasing due to the impact of global climate change. According to a recent study undertaken by the Bank under the regional technical cooperation RG-T2416 , "Country disaster risk profile[3]", it is estimated that more than US$4,000 million of Paraguay's assets and economic activities could be affected in case of a once in 100 years return period flood event.

2.3 **National Policy.** In 2014 the Executive Branch of the country approved the National Policy on Risk Management and Reduction (No 1402/14). This policy promotes the incorporation of disaster risk reduction activities in different levels of governments, institutions and activities of civil society, private entities and communities. The Policy includes four Strategic Pillars: (i) strengthening of institutional capacity; (ii) financing enhancement for better national DRM performance; (iii) education, communication and participation of citizens; and (iv) knowledge management and technology. The focus of this TC addresses the first Strategic Pillar (institutional capacity strengthening) and its priority action: upgrading the National EWS and its equipment and operation skill that guarantee universal (early warning) information access to all citizens.

2.4 **Definition.** In this TC an EWS refers to a system that comprises 4 elements working together effectively: (i) climate hazard monitoring (using remote sensing information gathered from climate radars, ground observation stations and weather satellites), (ii) decision making (timely and accurate warning issuance and diffusion, that is in general responsibility of the disaster risk management authority), (iii) diffusion and communication of warning information, and (iv) response capacity of citizens.

2.5 **Challenges.** An efficient and accurate National EWS operability in Paraguay includes the following needs: (i) **Complementary equipment for EWS** – There are two main types of equipment that needs to be installed: (a) **Climate radars:** Paraguay (at the National Direction of Civil Aviation: DINAC) owns and operates a single C-band[4] weather radar; the only equipment in the country that can identify accurately the development of severe weather conditions[5]. (b) **Ground weather monitoring stations:** Since 2002, DINAC owns and operates 24 automatic ground weather monitoring stations installed through the national territory. Additionally, other entities[6] own monitoring stations for their own operation. Nonetheless, the current ground weather monitoring network has very low density; only one station in average

[3] For more information on this project, see: http://www.iadb.org/en/projects/project-description-title,1303.html?id=RG-T2416

[4] A "medium-size" weather reader that covers 200-400km around; smaller than S-band (covers 800km around) and lager than X-band (100km around).

[5] The other equipment that may be useful for weather forecast is satellite. Satellite images are relevant to identify the general rain front systems and its displacement; however, it cannot detect the details of the clouds, areas severity and speed of movement.

[6] The National Electricity Administration (ANDE) has 22 monitoring stations, mostly rain gauges, in the eastern region; Yacyreta Binational Entity has 7; the Catholic University of Asuncion has 5 stations, etc.

for every 15,000 km^2. This situation causes a lack of monitoring accuracy and makes it difficult to perform critical real-time hazard analysis in the national territory.

(i) **Community knowledge and capacity to respond when warning issues**: Effective EWS requires citizens to be trained in order to respond when warning issues. Even though several community training programs have been implemented[7], these are not sufficient to cover all the vulnerable communities in the country. One of the lessons learned from December 2015 floods indicates[8] that many families refused to evacuate even though the warning was issued and flooding was imminent. Therefore, it is critical to sensitize vulnerable communities about the risks they might face and train them to take appropriate action in case of warning issues.

(ii) **Institutional capacity:** Even though the National Emergency Secretariat (*Secretaría de Emergencia Nacional - SEN*), the disaster risk reduction authority, plays an important role in emergency operation during and immediately after disasters, challenges still remain for implementing *ex ante* (or proactive) disaster risk prevention measures. This is one of the reasons why the National Policy assigns Institutional Capacity Strengthening as its first Strategic Support, and why this TC focuses on upgrading the national EWS[9]. Institutional Capacity improvement is required for SEN as well as for other relevant national (and local) entities; effective disaster risk reduction requires communication and coordination amongst a wide range of institutions.

2.6 In order to address these challenges, SEN requested technical assistance from the Bank to strengthen national capacity for EWS, through (i) design of the national EWS including additional radar and ground weather monitoring equipment; (ii) pilot implementation for community sensitizations on proactive disaster risk reduction; and (iii) institutional capacity strengthening. These activities are relevant from a technical point of view because some IDB member countries, including Japan, have experience with upgrading and improving the usage of national EWS toward climate-hazard resilience, e.g., the use of innovative multi-layered weather radar equipment[10] to monitor critical climate hazards including recent additional hazard risks due to climate change, and provide a user-friendly communication to all citizens and visitors. These experiences should be useful for addressing the country's requirement.

2.7 EWS is highlighted as one of the priority actions of the Sendai Framework for Disaster Risk Reduction 2015-2030[11], adopted at the 3rd World Conference on

[7] The community disaster risk reduction project executed by DIPECHO in 2013-2014 and by USAID/OFDA in 2013.

[8] See example, BBC: http://www.bbc.com/news/world-latin-america-35206080

[9] One of the specific challenges, for example, is related to the climate hazard monitoring and analysis (basic information necessary for EWS). Therefore, special and long-term institutional capacity building is necessary.

[10] For example, Japan's newly established X-Band multi parameter radar information network, including 3D real time analysis technology, for local torrential rains.

[11] Priority 4. Enhancing disaster preparedness for effective response.

Disaster Risk Reduction held in March 2015 in Sendai, Japan. Efficient and reliable early warning information of the country will contribute not only for disaster risk prevention but also for other alert issuance e.g., epidemic, pandemic or other national crisis. Upgrading of the National EWS will be useful to the disaster risk reduction of neighbor countries because many rivers in Paraguay flow across borders.

2.8 **Alignment with Bank's sector priorities:** The main context of the TC is for providing early warning information to all citizens in the country; the TC will seek to reduce negative impacts caused by climate hazards and will contribute for sustainable climate-related productivity (especially for agriculture productivity). Therefore, the TC is in line with (i) the Update to the Institutional Strategy (UIS) 2010-2020 (AB-3008), in its two development challenges of (a) productivity and innovation and (b) social inclusion and equality, (ii) the Corporate Results Framework 2016-2019 (GN-2727-4) of its crosscutting areas of sustainability and climate change; and (iii) the overall context of the Climate Change Sector Framework Document (GN-2835).

2.9 **Alignment with Japan Special Fund (JSF):** this TC supports implementing the National Policy on Risk Management and Reduction of Paraguay (No 1402/14), specifically the subject of the National EWS and enhances technical capacity that guarantees universal early warning information access to all citizens. This objective address the eligibility of JSF according to the Chapter 2 of the JSF operational guidance; (a) JSF Eligible project type: *policy and strategy formulation/implementation activities with priority given to C and D Countries (eligible for JSF/JCF resources).*

III. Description of activities/components and budget

3.1 The TC will include 3 components to address the following challenges: (i) provide technical support in designing National EWS; (ii) provide technical support in implementing community sensitization and capacity building for hazardous event prevention; and (iii) provide technical support in achieving institutional capacity building especially in terms of coordination and communication among national/local entities.

3.2 **Component 1: Design of National Early Warning System.** The final output of this component will be to enhance the technical knowledge of the SEN to design an effective National EWS. The activities include: (i) knowledge enhancement on EWS - empirical review in terms of positive impacts of upgrading EWS in other countries; (ii) designing National EWS; and (iii) cost benefit analysis. The Bank will finance the training services for the national government in order to provide technical inputs. The results of this component will be disseminated to SEN and other relevant public entities through a national workshop (See paragraph 3.4 (i)). A consulting firm will implement the following activities:

(i) **Empirical review** of positive impacts related to EWS in other countries; an introductory study for the country. The study will: (i) identify good practices and

lessons learnt on EWS in other countries, including the use of latest technologies of climate radars and ground weather monitoring stations; (ii) identify good practice on national government, local governments' and private-public partnerships on the EWS operation, and (iii) make conceptual (or qualitative) recommendations for upgrading the National EWS in Paraguay.

(ii) **National EWS designing:** The consulting firm will provide technical support to SEN and other national public entities for the design and upgrade of the National EWS (based on the existing EWS). This technical design work includes: (a) appropriate allocation of the weather radars and ground weather monitoring stations that will cover all the national territory, (b) definition of technical specifications and costs of the equipment; (c) necessary software for real-time climate hazard analysis; (d) (early warning) communication protocols and mechanisms among DINAC, SEN, other national/local entities and communities for better warning messages. After the trainings, SEN, with support from the consulting firm, will develop the National EWS design.

(iii) **Cost Benefit analysis:** The consulting firm will provide a cost benefit analysis to assess whether the benefits from the National EWS are greater than its investment cost. The "benefits" in this case should include not only the economic benefits but also social impact[12]. The national EWS design should be reviewed and modified once the Cost Benefit analysis has determined options that will provide a more efficient EWS function.

3.3 **Component 2: Pilot implementation for community capacity building.** The final output of this component will be community capacity enhancement to empower individuals by enabling proactive actions in sufficient time during an emergency issue. The Component will select (vulnerable and priority) communities in hazard prone areas as project beneficiaries, especially those communities dedicated to climate sensitive activities such as agriculture. The activities will include: (i) develop a national action plan for community capacity enhancement and effective early warning communication through the EWS; (ii) conduct pilot activities in selected communities based on the national action plan. After these activities, the consulting firm will develop a toolkit[13] to replicate and scale up the activities toward the rest of the communities in the country. The results of this component will be disseminated through a national workshop (See paragraph 3.5 (i)).

(i) **National action plan for improving community capacity on disaster risk prevention**. The individual consultant will develop an action plan through these activities: (a) evaluate the results, impacts, good practices and lessons learned from the relevant projects related to community disaster risk management executed recently; (b) review the county's current protocol/mechanism of warning information transmission from the national/local authorities to the communities

[12] The methodology should be based on the existing methodologies, e.g., Lazo et al. (2007) "Methodologies for Assessing the Economic Benefits of National Meteorological and Hydrological Services" and The World Bank (2008) "Weather and Climate Services in Europe and Central Asia: A regional Review".

[13] The toolkit will consist of a multimedia package that includes a guidelines, short video and non-technical manual.

and identify challenges for better warning information dissemination; (c) meetings with people in some of the sample communities (especially in areas recently affected by disasters) to identify the gap between authorities and communities in terms of warning issuance vs. reception; (d) elaborate a proposal of the national action plan for improving community capacity for awareness and reaction against hazard warning in short, medium and long term; and (e) workshop to disseminate the action plan to the national authorities.

(ii) **Pilot Community Activities** based on the Action Plan. SEN with support from the consulting firm (or NGO) will conduct the following activities in 2 or 3 pilot communities selected by SEN: (a) Community workshop to enhance awareness of hazard exposure of the communities and how to interpret warnings and respond in time; (b) elaborate, with community participation, local "hand-made" hazard maps incorporating local traditional knowledge; (c) define and map the evacuation routes and shelters in case of disaster; (d) define additional local warning protocol issued by local authorities, in addition to the warning issuance made by the national authority; (e) establish the local disaster management committee who will have the role of guiding families to the evacuation shelter in coordination with national/local authorities; (f) Install, if necessary, appropriate tool for proactive local disaster risk management, e.g. signboard for leading to the evacuation shelters and precipitation monitoring gauge for climate hazard monitoring; (g) conduct evacuation drill with the participation of communities and local/national authorities; and (h) additional training course for communities if necessary, e.g. for agriculture resilience in case of droughts.

3.4 **Component 3: Institutional capacity building in terms of coordination and communication among national/local entities.** This will improve coordination and communication ability among national/local entities through: (i) organizing national workshops; and (ii) publishing technical products. These objectives will provide support to SEN in the following activities: (i) **Workshops:** SEN will organize, inviting all the relevant actors of both Component 1 and 2, to three national workshops: the kick-off workshop to introduce the project activities to all the relevant actors of this TC; Intermediate workshop to present the progress made in the previous components; and the final workshop to disseminate all results/products of the project (see paragraphs 3.3 and 3.4)); and (ii) **Technical product disseminations:** All the results from Component 1 and 2 will be materialized and published for public use. Thereby, this component will provide support for (a) publishing works of the technical products developed in the Component 1 (two documents: the Empirical review of the EWS in other countries and the Cost Benefit Analysis) [see Paragraph 3.3 (i) and (iii)]; (b) the National Action Plan of the Component 2 [Paragraph 3.4 (i)]; and (c) the toolkit for community awareness and preparedness to replicate the experience extracted from Component 2 [Paragraph 3.4 (ii)]. The aim of this subcomponent is to outreach the products and knowledge developed by the TC toward public, private and academic actors.

Table 1. Indicative Results Matrix

Results	Indicator	Base Line (2016)	Goal (2018)
Institutional technical capacity on EWS enhanced that is necessary to implement universal early warning information access to all citizens.	# of counterparts that enhanced technical knowledge on national EWS (This indicator will be measured with a questionnaire to be developed, and applied before and after the TC execution.)	0	1
Products	**Indicator**	**Base Line (2016)**	**Goal (2018)**
Technical design of the National EWS (Component 1, Cost: US$113,000)	Technical design for the upgrading of existing National EWS (document developed).	0	1
Action plan for community's capacity on disaster risk prevention (Component 2, Cost: US$20,000)	Action plan (document developed) to guide the improvement of the activity - community capacity on disaster risk prevention.	0	1
Pilot Community Activities (Component 2, Cost: US$60,000)	A package of two tangible products in each community developed during the pilot community activities in including (i) local "hand-made" hazard maps developed; and (ii) local disaster management committee established.	0	Minimum 2
	Toolkit for further dissemination to create community awareness and preparedness	0	1
National workshops for knowledge dissemination (Component 3, Cost: US$24,000)	# of executed workshops (executed)	0	3
Technical products (Component 3, Cost: US$22,000)	# of technical products (published)	0	4

3.5 The estimated total cost of the TC is US$252,000, with US$200,000 to be drawn from the Bank contribution and local counterpart contribution of US$52,000, in-kind.

Table 2. Indicative Budget

Component	Description	IDB/Fund Funding	Counterpart Funding	Total Funding
Component 1	**EWS Design** - Firm consultant all sub-components (i)-(iii): US$100K - Meetings and coordination: US$13K	US$100,000	US$13,000	US$113,000
Component 2	**Pilot implementation for community capacity building** - Individual consultant sub-component (i): US$20K - Firm consultant sub-component (ii) except equipment: US$55K - Equipment (community signboard and	US$80,000	US$13,000	US$93,000

	precipitation monitoring gauge): US$5K - Meetings and coordination: US$13K			
Component 3	**Institutional capacity building** - 3 Workshops (sub-component (i): 24K - Publishing cost – sub-component (ii): 22K	US$20,000	US$26,000	US$46,000
			Total	US$252,000

IV. Executing agency and execution structure

4.1 The IDB will be the executing agency of this TC. The RND division will be responsible for planning, organizing and implementing the TC activities. In carrying out these activities, the Bank may consult with SEN, the disaster risk reduction authority, as well as other institutions necessary for EWS operation.

4.2 As requested by the beneficiaries, and with the objective of expediting execution, this TC will be administered by the Bank, which has extensive experience in recruitment and supervision of the technical activities related to disaster risk reduction.

4.3 The technical responsibility will correspond to the RND division of the Bank; the Project Team Leader (RND/CPR) will conduct this effort and will be responsible for the execution of the TC; CSD/RND will support from the technical perspective.

4.4 All administrative, technical supervision, internal and external coordination necessary for the final product, monitoring and final evaluation will be the responsibility of CSD/RND. The Bank will hire individual consultants , consulting firms and various consulting services in accordance with the current policies and procedures of the bank

4.5 Project teams are responsible for reporting progress and completion of the TC annually through the use of IDB systems standard to all TC operations. These reporting works will be done in coordination with the JSF/JCF fund coordinator, and the information should include inputs disbursed, outputs delivered and outcome achieved.

V. Major issues

5.1 The consultation process between the Bank and SEN and other institutions necessary for EWS operation (includes DMH) may present a risk to execution delay of the TC. This risk will be mitigated through the establishment of a consultation mechanism during the TC execution, including periodical meetings and frequent dialogues amongst the Bank, SEN, DMH and other relevant institutions.

VI. Environmental and Social Strategy

6.1 The TC is classified as Category “C” pursuant to the Bank's Environment and Safeguards Compliance Policy (OP 703). No negative social and environmental impact is expected through the activities financed by this TC. See Safeguard Policy Filter Report.

Required Annexes:

- Annex I - Letter of Government Request
- Annex II - Terms of Reference for activities/components to be acquired
- Annex III - Procurement Plan

MINISTERIO DE HACIENDA

Asunción, 5 de abril de 2016

M.H. Nº 324.-

SEÑOR
EDUARDO ALMEIDA, REPRESENTANTE RESIDENTE
BANCO INTERAMERICANO DE DESARROLLO (BID)
ASUNCIÓN, PARAGUAY

Tengo el agrado de dirigirme a usted para hacer referencia al pedido interpuesto por la Secretaría de Emergencia Nacional (SEN) en la nota SEN-SE Nº 221 de fecha 23 de abril de 2015, cuya fotocopia se remite adjunto con la presente (Exp M.H. Nº 15.812/2016), a través de la cual se solicita las gestiones ante el Banco Interamericano de Desarrollo (BID) para la obtención de una Cooperación Técnica No Reembolsable, a efectos de financiar el diseño e implementación piloto de acciones prioritarias para el Sistema de Alerta Temprana (SAT).

Al respecto, me permito solicitar el apoyo del Banco y las gestiones necesarias para obtener el financiamiento del citado proyecto por medio de una Cooperación Técnica No Reembolsable, que será administrada por el BID.

Hago propicia esta oportunidad para saludarle con mi distinguida consideración.

SANTIAGO PEÑA PALACIOS
MINISTRO DE HACIENDA
GOBERNADOR TITULAR POR PARAGUAY

RECIBIDO
06 ABR. 2016
BID
CPR

C.c.: Señor Joaquín Daniel Roa Burgos, Ministro Secretario Ejecutivo, Secretaría de Emergencia Nacional.

SSEE/SG/odgr.

Paraguay

CSD/RND

Priority Actions for Upgrading the National Early Warning System (EWS)
(PR-T1216)

Design of a National Early Warning System (EWS) in Paraguay

TERMS OF REFERENCE

1. Background

1.1. Paraguay's vulnerability to climate-hazard events[1] (floods, storms, thunderstorms and droughts) is significant. From 1980 to 2015, the country has experienced more than 1,600 climate-related disasters that affected more than 1.1 million citizens in total[2]. In recent years, the country was affected by severe and repeated floods, in November 2012, March 2013, February 2014 and December 2015. The latest flood (2015) had more than 100,000 people, mainly in Asuncion, being evacuated especially people living in/near the Rio Parana river basin area (one of the largest river basin area). In fact, the frequency and intensity of extreme flood events is increasing due to the impact of global climate change.

1.2. According to a recent study by the Bank, "Paraguay's disaster risk profile"[3], it is estimated that more than US$ 4,000 million of Paraguay's assets and economic activities could be affected in case of a once in 100 years return period flood event.

1.3. In 2013 the country approved the National Disaster Risk Management and Reduction Policy. This policy promotes the incorporation of disaster risk reduction activities in different levels of governments, institutions and activities of civil society, private entities and communities.

1.4. The Policy includes four Strategic Pillars: (i) strengthening of institutional capacity; (ii) financing enhancement for better national DRM performance; (iii) education, communication and participation of citizens; and (iv) knowledge management and technology. Each Strategic Pillar comprises several priorities of actions.

1.5. The focus of these terms of reference is to address the first Strategic Pillar (institutional capacity strengthening) and its priority action: upgrading the National Early Warning System (EWS) in its equipment and operation skill that guarantee universal (early warning) information access to all citizens in Paraguay.

1.6. An Early Warning System (EWS) for the purpose of this project refers to a system that comprises four elements working together effectively; (i) climate hazard monitoring (using remote sensing information gathered from climate radars, ground observation stations and weather satellites), (ii) decision making (timely and accurate warning issuance and diffusion, that is in general responsibility of the disaster risk management authority), (iii) diffusion and communication of warning information, and (iv) response capacity of citizens. The overall aim of the EWS is to reduce social impacts

[1] In combination with the two reasons: (i) geographical location - Paraguay is located in Subtropical South America (SSA) - a region susceptible to the world's most intense thunderstorm complexes and their resultant heavy precipitation events; and (ii) physical, institutional and social vulnerability to hazardous impacts.
[2] According to the result of DesInventar database.
[3] IDB implemented the project: RG-T2416. For project information see:
http://www.iadb.org/en/projects/project-description-title,1303.html?id=RG-T2416

(deaths and injuries) from climate hazardous events, as well as to prevent economic loss of climate sensitive activities such as agriculture.

1.7. Early warning system is highlighted as one of the priority actions of the Sendai Framework for Disaster Risk Reduction 2015-2030[4], adopted at the Third World Conference on Disaster Risk Reduction held in March 2015 in Sendai, Japan with the participation from 187 countries including Paraguay. Efficient and reliable early warning information of the country will contribute not only for disaster risk prevention but also for other alert issuance e.g., epidemic, pandemic or other national crisis. Moreover, upgrading of the national early warning system will be useful to the disaster risk reduction of neighbor countries because many rivers in Paraguay flow across borders. For example, accurate flood warning information from Rio Paraguay, an upper river basin of the La Plata River in Argentina, would provide flood hazard information that can protect vulnerable families living in the lower basin of the river in Argentina (which was affected by floods during December 2015 – January 2016).

1.8. In this context, the present consultancy seeks to help the National Emergency Secretariat (SEN) with the design

2. Consultancy objective(s)

2.1 The objective of this consultancy is to develop a technical design of a National EWS in Paraguay. The principal beneficiary of this project will be the National Government of Paraguay, specifically the National Emergency Secretariat (SEN). The final output of this project will be to enhance the technical knowledge of the SEN to design the effective national EWS.

2.2 Even though the existing national EWS of the country provides, to some degree, reasonable forecasts; several important challenges remain to be accomplished. An efficient and accurate national EWS operability in Paraguay includes the following needs:

(i) Complementary equipment for EWS – There are two main types of equipment that needs to be installed: (a) climate radars and (b) ground weather monitoring stations.

(a) Climate radars: Currently, the country (at the *National Direction* of Civil Aviation: *DINAC*) owns and operates a single C-band[5] weather radar; the only equipment in the country that can identify accurately the development of clouds associated with severe thunderstorms and allows detecting areas of precipitation, turbulence and wind shear[6]. According to DINAC, this weather radar covers a range of around 250km, which represents only 10-15% of the national territory. Moreover, the existing radar function is deteriorating because of its long time operation with no maintenance break periods.

(b) Ground weather monitoring stations. Since 2002, DINAC owns and operates 24 automatic ground weather monitoring stations installed through the national territory. Additionally, other entities[7] own monitoring stations for their own operation. Nonetheless,

[4] Priority 4. Enhancing disaster preparedness for effective response.
[5] A “medium-size” weather reader that covers 200-400km around; smaller than S-band (covers 800km around) and lager than X-band (100km around).
[6] The other equipment that may be useful for weather forecast is satellite. Satellite images are relevant to identify the general rain front systems and its displacement; however, it cannot detect the details of the clouds, areas severity and speed of movement.
[7] For example, The National Electricity Administration (ANDE) has 22 monitoring stations, mostly rain gauges, in the eastern region; Yacyreta Binational Entity has 7 stations in Paraguay; the Catholic University of Asuncion has 5 stations etc.

the current ground weather monitoring network has very low density; only one station in average for every 15,000 km^2. This situation causes a lack of monitoring accuracy and makes it difficult to perform critical real-time hazard analysis in the national territory.

(ii) Community knowledge and capacity to respond when warning issues: Effective EWS requires citizens to be trained in order to respond when warning issues. Even though several community training programs have been implemented[8], these are not sufficient to cover all the vulnerable communities in the country. One of the lessons learned from the recent December 2015 floods indicates[9] that many families refused to evacuate even though the warning was issued and flooding was imminent. This was because families did not realize the hazard they were facing. Therefore, it is critical to sensitize vulnerable communities about the risks they might face and train them to take appropriate action in case of warning issues.

(iii) Institutional capacity: Even though the National Emergency Secretariat (Secretaría de Emergencia Nacional: SEN), a disaster risk reduction authority established in 2006, plays an important role in emergency operation during and immediately after disasters, challenges still remain for implementing *ex ante* (or proactive) disaster risk prevention measures. Institutional Capacity Building is required for SEN as well as for other relevant national (and local) entities; effective disaster risk reduction requires communication and coordination amongst a wide range of institutions. Each entity should have their own functions and responsibilities and coordinate between each other. However, permanent coordination among SEN and other institutions for the national early warning is not yet established.

2.3 In order to address these challenges, SEN requested technical assistance from the Bank to strengthen national capacity for EWS, through (i) design of the national EWS including additional radar and ground weather monitoring equipment; (ii) pilot implementation for community sensitizations on proactive disaster risk reduction; and (iii) institutional capacity strengthening. These activities are relevant from a technical point of view because some IDB member countries, including Japan, have experience with upgrading and improving the usage of national EWS toward climate-hazard resilience, e.g., the use of innovative multi-layered weather radar equipment[10] to monitor critical climate hazards including recent additional hazard risks due to climate change, and provide a user-friendly communication to all citizens and visitors. These experiences should be useful for addressing the country's requirement.

2.4 The Bank will finance the training services for the national government in order to provide technical inputs. The results of this study will be disseminated to SEN and other relevant public entities through a national workshop.

3. Main activities

3.1 The consulting firm will implement the following activities:

a. Empirical review of positive impacts related to EWS in other countries; an introductive study for the country. The study will (i) identify good practices and lessons learnt on EWS in other countries, including the use of latest technologies of climate radars and ground weather monitoring stations; (ii) identify good practice on national government, local governments' and private-public partnerships on the EWS operation, and (iii) make conceptual (or qualitative)

[8] For example: the community disaster risk reduction project executed by DIPECHO in 2013-2014 and by USAID/OFDA in 2013.
[9] See as an example, BBC: http://www.bbc.com/news/world-latin-america-35206080
[10] For example, Japan's newly established X-Band multi parameter radar information network, including 3D real time analysis technology, for local torrential rains.

recommendations for upgrading the National EWS in Paraguay. The results of this study will be used as an input for the following activity: National EWS designing.

b. National EWS designing: The consulting firm will provide technical support to SEN and other national public entities for the design and upgrade of the National EWS (based on the existing EWS). This technical design work includes (i) appropriate allocation of the weather radars and ground weather monitoring stations that will cover all the national territory, (ii) definition of technical specifications and costs of the equipment; (iii) necessary software for real-time climate hazard analysis; (iv) (early warning) communication protocols and mechanisms among DINAC, SEN, other national/local entities and communities for better warning messages. After the trainings, SEN, with support from the consulting firm, will develop the National EWS design.

c. Cost Benefit analysis: The consulting firm will provide a cost benefit analysis to assess whether the benefits from the National EWS are greater than its investment cost. The "benefits" in this case should include not only the economic benefits but also social impact[11]. The national EWS design should be reviewed and modified once the Cost Benefit analysis has determined options that will provide a more efficient EWS function.

d. Develop a Toolkit: For community capacity enhancement to empower individuals by enabling proactive actions in sufficient time during an emergency issue the consulting firm will develop a toolkit to replicate and scale up the activities toward the rest of the communities in the country. The toolkit will consist of a multimedia package that includes guidelines, short video and non-technical manual.

4. Reports / Deliverables

The consulting firm will deliver the following products:

a) Product 1: Work plan and schedule of activities to be performed.
b) Product 2: Draft with the empirical review of positive impacts related to EWS in other countries identifying good practices, use of latest technologies and conceptual (or qualitative) recommendations for upgrading the National EWS in Paraguay.
c) Product 3: Draft with the design and upgrade of National EWS in Paraguay (based on existing EWS)
d) Product 4: Draft with the Cost Benefit analysis.
e) Product 5: Final document with a toolkit of a multimedia package that includes guidelines, short video and a non-technical manual.

5. Payment Schedule

The contract payments will be lump sum. The payment schedule will be as follows:

a) Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received the Work Plan (Product 1)
b) Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 2.
c) Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 3.
d) Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 4.

[11] The methodology should be based on the existing methodologies e.g., e.g., Lazo et al. (2007) "Methodologies for Assessing the Economic Benefits of National Meteorological and Hydrological Services" and The World Bank (2008) "Weather and Climate Services in Europe and Central Asia: A regional Review".

e) Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 5.

6. Qualifications

- Academic Degree / Level & Years of Professional Work Experience:
- Languages: Spanish and English
- Areas of Expertise:
- Skills: [Any other characteristics deemed relevant to perform the work]

7. Characteristics of the Consultancy

- Consultancy category and modality: Consulting Firm, Lump Sum
- Contract duration: *[In months] or [In days for retainers]*
- Place(s) of work: External consultancy
- Division Leader or Coordinator: Alvaro Garcia Negro (RND/CPR), alvarog@iadb.org, Rural Development Specialist in coordination with Tsuneki Hori (CSD/RND) tsunekih@iadb.org Disaster Risk Management Specialist. Environment, Rural Development and Disaster Risk Management Division (CSD/RND).

Payment and Conditions: Compensation will be determined in accordance with Bank's policies and procedures. In addition, candidates must be citizens of an IDB member country.

Consanguinity: Pursuant to applicable Bank policy, candidates with relatives (including the fourth degree of consanguinity and the second degree of affinity, including spouse) working for the Bank as staff members or Complementary Workforce contractuals, will not be eligible to provide services for the Bank.

Diversity: The Bank is committed to diversity and inclusion and to providing equal opportunities to all candidates. We embrace diversity on the basis of gender, age, education, national origin, ethnic origin, race, disability, sexual orientation, religion, and HIV/AIDs status. We encourage women, Afro-descendants and persons of indigenous origins to apply.

ANNEX A

Paraguay

CSD/RND

Priority Actions for Upgrading the National Early Warning System (EWS)
(PR-T1216)

National action plan for improving community capacity on disaster risk prevention in Paraguay

TERMS OF REFERENCE

1. Background

a. Paraguay's vulnerability to climate-hazard events[12] (floods, storms, thunderstorms and droughts) is significant. From 1980 to 2015, the country has experienced more than 1,600 climate-related disasters that affected more than 1.1 million citizens in total[13]. In recent years, the country was affected by severe and repeated floods, in November 2012, March 2013, February 2014 and December 2015. The latest flood (2015) had more than 100,000 people, mainly in Asuncion, being evacuated especially people living in/near the Rio Parana river basin area (one of the largest river basin area). In fact, the frequency and intensity of extreme flood events is increasing due to the impact of global climate change. According to a recent study by the Bank, "Country disaster risk profile"[14], it is estimated that more than US$ 4,000 million of Paraguay's assets and economic activities could be affected in case of a once in 100 years return period flood event.

b. In 2013 the country approved the National Disaster Risk Management and Reduction Policy. This policy promotes the incorporation of disaster risk reduction activities in different levels of governments, institutions and activities of civil society, private entities and communities. The Policy includes four Strategic Pillars: (i) strengthening of institutional capacity; (ii) financing enhancement for better national DRM performance; (iii) education, communication and participation of citizens; and (iv) knowledge management and technology. Each Strategic Pillar comprises several priorities of actions.

c. The focus of these terms of reference is to address the first Strategic Pillar (institutional capacity strengthening) and its priority action: upgrading the National Early Warning System (EWS) in its equipment and operation skill that guarantee universal (early warning) information access to all citizens in Paraguay.

d. An Early Warning System (EWS) for the purpose of this project refers to a system that comprises four elements working together effectively; (i) climate hazard monitoring (using remote sensing information gathered from climate radars, ground observation stations and weather satellites), (ii) decision making (timely and accurate warning issuance and diffusion, that is in general responsibility of the disaster risk management authority), (iii) diffusion and communication of warning information, and (iv) response capacity of citizens. The overall aim of the EWS is to reduce social impacts (deaths and injuries) from climate hazardous events, as well as to prevent economic loss of climate sensitive activities such as agriculture.

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[12] In combination with the two reasons: (i) geographical location - Paraguay is located in Subtropical South America (SSA) - a region susceptible to the world's most intense thunderstorm complexes and their resultant heavy precipitation events; and (ii) physical, institutional and social vulnerability to hazardous impacts.

[13] According to the result of DesInventar database.

[14] IDB implemented the project: RG-T2416. For project information see: http://www.iadb.org/en/projects/project-description-title,1303.html?id=RG-T2416

e. Early warning system is highlighted as one of the priority actions of the Sendai Framework for Disaster Risk Reduction 2015-2030[15], adopted at the Third World Conference on Disaster Risk Reduction held in March 2015 in Sendai, Japan with the participation from 187 countries including Paraguay. Efficient and reliable early warning information of the country will contribute not only for disaster risk prevention but also for other alert issuance e.g., epidemic, pandemic or other national crisis. Moreover, upgrading of the national early warning system will be useful to the disaster risk reduction of neighbor countries because many rivers in Paraguay flow across borders. For example, accurate flood warning information from Rio Paraguay, an upper river basin of the La Plata River in Argentina, would provide flood hazard information that can protect vulnerable families living in the lower basin of the river in Argentina (which was affected by floods during December 2015 – January 2016).

f. The Bank will finance the training services for the national government in order to provide technical inputs. The results of this study will be disseminated to SEN and other relevant public entities through a national workshop.

2. Consultancy objective(s)

2.1 The objective of this consultancy is to develop a National Action Plan for improving community capacity on disaster risk prevention in Paraguay.

2.2 This study is to beneficiate communities where the EWS will provide the information. The final output will be community capacity enhancement to empower individuals by enabling proactive actions in sufficient time during an emergency issue. Therefore, this National Action Plan aims to reduce personal injury, loss of life, damage to property and economic loss due to eventual disasters. The National Action Plan will select (vulnerable and priority) communities in hazard prone areas as project beneficiaries, especially those communities dedicated to climate sensitive activities such as agriculture. The activities of this Component will include: (i) develop a national action plan for community capacity enhancement and effective early warning communication through the EWS.

3. Main activities

3.1 The individual consultant will develop the National Action Plan through the following activities:

e. Evaluate the results, impacts, good practices and lessons learned from the relevant projects related to community disaster risk management executed recently in Paraguay;

f. Review the county's current protocol/mechanism of warning information transmission from the national/local authorities to the communities and identify challenges for better warning information dissemination;

g. Meetings with people in some of the sample communities (especially in areas recently affected by disasters) to identify the gap between authorities and communities in terms of warning issuance vs. reception;

h. Elaborate a proposal of the national action plan for improving community capacity for awareness and reaction against hazard warning in short, medium and long term; and

i. Workshop to disseminate the action plan to the national authorities.

[15] Priority 4. Enhancing disaster preparedness for effective response.

4. Reports / Deliverables

The consulting firm will deliver the following products:

a. Product 1: Work plan and schedule of activities to be performed.
b. Product 2: Evaluation of results, impacts, good practices and lessons learned from relevant projects related to community disaster risk management.
c. Product 3: Draft of proposal of the National Action Plan.
d. Product 4: Final document with National Action Plan for Paraguay.

5. Payment Schedule

The contract payments will be lump sum. The payment schedule will be as follows:

a. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received the Work Plan (Product 1)
b. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 2.
c. Thirty percent (30%) no later than fifteen (15) calendar days after the Bank has received and approved Product 3.
d. Thirty percent (30%) no later than fifteen (15) calendar days after the Bank has received and approved Product 4.

6. Qualifications

- *Academic Degree / Level & Years of Professional Work Experience:*
- *Languages: Spanish and English*
- *Areas of Expertise:*
- Skills: [Any other characteristics deemed relevant to perform the work]

7. Characteristics of the Consultancy

- Consultancy category and modality: Individual Consultant, Lump Sum
- Contract duration: *[In months] or [In days for retainers]*
- Place(s) of work: External consultancy
- Division Leader or Coordinator: Alvaro Garcia Negro (RND/CPR), alvarog@iadb.org, Rural Development Specialist in coordination with Tsuneki Hori (CSD/RND) tsunekih@iadb.org Disaster Risk Management Specialist. Environment, Rural Development and Disaster Risk Management Division (CSD/RND).

Payment and Conditions: Compensation will be determined in accordance with Bank's policies and procedures. In addition, candidates must be citizens of an IDB member country.

Consanguinity: Pursuant to applicable Bank policy, candidates with relatives (including the fourth degree of consanguinity and the second degree of affinity, including spouse) working for the Bank as staff members or Complementary Workforce contractuals, will not be eligible to provide services for the Bank.

Diversity: The Bank is committed to diversity and inclusion and to providing equal opportunities to all candidates. We embrace diversity on the basis of gender, age, education, national origin, ethnic origin, race, disability, sexual orientation, religion, and HIV/AIDs status. We encourage women, Afro-descendants and persons of indigenous origins to apply.

ANNEX A

Paraguay

CSD/RND

Priority Actions for Upgrading the National Early Warning System (EWS)
(PR-T1216)

Pilot Community Activities in Paraguay

TERMS OF REFERENCE

1. Background

a. Paraguay's vulnerability to climate-hazard events[16] (floods, storms, thunderstorms and droughts) is significant. From 1980 to 2015, the country has experienced more than 1,600 climate-related disasters that affected more than 1.1 million citizens in total[17]. In recent years, the country was affected by severe and repeated floods, in November 2012, March 2013, February 2014 and December 2015. The latest flood (2015) had more than 100,000 people, mainly in Asuncion, being evacuated especially people living in/near the Rio Parana river basin area (one of the largest river basin area). In fact, the frequency and intensity of extreme flood events is increasing due to the impact of global climate change. According to a recent study by the Bank, "Country disaster risk profile"[18], it is estimated that more than US$ 4,000 million of Paraguay's assets and economic activities could be affected in case of a once in 100 years return period flood event.

b. In 2013 the country approved the National Disaster Risk Management and Reduction Policy. This policy promotes the incorporation of disaster risk reduction activities in different levels of governments, institutions and activities of civil society, private entities and communities. The Policy includes four Strategic Pillars: (i) strengthening of institutional capacity; (ii) financing enhancement for better national DRM performance; (iii) education, communication and participation of citizens; and (iv) knowledge management and technology. Each Strategic Pillar comprises several priorities of actions.

c. The focus of these terms of reference is to address the first Strategic Pillar (institutional capacity strengthening) and its priority action: upgrading the National Early Warning System (EWS) in its equipment and operation skill that guarantee universal (early warning) information access to all citizens in Paraguay.

d. An Early Warning System (EWS) for the purpose of this project refers to a system that comprises four elements working together effectively; (i) climate hazard monitoring (using remote sensing information gathered from climate radars, ground observation stations and weather satellites), (ii) decision making (timely and accurate warning issuance and diffusion, that is in general responsibility of the disaster risk management authority), (iii) diffusion and communication of warning information, and (iv) response capacity of citizens. The overall aim of the EWS is to reduce social impacts (deaths and injuries) from climate hazardous events, as well as to prevent economic loss of climate sensitive activities such as agriculture.

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[16] In combination with the two reasons: (i) geographical location - Paraguay is located in Subtropical South America (SSA) - a region susceptible to the world's most intense thunderstorm complexes and their resultant heavy precipitation events; and (ii) physical, institutional and social vulnerability to hazardous impacts.

[17] According to the result of DesInventar database.

[18] IDB implemented the project: RG-T2416. For project information see http://www.iadb.org/en/projects/project-description-title,1303.html?id=RG-T2416

e. Early warning system is highlighted as one of the priority actions of the Sendai Framework for Disaster Risk Reduction 2015-2030[19], adopted at the Third World Conference on Disaster Risk Reduction held in March 2015 in Sendai, Japan with the participation from 187 countries including Paraguay. Efficient and reliable early warning information of the country will contribute not only for disaster risk prevention but also for other alert issuance e.g., epidemic, pandemic or other national crisis. Moreover, upgrading of the national early warning system will be useful to the disaster risk reduction of neighbor countries because many rivers in Paraguay flow across borders. For example, accurate flood warning information from Rio Paraguay, an upper river basin of the La Plata River in Argentina, would provide flood hazard information that can protect vulnerable families living in the lower basin of the river in Argentina (which was affected by floods during December 2015 – January 2016).

f. The Bank will finance the training services for the national government in order to provide technical inputs. The results of this study will be disseminated to SEN and other relevant public entities through a national workshop.

2. Consultancy objective(s)

2.1 The objective of this consultancy is to conduct pilot activities in selected communities based on a national action plan.

3. Main activities

3.1 The consulting firm will conduct the following activities (in two or three pilot communities selected by SEN):

(a) Community workshop to enhance awareness of hazard exposure of the communities and how to interpret warnings and respond in time;

(b) Elaborate, with community participation, local “hand-made” hazard maps incorporating local traditional knowledge;

(c) Define and map the evacuation routes and shelters in case of disaster;

(d) Define additional local warning protocol issued by local authorities, in addition to the warning issuance made by the national authority;

(e) Establish the local disaster management committee who will have the role of guiding families to the evacuation shelter in coordination with national/local authorities;

(f) Install, if necessary, appropriate tool for proactive local disaster risk management e.g., community signboard for leading to the evacuation shelters and precipitation monitoring gauge for climate hazard monitoring;

(g) Conduct evacuation drill in practice with the participation of communities and local/national authorities; and

(h) Additional training course for communities if necessary, e.g., for agriculture resilience in case of droughts.

4. Reports / Deliverables

[19] Priority 4. Enhancing disaster preparedness for effective response.

The consulting firm will deliver the following products:

a. Product 1: Work plan and schedule of activities to be performed.
b. Product 2:
c. Product 3:
d. Product 4:

5. Payment Schedule

The contract payments will be lump sum. The payment schedule will be as follows:

a. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received the Work Plan (Product 1)
b. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 2.
c. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 3.
d. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 4.
e. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 5.

6. Qualifications

- *Academic Degree / Level & Years of Professional Work Experience:*
- *Languages: Spanish and English*
- *Areas of Expertise:*
- Skills: [Any other characteristics deemed relevant to perform the work]

7. Characteristics of the Consultancy

- Consultancy category and modality: Consulting Firm, Lump Sum
- Contract duration: *[In months] or [In days for retainers]*
- Place(s) of work: External consultancy
- Division Leader or Coordinator: Alvaro Garcia Negro (RND/CPR), alvarog@iadb.org, Rural Development Specialist in coordination with Tsuneki Hori (CSD/RND) tsunekih@iadb.org Disaster Risk Management Specialist. Environment, Rural Development and Disaster Risk Management Division (CSD/RND).

Payment and Conditions: Compensation will be determined in accordance with Bank's policies and procedures. In addition, candidates must be citizens of an IDB member country.

Consanguinity: Pursuant to applicable Bank policy, candidates with relatives (including the fourth degree of consanguinity and the second degree of affinity, including spouse) working for the Bank as staff members or Complementary Workforce contractuals, will not be eligible to provide services for the Bank.

Diversity: The Bank is committed to diversity and inclusion and to providing equal opportunities to all candidates. We embrace diversity on the basis of gender, age, education, national origin, ethnic origin, race, disability, sexual orientation, religion, and HIV/AIDs status. We encourage women, Afro-descendants and persons of indigenous origins to apply.

ANNEX A

Paraguay

CSD/RND

Priority Actions for Upgrading the National Early Warning System (EWS)
(PR-T1216)

Institutional capacity building in terms of coordination and communication among national/local entities in Paraguay

TERMS OF REFERENCE

1. Background

a. Paraguay's vulnerability to climate-hazard events[20] (floods, storms, thunderstorms and droughts) is significant. From 1980 to 2015, the country has experienced more than 1,600 climate-related disasters that affected more than 1.1 million citizens in total[21]. In recent years, the country was affected by severe and repeated floods, in November 2012, March 2013, February 2014 and December 2015. The latest flood (2015) had more than 100,000 people, mainly in Asuncion, being evacuated especially people living in/near the Rio Parana river basin area (one of the largest river basin area). In fact, the frequency and intensity of extreme flood events is increasing due to the impact of global climate change. According to a recent study by the Bank, "Country disaster risk profile"[22], it is estimated that more than US$ 4,000 million of Paraguay's assets and economic activities could be affected in case of a once in 100 years return period flood event.

b. In 2013 the country approved the National Disaster Risk Management and Reduction Policy. This policy promotes the incorporation of disaster risk reduction activities in different levels of governments, institutions and activities of civil society, private entities and communities. The Policy includes four Strategic Pillars: (i) strengthening of institutional capacity; (ii) financing enhancement for better national DRM performance; (iii) education, communication and participation of citizens; and (iv) knowledge management and technology. Each Strategic Pillar comprises several priorities of actions.

c. The focus of these terms of reference is to address the first Strategic Pillar (institutional capacity strengthening) and its priority action: upgrading the National Early Warning System (EWS) in its equipment and operation skill that guarantee universal (early warning) information access to all citizens in Paraguay.

d. An Early Warning System (EWS) for the purpose of this project refers to a system that comprises four elements working together effectively; (i) climate hazard monitoring (using remote sensing information gathered from climate radars, ground observation stations and weather satellites), (ii) decision making (timely and accurate warning issuance and diffusion, that is in general responsibility of the disaster risk management authority), (iii) diffusion and communication of warning information, and (iv) response capacity of citizens. The overall aim of the EWS is to reduce social impacts (deaths and injuries) from climate hazardous events, as well as to prevent economic loss of climate sensitive activities such as agriculture.

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[20] In combination with the two reasons: (i) geographical location - Paraguay is located in Subtropical South America (SSA) - a region susceptible to the world's most intense thunderstorm complexes and their resultant heavy precipitation events; and (ii) physical, institutional and social vulnerability to hazardous impacts.

[21] According to the result of DesInventar database.

[22] IDB implemented the project: RG-T2416. For project information see http://www.iadb.org/en/projects/project-description-title,1303.html?id=RG-T2416

e. Early warning system is highlighted as one of the priority actions of the Sendai Framework for Disaster Risk Reduction 2015-2030[23], adopted at the Third World Conference on Disaster Risk Reduction held in March 2015 in Sendai, Japan with the participation from 187 countries including Paraguay. Efficient and reliable early warning information of the country will contribute not only for disaster risk prevention but also for other alert issuance e.g., epidemic, pandemic or other national crisis. Moreover, upgrading of the national early warning system will be useful to the disaster risk reduction of neighbor countries because many rivers in Paraguay flow across borders. For example, accurate flood warning information from Rio Paraguay, an upper river basin of the La Plata River in Argentina, would provide flood hazard information that can protect vulnerable families living in the lower basin of the river in Argentina (which was affected by floods during December 2015 – January 2016).

f. The Bank will finance the training services for the national government in order to provide technical inputs. The results of this study will be disseminated to SEN and other relevant public entities through a national workshop.

2. Consultancy objective(s)

2.1 The objective of this consultancy is to improve coordination and communication ability among national/local entities through (i) organizing national workshops; and (ii) publishing technical products. The principal beneficiary of this component will be the National Secretariat of Emergencies (SEN in Spanish).

3. Main activities

3.2 The individual consultant will implement the following activities:

(i) Workshops: The SEN will organize, inviting all the relevant actors of the team in charge of designing the National Early Warning System (Component 3) and the team in charge of the Pilot Implementation for Community Capacity Building (Component 2), to three national workshops: the kick-off workshop to introduce the project activities to all the relevant actors involved in this project; Intermediate workshop to present the progress made in the previous components; and the final workshop to disseminate all results/products of the project.

(ii) Technical product disseminations: All the results from Component 1 and 2 will be materialized and published for public use. Thereby, this component will provide support for (a) publishing works of the technical products developed in the Component 1 (two documents: the Empirical review of the EWS in other countries and the Cost Benefit Analysis) – see Paragraph 3.3 (i) and (iii); (b) the National Action Plan of the component 2 – Paragraph 3.4 (i) and (c) the toolkit for community awareness and preparedness to replicate the experience extracted from the Component 2 – Paragraph 3.4 (ii). The aim of this subcomponent is to outreach the products and knowledge developed by the TC toward public, private and academic actors.

4. Reports / Deliverables

The individual consultant will deliver the following products:

[23] Priority 4. Enhancing disaster preparedness for effective response.

a. Product 1: Work plan and schedule of activities to be performed.
b. Product 2:
c. Product 3:
d. Product 4:

5. Payment Schedule

The contract payments will be lump sum. The payment schedule will be as follows:

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b. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 2.
c. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 3.
d. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 4.
e. Twenty percent (20%) no later than fifteen (15) calendar days after the Bank has received and approved Product 5.

6. Qualifications

- *Academic Degree / Level & Years of Professional Work Experience:*
- *Languages: Spanish and English*
- *Areas of Expertise:*
- Skills: [Any other characteristics deemed relevant to perform the work]

7. Characteristics of the Consultancy

- Consultancy category and modality: Individual consultant, Lump Sum
- Contract duration: *[In months] or [In days for retainers]*
- Place(s) of work: External consultancy
- Division Leader or Coordinator: Alvaro Garcia Negro (RND/CPR), alvarog@iadb.org, Rural Development Specialist in coordination with Tsuneki Hori (CSD/RND) tsunekih@iadb.org Disaster Risk Management Specialist. Environment, Rural Development and Disaster Risk Management Division (CSD/RND).

Payment and Conditions: Compensation will be determined in accordance with Bank's policies and procedures. In addition, candidates must be citizens of an IDB member country.

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Inter-American Development Bank
VPC/FMP

PROCUREMENT PLAN FOR NON-REIMBURSABLE TECHNICAL COOPERATIONS

Country: Paraguay | **Executing agency: US-IDB** | **Public or private sector:** Public Sector

Project number: PR-T1216 | **Title of Project: Priority Actions for Upgrading the National Early Warning Systems (EWS)**

Period covered by the plan: 24 months

Threshold for ex-post review of procurements: **Goods and services (in US$):** $17,000 **Consulting services(in US$):** 183,000

Item Nº	Ref. AWP	Description (1)	Estimated contract cost (US$)	Procurement Method (2)	Review of procurement (3)	Source of financing and percentage		Estimated date of the procurement notice or start of the contract	Technical review by the PTL (4)	Comments
						IDB/MIF %	Local/other %			
1		**Component 1**								
		Goods								
		N/A								
		Non consulting services								
		N/A								
		Consulting services (Firm)								
		Design of National EWS	$100,000	QBS	N/A	100%	0%			Consulting firm
2		**Component 2**								
		Consulting services								
		National Action Plan (individual)	$20,000	IICQ	N/A	100%	0%			Individual Consultant
		Pilot Implementation for community capacity building (Firm)	$55,000	QBS	N/A	100%	0%			Consulting firm
		Non consulting services								
		Goods/Equipment: Pilot community activities	$2,500		N/A	100%	0%			Signboard for community evacuations
		Goods/Equipment: Monitoring tools	$2,500		N/A	100%	0%			Precipitation monitoring gauges
3		**Component 3**								
		Consulting services								
		Technical product elabolation (edditorial works)	$8,000	IICQ	N/A	36%	63%			Individual Consultant
		Non consulting services								
		Workshops	$12,000		N/A	50%	50%			Individual Consultant
Total			$ 200,000.00	Prepared by: CSD/RND			Date: 5/24/2016			

(1) Grouping together of similar procurement is recommended, such as computer hardware, publications, travel, etc. If there are a number of similar individual contracts to be executed at different times, they can be grouped together under a single heading, with an explanation in the comments column indicating the average individual amount and the period during which the contract would be executed. For example: an export promotion project that includes travel to participate in fairs would have an item called "airfare for fairs", an estimated total value od US$5,000, and an explanation in the Comments column: "This is for approximately four different airfares to participate in fairs in the region in years X and X1".

(2) **Goods and works:** CB: Competitive bidding; PC: Price comparison; DC: Direct contracting.

(2) **Consulting firms:** CQS: Selection Based on the Consultants' Qualifications; QCBS: Quality and cost-based selection; LCS: Least Cost Selection; FBS: Selection nder a Fixed Budget; SSS: Single Source Selection; QBS: Quality Based selection.

(2) **Individual consultants:** IICQ: International Individual Consultant Selection Based on Qualifications; SSS: Single Source Selection.

(2) Country system: include selection Method

(3) **Ex-ante/ex-post review:** In general, depending on the institutional capacity and level of risk associated with the procurement, ex-post review is the standard modality. Ex-ante review can be specified for critical or complex process.

(4) **Technical review**: The PTL will use this column to define those procurement he/she considers "critical"or "complex"that require ex ante review of the terms of reference, technical specifications, reports, outputs, or other items.