

行政院所屬各機關出國報告
(出國類別：國際會議)

參 與

聯合國氣候變化綱要公約(UNFCCC)

協約國第 20 次會議(COP20)

相關活動報告

服務機關：交通部中央氣象局

姓名職稱：程家平主任

派赴國家：秘魯

出國期間：103 年 12 月 5 日至 15 日

報告日期：104 年 3 月 16 日

摘要

中央氣象局派員參加由行政院組團出席聯合國氣候變化綱要公約第 20 屆締約國會議 UNFCCC/COP20 相關活動。依行政院團整體任務分工，中央氣象局屬科研應用組，在會中針對氣候科學資訊部分與氣候變遷資料應用發展趨勢進行觀察，瞭解各國氣象單位對氣候的監測、預報與服務能力，期待透過與各國的交流，強化中央氣象局對極端氣候事件掌握並提升氣候調適應用服務能力，進而提供我國各領域所需之氣候風險管理與調適決策的氣象應用資訊，減輕災損並創造經濟效益。

中央氣象局人員亦在與會期間分別與越南、印尼、索羅門群島、吉里巴斯共和國、英國等國的官方氣象相關作業或研發單位進行會談，就雙方的技術交流與合作廣泛交換意見。另外亦針對世界氣象組織 WMO 推動全球氣候服務框架 GFCS 之發展、氣候變遷與性別議題、氣象資訊應用的經濟效益、區域氣候推估的技術發展與合作、氣象資訊在能源領域的應用等議題蒐集資料供國內參考。

關鍵詞：氣候變遷調適、全球氣候服務框架、氣象經濟效益、氣候推估、氣候衝擊

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壹、會議背景與目的

今年 UNFCCC 舉辦的 COP20 於秘魯首都利馬舉行，會議期間為 2014 年 12 月 1 日至 14 日。它包括締約國大會 (COP20)、京都議定書的締約國會議第 10 次會議 (CMP10)。三個附屬機構 (SBS) 會議：附屬科學和技術諮詢的第 41 屆會議 (SBSTA41) 和附屬履行機構 (SBI41)，以及特設工作組第二次會議的第七部分德班平台增強行動 (ADP2-7)。

利馬 COP20 大會匯集了超過 11000 人參加，其中包括政府官員大約 6300 人，聯合國機構和相關機構，政府間組織和民間社會組織 4000 代表，以及媒體約 900 人。

COP20 大會於 12 月 14 日閉幕。會議通過了削減溫室氣體排放的框架協議。協議指出，《公約》一百九十個締約國明年 5 月 31 日前必須批准國家減排計畫，明年 11 月 1 日前必須遞交一份補充報告，評估各國自己為限制地球升溫比前工業化時代不超過攝氏 2 度所作的努力。這項結論也為明年在法國巴黎所舉行的 COP21 定下一個基礎。各方預計在明年的會議中能達成替代將於 2020 年到期的《東京議定書》的新協定。



COP20 會議現場

會中除了通過利馬氣候行動方案(Lima Call for Climate Action)的決議外，大會還通過了19項決定，其中包括：協助華沙機制的操作化、建立關於性別議題的利馬工作方案(Lima work programme on gender)、並採用了利馬教育及提高認知宣言(Lima Declaration on Education and Awareness Raising)。

本局參與行政院官方團，在會中針對氣候科學資訊部份與氣候變遷資料應用發展趨勢進行觀察，瞭解各國氣象單位對氣候的監測、預報與服務能力，透過氣象國際合作及跨領域發展使我國能強化對極端氣候事件掌握及對自身氣候服務能力的提升，進而提供防災或經濟決策的氣象應用資訊，提升我國全體的氣候適應力，減輕災損並創造經濟效益。

貳、參與會議過程與重點

本次 COP20 相關的週邊會議超過 180 場次，相關的會議內容分為”減量”、”調適”、”與二者皆有關”、”其它”等四大類分。由於本局業務的性質是屬於”調適”工作較前端的氣象(候)資料提供與應用服務，因此所選擇參與研討的議題，以和氣象(候)及相關應用有關且由官方機構主辦的為主(相關參與的研討議題，如附錄一)，以儘量擴大接觸氣候變遷調適相關的應用領域。此外，於會議期間亦分別與越南、印尼、索羅門群島、吉里巴斯共和國、英國的氣象官方機構進行會談，就各國在氣候變遷相關活動中與氣象有關的發展情形及雙方的技術交流與合作廣泛交換意見。在此特別提出說明如下：

一、越南

單位：越南氣象水文及氣候變遷研究院 Vietnam Institute of Meteorology, Hydrology and Climate Change(IMHEN)

對象：(1)Assoc. Professor Dr. Nguyen Van Thang：現任院長(Director General)；(2)Professor Dr. Tran Thuc：資深官員(前院長)

會談主題：氣象科學及氣候變遷研究與調適應用的交流與互動(瞭解 IMHEN 在越南國家氣候變遷相關工作中扮演的角色)

會談紀要：

(1)IMHEN 隸屬越南自然資源與環境部 Ministry of Natural Resources and Environment，與越南氣象局(Vietnam Hydro-Meteorological Service, National Center for Hydro-Meteorological Forecasting；NCHMF)平行。IMHEN 是越南自然資源與環境部的科學

政策幕僚機關，負責國家策略發展以及氣象，水文和氣候變遷政策制定所需之科學基礎的研究。

(2)IMHEN 工作的範疇包括：海平面上升與災害風險降低、氣候變遷國家因應計畫、氣候變遷國家通訊、氣候變遷對水資源的影響及調適對策、清潔發展機制的策略、溫室氣體限制的經濟效應之方法論架構、越南的海岸帶脆弱性評估、氣候變遷相關災害的整備、…等。

(3)IMHEN 和澳大利亞、中國、丹麥、德國、日本、荷蘭、挪威、韓國及美國皆有簽署雙邊合作協議。對前來我國進行氣候變遷相關工作的交流與討論相當有興趣。



越南環境部氣象水文及氣候變遷研究院院長(左 1)前院長(右 2)

二、印尼

單位：印尼氣象局 BMKG(Badan Meteorologi, Klimatologi, dan Geofisika)

對象：印尼氣候變遷及空氣品質中心主任 Dr. Dodo Gunawan , Center for

Climate Change & Air Quality(CCCAQ)

會談主題：氣象科學及氣候變遷研究與調適應用的交流與互動(瞭解 CCCAQ 在印尼國家氣候變遷相關工作中扮演的角色)

會談紀要：

- (1) 印尼氣候變遷及空氣品質中心隸屬印尼氣象局(Indonesian Agency for Meteorological, Climatological and Geophysics (Badan Meteorologi, Klimatologi, dan Geofisika ; BMKG) ，負責印尼國家氣候變遷相關政策所需之科學基礎的研究。
- (2) 印尼 CCCAQ 目前正進行國家各項氣候資料整集和氣候變遷科學基礎的研究，期待能協助相關政府機關瞭解所面對的氣候風險，並提供進行國家進行氣候變遷調適決策所需的各項資訊。
- (3) Dodo 主任表達對我國的氣候變遷資料處理和相關技術相當感興趣，並希望能來局進行氣候變遷相關工作的交流與討論。



程家平主任與印尼氣象局 Dodo 主任討論並於印尼館前合影

三、索羅門群島

單位：索羅門群島環境、氣候變遷、災害管理與氣象部(Ministry of Environment, Climate Change, Disaster Management & Meteorology ; MECDM)

對象：索羅門群島環境、氣候變遷、災害管理與氣象部次長 Undersecretary Chanel Iroi

會談主題：索羅門群島與我國可能進行的氣象技術交流與合作事宜

會談紀要：

- (1)索國目前面臨之氣候威脅包括全球暖化海平面升高，海岸侵蝕嚴重，旱澇漸趨頻繁衝擊糧食安全等，災害性的海氣象有熱帶氣旋、洪水、海嘯等，對民生及農業影響至鉅。
- (2)索羅門群島對有興趣進行技術交流合作議題包括：氣候監測與降尺度技術、紙本歷史資料數位化、氣象衛星資料以及數值天氣預報應用技術、天氣及海嘯預警技術、地面及高空觀測設備維運、以及氣候資料應用服務等議題。
- (3)未來可能的交流與合作形式將包括：人員訓練、資料交流、顧問諮詢、技術合作等大項。索國將研擬合作草案，再由雙方議訂。
- (4)索國次長另表示，目前索國有已參與的太平洋區域環境計畫秘書處 (Secretariat of the Pacific Regional Environment Programme ; SPREP)所進行的多項計畫或活動對索國也亦相當重要，期待我國亦能提供相關參與的顧問協助。



與索羅門群島環境、氣候變遷、災害管理與氣象部次長合影

四、吉里巴斯共和國

單位：吉里巴斯總統府辦公室(Office of the President ; OB)

對象：吉里巴斯總統府副秘書長 Mrs. Taare Aukitino, Deputy Secretary General,

會談主題：吉里巴斯與我國可能進行的氣象技術交流與合作事宜

會談紀要：

- (1) 吉國受氣候變遷影響至鉅，為聯合國關注之重點國家。吉國現階段面臨海水上升、地下水之淡水層鹹化而無法飲用、降雨量出現了異常變化。吉國總統府將氣候變遷列為國家重點計畫，並尋求國際資源協助，吉國總統府 Aukitino 副秘書長表達希望我提供技術顧問的需求與期待。
- (2) 吉國氣象局(KMS)組織規模有限，且基礎氣象建設及服務能力待強化，Aukitino 副秘書長表達在未來氣象與氣候變遷議題的交流與合作上，希望能加強該國人員的能力建構，並協助提供吉國進行天氣或氣候

預報所需的基礎資訊，以強化其預報作業能力以及與其它機關間的氣候應用服務。



與 Aukitino 副秘書長討論合作議題



與索國和吉國代表共同合影

五、英國

單位：英國氣象局哈德雷研究中心(UK Met office, Hadley Center)

對象：英國氣象局東南亞氣候分析及模式架構(Southeast Asia Climate Analysis and Modelling Framework)計畫主持人 Dr. Richard Johns

會談主題：英國氣象局推動東南亞氣候分析及模式計畫的重點

會談紀要：

- (1) 東南亞國家因地理環境、經濟水準、人口密度、技術能力、都市化等程度不同，對極端的天氣和氣候事件特別脆弱。在本世紀內，氣候變遷非常可能改變東南亞區域內的季風型態，增加小區域尺度的溫度和極端降雨事件，將增加此區域於社會經濟和及環境發展挑戰。

- (2)本計畫藉由建構區域氣候模式的能力，提供此區域內所缺乏的區域氣候資訊。關注的重點現象包括：溫度和降雨的年週期、平均與極端之溫度和降雨變化、西南/東北/亞澳等季風系統、地面風、地表及海面溫度、濕度、對流性降雨等。
- (3)本計畫下一階段將推動氣候資訊的跨領域的政策和資源規劃及氣候變遷調適等應用，包括：農業、糧食安全、森林、土地利用變遷、災害風險管理、健康及水資源應用、。
- (4)本計畫為英國氣象局、新加坡氣候研究中心和東南亞國協 (Association of Southeast Asian Nations ; ASEAN)間的合作研究計畫。我國非 ASEAN 的成員，無法直接參與獲得相關資訊，但 Dr. Richard Johns 博士表示非常樂意前來本局進各項模式發展或降尺度技術應用的交流，對於未來進行技術合作的可能性也表達樂觀與期待。



與英國氣象局哈德雷中心 Dr. Richard Johns 討論

參、會議觀察與心得

一、世界氣象組織號召各國氣象機構共同合作，大力推展氣候服務

世界氣象組織(WMO)特別在此 COP20 會議中對世界各國發布一份資料(摘要如附錄二)，說明 WMO 在全球對抗氣候變遷行動中所扮演的角色，和基於氣象科學可以提供的服務，其所傳達的重要訊息重點包括：

- (一)地球氣候系統呈現的警訊是無庸置疑的。氣候變遷會降低各國於永續發展的成果，影響糧食安全和健康，並使調適行動更加昂貴和困難。
- (二)雖然氣候科學仍在發展，在科學上進一步提升知識，降低不確定性是必要的，但是 IPCC-AR5 和 WMO 相關文件中所提供的訊息及相關測報技術，已足夠支持氣候相關政策實務的應用。
- (三)國家氣象機構是支援國家層級調適和全球氣候變遷監測等氣候服務所需高品質科學資訊的主要提供與權責單位，國家氣象機構需要儘速採取行動，支援氣候風險管理應用。
- (四)WMO 強大的科研和技術能力結合本地、區域和全球的知識，提供 UNFCCC 的附屬科學和技術諮詢機構(SBSTA)及附屬履行機構(SBI)具有權威性和針對性的分析資訊。WMO 提供協調配套的全球框架來產製氣候資訊，以支援氣候變化的評估、脆弱領域的衝擊和國家經濟的發展，這些資訊也是進行調適政策設計和研究所不可或缺的。
- (五)目前在決策者、弱勢社群、發展者和氣候科學家間對於氣候知識及現行能力，特別是對發展中國家和低發展國家(LDC)而言，存在著認知與溝

通的差距。配套的方式可整合宣傳和推廣，有助於縮小相關技術及能力認知間的差距，並提供調適所需的作業性氣候服務支援。



於會中與 WMO 秘書長之幕僚長交換意見並合影

二、氣候變遷與性別議題的關聯

- (一) UNFCCC 在會議中大力推動氣候變遷與性別議題，認為氣候變遷對於男性與女性的影響層面有所不同，特別是女性，是屬於氣候變遷影響的脆弱族群。然而，女性在於氣候變遷調適上扮演重要的角色，對女性的賦權增能對於達成 UNFCCC 的長期目標是有明顯助益的。
- (二) 在世界各地許多農村社區，婦女承擔家庭中食物和水供應的最大責任，但這樣的工作卻逐漸因氣候變遷的影響而顯得愈發困難；若婦女能取得與天氣相關的資訊以及得到更高的知識，就能將這些能力轉化為更高的生產力和更好的生活。
- (三) 發展中國家的婦女在面對極端天氣往往有更高風險：他們可能移動比男性少，對外聯繫的機會與頻率也較少，同時他們也更容易面對如營養不良和水傳播的疾病的風險。

(四)在氣候資金相關財務資源以及能力建構的計畫和技術提昇上，普遍來說女性取得的機會較少，若能夠排除這些取得的障礙，使女性能力增加，對於提升整體氣候變遷調適和減緩皆有相當幫助。

(五)女性在於有關氣候變遷各種議題的決策中普遍有代表性不足的情形，這嚴重限制了她們的能力；應該促進和實施解決方案，並運用他們的專業知識，使女性代表能在氣候變遷議題的決策中展現她們的能力與判斷力。

(六)世界氣象組織 WMO 於 2014 年 11 月召開「天氣和氣候服務的性別面向大會」，會中針對性別與天氣和氣候服務的相關議題做出重要討論，提出建議如下：

1. 提高天氣和氣候服務中性別層面及天氣和氣候的性別影響的認識。
2. 提高婦女在天氣和氣候服務的參與。
3. 生產和傳遞具有性別感知的天氣和氣候服務。
4. 技術和通訊的培訓與專業發展，包括性別培訓。
5. 增加對女性的投資
6. 在各氣象相關機構中推動性別平等策略
7. 加強和相關組織的合作以推行性別與天氣和氣候服務政策



女性與氣候變遷高階會議

三、氣象資訊應用的經濟效益

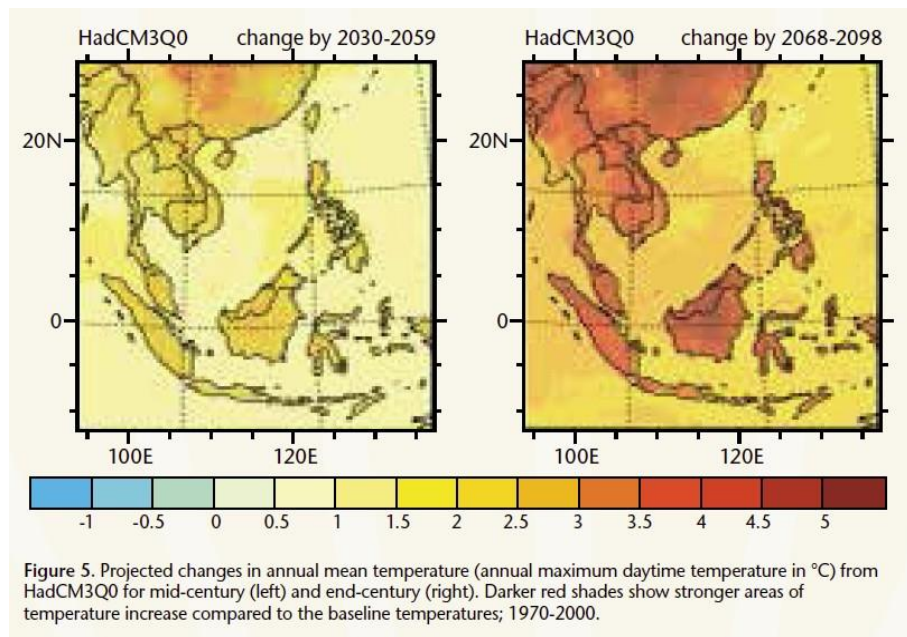
- (一)在氣候變遷衝擊下，極端氣候事件所造成的經濟災損急劇增加，妥善使用氣象資訊以避免經濟社會損失是面對氣候變遷的重要面向。
- (二)主辦國秘魯依據世界銀行最新的資料公佈該國因為極端氣候所產生的經濟損失每年約有 9 億 8200 萬美金，佔該國 GDP 約百分之 0.5。
- (三)秘魯以自身為例將氣象資訊妥善運用於咖啡及馬鈴薯等經濟作物上，產生出顯著的經濟效益，因此經濟效益不僅是減少損失，更能夠創造價值。
- (四)要強化氣象資訊的使用以減少經濟的損失，應在世界氣象組織 WMO 所推行全球氣候服務架構 GFCS 下，將氣象資訊做跨領域的氣候服務，這樣的氣候服務計劃建構所產生氣象資訊的經濟效益可體現於農業、災害管理、公共衛生、水資源管理、觀光、公共建設及交通運輸的實質效益上，應視為對未來經濟效益的投資。



WMO 秘書長(右)與世界銀行代表(左)說明氣象經濟效益與氣候服務

四、區域氣候推估的技術發展

- (一)IPCC 在 1990 年出版第 1 次評估報告(Assessment Report)，之後陸續在 1995、2001、2007 年出版了第 2、3、4 次的評估報告。其重點在利用氣候數值模式，推估不同氣候變遷政策如何影響氣候與社會經濟以量化政策對未來的影響。
- (二)從第一次報告至今 23 年來科技不斷進步，使全球氣候模式愈來愈精細，科學家比較模式的模擬結果與實際觀測資料差異之後，對於模式模擬大尺度氣候現象長期變化的能力較具信心，然而對於比洲際尺度更小的空間範圍則認為模式還沒有模擬實際狀況的能力。
- (三)為了能提供世界各國於區域氣候衝擊和調適應用所需高解析度資訊，WMO 配合 AR5 的工作時程，協助推動 CORDEX (COordinated Regional climate Downscaling Experiment)區域氣候降尺度實驗計畫，提供 50 公里解析度有科學依據的區域氣候變遷推估資訊。
- (四)東南亞國家因地理環境、經濟水準、人口密度、技術能力、都市化等程度不同，對極端的天氣和氣候事件特別脆弱。英國氣象局哈德雷中心(UK Met office Hadley Center)和東南亞國協(Association of Southeast Asian Nations; ASEAN)合作進行東南亞氣候分析及模式架構(Southeast Asia Climate Analysis and Modelling Framework)計畫，建構解析度高達 5 公里的區域氣候模式，提供各國所缺乏的區域氣候資訊。



東南亞地區未來氣候的動力降尺度推估結果

五、氣象資訊在綠能領域的應用

- (一) 聯合國基金會(United Nations Foundation; UNF)指出，目前全球尚有 12 億人無電，可用以改善健康、產生收入、施行教育、強化提升安全，以提升基本生活品質。
- (二) 國際能源組織(International Energy Agency; IEA)估計 60% 的新能源需求將由分散式(微型及非格網)的解決方案來提供。
- (三) 聯合國將尋求在 2030 年能達到普遍的能源取用(universal energy access)和改善能源效率及和全球再生能源分享做為其領導永續能源的各項倡議(initiative)的 3 個目標之一。
- (四) 達到上述目標，除增設或強化現有已存在的大型自然能源電力生產系統，也需納入小型電力系統的解決方案，包括：微型太陽能光電系統、小型電力格網、生質能源、小型水力發電、小型風力發電等。

(五)不論是大型或小型利用自然能源的電力生產系統，皆需要氣象相關的風力、日照、降雨、雲量等資料來進行的設廠的評估，此外由於自然能源不穩定的特性，需要搭配良好的電力調度與平衡系統(smart grid)，以在各種電力產生系統與使用者的穩定用電間，做運轉的最佳化。目前國際採用歷史氣候資料進行相關電廠的設置評估相當普遍，但在運用即時氣象測報資料做電力格網平衡運轉的最佳化控管，則尚在起步階段。



程家平主任與沙烏地阿拉伯王國代表討論能源議題

肆、建議與結語

一、參考世界氣象組織之全球氣候服務框架規劃，推展氣候服務

世界氣象組織於 2011 年通過全球氣候服務框架(GFCS) 的建置計畫，號召世界各國氣象機構分享資源共同合作，投入跨領域的氣候風險管理應用服務，以強化人類面對氣候變遷衝擊的調適能力，並以農業(糧食安全)、自然災害防治、水資源、健康(公共衛生)為 4 個優先實施的領域。

我國因國際現勢無法參加世界氣象組織，損失相當多以官方身分取得國際資源以及與國際交流互動的機會！需要更努力以學術交流的角度參與國際研討會或邀請國際學者專家來台互動，在我國現有氣候科學的良好基礎及氣象測報實務作業能力上，參考 GFCS 的規劃，結合我國相關機構進行跨領域的應用研發，以提升我國面對氣候變遷衝擊的能力，有效支援政府進行氣候風險控管及變遷調適行動的開展。

二、加強對性別議題與氣候變遷關聯性的瞭解

UNFCCC 近年來大力推動氣候變遷與性別議題發展，每次大會皆舉辦性別與氣候變遷的高階層官方論壇，呼籲從各方面正視性別議題在氣候變遷中的重要性。世界氣象組織 WMO 亦召開第 3 次性別會議，討論性別於氣象相關議題中扮演的角色。

從本次會議的討論來看，性別議題可體現在女性對於氣候變遷的脆弱度、女性在氣候變遷影響下的糧食安全議題、水資源、衛生疾病衝擊影響等；大會希望各國透過增加女性在氣候變遷相關決策上的參與、資金上的取得，以及技術訓練上的提升，對女性賦權增能，使其得以面對未來氣候變遷的挑戰，同時對氣候變遷調適及減緩皆有所助益。

UNFCCC 大會的重視以及世界氣象組織 WMO 性別會議的結論，是加強本局對性別議題與氣候變遷關聯性的瞭解的重要參考，以促進女性對天氣和氣候服務的認知及參與。

三、 進行氣象資訊應用的經濟效益分析

由於氣候變遷的衝擊，極端氣候所產生的經濟災損遽增，世界氣象組織目前所推行的全球氣候服務框架 GFCS，即是為了妥善運用氣象資訊，以減少損失，進而創造價值。主辦國秘魯本次會議中特別與世界氣象組織及世界銀行共同召開「天氣、氣候與水服務的社會經濟利益論壇」，以實際的數據和研究計畫成果展現氣象資訊的經濟價值。

該論壇與會者一致表示，面對氣候變遷所帶來的不確定性，社會經濟遭受損失，政府施政亦加困難。因此，各國政府應該大力推動氣候服務計劃，運用於農業、災害管理、公共衛生、水資源管理、觀光、公共建設及交通運輸各政府部門，這樣的計畫應視為對未來經濟效益的投資。

我國位於世界銀行報告中具有極高脆弱度的地區，面對氣候變遷風險增加，我國正推動各調適領域的行動計畫，以降低未來政府施政的風險。本局宜與各機關合作，對各氣象(候)資訊在跨機關之應用的經濟效益進行分析。

四、 尋求區域氣候推估的技術發展與合作

我國位於亞洲大陸與太平洋的交界且地形陡峭，受極端天氣和氣候事件的影響複雜，高解析度的區域氣候推估資訊對我國的氣候衝擊評估與調

適應用相當重要。

英國氣象局哈德雷中心所推動進行的東南亞氣候分析及模式架構計畫的產出資訊對我國有相當高的參考價值，唯我國非東南亞國協(ASEAN)的成員，無法直接參與獲得東南亞氣候分析及模式架構計畫產製的各項推估資訊！所幸我國過去在國科會(現科技部)的支持下，已初步投入相關區域降尺度氣候推估技術的開發，有能力和英國氣象局進行模式發展及降尺度技術應用的交流，並進行交叉驗證，未來可尋求和英國氣象局哈德雷中心進行合作，提升我國於對區域氣候推估和應用的技術與能力。

五、加強氣象資訊在能源領域的應用

我國經濟部能源局曾委託工研院進行風力發電潛能的評估，得知台灣風力潛能蘊藏區除澎湖等離島外主要分布在西部沿海，若要進行淺海區的風力電廠設置，更需要增加運用到風浪等海氣象資料；另，台灣地區的等效日照北/中/南部各約 2.5/3/3.5 小時，進行電力產生或儲能暖水系統的設置，也都需要考慮日照資料。

鑒於目前國際在運用即時氣象測報資料做電力格網平衡運轉的最佳化控管，尚在起步階段，我國有良好的電力平衡管理和及氣象作業的技術能力基礎，未來可加強進行氣象與能源的跨領域應用合作，提升我國能源運用的效力。

附錄一、本局人員所參與的議題研討會

Side Events & Exhibits | COP 20/CMP 10

Side events schedule

Legend:

Adaptation and related issues
Mitigation and related issues
Cross-cutting issues
Others

Scheduled	Time/room	Organizer	Title / theme / speakers
06 DEC			
Saturday, 06 Dec 2014	13:15—14:45 Maranga (130)	Kiribati Ms. Taare Aukitino jaivehsu@gmail.com +686 22 557 <hr/> Industrial Technology Research Institute (ITRI) Mr. Wen-Cheng Hu vincenthu@itri.org.tw +886 3 5913770	Engaging the Participation of Green Economy in the Climate Action Incubation Mechanism Climate Action entails the bridge from financial and technical supports in the developing world. An incubation mechanism initiative for island countries can exemplify and enhance competence of resilience to climate change and the public awareness of green economy. Speakers: To be confirmed.
08 DEC			
Monday, 08 Dec 2014	13:15—14:45 Sipang (300)	United Nations (UN) Mr. Reuben Sessa reuben.sessa@fao.org +39 324 6299174	Achieving food security and agriculture sustainability under a changing climate In light of the recently released fifth assessment of IPCC the side event will explore approaches and success stories on addressing the challenges of climate change especially by low-income countries in Africa, Asia and Central and South America. Speakers: Co-leading: FAO, IFAD, WFP Contributing/ other partners: UNCCD, UN-ECA, UN-ECLAC, Government of Peru, other Government representatives (tbc)
Monday, 08 Dec 2014	15:00—16:30 Paracas (300)	United Nations (UN) Ms. Marina Maiero maierom@who.int +41 179 2134304	Protecting Health, Fighting Climate Change The event will discuss the new strategic direction and programmatic initiatives on health resilience to climate; estimates of how much carbon pricing is in countries' own interests due to local health benefits; and other opportunities for maximizing health benefits of a low-carbon future.

			Speakers: Leading: WHO Contributing/ other partners: IMF, OECD, Ministry of Health Peru and France
Monda y, 08 Dec 2014	16:45— 18:15 Paracas (300)	<p>University of Copenhagen Ms. Lucy Holt l.holt@cgiar.org +45 51 911527</p> <hr/> <p>Centro Internacional de Agricultura Tropical (CIAT) Mr. ANDREW JARVIS a.jarvis@cgiar.org +57 2 4450000</p> <hr/> <p>Kenya Mr. Charles Mutai drcmutai@gmail.com +254 722 856452</p>	<p>Climate smart agriculture innovations to raise rural incomes under climate change Growing climate risks require transformations to climate smart agriculture innovations by farmers, private sector and public services that can provide widely shared livelihood benefits. Presenters, panelists and participants will share recent and emerging progress.</p> <p>Speakers: Tuong Ngoc Chi, CRRRI; Julian Goncalves, IIRR; El Hadji Moussa Seck, Min. of Ag. (Senegal); Prof. Judi Wakhungu, Min. of Env., Water & Nat. Res. (Kenya); Blanca Rosa Molina (Nicaragua); Luis Alfonso Ortega Fernandez, Ecohabitats; Dr. Theo de Jager, SACAU-President, Dr. Chinwe Ifekija Speranza, UoB</p>
09 DEC			
Tuesda y, 09 Dec 2014	13:15— 14:45 Paracas (300)	<p>Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) Mr. Moritz Weigel mweigel@unfccc.int +49 228 8151035</p>	<p>High-Level Event on Gender and Climate Change This milestone event will bring together influential leaders to envision a way forward to a sustainable future in which fully empowered women and men can be drivers of change.</p>
Tuesda y, 09 Dec 2014	16:45— 18:15 Wari (130)	<p>Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) Ms. Sarah Marchildon smarchildon@unfccc.int +49 228 8151065</p>	<p>Momentum for Change: Women for Results This salon-style event will demonstrate how women around the world are taking a leadership role in addressing climate change through concrete examples. It will showcase on-the-ground climate action led by women, for women.</p> <p>Speakers: tbc</p>
10 DEC			
Wedne sday, 10 Dec 2014	11:30— 13:00 Caral (130)	<p>Stockholm International Water Institute (SIWI) Ms. Sofia Widforss sofia.widforss@siwi.org +4 8 12136061</p> <hr/> <p>Leadership for Environment and Development (LEAD Pakistan) Ms. Areej Riaz ariaz@lead.org.pk +92 51 2651511</p>	<p>Water holds the key for mitigation, adaptation and for building resilience: towards a climate deal The side event is organized by SIWI, France, UNESCO-IHP, and LEAD. The side event is co-organized in collaboration with Sweden, AGWA, FWP, ANA, SENAMHI, IWA, CI, GWP, Conagua and UNECE.</p> <p>Speakers: Speakers will include representatives from the International Network of Basin Organizations (INBO), the Water User Community of the Huasco River (JVRH), SENAMHI and the Peruvian IHP National Committee, LEAD, and from the Ministry of Housing of Peru (MVCS).</p>

<p>Wednesday, 10 Dec 2014</p>	<p>15:00— 16:30 Marang a (130)</p>	<p>Women in Europe for a Common Future (WECF) Ms. Sabine Bock sabine.bock@wecf.eu +49 89 232393812</p> <hr/> <p>Women's Environment and Development Organization (WEDO) Ms. Bridget Burns bridget@wedo.org +1 914 3103270</p>	<p>Towards a Gender-Responsive Mitigation Framework for transformative change in the energy sector Gender equality is a key component for the new climate change agreement. Gender mainstreaming in the energy sector is taking place from national policies, to institutional reforms and project development. Crucial lessons of these efforts for a just and sustainable agreement will be presented.</p> <p>Speakers: WECF/WEDO members and partners, government representatives, CSO and INGO representatives.</p>
<p>Wednesday, 10 Dec 2014</p>	<p>16:45— 18:15 Caral (130)</p>	<p>Fundación Futuro Latinoamericano (FFLA) Ms. Mónica Andrade monica.andrade@ffla.net +593 9 99938610</p> <hr/> <p>Sociedad Peruana de Derecho Ambiental * (SPDA) Mr. Jorge Villanueva jvillanueva@spda.org.pe +51 1 6124700</p> <hr/> <p>WWF (WWF) Mr. Hendrik du Toit jdutoit@wwf.org.za +27 82 7659461</p>	<p>A new Security Agenda: safeguarding water, food, energy and health security in a changing climate Leaders from around the world will explore dependencies on natural resources in their regions and the nexus, synergies and trade-offs between water, energy, food and health security, recognising that climate change is multiplying existing threats to sustainable economic growth and people's wellbeing</p> <p>Speakers: Convened by Manual Pulgar-Vidal, speakers will include government representatives from Amazon countries who are engaged in the Amazonia Security Agenda project. Speakers will also include government ministers from trans-boundary water basins in Africa (Congo) and Asia (Mekong).</p>
<p>11 DEC</p>			
<p>Thursday, 11 Dec 2014</p>	<p>11:30— 13:00 Sipan (300)</p>	<p>ZOI Environment Network (ZOI) Ms. Clara Ariza clara.ariza@mtnforum.org +41 77 4685578</p> <hr/> <p>Delta Electronics Foundation (DEF) Mr. Wenkai Hsieh lowestc@gmail.com +886 2 87972088</p> <hr/> <p>Mountain and Glacier Protection Organization * (MGPO) Mr. Tanweer Ahmad Bhutta tanweer@mgpo.org +92 345 8589006</p> <hr/> <p>Netherlands Mr. Ivo de Zwaan ivo.de.zwaan@minienm.nl +31 6 52596791</p>	<p>Integrated Climate Risk Management for a resilient world Climate change and disasters in mountains impact highlands, lowlands and coastal areas, and threaten sustainable development efforts. This event presents Integrated Risk Management as an answer to these challenges and offers a highly relevant contribution to climate change adaptation discussions.</p> <p>Speakers: The Ministers of Environment of the Netherlands and Tuvalu, and high representatives from the Global Facility for Disaster Risk Reduction (GFDRR), ISDR, youth leaders from Asia (MGPO), Delta Foundation, Zoi Network and partners SDC, JICA (major interaction and participation in a roundtable).</p>

Thursd ay, 11 Dec 2014	13:15— 14:45 Sipan (300)	Bhutan Mr. Thinley Namgyel tn@nec.gov.bt +975 2 323384	Mountains and water - from understanding to action To mark International Mountain Day (11 Dec), this event will raise awareness of the role, challenges and opportunities of mountains as the water towers of the world, and will articulate discussions on sustainable mountain ecosystem and water management with current reflections of the UNFCCC parties. Speakers: High level representatives (Ministers) of: Bhutan, Peru, Kyrgyzstan, Guinea, Argentina, Chile, Switzerland (all tbc), Mountain Partnership Secretariat (FAO) and Ms. Christiana Figueres UNFCCC,(invited)
		Guinea Ms. Mia Rowan mia.rowan@fao.org +39 6 57056939	
		Kyrgyzstan Ms. Sara Manuelli sara.manuelli@fao.org +39 6 57056516	
		The Mountain Institute, Inc. * Mr. Andrew Taber ataber@mountain.org +1 202 3229492	
Thursd ay, 11 Dec 2014	15:00— 16:30 Machu- Picchu (300)	Green Climate Fund secretariat (GCF) Mr. Michel Smitall msmitall@gcfund.org +82 102 4586062	GCF Outlook -- Prospects for the Green Climate Fund in 2015 The Green Climate Fund is set to start deploying its resources in 2015. The GCF Board recently adopted policies for selecting institutions through which it will disburse funds, as well as for receiving additional funding. This interactive session discusses key deliverables of GCF in 2015. Speakers: Ms. Hela Cheikhrouhou, Executive Director of the Green Climate Fund (GCF)
12 DEC			
Friday, 12 Dec 2014	11:30— 13:00 Machu- Picchu (300)	New Venture Fund (NVF) Ms. Eleanor Johnston ejohnston@climateinteractive.org +1 336 2028907	Showing What's Possible: Computer Simulation and GIS Mapping for Decision Makers Computer simulations can support decision-making. In this high-audience-participation event, we'll interactively discover future climate scenarios with Climate Interactive's global mitigation simulation, En-ROADS. Then REC presents experience with GIS mapping for adaptation at the national level. Speakers: Drew Jones, Climate Interactive Co-Director, and Ellie Johnston, Climate Interactive Program Associate
		Regional Environmental Center for Central and Eastern Europe (REC) Ms. Mariia Khovanskaia mkhova@rec.org +36 26 504000	
Friday, 12 Dec 2014	13:15— 14:45 Paracas (300)	United Nations Foundation (UNF) Ms. Madhavi Ganeshan mganeshan@unfoundation.org +1 202 8879040	Achieving Universal Energy Access: A development imperative in addressing climate change To showcase innovative approaches to reach the ambitious but achievable goal of universal energy access by 2030. It will bring together policy makers, practitioners, researchers, investors, private sector, and experts working to deliver decentralized energy services and clean
		Women Environmental Programme (WEP)	

		<p>Ms. Priscilla Mbarumun Achakpa priscilla.achakpa@wepnigeria.net +234 9 2910878</p>	<p>cooking solutions.</p> <p>Speakers: Mr. Ryan Hobert, UN Foundation Simon Trace, CEO, Practical Action Engr(Mrs) Bahijjatu Abubakar, National Coordinator, Renewable Energy Programme, Federal Ministry of Environment Nigeria (and WEP Nigeria) Angel Verastegui, Deutsche Gesellschaft für internationale Zusammenarbeit (GIZ) GmbH</p>
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附錄二、世界氣象組織在 COP20 會議發布的訊息(摘錄)

KEY MESSAGES OF THE WMO COMMUNITY FOR COP 20

Introduction

NMHSs serve as major custodians and providers of data and competencies required to support climate services. These services underpin adaptation at national level as well as global monitoring of atmospheric concentrations of greenhouse gases and climate change. It is therefore important that NMHSs are provided access to the necessary financial, human, technical and institutional resources for a wide range of climate related activities.

The conclusions of the IPCC Fifth Assessment Report (AR5), the information contained in key WMO publications such as the Greenhouse Gas Bulletins, the Ozone Bulletins and the Status of Climate should be used to promote the stance that the climate science is solid enough to be efficiently and cost-effectively used in policy formulation and implementation. At the same time there is a need for further progress, on downscaling and communicating and educating about climate risks.

1. Subsidiary Body for Scientific and Technological Advice (SBSTA)

1.1 Knowledge needs arising from the Cancun Adaptation Framework

A communication gap currently exists between decision-makers, vulnerable communities, development practitioners, and climate scientists, particularly in developing countries and Least Developed Countries (LDCs), with respect to the knowledge and capabilities available to support adaptation. This includes the

processes for development and implementation of National Adaptation Plans. A coordinated approach incorporating advocacy and outreach regarding available technical, capacity development, and advisory services and research could help narrow this gap and deliver targeted operational climate services in support of adaptation.

1.2 Development and transfer of technologies and implementation of the Technology Mechanism

WMO's Technical Commissions, international programmes, Global Data Processing and Forecasting System (GDPFS), WMO Information System (WIS), Global Telecommunication System (GTS) and Regional Climate Centers (RCCs) enable NMHSs to contribute to the work of the Climate Technology Centre and Network (CTCN) under the Convention.

1.3 Research and systematic observation

Policymakers, development planners, farmers in the field, the health community, and communities of practice of other socio-economic sectors need timely, reliable, and easily

understandable climate information. There are critical gaps in climate observing systems, particularly in Africa, that need to be filled to facilitate sound science and decision-making. Lack of adequate data and observation systems seriously hinders the ability of scientists to assess the past and current state of the climate and conduct research on climate risks, impacts and adaptation measures.

There is a growing need for detailed, high-resolution information about regional aspects of climate change and variability. This information is needed by scientists in disciplines that require climate information (e.g. such as hydrologists) and by policymakers, other decision-makers and officials responsible for assessing climate change impacts, and developing adaptation policies. The World Climate Research Programme (WCRP) is working to address these needs.

Efforts need to be made to ensure that observations crucial to our understanding of terrestrial systems, including the hydrosphere, biosphere and cryosphere, are moved from the largely research driven funding base to a secure, longer term monitoring network that fully adheres to the Global Climate Observing System and Climate Monitoring principles.

1.4 Issues relating to agriculture

WMO assists NMHSs in a number of areas related to a SBSTA 40 conclusion concerning agriculture (FCCC/SBSTA/2014/L.14). Priorities include early warning systems and contingency plans for extreme weather events, assessment of risks to agricultural systems, and identification of adaptation measures. Many products and services of NMHSs, such as weather forecasts and seasonal climate forecasts, aid the agricultural community in the identification and assessment of agricultural practices and technologies to enhance productivity, food security and resilience in a sustainable manner.

2. Subsidiary Body for Implementation (SBI)

2.1 Matters relating to the least developed countries and National Adaptation Plans (NAPs)

In the context of climate change adaptation, NMHSs are critical actors in national development planning within almost all sectors. Key services include providing information and scientific advice on climate variability, trends and change (including at the policy level). NMHSs are encouraged to continue their active role in the UNFCCC Least Developed Countries Expert Group (LEG) process and to provide technical advice to LDCs for preparing and implementing National Adaptation Plans (NAPs) and other contributions to the LDC's work programme. NAPs are expected to guide the allocation of significant climate finance in the future.

The LEG has identified a clear list of needs for its future work. WMO can specifically contribute to the following areas:

- Identification, analysis and management of key data to support adaptation planning and implementation, including rescue and archival of the data;
- Analysis of climate data and the development and application of climate change scenarios in assessing climate change risks at the national, sectoral and local levels;

- Design of research and systematic observations to support adaptation analysis and planning.

2.2 Warsaw international mechanism for loss and damage associated with climate change impacts

Monitoring of climate extremes and trends which lead to loss and damage is an exceptionally powerful policy support function that NMHSs are uniquely positioned to perform. Data on extreme events, “slow-onset” climate trends, and associated losses and damage are crucial for underpinning implementation and monitoring not only of the Warsaw international mechanism but also of adaptation more generally and the implementation of National Adaptation Plans¹. The same data is also needed for monitoring implementation of other frameworks outside the UNFCCC context including the post-2015 Sustainable Development Goals (SDGs) and the successor framework to the Hyogo Framework for Action which guides international disaster risk reduction efforts². The role of systematically collected data on extreme and slow onset events at the convergence of these high-level policy frameworks makes focused work in this area one of the highest priorities for supporting the UNFCCC and post-2015 agendas.

Many countries have already established or are establishing loss and damage accounting systems that track deaths, damage and loss to housing, health and educational facilities, infrastructure, etc. associated with hazard events and extremes. NMHSs have a vital role to play in the provision and quality assurance of this data. Specific roles for NMHSs include:

- Official designation/validation of extreme events and the values of key climate indicators for which losses and damages are recorded and reported at country level
- Archiving of event data and trend indices as part of national or sub-national loss and damage accounting systems
- Participating in the development of standards for loss and damage accounting applications including for
 - ✧ Extreme event characterization
 - ✧ Unambiguous identification of events through a universal indexing system
 - ✧ Hazardous climate trend analysis and key variables.

WMO is preparing a concept note further outlining these functions. WMO will also promote the delivery of critical data, forecasting and analysis products and services and collaborate on geo-referencing loss and damage data associated with extreme events and slow onset trends. This will also support the development of the GFCS, which aims to improve access to science-based climate products and services in support of risk management and decision-making.

NMHSs recognize that there is also a need to develop geo-referenced and categorized impact datasets across all climate-sensitive sectors (e.g., for crop yields, river flows, groundwater, and health/hospital admission statistics) to aid development and targeting of applications models. At the national level, NMHSs will continue developing projects for data rescue and data management systems and improving technical capacities in hazard mapping and analysis.

2.3 Capacity-building under the Convention

WMO participates in the eight-year Doha work programme under Article 6 of the Convention. Article 6 commits governments to promote and facilitate education, public awareness and training in the field of climate change. WMO and five other UN bodies are members of the United Nations Alliance on Climate Change Education, Training and Public Awareness. WMO brings to the Alliance its invaluable networks of experts and of NMHSs as well as a number of relevant programmes on education and training and scientific capacity-building.

WMO builds capacity through education and training on climate science operations and methodologies. It identifies best practices in climate service delivery to help countries effectively incorporate climate issues into national sustainable development plans such as NAPAs and NAPA.

3. Climate Finance

The Global Framework for Climate Services represents a major, concerted and coordinated global effort to improve the wellbeing of all parts of society vulnerable to climate variability and climate change in alignment with already existing mechanisms. Implementation of the GFCS will generate scientifically sound knowledge that will be a direct contribution to adaptation to climate variability and change.

Investments in GFCS implementation will contribute towards concerted collective action on adaptation. There will be a need to allocate resources from the Green Climate Fund to strengthen the information base for addressing climate change, including through GFCS, especially in developing countries.