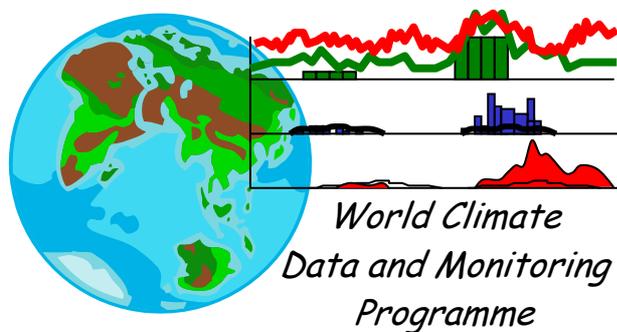


RA VI TRAINING SEMINAR ON CAPACITY BUILDING IN CLIMATE-RELATED MATTERS

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RA VI TRAINING SEMINAR ON CAPACITY BUILDING IN CLIMATE-RELATED MATTERS

Yerevan, Armenia
2-5 October 2006

1. Introduction

WMO Regional Association VI (Europe), at its Fourteenth Session in Heidelberg, Germany, during 7-15 September 2005, re-established the Working Group on Climate Related Matters (RAVI WGCRM), with a resolution specifying its Terms of Reference (ToRs) and nominating experts with specific responsibilities dealing with climate related matters as its members [Resolution 8 (XIV-RAVI)]. The present RA VI WGCRM consists of expert members from Bulgaria, Czech Republic, Germany, Hungary, Netherlands, Portugal, Russian Federation, Slovenia and Switzerland. Mr Peer Hechler of Deutscher Wetterdienst, Germany, is the Chairman of the working group. The present Training Seminar has the prime focus on dealing with the scientific issues relevant to RAVI WGCRM, and was structured to contain scientific presentations by its members and invitees to help discussions on the RAVI WGCRM work plan for the inter-sessional period 2005-09. At the kind invitation of the Government of Armenia, the meeting was held in Yerevan, Armenia, during 2-5 October 2006.

2. Opening Session

The meeting started with a brief opening session which was attended by the dignitaries Mr. V. Ayvazyan, Minister of Nature Protection of the Republic of Armenia, Mr Levon Vardanyan, the Permanent Representative (PR) of Armenia with WMO, and other senior officials of the Armenian State Hydrometeorological and Monitoring Service (ARMSTATEHYDROMET). After brief introductory remarks by the dignitaries, Dr. Peer Hechler, Chair, RAVI WGCRM and Mr D Hrcek, WMO thanked the Government of the Republic of Armenia, the PR and all the staff of ARMSTATEHYDROMET for the kind hospitality and the excellent arrangements to facilitate the meeting. They provided the background for the seminar and the meeting plan highlighting the opportunity for the WG to discuss in detail their activities and come up with a tangible work plan and identify specific roles for the members for the remaining part of the inter-sessional period. The members then considered the agenda prepared by the Chair with prior consultations with the members, and adopted the same and agreed on the organization of the meeting.

3. RA VI Strategic Plan

The representative of the WMO Office for Europe, Mr D. Hrcek, made a presentation giving a brief introduction into the theme. He outlined some important decisions of XIV-RA VI, including RCC along with information on the follow-up and the RA VI Action Plan, with special focus on the objectives related to WGCRM. He also provided information on the draft Strategic Plan for the Enhancement of NMHSs in RA VI (Europe) based on WMO Strategic Plan. He articulated the main driving forces for climate related matters in Europe, and highlighted the European Meteorological Infrastructure (EMI) as a unique initiative within the RAVI. While the EMI is primarily led by Western Europe, there are plans to extend its activities all over the Region. He referred to the XIV RA VI decision to take immediate steps to implement a network of multiple multifunctional centres and/or specialized centres on a pilot basis as the structure for implementing Regional Climate Centre (RCC) activities in RA VI, in order to determine optimal composition of the RA VI RCC network which would best comply with the functions of RCC. He mentioned that there were plans in RA VI to establish sub-regional centres of excellence, viz., drought management centres, training and

education centres, marine meteorology centres, calibration centres, etc., which need substantial support and assistance not only from WMO programmes but also from the European Commission, World Bank, etc. He summarized the organizational structure of the RAVI in terms of the various working groups, rapporteurs, task teams and the RAVI Management Group (MG). The RA VI MG has been established in order to review and assist the work of the subsidiary bodies, and ensure that the Action Plan is on track. Members of the MG have been assigned relevant areas of responsibility, and RAVI WGCRM is associated in this respect with Dr. A. Leitass, the PR of Latvia with WMO and the vice - president of RA VI.

The most important outcome of the XIV RAVI was a decision to develop the Regional Strategic Plan. The goal of the Strategic Plan is to strengthen the capabilities of all NMHSs in RA VI by providing appropriate meteorological, hydrological and related services in the prevention and mitigation of natural disasters, protection of life and property, safeguarding of the environment and contributing to sustainable development. The session adopted an Action Plan for implementation while the Strategic Plan is being developed. Mr Hrcek apprised the members about the following objectives of the Action Plan relevant to RAVI WGCRM:

Objective 2.4: Assess the capabilities and needs of RA VI Members in delivering marine, agriculture, and health services and propose methods for improving coordination of effort, by end 2007. (Suggested responsible groups: Rapporteur on Regional Marine Meteorology and Oceanographic Services, WG on Agricultural Meteorology, WGCRM)

Objective 5.5: Review needs of Members for RCCs, and develop detailed specifications for the services and products to be provided by RCCs, whilst concurrently establishing the scope and remit of such centres by mid 2006. (Suggested responsible group: WGCRM)

Objective 5.6: Review needs of Members for Regional Climate Centres, and develop detailed specifications for the services and products to be provided by RCCs, whilst concurrently establishing the scope and remit of such centres by mid 2006. (Suggested responsible group: WGCRM):

Objective 6.12: Consider and propose mechanisms to strengthen the collaboration between CCI, CIMO and CBS, to ensure the effectiveness, appropriateness, and accuracy of observing systems and networks for climate purposes, and complete a statement of requirements for observations, as well as for networks by early 2006. (Suggested responsible group: CCI Expert Team).

Objective 6.13: Organize a training workshop on CLIREP software with the aim of providing the software to Members of RAVI by late 2005. Investigate the possibility of conducting expert missions to RA VI Members that urgently need assistance in climate data management/data rescue, and explore the possibility of financial support through VCP, of providing NMHSs with Cliware software and related applications/equipment by end 2006. (Suggested responsible group: CCI/CLIVAR Expert Team in association with Roshydromet).

Objective 8.5: Elaborate within the draft Strategic Plan for RA VI the desired relationship between regional activities undertaken by designated centres, specific activities undertaken by few NMHSs and activities being done in every NMHS by mid 2007.

Mr Hrcek highlighted the RCCs as the most important task for RAVI WGCRM. He informed the members that the Task Team on the Strategic Plan and Action Plan recommended that, during meetings RA VI WGs, the following are taken into account:

- The RA VI Strategic Plan is included as an item on the agenda;
- The Action Plan remains in place through to the end of December 2007, and the RA VI WG is requested to provide further input to the monitoring process in April and December 2007, for review by the Management Group;
- That time is taken to review the relevant actions in the RA VI Action Plan;
- That the draft strategic plan is discussed to see if the draft strategic aims, key performance targets etc. are achievable and realistic in your domain, and that feedback is provided to the RA VI Task Team if needed;
- That the future work plan of subsidiary bodies is arranged in order to achieve the draft strategic aims of the RA VI strategic plan (iterative process)

Mr Hrcek gave an overview of the conceptual frame work of WMO Strategic Plan and Operating Plan, and how the RAVI Strategic Plan fits into them. He also provided the members the current draft version of RAVI vision:

To be the primary source of expertise on weather, climate, water and related environmental and development issues throughout the region, through a coordinated European meteorological and hydrological infrastructure, and to contribute worldwide to the safety and well-being of people and to sustainable development.

Mr Hrcek informed the members about the forthcoming Technical Conference on strategic planning in RA VI to be held in Riga, Latvia, 6-7 November 2006. The Conference will review the preparatory work done by the RA VI Task Team on Strategic Plan and Action Plan. An active participation of RA VI structure (WGs, Rapporteurs and members of the informal network of international advisers and focal points of NMHSs - INTAD-6) is expected.

Mr Hrcek concluded by providing an indication of the way forward, whereby the RAVI Strategic Plan should be linked to the WMO 7SP and be valid for the same time period. This would require the final draft of the RAVI Strategic Plan to be presented to the RA VI president and the MG at the Fifteenth World Meteorological Congress, and for the president to request any last amendments (following consultation with the RAVI Members at Congress) before approving the Plan for implementation from January 2008.

Participating in the discussion following this presentation, Mr George Kordzakhia highlighted the need for active contributions to the IPCC assessment process. Mr Peer Hechler mentioned the questionnaire analysis of RA VI CLIPS-related requirements and capabilities, and the relevant issues that it brought out. Mr Kordzakhia stressed that the strategic plans and related initiatives in RAVI should emphasize on regional strengthening of climate activities and showcases related thereto. Mr Hrcek reiterated that the aspects presented by him were based on the outcome of the Task Team, and that the first draft is expected to be ready shortly. He said it was up to the WGCRM to identify the gaps and articulate the need for a well-balanced representation of climate related matters in RAVI Strategic Plan.

4. Host Presentation: Monitoring of Climate System and its Future Development

A presentation on behalf of the hosts was made by Dr H. Melkonyan, Deputy Director, ARMSTATEHYDROMET, on the monitoring of the climate system and its future development relevant to Armenia. He provided a description of the characteristic features of the climate of Armenia, recent trends and the related aspects. He also described the meteorological station network in Armenia, and the climate-related activities of ARMSTATEHYDROMET. He highlighted their activities to cater to various application sectors, particularly on water resources (with focus on Lake Sevan), natural disasters, agriculture and food security, renewable energy, public health, urban climatology, tourism, etc. Armenia routinely shares its climate information with other countries in RAVI and contributes to the international bodies

on climate change such as IPCC and UNFCCC. The meteorological data of ARMSTATEHYDROMET are systematically sent to ECA/D and other data centres in Europe. ARMSTATEHYDROMET collaborates with GURME program in the field of urban climatology and atmospheric pollution. He mentioned that the meteorological education and training needs of Armenia are met by the Yerevan State University and WMO Training programmes.

5. Climate Observations and Data Management including DARE/Digitization

The Rapporteurs on Observations and Data Management (Martin Striz, Rapporteur on Observations and Data Management) as well as DARE and Digitization (Aryan van Engelen, Rapporteur on DARE) were invited to deliver overview talks on recent activities and developments in the given domain with respect to the WG's Terms of Reference and work plan components.

Mr Striz outlined the main tasks for this theme as help in climate database management, concept of a graduated quality control process for data exchange, organization of homogenization seminar, metadata guideline for data exchange, promotion of ECA/D and support to it with data and methods and promotion of the UNIDART data and information exchange platform. Elaborating on the activities to help in climate database management, Mr Striz stressed the need to promote the activities of Czech Hydrometeorological Institute (CHMI) and WMO to install the CLIDATA system and provide the required training. He informed the members that CLIDATA was installed in more than 15 countries, and that, in the last project led by CHMI during 2004-06, CLIDATA was installed in Ethiopia, Dominican Republic, Bosnia and Herzegovina and Serbia. He also informed that a CLIDATA conference will be held in Ostrava during October 2006, on which more information can be obtained at <http://www.clidata.cz>.

The members noted that CLIDATA was not a free software, and might cost up to €10,000. Mr Striz explained that CLICOM software being used earlier became outdated, and that CLIDATA was very easy to install and manage. Mr Hrcek mentioned that Action Plan 6.13 deals with this issue (see Section 3) and enquired whether there were any other database systems. The members noted that there are several such systems, and the Chair suggested the examination of software issue as an action to be noted. In response to a query regarding software development and updates, Mr Striz informed that CLIDATA works on Oracle 10G and that there were plans to transfer the technology to ArcGIS, and that the updates are free of charge. In any case, the members noted that Oracle is a commercial system, and that open source software which does not have such constraints may be explored.

Dr Aryan van Engelen, Rapporteur on DARE and a member of CCI XIV Expert Team (ET) on Rescue, Preservation and Digitization of Climate Records, provided an overview of his activities and developments in the area for the period September 2005 to November 2006, which are outlined below in chronological order and follow the TOR's and actions of the draft work plan for DARE:

1. **Sept. 2005:** Launched, as member of CCI XIV ET on DARE, a questionnaire related to DARE needs. Addressed were the 50 partners (mainly NMHSs) of ECA/D (European Climate Assessment and Data set) in RAVI with the following motivation: "We are all well aware that the availability of long time series of climate data is the basis for climate applications and research. Maximizing the availability of digitized historical data (and metadata) is of paramount importance for long-term climate monitoring, particularly for analyzing trends in the occurrence of extreme events." Response from RAVI has been very good (70%), and the results are under examination.

2. **December 2005:** Organized and hosted the 5th ECSN Data management symposium. Convened the session on DARE with about 70 participants from RAVI.
3. **January 2006:** Kick-off meeting of the EC-FP6 Millennium project. This project aims at a reconstruction of the climate of Europe since the last 1000 years and is related to the so-called “hockey stick” discussions. Leader of WP1, aiming at making long instrumental climatological data series from Europe (RAVI) available for Millennium research community via ECA/D platform. Millennium demand is input to TOR for DARE activities to be undertaken in RAVI.
4. **June 2006:** Exeter, ECSN-EAC meeting where the collaboration between ECSN-ECA/D and Millennium was announced.
5. **September 2006:** Convened a session at the EMS Conference, on climate reconstruction and monitoring, where the link between monitoring, reconstruction and DARE was highlighted.
6. **October 2006:** Discussions with WMO secretariat and RAVI WGCRM for recommendations how to implement/organize a RAVI DARE workshop for the Mediterranean area this year or beginning next year. Made a preceding analysis of DARE needs, based on questionnaire and above mentioned activities and experiences.
7. **November 2006:** To participate in ESF-MEDCLIVAR meeting, concerning long climate reconstruction Mediterranean area, to explore needs MEDCLIVAR for long instrumental series and attuning/collaboration ECA/D/Millennium. To contribute to the development of RAVI DARE workshop.

Dr Engelen also provided a brief description on the status of the European Climate Assessment and Dataset (ECA/D), which started as an optional EUMETNET-ECSN programme in 2002 (<http://eca.knmi.nl>). ECA/D aims at the continuous collation and analyzing of daily time series of all RAVI countries and the Mediterranean countries of RAVI. The collated series are provided by and disseminated to its 50 partners, NMHS's predominantly. Next to homogeneity testing the series are analyzed at the hand of a number of indices, calculated from the daily data. In 2002, the report “Climate of Europe, Assessment of Observed Daily Temperature and Precipitation Extremes”, containing an extensive descriptive and quantitative assessment of the climate of Europe, was published that addressed the policymakers predominantly. The launch of the follow up assessment report is foreseen spring 2007. The data series in ECA/D are – as decided by EUMETNET - principally public available (i.e. downloadable) without any charge. However for a number of series, especially those from non-EUMETNET countries, the data have restricted user access rights, conform the guidelines from the providing participant in concern. ECA/D is also used as a data gathering and dissemination platform for the EC-FP6 projects ENSEMBLES and Millennium and the upcoming ECSN project EUROGRID. Today ECA/D contains ca. 7000 climatic time series of 9 elements observed at some 2000 stations.

Participating in the discussion on Dr Engelen's presentation, Mr Mark Liniger noted that research is mostly concentrated in the universities and other institutions and the data availability for their work within the present initiative may not be smooth. Dr Engelen clarified that the NMHSs usually supply data to such groups. In response to a query, Dr Engelen remarked that the situation in the other RAs is even less satisfactory. The Chair pointed out that the CCI mechanisms ensure information exchange between the RAs. There was also some discussion on the constraints on downloadable data and the expected outcomes of the DARE workshop. Dr Engelen stressed that a web portal on these aspects needs to be highlighted. It was also noted that the present focus is only on station data, and although there are no initiatives to gridded data, the aim is that the geographical density and quality of the collated station series is suitable to serve as a base for high quality and density gridded data sets.

Ms Fatima Coelho made a brief presentation on the International Conference on Experiences with Automatic Weather Stations (ICEAWS) series. The Chair mentioned briefly the background and history of the ICEAWS-series. The 4th ICEAWS was held during 24-26 May 2006 at Lisbon, Portugal, and was attended by 140 participants from 32 countries. The conference programme consisted of (i) New Developments in the field of Automatic Weather Stations (AWS); (ii) Experiences and feedback of AWS data users; (iii) AWS data and networks evaluation; and (iv) Homogeneity of time series. However, Ms. Coelho noted that there were not many papers on homogenization. To improve AWS networks towards a better monitoring of weather and climate, Ms Coelho made the following observations:

1. Major concerns from data users relate mainly to data availability, e.g. data failures and to data compatibility, such as present weather generated by AWS or by human observers;
2. Much work must still needs to be done in several AWS related fields in order to fully meet the needs of climate and also towards better networks for weather watch, such as:
 - adequate calibration and maintenance of existing national AWS networks,
 - guidelines and standardization of data acquisition/processing algorithms,
 - regular update and/or correction of local conditions of stations exposure - metadata
 - intercomparison and tests of new sensors, prior to operational use,
 - methods to homogenize data series based on overlapping AWS/classic stations
3. Regular cooperation needs to be enhanced between the suppliers of meteorological equipment, managers of stations networks and data users. In this regard, the continuation of the ICEAWS series is highly desirable, and the increased frequency of the ICEAWS from (nearly) every 4 years to every 2 years has been suggested. Finally, the Brazilian "Instituto de Agronomia" has offered to organize the 5th ICEAWS in Brazil, with the timing yet to be decided.

Members felt that there should be an effective dialogue between different stakeholders of AWS data. However, it could be difficult to reach a consensus between climatological and non-climatological perspectives of the AWS data. Dr Engelen suggested that these aspects may be considered in the WMO "Guide to Climatological Practices", which is being updated by WMO with the help of CCI XIV.

Mr Sandor Szalai made a brief presentation on the series of homogenization seminars. The series of Seminars for Homogenization of Surface Climatological Data were held in Budapest and hosted by the Hungarian Meteorological Service (HMS), the fifth of which was held during 29 May – 2 June 2006. They have initiated scientific discussion in this field of climatology, and also the CCI XIV session expressed its satisfaction with the results of these seminars. The proceedings of the fourth Seminar have been published by the World Climate Data and Monitoring Programme (WCDMP), the material of the 3rd seminar is available on the homepage of the HMS (<http://www.met.hu>). The World Meteorological Congress urged efforts to develop standardized methods for homogenization and quality control. Furthermore, it suggested undertaking measures, using recently developed techniques, to test homogeneity of all long climatological time series, to homogenize them as far as possible and to make such high quality time series available. Mr Szalai briefed the members on the available publications on the topic, and the recommendations of the latest seminar.

The Chair presented the status and outlook of UNIDART, prepared by him with Jürgen Seib, DWD. The Uniform Data Request Interface Programme (UNIDART) is aimed at the development of services to access meteorological data and products from distributed databases through one Web portal. A Web interface allows registered users to log on and get access to data stored in, and controlled by the participating meteorological centres (<http://www.unidart.eu>).

Status

The UNIDART software is currently running in a non-operational environment at DWD, FMI and Met.no. A central metadata catalogue used by UNIDART is hosted at DWD. Efforts are under way to implement the system at KNMI and MeteoSuisse. Several EUMETNET Members expressed their interest in the system, whilst some raised objections (e.g. security policy reasons). With the UNIDART software available and prototypes implemented and under evaluation, the related EUMETNET-project reaches its natural end by the end of 2006.

Meanwhile a call for participation as data provider has been launched by DWD inviting all UNIDART-contributing NMHSs to join the system [Note: A NMHS can use the UNIDART software to connect its national climate data base to the UNIDART data grid; prerequisite is the existence of a relational data base containing climate time series and of a server machine which is accessible from the Internet and on which the UNIDART software can be installed.]

An important feature of UNIDART is the description of the own database by agreed metadata standards (WMO metadata standard based on ISO 19115 and 19139). UNIDART provides means to develop the required metadata documents.

DWD is using the UNIDART software to meet national requirements for climate data exchange. Furthermore UNIDART is a pilot project of the new WMO Information System, called WIS (see <http://www.wmo.int/web/www/WISweb/home.html>). The UNIDART software will demonstrate one solution how a National Centre (NC) could be connected to a GISC or a DCPC such that users can access the data of a NC via the GISC resp. DCPC. Whilst the GISC portal provides the features for the communication with the users, UNIDART services submit the final user request to the corresponding NC. Within the WIS approach described above, UNIDART has been implemented successfully in the Korean Meteorological Agency (KMA). The Meteorological Agencies of Japan and China expressed their interest.

Outlook

- extension of number of participants (->call for input)
- development of new UNIDART web services for further data categories, e.g. forecast data
- use of UNIDART within related national and international DWD activities
- use of UNIDART in the WIS approach.

The subsequent discussions aimed at gaining a full understanding of the issue as well as working out recommendations or work plan specifications with special regard to capacity building in RA VI. After detailed discussions, the following actions and recommendations were agreed on this theme, along with the assigned responsibilities and deadlines:

5.1 Actions

1. Provide an overview summary report on the status of data management systems in RA VI: needs and prospects of the use of CLIDATA (Czech Republic), CLISYS (France), CLIWARE (Russian Federation), constraints and limitations, requirements etc. and recommendations on how to proceed in close liaison with the WMO Secretariat (M Striz, September 2007)
2. Provide input to ToR and IOC of potential DARE Workshop, recommend how to implement the workshop under the guidance of the WGCRM and co-ordinated by the DARE Rapporteur, consider role of GCOS in this event (A Engelen, October 2006)

3. Contact the Chair of CCI/ET on DARE to ensure the provision of information concerning ongoing activities in other RAs (A. Engelen, September 2007)
4. Provide input to the ICEAWS series from the climate perspective and explore, with support from WCP Department, how the ICEAWS results can be reflected in the guidelines, considering Annex 1, Action A4 of CCI-XIV (e.g., Guide to Climatological Practices, Guidelines on Climate Observation Network and Systems) (M Striz, December 2008)
5. Contact the Task Team on the RA VI Strategic Plan in order to clarify Action 6.12, considering the regional GCOS initiatives (P Hechler, October 2006)
6. Contact the Task Team on the RA VI Strategic Plan in order to clarify 6.13 (P Hechler, October 2006)

5.2 *Recommendations*

1. Members to consider approaching the Research and Archiving (esp. ECPA) community in order to explore funding opportunities for DARE activities;
2. Consider EU structures and activities, especially the WMO office in Brussels;
3. Through the proposed DARE workshop to install a prototype Web Portal informing on rescued and still not rescued time series (consider 4.4.5 of CCI-XIV);
4. Encourage Members to contribute to MILLENNIUM, mainly through ECA/D (F Coelho, A Engelen and M Striz to elaborate);
5. Continue ICEAWS series;
6. Continue series of Homogenization Seminars;
7. Encourage Members to participate in the COST action on Homogenization.

6. Climate System Monitoring and Analysis including Drought Monitoring

Dr Anelia Gocheva, Rapporteur on Climate System Monitoring and Analysis as well as the Dr Sandor Szalai, Expert on Drought Monitoring, were invited to deliver overview talks on the recent activities and developments in the given domain with respect to the WG's Terms of Reference and work plan components.

Dr Gocheva, providing a conceptual overview of the topic, highlighted that climate monitoring involves monitoring of local/regional climates, establishing relevant climate databases, providing information on the current climate status and quantitative estimates of climate anomalies, monitoring the developing anomalies (possibly following up on predicted anomalies), monitoring of large-scale feature of the climate system such as ENSO, NAO, providing information relevant to the end users concerning any climate evolution, etc. Climate analysis involves a comparison of the current climate conditions to historical observations and the related diagnostics, placing regional conditions into context with large-scale phenomena and how they influence the local/regional climate anomalies, identifying and analyzing climate extremes, etc. She pointed out that there is a great interest in climate system monitoring and analysis products, as can be seen from the huge number of hits the Internet search engines get on this topic. She gave examples of NCDC and TCC products available on the Internet, and also mentioned the numerous projects, initiatives, activities, products available in Europe, several of them being ECSN Projects. She referred to the 11th Meeting ECSN Advisory Committee (EAC), held at Exeter, UK, during 21-23 June 2006 and said both ECSN and the WGCRM provide excellent opportunities to strengthen the Members' climate-related capabilities in the framework of EUMETNET and in the WMO context. She informed the members that the EAC discussed the proposals made by Mr. P. Hechler, Chair, RAVI WGCRM warmly supported the establishment of a potential ECSN-WGCRM partnership. Dr Gocheva said that there was a sea of documentation, plans, reports, web sites, links, products, etc. on this theme, and there is a need to systematically review the available information and come up with an assessment of the current Status of the national/regional activities possibly through a suitable questionnaire. It is also important to

compare with the related activities of other Regions and determine how RAVI stands. She referred to the climate as an "Anti-resource" to indicate the associated dangerous phenomena and disasters, and stressed the need to develop the criteria to identify them as relevant to different applications (with links to CLIPS) and provide a status report in the framework of Hyogo Plan and WMO Natural Disaster Prevention Programme (DPM). She suggested that a bibliography on CSM&A may be developed including useful links, software available, projects, etc. and provide wide access to the information possibly through an appropriate web-portal of the RAVIWGCRM. She also suggested a work plan in this area, from her own perspective as follows:

- RA VI review/questionnaire on NMHSs' requirements for, and capabilities of, CSM&A to get a Region's statement of requirements (A. Gocheva, P. Hechler)
- Climate monitoring products and its presentation across RA VI including extremes
- Review on dangerous phenomena (A. Gocheva)
- Promote the climate monitoring activities/initiatives within RA VI & ECSN and consolidate these activities and to enhance the number of participating Members (P. Hechler, S. Szalai, A. van Engelen, T. Cegnar, A. Gocheva)
- Examine the CLIPS questionnaire analysis to look for appropriate input (F. Coelho, A. Gocheva)
- Elaborating a concept for the next RA VI CLIPS Workshop (F. Coelho, P. Hechler, S. Szalai, A. Gocheva)
- Ensure the appropriate link of the WG CRM activities with the RA VI Action plan with special focus on the important domain of natural disasters (P. Hechler, A. Gocheva)

In the discussion that followed this presentation, the Chair stressed that the knowledge and competence of RAVI needs to be integrated to provide a state-of-art climate system monitoring capability and that we may look at the other Regions but should build our own system optimally addressing the regional needs and requirements. Mr Hrcek suggested that the WGCRM may request the Task Team to reflect this need in the RAVI Strategic Plan. The members agreed that there should be a suitable web portal on this theme, which may initially contain only links to the appropriate resources, and possibly develop EUCLIS to be that portal. Dr Engelen suggested that there should be special efforts to engage the countries in the southern fringes of Europe including those in northern Africa within the projects being developed in RAVI. Dr Kiktev said that the data policy issues need to be reconsidered. Mr Hrcek said that the Task Team may be requested to include the regional action plans of GCOS in this context. There was also a suggestion to utilize the mechanisms of CCI for this purpose, and the Chair mentioned the role of the ICT in facilitating the flow of information from the CCI Expert Teams.

Dr Sándor Szalai made a presentation providing an overview of the drought issue in the RAVI. His talk consisted of historical overview, climate change, scenarios, collaborations, international projects, EU views and tasks ahead. He discussed the issue of the definition of drought in terms of water scarcity, aridity, etc., their indices, sensitivity and time scales. He apprised the members on the international projects, initiatives such as the Drought Management Centre for the South-Eastern Europe (DMCSEE), GCOS, Water Framework Directive, FP5, FP6 projects (CIRCLE), ICID WG on Water scarcity (Europe is not very important) and GMES. He briefed the members about the Regional GCOS Action Plan for Eastern and Central Europe, and the 12 regional projects therein. Among these, he particularly highlighted the following projects:

- *Training in the Use of Satellite Data for Climate Monitoring Based on the Satellite Application Facility.* As a result of this project, Eastern and Central European countries will acquire state-of-the-art capabilities in the application of satellite remote sensing data for climate impact assessments, development of adaptation strategies and national development.

- *Drought Monitoring by Combined Use of Surface and Remotely Sensed Data.* This project will ensure that decision-makers in Eastern and Central Europe have access to state-of-the-art drought monitoring and prediction information, providing a solid basis for management decisions in drought situations.

Dr Szalai also described the GCOS activities in the Mediterranean basin in strengthening the networks, data rescue, etc. and their implications for drought monitoring and prediction, and risk management. He informed the members about the Balkan Drought Centre, which is a joint initiative of UNCCD and WMO, and is primarily focused on monitoring and research. He briefly described the project Climate Impact Research Coordination for a Larger Europe (CIRCLE), which mainly aims at coordinating European research on climate change impact assessment and adaptation. It has 4 horizontal and 4 vertical packages. Dr Szalai outlined the main tasks in terms of developing the knowledge base on the topic, liaison with the existing projects and enhancing research and operational activities.

Mr Hrcek pointed out that drought management is a cross-cutting issue for many working groups, and called for a close coordination. The members were informed about a training course for RAVI on drought scheduled next month.

Dr Coelho made a brief presentation on aspects related to the United Nations Convention to Combat Desertification (UNCCD), and presented the salient features from the report of the Conference of the Parties on its seventh session (COP-7), held in Nairobi during 17-28 October 2005. She also brought the attention of the members to the emerging opportunities under the activities of the UNFCCC, particularly the five-year programme of work on impacts, vulnerability and adaptation to climate change to be considered by SBSTA-25 at the COP-12 at Nairobi, Kenya during 6-14 November 2006. She also explained the current EU position on the five-year programme, which may be reviewed after the release of the IPCC AR4. She also apprised the members about the current status of the IPCC AR4 process, which is in the final stages of preparation. Her presentation was mostly informative, and she stressed the need for the WGCRM to closely engage with these international initiatives on climate change.

On the topic of climate extremes indices and indicators, members noted the global initiatives to use standard definitions and software such as Rclimdex, and the relevant possibilities for RAVI.

The Chair made a brief presentation on components of a regional climate monitoring system in WMO-RA VI, and mentioned the Annual Bulletin on the Climate in WMO Region VI (RA VI Bulletin) to which about 40 Members have been contributing. However, he said that there was considerable delay in its publication (initial schedule to be caught up in 2007), and that language and harmonization of national products pose a challenge in this regard. He also summarized the EuCLIS and EuroCLIS activities. EuCLIS is a web platform to be operated in operational mode allowing access to national and European climate monitoring products. EuCLIS is the successor platform to GCMP (Generate Climate Monitoring Products), an ECSN project, which is meanwhile operated in quasi-operational mode with 18 contributing NMHSs ([http:// www.gcmp.dwd.de](http://www.gcmp.dwd.de)). The EuCLIS development phase started in December 2005 whilst the system is expected to be operational in spring 2007. He clarified that EuCLIS only provides monitoring information, and contains no forecast products. He also mentioned about the WMO Annual Statement on Climate and BAMS State of Climate series. Referring to the RCC functions and its product dissemination, the Chair clarified that EuCLIS is not meant to be the RCC home page.

Ms Cegnar suggested that, in addition to the Annual Statement, there should be similar statements on the seasonal scale. It was noted that the NMHSs are already issuing monthly bulletins, which may be linked to address the region-specific needs. The Chair said that the seasonal and monthly information should be largely web-based. He said that new members

participating in EuCLIS will have the opportunity to contribute in their own perspective as long as they address the requirements of the members. Mr Liniger said that data restrictions within EuCLIS may prevent users from benefiting from the information. The Chair clarified that the users will have to approach the NMHSs for specific services. NMHSs may agree for certain products to be disseminated directly. Dr Engelen remarked that the initial basis should be an open system rather than starting from a closed system. The Chair informed that, in EuCLIS, the members will have the option to add to the products and re-submit. English is the preferred language, but members can use their own national language.

The subsequent discussions aimed at gaining a full understanding of the issue as well as working out recommendations or work plan specifications with special regard to capacity building in RA VI. It was agreed that the aim of CSM activities of the WGCRM is to build up Regional capabilities in CSM to ensure the best reflection of the know-how and competence of the RA VI Members. Special focus shall be given to climate as a resource, climate watch and the natural disaster domain. WG agrees to facilitate information flow on appropriate activities to the Members and stimulate Members to participate actively in RA VI –covering projects. The Chair cautioned against any discussion of modification of ToRs and suggested that a suitably flexible work plan could be prepared to address the priorities determined by the WG. The following actions and recommendations were agreed after the discussion:

6.1 Actions

1. consider the participation of Northern African countries in the Mediterranean CLIPS showcase, in ECA/D and the envisaged RA VI DARE event (Aryan, Fatima)
2. explore opportunities to implement a WGCRM web site to improve the exchange of information and to raise the visibility of the WG and fasten the information flow (Peer, Secretariat, Sept. 2007)
3. ensure a proper reflection of the GCOS regional plans in the RA VI strategic plan (Peer, end of Oct.)
4. invite S. Szalai, the drought expert of the WG to the WMO kick-off meeting on DMCSEE (RA VI bureau)
5. consider the implementation of a drought management centre according to the already collected materials in different projects in the Caucasian area (Sandor, representatives of Caucasus region)
6. consider the appropriate treatment of 'drought forecasting, in the ToR of Drought Management Centres (Sandor, RA VI-XV)

6.2 Recommendations

1. Encourage Members to contribute to already existing and up-coming activities initiated by ECSN and foreseen to be broadened to the whole RA VI, e.g. ECA/D and EuCLIS in order to develop Regional RA VI capabilities in the CSM domain.
2. Encourage Members to actively contribute to the RA VI Bulletin and other regional CSM information sources due to the given deadlines.
3. Encourage Members to further support the conduct of RA VI-wide or sub-Regional climate-related projects and discuss the further development of such supports.
4. Encourage Members to initiate and/or actively participate in the preparation of National Drought Plans in their countries.

7. Climate Watches

The representative of the WMO, Dr R Kolli, was invited to give a brief introduction into the theme. Dr Kolli provided a brief overview of the conceptual framework of climate watches, which essentially provides the caution, "the conditions for a problem are present, so pay attention". Climate watch forms an essential component of climate monitoring with the

relevant links to DARE and CDMS, but it also fits within the framework of the World Climate Applications and Services Programme (WCASP). Climate watch is essentially an advisory issued to heighten awareness in the user community concerning a particular state of the climate system and disseminated to serve as a mechanism for initiating preparedness activities by users and/or a series of events that affect user decision making. It is based on real-time monitoring (current status) of conditions and on climate outlooks and issued by individual NMHSs, perhaps in coordination with other NMHSs or RCCs in the region. The objective of a Climate Watch is to enable an end user to take some action to minimize the effects of an expected adverse climate-related impact, rather than simply reacting to an observed climate anomaly. A Climate Watch System should also be seen as an addition to an NMHS's climate forecasting system and to RCOF. A Climate Watch will use climate forecasts and outlooks generated by RCOF, but should be thought of as being a proactive alert of impending unfavorable climate anomalies specifically focused on the end user. The Climate Watch is not intended to replace the RCOF or other climate forecasting activities that NMHSs are already involved in. NMHSs participating in RCOF should consider how the results of the RCOF in their region should be integrated into the Climate Watches issued by the NMHSs and/or associated regional climate institutions. A Climate Watch System adds value to climate monitoring and forecasting within the NMHS in the form of providing necessary and specific information on potential climate anomalies to end users. The components of a climate watch are (i) An Initial Climate Watch – outlining the expected climate anomaly; (ii) Climate Watch Update(s) at regular or agreed upon intervals (e.g., monthly) – issued to keep the end user informed about the progress of the Climate Watch. (e.g., most recent long-range forecasts, or updated climate outlooks); and (iii) A Final Climate Watch – confirming that the Climate Watch has expired and that the likelihood of risks, associated with the climate anomaly, has diminished significantly. To be in a position to issue Climate Watches it is important for the NMHS to monitor local climate and to establish a readily accessible climate database, which will enable current climate situations to be placed in historical context. It is important for the NMHS to monitor the local climate situation before, during and after the Climate Watch has been issued. Before issuing a Climate Watch there is a need to know the current climate state and the magnitude of deviations from climatology. During the period of the Climate Watch it may be necessary to provide updated information to the end users concerning the evolution of the climate departures and any changes in the climate outlooks. This may involve the issuing of a Climate Watch Review at set stages after the initial Climate Watch. After the period of the Climate Watch has passed there is a need to monitor the potential for further climate anomalies. There is a need to constantly keep track of large-scale climate phenomena such as ENSO, NAO, MJO, etc. that can lead to significant regional anomalies.

Dr Kolli briefed the members on the Guidance on Climate Watches developed by a CCI XIII Expert Team (WCDMP-No. 58, WMO-TD No. 1269). He also informed the members that an ad-hoc Working Group formed by CCI-XIV to summarize the guidelines on the issue of Climate Watch emphasized that:

- Climate Watch is a system (i.e. set of functions and responsibilities), providing information on the status of climate, and first of all on its possible negative impacts;
- Climate Watch system does not imply or require creation of new entities to run climate watch activities;
- Climate watch advisories are to be issued by NMHSs to their users;
- Regional Climate entities assist NMHSs by providing regional climate products to NMHSs.

Dr Kolli said that Climate Monitoring and Climate Watch Systems form part of the WMO initiatives in regional capacity building, to help NMHSs to implement a climate watch system to contribute in preventing climate related hazards such as floods, windstorms, droughts, heat waves, landslides, but that these initiatives would require extra-budgetary resources and partnerships.

The members noted that climate watches could be considered for development within the Caucasian showcase project. While only the negative impacts are highlighted for climate watches, it must be noted that negative impacts can be different for different users for the same climate anomaly. Dr Gocheva suggested that the information on dangerous phenomena in specific regions may also be added to the items on the questionnaire being considered. Forecasting of extremes, early warning systems and training for forecasters are also relevant in this context. Mr Kiktev said that climate watches can be a major challenge for RAVI because of the lack of prediction skills on seasonal scale, but could have some practical utility on the monthly scale. The Chair said that they might have an immediate practical use within the tropics because of the RCOF activity, but the climate watches may be taken up as demonstrative elements within the CLIPS showcase projects being proposed.

The actions and recommendations for this item have been considered in conjunction with CLIPS, described in the subsequent section.

8. Climate Information and Prediction Services including Applications, Predictive Capability and CLIPS Showcases

8.1 Overview by CLIPS Rapporteur

Ms. F. Coelho provided a summary of her activities related to climate information and applications, including those at the national level. She has actively participated on the Commission for 2005 Drought established by the Portuguese Government. She collaborated in studies of climate extremes and analysis of changes in climatic indices over Portugal. She participated on Project SIAM II (Scenarios, Impact and Adaptation Measures), the report of which has been published in the form of a book in January 2006. She has also been involved in the activities in the framework of Technical Committee on "Thermal Performance of Buildings". Her other national activities included her involvement with the Portuguese Commission of Climate Change, Coordinating Committee of NAP (UNCCD) and as an IPCC Focal Point. She participated in the GCOS Regional Workshop for the Mediterranean Basin, Marrakech, Morocco, 22-24 November 2005. She was a member of the International Organizing Committee for the 4th International Conference on Experiences with Automatic Weather Stations (ICEAWS), Lisbon, 24-26 May 2006. She also participated in COST 719 – The use of GIS in Climatology and Meteorology. She gave some examples of using GIS approach to study drought, fire weather index and weather stress index. She also showed some results of the trends and variability of precipitation and temperature, including the extremes such as drought, flood, cold spells, hot weather days, etc. based on observed data over the past century.

8.2 Overview by Rapporteur on Predictive Capability

Mr Mark Liniger provided an overview of the predictive capabilities within RAVI. He highlighted the predictive tasks of national weather and climate services as being focused on seasonal (3-6 months) and decadal (1-10 years) scale forecasts and the development of climate scenarios (50-100 years). Both statistical and dynamical models are being employed for this purpose, for which he has cited a few examples. Mr Liniger outlined the challenges in effective use of these models, in terms of data coverage and policies, model skill and resolution, communication and real-world applications. Some of the approaches adopted in this context are based on Probabilistic verification and model intercomparisons, multi-model ensembles, downscaling and bias correction, and end-user liaison. He gave a brief overview of the EU FP6 project, "ENSEMBLES", whose overarching objectives are to (i) develop an ensemble prediction system based on the principal state-of-the-art high resolution, global and regional Earth System models, validated against quality controlled, high resolution gridded datasets for Europe, to produce for the first time, an objective probabilistic estimate of uncertainty in future climate at the seasonal, decadal and longer timescales; (ii) quantify

and reduce uncertainty in the representation of physical, chemical, biological and human-related feedbacks in the Earth System; and (iii) maximize the exploitation of the results by linking the outputs to a range of applications, including agriculture, health, food security, energy, water resources, insurance and risk management. He also briefed the members regarding the recent and forthcoming scientific events related to climate prediction and applications.

8.3 *CLIPS in RA VI*

The CLIPS project aims at developing the capacity of NMHSs to take advantage of recent advances in science and (communications) technology and to pass on the benefits of improved climate services to the users. The CLIPS project's 4 components to reach these aims are Training and Capacity Building, Liaison with Research Programmes, Demonstration and Pilot Projects (Showcases) and Networking. The Chair took up the discussion of CLIPS activities in the Region, by considering the current status and possible ways to enhance the activities. He noted that a network of CLIPS Focal Points is existing, and that first RA VI CLIPS Workshop was held in June 2003 at Erfurt, Germany (see WCASP-No.61 for a report). He made a special mention of the questionnaire analysis of RA VI CLIPS-related requirements' and capabilities' (see WMO CLIPS WebPages) and the relevance of the results for the present discussion. He mentioned that the outlines of two CLIPS Showcases have already been prepared, which will be presented at this meeting. He called for individual contributions to the CLIPS Curriculum, which can be shared widely on WMO CLIPS web pages. He brought the attention of the members to Resolution 10 – RA VI-XIV (see Annex I). He expressed the need for an effective coordination of the CLIPS Focal Point Network, and expressed concern that one CLIPS Rapporteur of the WGCRM may not be able to coordinate a network of more than 50 CLIPS Focal Points with completely different needs and capabilities. He called for sub-regional coordination of CLIPS Focal Points, and guidance on their regular reporting. Keeping in view the practical aspects of engaging a large number of CLIPS Focal Points in a centralized manner, it was agreed that WMO will have the sub-regional CLIPS Coordinators as the main contact points.

The members noted the need for a 2nd CLIPS Training Workshop for the region, and considered the possibilities. Russia has kindly offered to host a RA VI Workshop on the presentation and dissemination of climate information and prediction products. A communication has been initiated to consider using this opportunity to hold a 2nd RA VI CLIPS Workshop. However, Dr R Kolli, Chief, World Climate Applications and CLIPS Division, WMO brought to the attention of the members the fact that there is at present no budgetary provision for a second CLIPS Workshop, and that WMO was required to cover all the Members in the first cycle of CLIPS workshops before it could take up a second workshop for any region. However, the members agreed that there was a great demand for the workshop at the earliest, and a number of possibilities for generating the required resources were considered, such as using funds from DARE Workshop sources, if any, for a CLIPS Workshop. Mr Hrcek suggested that the RAVI WGCRM could highlight the special needs for a second CLIPS Training Workshop in the Region, and pursue resources from other relevant programmes within WMO. It was agreed that a team comprising of Dr A. Gocheva, Dr F. Coelho and Mr. P. Hechler would pursue this issue.

The members noted the following action items of the RA VI Strategic Plan in the CLIPS context:

2.4: Assess the capabilities and needs of RA VI Members in delivering marine, agriculture, and health services and propose methods for improving coordination of effort, by end 2007.

5.6: Assess the current capabilities within the region for undertaking climate change vulnerability studies, including impacts, by end 2006, including work under the auspices of WCRP and the European Union.

8.4 CLIPS Showcases

Ms A. Hovsepyan was invited to deliver an overview talk on the concept and recent status of the Caucasian CLIPS Showcase. She provided a brief summary of the climate issues in the Caucasian region, and the current status of predictive capability and application needs. She then gave the background for the development of this showcase proposal. During RA-VI CLIPS Focal Point's Workshop, held in Erfurt, June 2003, the opportunity of South Caucasian show case project for development of long range forecasting capability in the region was first discussed, and the South Caucasus countries (Armenia, Azerbaijan, Georgia) were encouraged to submit a joint proposal. The Focal Points of these countries held several rounds of informal discussions and also with CLIPS experts on details of the proposal and on identifying a suitable funding agency. The Idea was to initiate Dynamic Modeling activity in these countries and to build on the enormous work done on Global and Regional Modeling at other lead Centres around the World. A project proposal has been prepared based on inputs from several experts on the field. The main goal of the project, expected to be implemented over a period of 3 years, is to develop a Long-Range Forecast system in the region and demonstrate application of the products in the management of agriculture, energy, water resources, transport, public health, environmental protection etc. The requirements of the project include, at the NMHS level, funding for computer equipment, project scientists, training, software and data. The members appreciated the efforts of Ms A. Hovsepyan and her colleagues from ARMSTATEHYDROMET for preparing such an excellent and professional proposal, and unanimously endorsed the scientific strategy as outlined in the proposal. The members expressed concern that it is taking too much time for the proposal to secure funding, and that the team deserves all assistance in their efforts in the mobilization of resources. Mr G. Kordzakhia said that the outstanding modeling capacity available in the Region should be exploited for this project, but that duplication should be avoided. He also highlighted the need to ensure sustaining of the activities after the project is completed. Mr Liniger said that there is a need for the project team to have close contacts with the relevant GPCs. It was noted that Ms Hovsepyan worked with APCC for two years, which would facilitate her liaison with GPCs in the Region like ECMWF, Météo-France, etc. Mr Kiktev said that it was essential to identify suitably qualified end-users who can effectively use the climate products, for the showcase to be successful. Mr Hrcek said that this proposal is also a showcase for regional cooperation, and suggested that the three PRs of the countries involved may jointly present the proposal to WMO for facilitating resource mobilization. He also said that WMO now has a lobbying office in Brussels, which may assist if any EU opportunities exist. Mr A. Martirosyan, UNDP Representative, suggested that some of the components may seek funding from GEF initiatives like National Communications.

Ms F. Coelho was invited to deliver an overview talk on the concept of the Mediterranean CLIPS Showcase. This proposal has the overall objective to address the predictability at long range scales in the Mediterranean region and develop systems to apply Long Range Forecast (LRF) products to areas such as drought monitoring and its impacts on agriculture, energy supply, tourism industry, etc. The members appreciated the efforts of Ms Coelho for taking this, but keeping in view her other commitments, agreed that the project needs a committed ownership to be fully developed scientifically into a form that could attract funding. It was noted that many countries expressed interest in the proposal in principle, there is as yet no firm commitment. The members also noted that the project theme is also relevant to the North African countries, and that it can be taken up as a cross-cutting initiative between RAI and RAVI. Mr Liniger expressed concerns that the region of interest has more than 20 countries, and it may be difficult to manage if all of them are to be involved in the project. Dr Engelen suggested that MedCLIVAR may be contacted for assistance, and that the project

may also be relevant in EUMETNET context. The Chair informed that Météo-France offered all possible cooperation for this project, but expressed inability to spare a full-time coordinator.

It has been agreed that RAVI WGCRM gives priority to the Caucasian showcase and supports the idea of a Mediterranean showcase. The sub regional CLIPS coordinator for Western Europe (to be nominated) may be entrusted to take the proposal forward with assistance from the RA VI CLIPS Rapporteur, Ms F. Coelho.

8.5 *Actions*

1. Consider incorporating the Climate Watch concept aspects into the showcases (F. Coelho, V. Grigoryan)
2. Consider incorporating Climate Watch concept aspects into the envisaged RA VI questionnaire on Climate System Monitoring. Therefore, the questionnaire should include severe events subject to Climate Watch approaches (A. Gocheva, P. Hechler, 2007)
3. Sub-regional CLIPS co-ordinators will contact WCAC Division in order to update the CLIPS FP network information (list of nominees, format of reports etc.)
4. Sub-regional CLIPS co-ordinators will initiate dedicated actions along the ToRs on the basis of the updated information (cf. c)
5. A substitute for the Western Europe sub-regional CLIPS co-ordinator has to be nominated; start with contacting INM (P. Hechler, Secretariat, end of year 2006)
6. The CLIPS co-ordinator for Western Europe should act as a coordinator for the Mediterranean showcase proposal with a limited number of participating countries in the western Mediterranean region. The Caucasian showcase proposal and the IM outline will be the basis for the MedShowcase proposal (Peer and WMO Secretariat by the end of November).
7. Explore funding opportunities for a 2nd RA VI CLIPS WS (Peer, Secretariat, A. Zaitsev)
8. WG Members and Sub-regional CLIPS co-ordinators will provide comments and ideas on the ToR of a 2nd RA VI CLIPS workshop to F. Coelho by the end of October.
9. A concept for the workshop on the basis of the Russian offer and the WG CRM ideas will be elaborated by F. Coelho, A. Gocheva, P. Hechler, together with A. Zaitsev.
10. Clarify actions 2.4 and 5.6 of the RA VI Action Plan (Peer, end of Oct.)
11. Incorporate, in the CLIPS Caucasian showcase, information on interfaces with existing projects and initiatives (V. Grigoryan, October 2006); initiate the communication of the Showcase proposal to WMO SG through the 3 PRs of the South Caucasus Republics (V. Grigoryan, December 2006), closely communicate with the UNDP office and consider incorporating the showcase proposal into the UNFCCC South Caucasus countries National Communications (V. Grigoryan)

8.6 *Recommendations*

1. Encourage Members to consider incorporating the Climate Watch concept idea in their national activities
2. Hold a 2nd RA VI CLIPS Workshop subject to the availability of resources
3. WGCRM highly appreciates the activities related to the Caucasian and Mediterranean Showcases and strongly recommend implementing both showcases as an example for cooperation and for demonstration of LRF benefits.

9. Regional Climate Centres (RCCs)

The Rapporteur on Co-ordination and Implementation of RCC Activities, Dr D. Kiktev, was invited to deliver an overview talk on recent activities and developments in the given domain with respect to the WG's Terms of Reference and work plan components. Starting with a conceptual overview of the RCCs, Dr Kiktev outlined the various steps required to establish them in an appropriate manner. RCCs will complement and support the NMHSs, and their

products and services will be regional in nature, those that the NMHSs cannot produce themselves, and defined and distributed by NMHSs. The basic purpose of RCCs is to assist NMHSs in a range of activities including:

- to interpret, understand and apply Seasonal to Inter-annual (SI) forecasts,
- to generate tailored products to meet NMHS needs,
- to help with data exchange, product verification and distribution,
- to assist regional and sub-regional coordination,
- to provide data services, training, capacity-building and research and development activities and support.

The capability of the proposed RCCs to produce the required products and services in a timely, accurate manner, must be established, which can be accomplished through pilot projects or demonstrations. Regular questionnaires should also be sent to users (NMHSs) to identify strengths, weaknesses. CLIPS Focal Points can be helpful in this context. Dr Kiktev apprised the members on the designation process, based on the Manual on the Global Data-Processing Systems (WMO No. 485):

Part I covers formal designation via CBS.

CBS and CCI to ensure all RCC functions are covered and consistently described throughout the manual.

Part II covers regional aspects.

Responsibility for developing and approving the requirements falls entirely to the RA.

He also noted that the RCC concept was being developed since 1999 (Cg-XIII, CCI questionnaire), and referred to the comprehensive vision of RCC activity outcomes as presented in “Guidelines for Establishment of Regional Climate Centres” (Geneva, November, 2003; WCASP-No.62). To consider the RCC network structure, eligibility and designation procedure in RA-VI, he felt that it would be useful to learn more about similar practical steps made by the counterparts in other regions. In this context, he brought to the attention of the members meeting of the RAIL WGCRM held at Tokyo, Japan, during 25 – 27 October 2004 (wcas-p-no.69), which had a single point agenda on the preparation of recommendations for practical implementation of RCC network in RAIL. Dr Kiktev reviewed the relevant issues from the RAIL report, concerning the feasible structures of RCCs and their proposed activities. He mentioned that RAIL WGCRM has taken up the responsibility of the overall coordination of the RCC activities, and proposed that a similar approach can be taken by RA VI.

Dr Kiktev referred to the substantial progress achieved in seasonal to interannual prediction on a global scale within the GPCs, and said regional interpretation and generating downscaled information should be one of the core activities of RCCs. He briefed the members on the outcomes of the joint meeting of CBS Expert Teams on Infrastructure for Long-Range Forecasting (LRF) and Standard Verification System for LRF, held at ECMWF during 3-7 April 2006. At the request of some members of the ETs on LRF, the application of WMO Resolution 40 related to LRF products and data was considered, especially for GPC products needed by RCCs and NMCs. In the spirit of Resolution 40, it was proposed that GPC products defined in the Appendix II.6 of the Manual on GDPFS shall be considered as essential and given free without condition to NMCs and RCCs. Other data or products should also be given by GPCs at request of RCCs or NMCs, especially for the purpose of enabling them to perform their tasks. RCCs and NMCs should adhere to the conditions, if any, attached by the GPCs to the data or products. The minimum set of LRF products to be made available by GPCs was described. However, Dr Kiktev expressed the concern that many RCC requirements might not be covered within this set. For example, forecast data for downscaling algorithms may involve much more than monthly mean data (e.g., daily data, anomalies for individual ensemble members, hindcast data, data for RCM boundary and initial conditions including SST data, etc.). Keeping in view the fact that RCCs are being

designed to help NMHSs on voluntary basis, and that the freely accessible GPC products are not adequate to meet RCC requirements, he called for a wider consideration of the issue.

Further aspects of the implementation of RCC Services in RA VI were provided by the Chair. With Resolution 9 (XIV-RAVI) the RA VI Members decided to take immediate steps to implement a network of multiple multifunctional centres and/or specialized centres on a pilot basis as the structure for implementing RCC activities in Region VI. Very recent activities along this path are the implementation of RCC-related services within the Region and considerations on the formal implementation including rules of eligibility. In May 2006, RA VI president invited Members to provide RCC-related services on a voluntary, non-commercial basis. So far the following offers have been received:

Hungary	harmonisation of homogenisation methods and procedures in RA VI
Armenia	sub-regional services in the domains of LRF; climate monitoring; drought monitoring; co-operation and information exchange amongst NMHSs, the climate community and other scientific disciplines; data management; application research and economic value of climate information
Russia	preparation of climate products for CIS NMHSs; list of services to be provided in 6 weeks after the XVIII Session of the Intergovernmental Council for Hydrometeorology of the Commonwealth of Independent States (CIS)
Netherlands	RA VI climate daily datasets, RA VI definitions of climate extremes and indices
Germany	RA VI Web Portal for climate monitoring products and services of RA VI Members (cf. hand-out EuCLIS) incl. related DWD products

Mr Hechler presented a draft proposal (see Annexure II) on how to tackle the formal establishment of RCC functions within RA VI and mentioned that discussions were still ongoing. In this context, he brought the attention of the members to Action 5.5 of the RA VI Strategic Plan, which requires to '*Review needs of Members for Regional Climate Centres, and develop detailed specifications for the services and products to be provided by Regional Climate Centres, whilst concurrently establishing the scope and remit of such centres by mid 2006*'.

Mr Hechler requested the members

1. to assess the offers on RCC services made so far and to advise on the way forward and communication of detailed services via RA VI President;
2. to discuss the draft proposal (Annexure II) and to reach a consensus on the formal establishment of RCC functions within RA VI, to be reported to the RA VI President;
3. to recommend rephrasing Action 5.5 of the RA VI Strategic Plan to better reflect the next steps regarding RA VI RCC services.

The launch of a specific questionnaire on climate monitoring was considered relevant in this context. Dr Gocheva remarked that the RCC issue was too complex, yet very important for the Region. She suggested that it would be best that Mr Hechler, having served as the RCC Rapporteur, continues lead and facilitate further actions on this subject. Mr Hechler said that the discussions were quite prolonged, and that the Region finally agreed to implement a network of RCCs on a pilot basis. Dr Kikteva referred to the forthcoming session of CBS in November 2006 where the long-range forecasting issues would come up for discussion, which could provide an opportunity to elaborate on the RCC issues. However, Mr Hechler said that the time is too short to gather more specific information on the needs of the Members of RA VI in this regard. WMO Secretariat was requested to facilitate communication of the relevant issues to the CBS. In this context, Mr Hrcsek mentioned that the documents for the forthcoming CBS session were already finalized, and that the matter can be brought up only through interventions. Commenting on the draft proposal, Dr Gocheva wondered whether it was required to send invitations to all the PRs, and Mr Hechler clarified that it was mandatory to communicate with all the PRs. Dr Gocheva said that, in

such a case, the invitations should solicit all the required information relevant to the capability of the Members. Mr Hechler confirmed that the letter would indeed contain information on the criteria. Dr Engelen stressed that active participation in the RCC functions is as important as running the RCC, and said that examples of EuCLIS and ECA/D may be provided to show how RCC-type networking can be effectively implemented.

Mr Hechler said that the members could have more time to provide comments on the draft proposal, but requested that this be done by the end of the next week. Mr Hrcek suggested that the RA VI Strategic Plan and Action Plan should be more closely examined in this context, and Mr Hechler said he would be in touch with the Task Team.

There was also some discussion concerning data in the RCC context. While Dr Kiktev suggested greater emphasis on the need for all Members to adhere to WMO Resolution 40, Dr Gocheva cautioned that RCCs may not ask Members to provide data. Mr Hechler said that Members could offer their data to the RCCs to carry out, for instance, verification. On the issue of verification, Dr Kiktev said that the skill of global forecasts, issued by the GPCs, currently is at best modest, and that the downscaling strategies cannot provide extra-skill in case of absence of reasonable skill in the background driving model data.

9.1 *Actions*

1. provide further comments to the Chair, on the draft proposal on how to tackle the formal establishment of RCC functions (All members, RAVI WGCRM, mid October 2006);
2. Re-consider the provision of recommendations of the Joint Meeting of CBS ETs on LRF (Reading, April 2006) and consider providing further input on RCC-related issues – as available so far – to the CBS session in November 2006 through J. Dibbern of DWD (P. Hechler and D. Kiktev, End of October 2006).
3. Provide the proposal to the RA VI president and the RA VI Management Group (P. Hechler and D. Kiktev, End of October 2006).
4. Rephrase Action 5.5 of the RA VI Action Plan accordingly (P. Hechler and D. Kiktev, End of October 2006).

9.2 *Recommendations*

WMO may consider organizing a follow-up meeting to the WMO Meeting on the Organization and Implementation of RCCs in order to discuss amongst the Regions the most efficient way to implement RCCs based on the experiences made so far and the discussions held so far.

10. European Climate Support Network (ECSN)

The Rapporteur on ECSN Ms T. Cegnar, was invited to deliver an overview talk on the recent activities and developments in the given domain with respect to the WG's Terms of Reference and work plan components.

The European Climate Support Network (ECSN) is a sub programme of the Network of European Meteorological and Hydrological Services (EUMETNET). The members are the NMHSs of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. In its projects, ECSN is cooperating with all NMHSs of RAVI. The objective of ECSN is to organize improved cooperation of its members in the field of climate and climate related activities in order to expand their capabilities to support the European user community through enhanced provision of high quality climate data and climate products (http://www.eumetnet.eu.org/ECSN_home.htm).

The scope of cooperative activities extends to areas such as:

- a) Exchange of information through publication and dissemination of ECSN activities, conferences and workshops.
- b) Data projects with the aim analyzing data, constructing data sets, developing catalogues and meta data (e.g., Météo France constructed the European Climate Atlas in co operation with 24 partners, the main goal of the collaboration in the T Alpine project of ZAMG is the preparation of a High Resolution Temperature Climatology for the Greater Alpine Region).
- c) Collaboration in climate research through new directions and further collaboration in research into climate variability and predictability, focusing on the exploitation of archived climatological data. Cooperation with the EU ENSEMBLES project aims at the collection of climate data series with a high spatial resolution for gridding purposes (www.knmi.nl/samenw/ensemblesRT5/WP51.html). An upcoming ECSN project is EUROGRID with a similar scope.
- d) Methodology and applications of climatology in order to improve climate monitoring and measurements, identifying users, customers and benefits of climate information. GCMP aims at generating and distribution of standardized Climate Monitoring Products for the European region (www.gcmp.dwd.de/)
- e) ECSN is organizing biannual ECAC (European Conference on Applied Climatology) conferences; the last one was in September 2006 in Ljubljana.

Both ECSN and the RAVI WGCRM run activities aiming at improving the RA VI Members' climate related capabilities by means of international cooperation. Hence, it is proposed to consider the development of a strategic partnership of both groups, resulting, for example, in a coordination of activities in domains of common interest, in an optimized exchange of information and where feasible, in a mutual consultation with respect to the groups' ToRs and workplans. Especially, the ECSN has the potential to act as a nucleus for RA VI wide activities. To ensure close exchange of information, the WGCRM has a special rapporteur on ECSN matters. As many of the RAVI WGCRM members attend joint ECAC/EMS conferences, it is proposed that an informal meeting during the conference should be organized.

Further information on recent activities (e.g. EAC Meeting, 21-23 June 06 in Exeter, UK) was provided by Dr Engelen, Dr Szalai and Mr Hechler. Dr Engelen informed the members that he was the chairman of the ECSN Advisory Committee, and that the WGCRM Rapporteur on ECSN had a standing invitation to attend annual ECSN Advisory Committee meetings, with no financial commitments. Mr Hrcek emphasized the need for close coordination between WMO and EUMETNET, and called for efforts to facilitate all RAVI Members to join EUMETNET and ECSN.

The members consider the ECAC as a very important platform for information exchange on ongoing and future climate activities in RA VI. In this context, it was also suggested that all the members of WGCRM attending the European Conference on Applied Climatology (ECAC) could informally meet and consider related issues.

The members agreed that, within RAVI, there was a need for capacity building on communication skills to ensure the better use and understanding of climatological information within the community of decision makers, the general public and other users. That aim could be largely achieved by conveying the information through the media and in direct communication with policymakers. There was a need for guidelines and training workshops on communication skills, tailored specifically to meet the needs of climatologists, especially with respect to the issues of climate variability, change and extremes. Such activities were

already foreseen by the CCI XIV session (paragraph 6.8.6 CCI XIV Report). Ms Cegnar proposed that the PR of the Republic of Slovenia be invited to submit a proposal to organize such a workshop in RAVI.

10.1 Actions

Liaise with the ECSN Manager and the EAC Chairman to explore opportunities to build up a strategic partnership (P. Hechler and T. Cegnar, September 2008)

10.2 Recommendations

RAVI WGCRM and ECSN to liaise in order to strengthen international co-operation for the benefit of RA VI Members

11. Work plan of the RA VI WG CRM

Based on the initial draft work plan and related discussions, actions and recommendations on various themes, the Chair led through a discussion on the finalization of the WG's work plan. The final work plan agreed by the members is given in Annex III.

12. General Recommendations

Theme-specific recommendations of the WGCRM are already included in the concerned sections of this report. Some overarching recommendations applicable to the entire group are listed below:

1. The visibility (and thus the potentials and capacity) of the NMHSs outside the WMO RAVI community is of paramount importance in order to get access to and funding from non-WMO programmes, projects, etc. (e.g., EU cost actions, EC-FP5,6,7 projects, governmental councils such as the Nordic Council of Ministers).
2. The work plan of RAVI WGCRM offers a good means to indicate the role of RAVI Members in projects and programmes other than those associated with the WMO (e.g., the collaboration of the RAVI WGCRM with EUMETNET-ECSN, ECA/D, ENSEMBLES, etc.). An appropriate way of highlighting this aspect may be worked out by the WGCRM.

13. Closure of Meeting

In his closing remarks Mr Hechler thanked the host for the meeting, the Armenian State Hydrometeorological and Monitoring Service, for their excellent hospitality and support for the session, and for the helpful logistical arrangements. He thanked the participants as well for their enthusiastic efforts and the WMO Secretariat for their dedicated support.

The meeting was closed at 15:30 p.m. on 5 October 2006.

Resolution 10 (XIV-RA VI)

CLIMATE INFORMATION AND PREDICTION SERVICES

THE REGIONAL ASSOCIATION VI (EUROPE),

NOTING:

- (1) Resolution 8 (XIII-RA VI) — Climate Information and Prediction Services Project,
- (2) That Members of RA VI are contributing to a range of CLIPS activities,
- (3) The report of the CLIPS Workshop for RA VI (WMO-TD No. 1164),

CONSIDERING:

- (1) That international climate variability, including, but not restricted to, variability linked to El Niño/Southern Oscillation, substantially impacts socio-economic activities in the Region,
- (2) That effective use of current seasonal to Interannual climate information and prediction technology can provide substantial benefit in socio-economic planning,
- (3) That improved use of climate information, in addition to, or in combination with, climate predictions, can provide further socio-economic benefit,
- (4) That the technology for seasonal to Interannual climate prediction is developing rapidly,
- (5) That effective application of climate prediction and information services requires capacity-building and development of correctly designed and adequately resourced projects,
- (6) That the implementation of CLIPS in the Region should be kept under constant review,
- (7) That there is a need for close coordination in the implementation of CLIPS in the Region,

DECIDES:

- (1) To appoint rapporteurs on the Implementation of the CLIPS project in the Region, with the following Terms of Reference (ToRs):
 - (a) To act in support of all CLIPS activities within the Region;
 - (b) To act as coordinators of sub-regional networks of national CLIPS Focal Points;
 - (c) To keep abreast of research activities on climate variability in the Region as well as of applications research pertaining to climate information and prediction services;
 - (d) To actively support the initiation and conduct of CLIPS showcase projects including any required resource mobilization;
 - (e) To liaise with relevant CCI Expert Teams;
 - (f) To liaise with the RCCs in the Region;
 - (g) To closely liaise with the CLIPS Rapporteur of the Working Group on Climate-related Matters;
- (2) To designate the following as rapporteurs to carry out these ToRs for Member countries in RA VI as follows:
 - (a) Mr C. Almarza (Spain) as Rapporteur for Western Europe (Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Luxembourg, Malta, Monaco, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom);
 - (b) Mr B. Sen (Turkey) as Rapporteur for Central Europe and the Middle East (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Greece, Hungary, Israel, Jordan, Lebanon, Poland, Romania, Serbia and

- Montenegro, Slovakia, Slovenia, Syrian Arab Republic, The former Yugoslav Republic of Macedonia, and Turkey);
- (c) Ms V. Grigoryan (Armenia) as Rapporteur for Eastern Europe (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, and Ukraine); and
- (3) To request the rapporteurs to submit annual progress reports to the president of the Association, and final reports no later than six months before the fifteenth session of the Association;

URGES:

- (1) Those members who have not yet done so, to appoint national CLIPS Focal Points and to provide them with the facilities and the management support necessary to effectively undertake their roles;
- (2) Members to supplement, through extrabudgetary contributions, the resources required for the further development and implementation of the CLIPS project;

REQUESTS the Secretary-General:

- (3) To provide the necessary coordination support and guidance, within available resources, (including existing coordination mechanisms between WMO and the European Union) to the rapporteurs on the implementation of CLIPS in the Region and to the national CLIPS Focal Points;
- (4) To bring this resolution to the attention of all concerned.

NOTE: This resolution replaces Resolution 8 (XIII-RA VI) which is no longer in force.

A Discussion Paper on the Formal Establishment of RCC functions in RA VI

Peer Hechler, Chair, RA VI WGCRM

Background

Whilst the process for the formal establishment of RCC functions is being discussed and realised, actions have been taken to provide as soon as possible RCC-related services for the benefit of the Members on a voluntary basis. The following proposal:

- refers to the establishment of RCC functions under part 2 of the Manual on the GDPFS (Regional Aspects) but leaving open the option to integrate RA VI RCCs under part 1 of the Manual on the GDPFS in a second step;
- aims at the further implementation of Res. 5.1/2 – RA VI XIV;
- is in line with the Guidelines for the establishment of RCCs (WCASP No. 62);
- takes into account the Region's RCC-related requirements and capabilities;
- starts with a limitation, if agreed, of 4 RCCs in RA VI without predetermining the final number of RCCs;
- aims at the implementation of a network of (virtual) distributed functional and/or multifunctional centres;
- bases the decision on the range of activities of a RCC on the Members' needs taking into account existing data, products and services accessible from other sources (Global Producing Centres, international organisations, and other NMHSs etc. pp.).

Proposal

1. Formal invitation to apply for RCC functions in the following domains: climate data, climate monitoring, Long-range Forecasting and climate applications with the notice, that the functions carried out by the candidate institutions shall comprise, in principle, co-ordination, data services, training and capacity building as well as research and development components.
2. Candidate institutions within each of the four domains form a candidate consortium (candidate consortium for a RA VI RCC on climate data, candidate consortium for a RA VI RCC on climate monitoring etc.).
3. Each of the four candidate consortia performs the following tasks: definition of a communication mechanism for the preparation of a RCC proposal, nomination of a consortium leader for the preparation phase, specification of the Region's requirements in the given domain on the basis of Annex 1 in close dialogue with the Members, co-ordination of the candidate consortium members' contributions to the envisaged RCC. *(With reference to points 2 and 3, the issues to be discussed are: the practical implications of organisation of consortium, nomination of a leader, reach consensus across the variety of interests, data policies and capabilities. Possible stronger co-ordination role of the WG CRM also needs to be considered).*
4. The candidate consortium elaborates a proposal for a RCC to be provided to the RA VI President (proposal template to be provided by the RA VI WG on Climate-related Matters via the RA VI President); the proposal addresses –beside other aspects- the following items: organisational structure, performance indicators, back-up solutions, feedback mechanisms, contributors/suppliers commitments, operational verification measures etc.

5. Upon approval of the RA VI President, and readiness of the candidate consortium, a 4 years pilot phase starts with regular communication of the agreed upon performance indicators and reports on user feedback (users = NMHSs or institutions approved by the NMHSs) to the RA VI President. To the extent possible, it is better to start all RCC services/RCCs at the same time because of the inter-dependencies.
6. Upon a successful conduct of the pre-operational phase the RA VI President recommends to the RA VI Session to appoint the "Candidate Consortium RCC" in the respective domain.
7. The RCC consortium regularly provides performance and feedback reports. The RCC performance and designation is under formal review at each RA VI Session.

It is suggested to encourage bigger consortia to establish a Steering Group of high-level representatives to oversee the RCC activities. It is further suggested to request the RA VI Management Group to serve as the RCC Network Steering Committee overseeing the activities of all 4 RCCs in the light of the Members needs. The RA VI WGCRM may be designated to perform tasks of a RA VI RCC Board dealing with day-to-day co-ordination of the RCC network. Therefore it should be considered to appoint one representative of each consortium as member of the next RA VI WGCRM (*It needs to be discussed whether the task is to be assigned to a specific group and WGCRM continues serve as advisory body for the RA VI*).

RA VI WORKING GROUP ON CLIMATE-RELATED MATTERS

Work plan for the 15th inter-sessional period (2005-2009)

Notes:

- (1) The work plan provides the frame for the Working Group's activities along its Terms of Reference as reflected in Res. 8 –XIV RA VI.
- (2) The contributions of the WG's experts and rapporteurs are not limited necessarily to one specific topic only (-> see indication of names in the work plan)

What is expected from the WMO Secretariat:

- thematic focal points
- lively flow of information; consultation of the WG CRM in the preparation phase of RA VI climate-related documents
- provision of an opportunity to implement and run a WG's Website
- assistance and support in funding issues (meetings, showcases etc.pp.)

Abbreviations:

Note: Numbers such as 5.2.2 refer to paragraph numbers within the Report of the Fourteenth session of RA VI, Heidelberg, September 2005; Similar numbers for CCI Report are referred with the prefix CCI..

CCI	WMO Commission for Climatology
CHH	Climate and Human Health
CLIPS	Climate Information and Prediction Services
CLIREP	Climate Reporting
DARE	Data Rescue
EAC	ECSN Advisory Committee
ECA/D	European Climate Assessment and Dataset (http://eca.knmi.nl/)
ECSN	European Climate Support Network
GCMP	Generate Climate Monitoring Products (http://www.gcmp.dwd.de)
ICEAWS	International Conference on Experiences with Automatic Weather Stations
LRF	Long Range Forecasting (forecast period 1 month – 2 years)
QC	Quality Control
RCC	Regional Climate Centre
Res	Resolution (of RA VI XIV)
ToR	Term(s) of Reference according to Resolution 5.1/1 (XIV-RA VI)
WCAC	World Climate Applications and CLIPS Division
WG CRM	Working Group on Climate-related Matters

Area: *Observations and Data Management*
Rapporteur: *Martin Striz*
Overall aim: *Improve Members' capabilities in observations and data management*

Term of reference / requirements	Action	Deadline
Provision of advice and assistance in project implementation to strengthen and improve climate observations, data management, provision of data sets and data rescue (ToR b)	Provision of an overview summary report on the status of data management systems in RA VI (requirements, constraints etc.) and recommendations on how to proceed in close co-ordination with the WMO Secretariat (M. Striz)	Sept. 2007
Related requirements:		
Help in climate database management.... (5.2.2, 5.2.26)	Organisation of a homogenisation seminar (S. Szalai)	29 May-2 June 06
Assist in inclusion of remotely sensed & other data in climate data processing.. (CCI 4.1.1)	Provide an overview of metadata requirements at different international centres (S. Szalai)	End of 2008
Consider CLIREP activities... (5.2.4)	Provision of input to the ICEAWS series from the climate perspective; explore –with support from WCP Dept.- how ICEAWS results be reflected in WMO guidelines (M. Striz)	End of 2008
Consider ICEAWS series... (5.2.5)		
CCI guidelines & software: transforming guidelines to knowledge... (5.2/ 5.2.10/CCI 4.1.1)	Promotion of ECA/D, e.g. by conference contributions (M. Striz, S. Szalai, A. van Engelen)	Ongoing
Consider concept of a graduated QC process for data exchange... (5.2.19, WG CRM)	Promotion of the UNIDART data and information exchange platform, e.g. by conf. contributions (P. Hechler)	Ongoing
Promotion of ECA/D... (WG CRM)		
Guideline on minimum metadata to be included in data exchange... (WG CRM)		

Area: *Climate System Monitoring and Analysis*
Rapporteur: *Anelia Gocheva*
Overall aim: *In 2009 a demonstrator for a co-ordinated and operational RA VI-wide climate system monitoring function exists, at least for standard climate parameters*

Term of reference / requirements	Action	Deadline
Provision of advice and assistance in project implementation to strengthen and improve climate monitoring activities considering different data sources (ToR d, WG CRM)	RA VI review/questionnaire on NMHSs' requirements for, and capabilities of, climate system monitoring and analysis -including climate watch concept aspects- in order to get a Region's statement of requirements (A. Gocheva, P. Hechler)	1 st quarter of 2007
Report on EUROCLIVAR with special regard to climate extremes and indices ... (ToR g)	Evaluation report of opportunities to harmonise climate monitoring products and its presentation across RA VI incl. extreme events (A. Gocheva, P. Hechler)	2008
<u>Related requirements:</u>		
Co-ordinated climate system monitoring (5.2.2, WG CRM)	Introduce climate-related products of the EUMETSAT SAF network into climate system monitoring activities (P. Hechler, A. Gocheva)	End of 2007
Development of early warning systems... (ToR g, WG CRM)	Review on dangerous phenomena (A. Gocheva)	End of 08
Capacity building projects... (5.2.11)	Promote the climate monitoring-related RA VI and ECSN activities and initiatives with special focus on severe events (GCMP / Eu(ro)CLIS / RCC / RA VI Bulletin/ ECA/D etc.) with the aims to consolidate these activities and to increase the number of participating Members from WMO-RA VI (P. Hechler, S. Szalai, A. van Engelen, T. Cegnar, A. Gocheva)	End of 2007 and ongoing
Consider ECSN projects/activities ECA/D, Climate Atlas, GCMP... (5.2.15)		
Consider the Bulletin on the Climate in WMO Region VI... (5.2.16)		
Compile a set of guidelines and standards used in climate maps... (WG CRM)	Acceleration of RA VI Bulletin provision, increasing the number of Member contributions (P. Hechler)	Ongoing
	Produce next European Climate Assessment report in close co-operations with participants (A. van Engelen)	2007
	Co-ordinate and improve the RA VI contribution to the annual BAMS article 'State of the Climate' (former Global Climate System Review) (P. Hechler, all)	Ongoing
	Drafting an concept outline for early warning system for drought (S. Szalai)	2008

Area: *Applications and CLIPS*
Rapporteur: *Fatima Coelho*
Overall aim: *In 2009 two CLIPS showcases are running within RA VI and the 2nd RA VI CLIPS Workshop took place*

Term of reference / requirements	Action	Deadline
Provision of advice and assistance in the implementation of CLIPS with special focus on training, showcases and Focal Point networking (ToR e)	Report on CLIPS and application-related activities of CCI and WCRP in order to obtain more information on Members' requirements with respect to climate applications for the different sectoral user communities (F. Coelho)	End of 2007
Provision of advice and assistance in the implementation of climate applications with focus on bioclimatic indices and urban and building climatology (ToR h, 5.3.10, 5.3.11)	Examine the existing CLIPS questionnaire analysis to elaborate appropriate input for a potential 2 nd CLIPS Workshop (F. Coelho, A. Gocheva)	Prior to CLIPS workshop
	Review the CLIPS Curriculum in close co-operation with WCAC: identify application areas that are missing or not well developed (F. Coelho, S. Szalai)	End of 2007
	Provide contributions to upgrade the CLIPS Curriculum in close co-operation with WCAC (F. Coelho)	End of 2008
	Translate key components of the Curriculum (e.g. translation for Portuguese speaking countries) (F. Coelho)	End of 2008
Related requirements:		
Enliven CLIPS Focal Point network... (5.3.2.a, 5.3.5, Res. 5.3/1, WG CRM)	Initiating procedures for an effective CLIPS Focal Point networking and linking with the 3 sub regional CLIPS rapporteurs in close co-operation with WCAC, ensuring that CLIPS FP reports are submitted regularly and be displayed at the WMO CLIPS Website (F. Coelho, P. Hechler)	End of 2007
User liaison... (5.3.2 e)		
Consider 2 nd RA VI CLIPS Workshop, outline training activities... (5.3.6, WG CRM)	Elaborating a concept for the next RA VI CLIPS Workshop incl. funding options; initiating the work for the organisation of a 2 nd RA VI CLIPS Workshop and support preparations in close co-operation with Russia and WMO-Secretariat (F. Coelho, P. Hechler, S. Szalai, A. Gocheva)	2007/2008
Initiate new, and accompany Mediterranean & Caucasian, showcases... (5.3.6, WG CRM)		
Consider contributions to the CLIPS Curriculum... (CCI 6.5.5)	Report on possibilities to make use of GIS in the domain of QC (M. Striz)	Sept. 2008
CHH: co-operate closely with health & social service agencies... (5.3.7, WG CRM)	Support the finalisation of a Mediterranean CLIPS Showcase proposal aiming at its implementation (F. Coelho, P. Hechler, S. Szalai)	End of 2008
Urban climatology: promote the optimal use of climate information... (5.3.8, WG CRM)	Support the implementation of the CLIPS Caucasian showcase in close co-operation with the sub-regional CLIPS rapporteur and WMO-Secretariat (P. Hechler, F. Coelho, S. Szalai)	Ongoing
Consider the domain climate & tourism... (CCI 6.10.2)	Report on human comfort-related bioclimatic indices (e.g. UTCI) (T. Cegnar, F. Coelho) .	Annual up from 2007
	Report on climatic parameters used for building purposes (e.g. EU-CEN/TC 89) (F. Coelho)	Annual up from 2007

Area: *Predictive Capability*
Rapporteur: *Mark Liniger*
Overall goal: *To promote the use of available LRF products in RA VI*

Term of reference / requirements	Action	Deadline
Review the progress in LRF research and implementation for the benefit of NMHSs including verification, information interpretation and conversion into users' management decisions (ToR f)	Report on current operational LRF products available to NMHSs in and for RA VI and their performance enabling their appropriate use by liaising with the RCC Rapporteur and the relevant CCI-ETs and RA VI CLIPS FPs (M. Liniger)	Annual up from 2007
Related requirements: Enable NMHSs to use LRF products... (cf WMO, 12 Nov 03, SSP/RAVI.SRO/44)	Report on methods for LRFs on calibration, combination of multi-model and downscaling approaches based on recent research results by liaising with the relevant CCI-ETs and RA VI CLIPS FPs (M. Liniger)	Annual up from 2007
Promotion of development & application of downscaling techniques... (5.3.2 b)	Assess the use of LRF products in CLIPS showcases (M. Liniger)	ongoing

Area: *Regional Climate Centres*
Rapporteur: *Dmitry Kiktev*
Overall aim: *Formal designation of RA VI RCC functions within a RA VI-wide RCC network structure according to the Manual on the GDPS, part 2 by RA VI-XV (2009)*

Term of reference / requirements	Action	Deadline
Provision of advice to the RA VI President on all matters concerning the implementation of RCCs in the Region (5.1.9, Res. 5.1/2, ToR k)	Drafting a RA VI President's letter asking Members to volunteer providing RCC-related services to Members in RA VI, in fulfilling the requirements stated, on the basis of existing capabilities (D. Kiktev, P. Hechler)	Jan/Feb 2006
Propose criteria for qualification and eligibility of RCCs... (Res 5.1/2) <u>Related requirements:</u>	Providing a proposal on how to proceed with the implementation of RCCs in RA VI (D. Kiktev, P. Hechler)	End of 2006
Specify RCC services... (RA VI Action Plan, objective 2.4)	Co-ordination of RA VI RCC functions' implementation (D. Kiktev, P. Hechler)	RA VI-XV
Consider Balkan UNCCD Drought Monitoring Centre... (5.1.14)	Monitoring of progress, requirements and functions of RCC-services in RA-VI. Provision of contributions to the annual progress reports of the WG (D. Kiktev, P. Hechler)	Annual up from 2007
	Active collaboration in the establishment of an UNCCD Balkan Drought Monitoring Centre and contribution to the RCC task in the field of drought and homogenisation (S. Szalai)	Ongoing
	Active promotion of EUMETNET/ECSN activities to be considered as nuclei for potential RCC functions (A. van Engelen, P. Hechler, T. Cegnar)	Ongoing

Area: *ECSN*
Rapporteur: *Tanja Cegnar*
Overall aim: *For RA VI-XV(2009) ECSN and the WG CRM present a joint strategy and action plan to increase the Members' climate-related capabilities*

Term of reference / requirements	Action	Deadline
Focus on ECSN projects (ToR c)	<p>Ensure a closer co-operation between ECSN and the RA VI WG CRM with the aim of promoting a strategy to use ECSN efforts as the nucleus for RA VI-wide activities (A. van Engelen, T. Cegnar, S. Szalai, P. Hechler)</p> <p>Ensure an appropriate flow of information: provide ECSN quarterly reports to WG CRM members and WG CRM reports to EAC members; consider 'joint' project proposals/activities (A. van Engelen, T. Cegnar, S. Szalai, P. Hechler)</p> <p>Use the European Conference on Applied Climatology (ECAC) to foster the ECSN – WG CRM link and to promote the WG CRM work (T. Cegnar)</p>	<p>Ongoing</p> <p>Regularly</p> <p>6th ECAC in Sept. 06 and 7th ECAC 08 (tbc)</p>

Area: *DARE and Digitalisation*
Rapporteur: *Aryan van Engelen*
Overall aim: *Recovery of long climatic observational series in RA VI, with a special focus on areas with sparse coverage*

Term of reference / requirements	Action	Deadline
Provision of advice and assistance in project implementation to strengthen and improve ... data rescue (5.2.2, ToR b)	Act as convenor on DARE on ECAC-6 (A. van Engelen) Representation of RA VI in the CCI Expert Team on DARE (A. van Engelen) Complete Questionnaire on RA VI DARE activities (A. van Engelen) Promote DARE activities within RA VI by contributions to seminars etc. (A. van Engelen)	Sept. 06 2006-2009 Sept. 2007 2006, 2007
Related requirements: Support inventorying climate related data sources... (5.2.21) Continue data rescue capacity building... (CCI 4.4.3) Web Portal for DARE activities... ?? (CCI 4.4.6) Consider RCC functions to support DARE activities... (CCI 4.5.1)	Collate long climatic observational series from RA VI and bordering countries, use ECA/D as a platform for storage and dissemination (A. v. Engelen)	ongoing

Area: *Drought Monitoring*
Expert: *Sandor Szalai*
Overall aim: *In 2009 a demonstrator for a co-ordinated and operational drought monitoring function exists*

Term of reference / requirements	Action	Deadline
Provision of assistance in the implementation of an effective drought monitoring in the Region in close liaison with the WG on Agrometeorology as well as the WG on Hydrology (ToR i)	Co-operation with the WG on Agrometeorology as well as the WG on Hydrology and the WG on Disaster Prevention and mitigation on the drought topic (S. Szalai)	Ongoing
<p><u>Related requirements:</u></p> <p>Consider Balkan UNCCD Drought Monitoring Centre... (5.1.14)</p>	<p>Contributing to the Drought Management Centre for South-eastern Europe (S. Szalai)</p> <p>Support to the potential establishment of a drought management centre in the Caucasus Region</p>	<p>Ongoing</p> <p>Ongoing</p>

Area: *Overall*
Rapporteur: *Peer Hechler/all members*
Overall aim: *RA VI Members are aware of the group's activities and re-establish the WG CRM during RA VI-XV (2009)*

Term of reference / requirements	Action	Deadline
Keep abreast of climate-related national and international activities ... (ToR a)	Ensure a lively communication amongst WG members; provide at least one message each quarter of the years 2006-2009 to the WG members summarising WG activities, addressing related and/or interesting topics and announcing/preparing issues to come (P. Hechler)	Ongoing
Advice the RA VI President on all WCP matters (ToR j)		
Encourage co-operation and networking across the Region ... (ToR l)	Reporting on drought vulnerability methodologies (S. Szalai)	End of 2007
Related requirements:		
Strengthen links to climate relevant international bodies... (5.1.1, WG CRM)	Active membership in the CCI's Implementation and Co-ordination Team as RA VI representative with the aims to support the effective implementation of CCI outcomes in the Region and to feed into the CCI's work the Region's requirements and expertise (P. Hechler)	Ongoing
Increase visibility of the Working Group... (WG CRM)		
ISDR/adaptation to climate change... (5.1.10/11, 5.3.9)	Connecting with GMES, GCOS on drought monitoring (S. Szalai)	Ongoing
Climate change vulnerability studies... (RA VI Action Plan, objectives 5.5, 5.6)	Provide yearly reports of the WG's activities and plans to the RA VI President (2006-2009), Provide a report of the WG's activities and plans to RA VI-XV (2009) (P. Hechler with contributions from all members)	Annual
Liaise with CCI Expert Teams... (WG CRM)		
Annual progress reports ... (Res. 5.1/1)	Initiation, preparation and realisation of the RA VI Training Seminar on Capacity Building in climate-related Matters (P. Hechler and all)	Oct. 2006
Consider funding opportunities, especially EU-related ones... (WG CRM)	Developing a WG CRM's Webpage (F. Coelho, P. Hechler, Secretariat)	End of 2007
Intersessional meeting...	Ensure the appropriate link of the WG CRM activities with the RA VI Action and Strategic Plans with special focus on the important domain of natural disasters in close co-operation with the DPM (P. Hechler, A. Gocheva, all)	2007 (tbc)

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