



**SUMAMAD**

Fourth Project Workshop  
***Sustainable Management of  
Marginal Drylands (SUMAMAD)***  
Islamabad (Pakistan) 26 January to 1 February 2006

**Workshop Report**

*Prepared by: Caroline King, UNU-INWEH*

**Introduction**

*Workshop Objectives*

*Workshop Content*

*List of Participants*

**Opening Session**

**Overview Presentations**

*SUMAMAD project directions*

*Expert presentations*

*Informational presentations*

**Review of SUMAMAD Activities in 2005**

*Overview of 2005 Country Reports*

*Presentation and discussion of SUMAMAD Country Reports*

*Review of implementation of the SUMAMAD Project in 2005*

**Future Activities of the SUMAMAD 2006-**

*Identification of training and capacity building needs and opportunities for 2006*

*Additional training and capacity building activities proposed for the future*

*Workplans for the SUMAMAD Project in 2006*

*Fifth SUMAMAD Project Meeting, 2006*

*Contributions to activities during the International Year of Deserts and Desertification (IYDD)*

*Dissemination activities*

*Preparation for future phase of SUMAMAD 2007-*

**Discussion of the Field Visit**

*Overview of the visit*

*PCRWR research station at Dingarh*

*Lal Suhanra Biosphere Reserve*

*General conclusions*

## **Introduction**

The fourth international workshop of the joint UNESCO-UNU-ICARDA-Flanders Project on “Sustainable Management of Marginal Drylands (SUMAMAD)” was held in Islamabad (Pakistan) from 26 January to 1 February 2006. The workshop was organized by the Pakistan Council of Research in Water Resources (PCRWR) and UNESCO Headquarters as well as its Islamabad Office within the context of the UNESCO Man and the Biosphere (MAB) Programme and the UNESCO International Hydrological Programme (IHP), and in collaboration with the United Nations University – International Network on Water, Environment and Health (UNU-INWEH) and the International Centre for Agricultural Research in Dry Areas (ICARDA).

## ***Workshop Objectives***

The workshop brought together the designated project coordinators and the members of the Core Management Group of the SUMAMAD project. The main objectives of the workshop were to:

- Review the implementation of the SUMAMAD Project in 2005,
- Discuss major objectives and workplans for implementing the SUMAMAD Project in 2006, and
- Provide practical training for data analysis.

## ***Workshop Content***

The workshop began with two days of presentations and discussion of the SUMAMAD project. Project Coordinators from the SUMAMAD project study sites presented the achievements that they had made during 2005. These presentations were preceded by overview presentations on dryland research from international experts, and on progress within the SUMAMAD project by the management team. A two-day field visit was then undertaken, including a tour of the PCRWR research station at Dingarh in the Cholistan Desert and a visit to the Lal Suhanra Biosphere Reserve. The participants returned to Islamabad for the final day of training sessions and discussion.

## ***List of Participants***

The following participants attended the workshop:

### **a) Team Leaders**

- Dr. Boshra Salem (Egypt: Omayed Biosphere Reserve sub-project);
- Mr. Me'en Smadi, on behalf of Mr Mohammad S. Al-Qawabah (Jordan: Dana Biosphere Reserve sub-project);
- Dr. Muhammad Akram Kahlowan (Pakistan: Lal Suhanra Biosphere Reserve subproject)
- Dr. Richard Thomas (Syria: Khanasser Valley sub-project);
- Mr. Mohamed Ouessar (Tunisia: Zeuss-Koutine Watershed Area sub-project);

*Note: the following Team Leaders were unable to attend*

- *Dr. Wang Tao (China: Heihe River sub-project) was unable to attend for personal reasons;*
- *Dr. Jiang Gaoming (China: Hunshandake Sand/Xilin Gol Biosphere Reserve subproject) was prevented from attending due to logistical reasons;*

- *Prof. Sayyed Ahang Kowsar (Islamic Republic of Iran: Gareh Bygone Plain subproject) was prevented from attending due to the late arrival of his passport;*
- *Dr. Muhtor G. Nasyrov (Uzbekistan: Karnab Chul sub-project) was unable to travel to the workshop for health reasons.*

b) Project Core Management Group

- Dr. Richard Thomas (ICARDA Headquarters, Aleppo);
- Dr. Thomas Schaaf (UNESCO Headquarters, Paris);
- Prof. Iwao Kobori (UNU Headquarters, Tokyo);
- Dr. Zafar Adeel (UNU-INWEH, Hamilton);
- Dr. Rudy Herman (Flemish Government of Belgium, Brussels);
- Ms Cathy Lee (UNESCO Headquarters, Paris);
- Ms Caroline King (UNU-INWEH, Hamilton).

c) Belgian Experts

- Prof. Donald Gabriels (Ghent University);
- Prof. Dirk Raes (K.U. Leuven).

d) Other participating experts

- Mr. Andreas Schneider (Clear Water Solutions, Switzerland)
- Dr. Abdin Salih (UNESCO-Tehran Office)
- Mr. Jorge Sequeira (UNESCO-Islamabad Office)

e) Local participants

- Ch. Muhammad Amin (WAPDA Pakistan)
- Dr. Abdul Majid (ICARDA Pakistan)
- Mr. Faisal Farooq Khan (WWF Pakistan)
- Mr. Malik Abdul Qadir (Dryland farmer, Balochistan, Pakistan)
- Mr. Faqir Nusrat Hussain (Chairman Sindh Commerce of Agriculture, Pakistan)
- Dr. Manzoor Ahmad Malik (PCRWR)
- Mr. Muhammad Khan Marri (PCRWR)
- Mr. Abdul Raof (PCRWR Pakistan)
- Mr. Abdul Jabbar Khan (PCRWR)

f) Organizers

- Dr. Ashfaq Ahmed Sheikh (PCRWR)
- Dr. Muhammad Akram Kahlowan (PCRWR)
- Dr. Muhammad Akram (PCRWR)
- Mr. Zamir Ahmed Soomro (PCRWR)
- Ms Sonia Lioret (UNESCO Pakistan)

## **Opening Session**

Participants were welcomed to the workshop by Dr Zafar Adeel (UNU-INWEH); Mr Jorge Sequeira (Director of the UNESCO-Islamabad Office); Dr Rudy Herman (Flemish Government of Belgium); Prof. Iwao Kobori (UNU); Dr Richard Thomas (ICARDA); Dr Thomas Schaaf (UNESCO-MAB); Dr Muhammad Akram Kahlowan (PCRWR) and Ch. Nouraziz Shakoor Khan, Federal Minister for Science and Technology, Pakistan.

## **Overview Presentations**

### ***SUMAMAD project directions***

The SUMAMAD project was introduced by Dr. Thomas Schaaf (UNESCO, Paris). Dr. Schaaf reflected on the progress of the project, from a 'soft start' in 2002, to its beginning in earnest in 2004. Dr. Schaaf observed that at the end of 2005, the project was well established, and that in 2006, it would be ready to bring its findings to a wider audience. During 2006, a number of international conferences will be held to mark the International Year of Deserts and Desertification (IYDD), providing a timely opportunity for the project to achieve visibility in the global arena. He referred in particular to the international scientific conference on "The Future of Drylands", which will be held in Tunis from 19 to 21 June 2006, and at which the SUMAMAD Project could showcase its activities to a global audience(see below). Further initiatives aimed at raising the profile of the SUMAMAD project were also outlined by Dr. Schaaf. These included an information management strategy and a brochure developed for the project by Ms Cathy Lee. Dr. Schaaf highlighted the recent publication of the proceedings from the Third SUMAMAD project workshop, held in Djerba, December 2004, and consulted participants to ascertain views on the publication of proceedings from the present meeting. Participants indicated their unanimous support for the production of the 2006 proceedings to be undertaken by PCRWR.

Dr. Zafar Adeel (UNU-INWEH) presented a review of existing and emerging frameworks for assessment of sites in marginal drylands. Dr. Adeel emphasized the relevance of the SUMAMAD project to current global initiatives on dryland assessment, and highlighted the synergies between the project and several other major initiatives in this area. The first initiative to be highlighted by Dr. Adeel was the publication in 2005 of the Millennium Ecosystem Assessment report on Global Desertification. These publications have provided conceptual tools and findings, particularly concerning the relationship between ecosystem services and human well-being in drylands, which can be of use to strengthen the SUMAMAD assessment framework. The SUMAMAD project seeks to develop a comprehensive, generalized methodology to understand the state of key ecosystem services, to evaluate socio-economic impacts, particularly on livelihoods and to assess the effectiveness of management approaches. This framework will enable comparisons of progress made at the different project sites, and by the project as a whole over its duration.

Dr. Adeel also introduced a new GEF initiative, which began in 2005, to which the SUMAMAD assessment framework can make a direct contribution. The GEF Interagency Project on Knowledge Management for Land (KM:Land) is setting out to develop a conceptual framework that describes sustainable land management and will lead to development a comprehensive set of indicators. This project will then formulate a Learning Network that captures and distills knowledge, disseminates lessons, and increases opportunities for innovation in land degradation mitigation. KM: Land will also seek to strengthen capacity for adaptive management leading to enhanced effectiveness and impact on

ecosystem integrity, stability, functions and services and enable monitoring and evaluation of the local and global impacts and performance of sustainable land management activities. Dr. Adeel observed the clear synergies and overlap between the SUMAMAD project and the KM:Land project objectives, and indicated that SUMAMAD participants should be involved in the KM:Land capacity development activities, expert panels, learning network and international events.

A number of the workshop participants took the opportunity to reflect on issues concerning assessment frameworks for drylands. Dr. Rudy Herman (Flemish Govt. Kingdom of Belgium) raised the issue of integrated models addressing the dynamics between carrying capacities at different levels. Dr. Richard Thomas (ICARDA) reviewed progress made over the past decade in the development of assessment frameworks for sustainable land management, and underlined the need for such frameworks to demonstrate to policy makers the full cost of doing nothing about land degradation. The emphasis on human well-being that has been incorporated into recent assessment efforts, such as the MA and KM :Land, is seen as the most effective way to convey this message. Dr. Boshra Salem (University of Alexandria) on the MA findings and their relevance to policy makers. In this regard, Dr. Salem indicated that she had translated the MA desertification synthesis report into Arabic, and that UN ESCWA Beirut had launched an initiative to identify successful interventions to reverse land degradation, and to assess the extent to which they are included in National Action Plans.

### ***Expert presentations***

Prof. Dirk Raes (K.U. Leuven) presented a computer program to simulate the increases in crop output per unit of water, called "Aquacrop". Prof. Raes highlighted the extent to which the more efficient allocation of water resources for irrigation can help to improve food production in the face of competing demands for water. The program is a tool to develop guidelines for the production of 'more crop per drop'. It relies on a series of simple input variables, including weather conditions, crop and soil type, as well as irrigation, to create a simulation of crop production. Prof. Raes described the application of the model to develop irrigation strategies under water deficit conditions and to find the most suitable crop calendar. This was illustrated by Prof. Raes with a case from Bolivia. This presentation was received with considerable interest by workshop participants, who found that the software could represent a useful analytical tool for application at their research sites. Questions raised concerned its applicability for different crops, including indigenous shrubs. Prof. Raes discussed the models adaptation for use for most crops, with the exception of fruit trees, which are affected by levels of water stress experienced in previous years that are not included in the current model.

Prof. Donald Gabriels (Ghent University), in his expert presentation, focused on aridity and precipitation indices, through the discussion of a case study in Yazd, Iran, that is currently being investigated by two PhD students. This presentation was selected by Prof. Gabriels following the observation of a lack of climate data for simulations presented during the previous SUMAMAD meeting for the project research site in Tunisia. The collection of data on precipitation can be used to delineate precipitation zones in order to identify irrigation zones and water harvesting systems. Prof. Gabriels stressed that problems relating to the lack of data for such studies are experienced in many parts of the world –including countries such as Belgium. In light of this problem, Prof. Gabriels offered an overview of five aridity indices that can be of use to researchers in order to assess aridity. These included the De Martonne Aridity Index, the Emberger Aridity Index, the UNEP Aridity Index, the Thornthwaite Classification and the Gaussen-Bagnouls Classification. Additional indices for rain

distribution and rain concentration highlighted by Prof. Gabriels were the Modified Fournier Index (MFI) and the Precipitation Concentration Index (PCI). The varying characteristics of these indices were considered with reference to their application at the study site in Yazd. The results obtained using all five indices were relatively similar, although the Gaussen-Bagnouls Classification gives a more precise climatic classification, indicating in this case that the climate of Yazd is characterized by an arid period of 11 months, with one semi-humid month and no humid months.

These expert presentations were complimented by a training session, held on the final day of the workshop on frequency analysis of climatic data (hydrological and rainfall data), moderated by Prof. Dirk Raes. This training was warmly received by SUMAMAD project members and members of staff of PCRWR. All participants found it useful and relevant to their work.

An expert training session on the use of satellite imagery was presented by Dr. Boshra Salem (University of Alexandria). This training offered insights into the analysis of satellite images that will be of considerable use to the project research activities. It will be complimented by the distribution of satellite images of the project sites that have been obtained for the project by UNESCO from NASA. Dr. Rudy Herman (Flemish Govt, Kingdom of Belgium) commented on the notable potential of remote sensing as a useful tool for the SUMAMAD project and indicated that a distinct area in the Flemish Government trust funds would be devoted to this topic under their next phase.

#### ***Informational presentations***

Presentations were made to the meeting concerning activities of relevance to the SUMAMAD project. These included presentations from IUCN Pakistan, Government of Pakistan, and from the UNESCO Regional Office concerning the launch of the G-Wadi network.

## **Review of SUMAMAD Activities in 2005**

### ***Overview of 2005 Country Reports***

Ms. Caroline King (UNU-INWEH) presented a review of the work carried out within the SUMAMAD project during 2005. This presentation focused in particular on the identification of practices for sustainable soil and water conservation and their testing and promotion with local communities, as well as the exploration of one to two income generating activities at each SUMAMAD study site, based on the sustainable use of dryland natural resources. These activities were explored by the study teams, in conjunction with complimentary research and training activities, including socio-economic surveys, environmental data collection and capacity building activities. The management practices that were explored, encompassed practices for water management, management of land and soil, rangeland rehabilitation and management and income generating activities. These practices are combined to form the overall management approach at each site. Exploratory activities undertaken during 2005 have ranged from feasibility studies to the design and construction of new and improved water management systems and scientific evaluation of their performance. Numerous experiments have been carried out by the research teams, working together with local farmers, in order to improve soil and water conservation and various different methods have been used to evaluate improvements in rangeland management and rehabilitation. Regarding income generating activities, explorations have proceeded at varying speeds across the project, with some teams focusing on one or two activities, while others were still exploring a larger

number of possibilities with local communities. At a number of study sites, results were already reported in 2005 concerning income generated from the project activities.

With regard to the evaluation of the overall success of the project in achieving its objectives, a number of the project sites had already proposed relevant indicators in their annual reports for 2005. These ranged from the quantification of ecosystem services such as biomass production, carbon sequestration, nutritional plants for grazing animals, volumes of milk production, groundwater recharge and water storage, to effects on human well-being such as income generation and diversification, economic and social development. Comments offered by participants on this presentation concerned the need to differentiate between the presentation of outputs and outcomes of the project.

### ***Presentation and discussion of SUMAMAD Country Reports***

Country reports were presented from the SUMAMAD study sites in Pakistan, Egypt, Jordan, Tunisia and Syria. Notable achievements were reported from each of the study sites concerning the exploration and promotion of traditional and innovative practices for dryland management. Mr. Mohamed Ouessar (Zeuss Koutine Watershed) reported on activities for the evaluation of traditional and innovative techniques in the restoration of degraded rangelands, ranging from natural restoration and replanting to the application of olive oil waste ('margine') to the soil. Innovations in the design of groundwater recharge wells were also showcased from this site, while explorations of the traditional practices in the use of small dams for groundwater recharge were undertaken by Dr. Richard Thomas and his research team through consultations with local communities (Khanasser Valley Integrated Research Site). Dr. Sayyed Ahang Kowsar (Gareh Bygone Plain) received the UNESCO Great Man-Made River International Prize for Water (2005) for his work on artificial recharge of groundwater. Dr. Muhammad Akram Kahlown (Dingarh/Lal Suhanra Biosphere Reserve) reported that his team had undertaken a successful pilot project on saline fish farming. This study had indicated that the overheads for a one acre fish farm were 78,000 rupees, while the income could amount to 100,000 rupees. Considerable net profits of 22,000 rupees per acre could therefore be anticipated from fish farming implemented within the framework of integrated dryland farming activities. Further discussions of this strategy took place during the field visit to the fish farming experiment at the PCRWR research station. Dr. Boshra Salem (Omayed Biosphere Reserve) and her team achieved excellent results with a pilot project on the use of solar powered desalination units installed on the roofs of houses to provide drinking water to dryland dwelling households. The quality of water provided by these units was warmly appreciated by local communities. Mr. Me'en Smadi (Dana Biosphere Reserve) reported on the continuing progress on the development of olive oil soap at the Dana Biosphere Reserve.

The discussion of the country reports focused on the potential for transferring technologies between sites. Of particular interest were the solar energy technologies that had been explored at the Omayed Biosphere Reserve study site in Egypt. Such technologies were considered to be of potential relevance to many of the other SUMAMAD sites. Discussions focused on the feasibility of using solar power for pumping as well as desalinating water, and for drying fruits. A systematic evaluation of relevant technologies was called for, including exploration of traditional techniques with local communities and an economic analysis of the costs and benefits of all alternatives.

Some common problems experienced at several of the study sites were identified, particularly concerning the expectations of local communities for material assistance through the SUMAMAD project. In both Egypt and Tunisia, these had been found to be extremely high, and Team Leaders had to work hard to explain the scope and objectives of the project to local people in order to gain their trust and cooperation. It was observed that all Team Leaders could benefit from an opportunity to discuss the problems that they had encountered in working with local communities, and the strategies that had been used to overcome these difficulties successfully. This discussion may be included in forthcoming meetings. For the coming year, Dr. Thomas Schaaf (UNESCO) called on all Team Leaders to focus on one or two income generating activities with local communities only, in order not to raise wider expectations too far, and to achieve measurable results within the timeframe of the project.

A number of comments were put forward concerning the presentation of Country Reports in future years. Dr. Boshra Salem (Omayed Biosphere Reserve) indicated that insufficient time was allocated to the country reports. Other participants agreed with this observation and added that time for discussion was also too short.

### ***Review of implementation of the SUMAMAD Project in 2005***

During 2005, the SUMAMAD project made considerable achievements, as demonstrated by the country reports. A number of problems were also encountered in the implementation of the project. In Pakistan, a major earthquake severely affected project reporting activities and the scheduling of the annual Project Meeting. Sympathies were expressed by all members of the project to colleagues in Pakistan for the suffering caused by this disaster in their country. In Iran, the project team had also experienced difficulties in their efforts to gain approval from local communities for the implementation of project activities. These problems had delayed the implementation of activities and the submission of reports. Nevertheless, the Iranian and Pakistani teams had remained in communication with the Management Group in order to overcome these setbacks and to enable the continuation of the project activities. The Management Group was appreciative of these efforts made under difficult circumstances.

In a few other cases, however, delays to project implementation and reporting were caused by avoidable communications failures; for example, changes to email addresses, lack of email communication, failure to use couriers for the transmission of important documents and failure to comply with project reporting requirements. It was emphasized that the project implementation can be further improved through due diligence on part of all the partners. In particular, it was noted that all project activities should be scheduled to be completed in good time before the required reporting deadlines.

### **Future Activities of the SUMAMAD 2006-**

#### ***Identification of training and capacity building needs and opportunities for 2006***

The following needs and opportunities were identified by SUMAMAD Team Leaders and experts:

- Omayed Biosphere Reserve offered to welcome anybody who would like additional information about solar desalination – either by visits or training. Training needs identified concerned the preparation of products to marketable standards
- Zeuss Koutine Watershed reported 3 main areas of training needs: groundwater recharge, solar energy and management of ecotourism sites.

- Dana Biosphere Reserve indicated that a second training would be held for staff on the development of olive oil soap products. In addition, training is needed in order to prepare and implement a grazing plan.
- Pakistan Council for Research on Water Resources offered to provide training on rainwater harvesting, groundwater recharge, sand stabilization, and rehabilitation of rangelands to members of the SUMAMAD project, as required.
- Dirk Raes (K.U. Leuven) indicated that the Belgian Government offers Scholarships for a two-year Masters Degree to qualified candidates. 25 Students are selected each year. Information is available on a website. This will be linked from the SUMAMAD homepage.
- Richard Thomas (ICARDA) will circulate a list of courses offered in 2006-02-08
- IUCN Pakistan affirmed their willingness to receive study visits from SUMAMAD participants.

#### ***Additional training and capacity building activities proposed for the future***

Mr. Mohamed Ouessar (IRA) raised the question of facilitation and support for exchanges between study sites. He gave the example of a trip to Dana Biosphere Reserve that he had wished to arrange for members of his study team, but which did not materialize for technical reasons.. Mr. Ouessar proposed that his institution could cover the costs of air-tickets for such a visit, and requested that the SUMAMAD project might then cover the additional local costs. Other expressions of interest in exchanges within the project were voiced by Dr. Boshra Salem (University of Alexandria), who wished to consider sending a Team Member to study fish farming methods in Pakistan.

Mr. Me'en Smadi (Dana Biosphere Reserve) suggested that the SUMAMAD project might facilitate the exchange of relevant expertise to undertake activities at the project sites. As an example, he referred to the search for qualified independent agencies to conduct socio-economic surveys at the Dana Biosphere Reserve, and suggested that the SUMAMAD project could assist in the identification of such expertise.

#### ***Workplans for the SUMAMAD Project in 2006***

Dr. Thomas Schaaf (UNESCO) announced that the budget for project activities during 2006 will be the same as that for 2004. This is less than the budget for 2005, because during that year there were extra funds available, due to the delay in the start to the project the previous year. Project funds for 2006 will be transferred to the sub-projects by UNU-INWEH in early 2006. In the meantime, activities should proceed as planned, without waiting for the arrival of funds. Workplans for 2006 were outlined to the Management Group by the Team Leaders.

The Management Group agreed that financial reports should demonstrate counterpart funding and complimentary relationships to other activities also taking place at the study sites. This is appreciated by donors, and will be of relevance to discussions concerning the future of the project. The report presented to the Project Meeting from the Dana Biosphere Reserve should be viewed as an example for the reporting of counterpart funding, in which relatively small amounts of counterpart funding were also captured.

The need for the participation of local and national officials in the SUMAMAD National Seminars was raised. Team Leaders discussed the difficulties that they had faced in making the project visible to them. In this regard, Dr. Richard Thomas (ICARDA) emphasized the need to inform UNCCD focal points of the project activities in each country. UNESCO and

UNU-INWEH indicated their willingness to assist Team Leaders in their efforts to approach officials, focal points and other policy-makers through the provision of letters of introduction and support to be addressed to relevant individuals as identified by the Team Leaders.

#### ***Fifth SUMAMAD Project Meeting, 2006***

The Secretary General of the Chambers of Agriculture of Pakistan affirmed the willingness of Pakistan to host future meetings for the SUMAMAD project. Two further offers were received from Syria and China. It was agreed that the workshop should be held in a different location each year, and in light of this, the project should wait some time before taking up the welcome opportunity to return to Pakistan. Furthermore, due to the scheduling of the IYDD Policy Conference in December, 2006, it was concluded that the ideal time for the Project Meeting to be held would be November, 2006. Since this time of year is too cold for visiting Inner Mongolia, Syria was selected to be the venue for the meeting at the Khanasser Valley Integrated Research Site. Dr. Richard Thomas (ICARDA) welcomed this decision, and requested participants to forward suggestions for training activities to be incorporated into the workshop to him by February 28<sup>th</sup>, 2006. The offer from China to host the Project Meeting would be welcomed next year for the final meeting of the project. Dana Biosphere, Jordan, also indicated their willingness to host the final meeting in 2007.

Participants at the workshop stressed the need for all Team Leaders to be present during the Project Meeting. It was agreed that in the event that Team Leaders are unable to attend, that they should ensure that another member of their team is present in their place.

Dr. Boshra Salem (University of Alexandria), highlighted the need for increased recognition of the contributions of Team Members, as well as the Team Leaders during the Project Meeting, and called for them also to be invited, if possible. Mr. Mohamed Ouessar (IRA) proposed to support one or two additional participants from his research team to attend the next Project Meeting with support from the budget of IRA. It was suggested that a larger meeting might be held at the end of the project in 2007 in order to enable more members of the project teams to be present.

Regarding the programme for the Project Meeting, it was suggested that an effective strategy would be plan for thematic presentations, rather than lengthy country reports (this was also suggested during the 2004 SUMAMAD Project Meeting). Thematic technical roundtable discussions with experts were also requested in order to make full use of their expertise and advice on problems encountered at the study sites. Additional resource persons with expertise in socio-economic research methods should be invited to participate in the Project Meeting. The Management Group agreed to discuss the programme for the workshop, and then to circulate it to participants before the meeting.

Dr. Richard Thomas (ICARDA) observed that the scheduling of the field visit in the middle of the workshop was successful. Other participants called for more background information to be presented before the field visit took place.

Practical information concerning travel to Syria will be circulated closer to the meeting date by ICARDA. However, Dr. Thomas took the opportunity to issue an early warning to participants that holders of passports containing Israeli stamps cannot be allowed into Syria. He advised any person whose passport contains such a stamp to be aware that they would have to apply for a new passport well in advance of the meeting date.

### ***Contributions to activities during the International Year of Deserts and Desertification (IYDD)***

SUMAMAD participants were encouraged to highlight their achievements through participation at international meetings during IYDD. These include two meetings for which support may be made available to them through the SUMAMAD project by the Flemish Government:

- International Scientific Conference on ‘The Future of Drylands’, to be held in Tunis, Tunisia, 19-21st June 2006
- International Policy Conference on ‘Desertification and the International Policy Imperative’, to be held in Algiers, December 2006

Dr. Thomas Schaaf enumerated the objectives and themes of the IYDD Tunis scientific conference, which is to be organized by UNESCO, together with numerous international partners (detailed information is available at:

[www.unesco.org/mab/ecosyst/futureDrylands.htm](http://www.unesco.org/mab/ecosyst/futureDrylands.htm)).

A scientific committee has been established for this conference, including a number of experts who are already associated with the SUMAMAD project. This committee will review abstracts submitted to the conference based on merit. Abstracts from SUMAMAD participants will be warmly welcomed. Early submission of abstracts is recommended in order to enable their approval by the selection committee.

### ***Dissemination activities***

A draft flier on the SUMAMAD Project was circulated by UNESCO for comments and corrections from project members. This flier will be an important tool in the project dissemination strategy. UNESCO also showcased a new website for the project, to be housed within the UNESCO Man and Biosphere homepage. Concerning the creation of a distinct identity for the project, UNESCO presented a logo that had been designed for the project. This was warmly approved by project participants.

Publications by the project so far have consisted of the proceedings of the Project Meeting, complimented by scientific publications made by the research teams. These will be collected and listed on the project website. In 2006, the proceedings of the Project Meeting will be produced by PCRWR. Further dissemination opportunities arising in the International Year of Deserts and Desertification will include the two conferences mentioned above, as well as other IYDD events.

During the next year of the project, a final project publication will be developed. This will include a synthesis of the project findings. With regard to the development of this publication, Dr. Akram Kahlowan (PCRWR) proposed that each Team Leader should write a synthesis of all activities undertaken during the project, including a review of achievements as well as the identification of grey areas requiring attention during a future phase of the project. These reports should then be reviewed by the Management Group and experts. This strategy, and the further development of the final publication will be discussed during the next Project Meeting in Aleppo during November 2006.

### ***Preparation for future phase of SUMAMAD 2007-***

Dr. Rudy Herman (Flemish Government of Belgium) called on the project members to prepare a proposal for the future phase of SUMAMAD beyond 2007. The proposal should include a timetable and activities. It might allow for participation of additional study sites, and greater participation by at least two team members from each site at the Project Meetings. Further suggestions for the development of the proposal for the next phase should be discussed during the next Project Meeting.

## **Discussion of the Field Visit**

### ***Overview of the visit***

Participants in the field visit were highly impressed by the organization of the visit, and by the staff members of PCRWR that they met. They also appreciated the opportunity to meet with some local people at the research site. The field visit focused on the many impressive achievements that have been made at this site in improving scientific management practices.

### ***PCRWR research station at Dingarh***

The field visit included viewing of water storage in traditional ponds and new scientifically constructed ponds. Participants expressed interest in the high rate of evaporation from open ponds for water storage in dry areas, and discussed strategies to reduce water losses, such as the use of wax blocks, covers or underground storage cisterns. Regarding the losses of water from seepage, PCRWR described a shift in strategy that had occurred from initial attempts at prevention of such losses through the use of plastic lining beneath the kunds, to the recognition of the value of groundwater recharge and storage below the ponds because this creates lenses of clean water that can be pumped for convenient use.

The considerable improvement in the availability of water resources that has been achieved by PCRWR led participants to reflect on the need to use the water resources for sustainable activities, with consideration given to water use efficiency. Some concerns were raised regarding potential problems of overstocking that might be caused by the improved availability of water for livestock. The selection of suitable crops was also discussed. Water efficient and salt tolerant species might be considered better adapted to the dryland conditions of the Dingarh site than cotton and rice crops. Water budget studies were recommended as a relevant tool for the evaluation of crop selection, as well as to determine losses of water due to storage methods and to quantify groundwater recharge rates. Socio-economic studies on water use efficiency were considered relevant by participants. Studies on salt accumulation were also recommended by expert participants in areas where conjunctive use of saline waters is adopted for irrigation.

Participants were interested to view the successful pilot project for saline fish farming that was described in the Country Report of Pakistan to the SUMAMAD project. Questions concerned many aspects of the suitability of fish farming for dryland communities. These included concerns relating to health issues and diseases that can appear in fish farms several years into implementation, cultural issues concerning the dietary habits of dryland people and their acceptance of fish, and ecological issues concerning the introduction of exotic fish species into dryland ecosystems. PCRWR affirmed that alternative species of fish would be investigated, along with the other issues mentioned.

The adoption of the fish farming activities within the framework of integrated farming activities was much admired by participants. They encouraged PCRWR to consider further investigation of the socio-economic benefits and impacts of such strategies on local livelihoods, diets, migration and development levels. Suggestions put forward by participants regarding the integration of additional activities to the demonstration sites included the use of waste products from nearby agroindustrial activities for supplementary feed sources.

### ***Lal Suhanra Biosphere Reserve***

Participants admired the foresight of the Government of Pakistan in establishing the Biosphere Reserve, and its efforts in reintroducing rare species. It was recognized that the management of the Biosphere Reserve had changed over the years, and that there was an opportunity for the UNESCO Man and Biosphere Programme to contribute to its strengthening through an institutional review process that would be undertaken by the park management.

Participants observed that wood resources from a portion of the original Biosphere Reserve area are currently being used for income generation purposes. The use of a mixed forest for this purpose was appreciated as a more sustainable alternative to the monocropping that is practiced in other forests. The desirability of diversification from the wood production strategy was discussed. Questions were raised concerning the suitability of exotic tree, crop and livestock species that had been introduced at the reserve. In many other dryland areas, indigenous species have been found to be more sustainable and better-adapted than non-native species.

### ***General conclusions from the field excursion***

- The strong scientific cooperation between the two sites was commended by participants. Observations were presented concerning the complementarity of approaches and scope for further exchange of knowledge on groundwater recharge, water use efficiency and selection of appropriate indigenous species
- Participants were interested to learn of PCRWR's strategies for scaling out technologies and making them available to local communities. This is facilitated by the selection of demonstration sites in areas where they can be viewed and replicated by many communities. PCRWR observed that the replication of sustainable land management strategies could be encouraged by offering tenure of land to local people so that they would see more of an incentive to improve their stewardship of the land.
- The opportunity for education and outreach to local communities through an education centre was noted by participants. Such a centre is currently being planned by PCRWR in the form of a dryland management desertification research institute to be established at Bahawalpur.
- A number of opportunities for student research projects were identified by the international experts in the SUMAMAD project team.
- Further study and training visits to the research sites from SUMAMAD project members were proposed.