

**The Final Workshop of
Land Degradation Assessment and Monitoring for Sustainable Land Management
and Climate Change Adaptation in South Asia
(TCP/RAS/3312)**

**Venue:
Imperial Chiang Mai Resort
Chiang Mai**

13-14 December 2013

**FAO Regional Office for Asia and the Pacific
Bangkok, Thailand**

1. Introduction

Land degradation (LD) is a ubiquitous phenomenon and that deprives ecosystem services to mankind. Major threats of LD include declining land productivity leading to reduced food production, threats to livelihood of vulnerable groups and loss of habitable lands. However, these threats vary with the nature of LD.

The project on Land Degradation Assessment and Monitoring for Sustainable Land Management and Climate Change Adaptation was initiated as a technical cooperation project, after the meeting held at the Asian Institute of Technology 30 March 2010, where country representatives presented the status, the quality and management of land resources in each of the four participating countries – Bangladesh, Bhutan, Nepal and Sri Lanka. They demonstrated land degradation as a serious concern because of the additive pressures of increasing population, and the subsequent need to expand agricultural production, in particular, expansion to marginal areas and the conversion of prime agricultural lands to non-agricultural uses, such as urban expansion and biofuels.

This necessitated exploration of science-based solutions before the situations in the four countries become unmanageable. Experience gained and protocols developed on land degradation assessment (LADA) in dry land tested in six pilot countries - South Africa, Tunisia, Nigeria, Cuba, China, Senegal were determined to be tested in the four project countries in the proposed project.

1.1 Project Objectives

The objectives of LADA project were to:

- 1) Develop and test an effective assessment methodology for LD; and,
- 2) Assess land degradation at global, national and sub-national levels to,
 - a) Identify the status and trends of land degradation;
 - b) Identify hotspots: areas with greatest land constraints, the actual degradation in such areas, and areas under risks of degradation, drought or floods;
 - c) Identify bright spots: areas where the degradation has been slowed or reversed through conducive policies and actions; and,
 - d) Build national, regional and global assessment capacities to enable the design and planning of interventions to mitigate land degradation and establish sustainable land use and management practices.

The project was initially planned to be commenced in November 2011; however, due to the threats of natural conditions, it was launched in March 2012, with the inception meeting held in Kunming, China where all the planning and implementation procedures were determined. Following the inception meeting, four regional training workshops were held in Sri Lanka (28-31 Aug 2012), Nepal (20-24 March 2013) and Bangladesh (14-18 July, 2013) and Sri Lanka (30 Sept-2 October 2013). Each country held national training workshops starting from second regional workshop to training technical working group (TWG) members. In the meantime, each country was provided with requested material to carry out project activities.

The project had three outputs: 1) formulating national and regional Land Degradation Assessment and Climate Change Technical Working Groups (TWG) in project countries, 2) training TWG members in LADA methodologies and tools to establish national LADA databases, and, 3) creation/preparation of National LADA database in each country and use for climate change impact assessment and planning for national and sub-regional climate change adaptation.

In order to ensure the achievement of above outputs, project training was conducted by LADA Experts from National Bureau to Combat Desertification (NBCD), State Forestry Administration (SFA), China. The first two regional training workshops provided basic concepts of LADA from global and regional points of view together with commonly used standard software, while the third and fourth regional workshops concentrated on national assessments and report preparation, respectively. These training programs developed technical capacities of the participating countries and exposed participants to different types of LD and sustainable land management measures adopted in three project countries. Although four countries participated up to the second regional workshop, Bhutan withdrew from the project after the second regional workshop due to unknown reasons. Since then, Bangladesh, Nepal and Sri Lanka continued with the rest of the project activities.

Currently, the project duration of two years has come to an end. Therefore, there was a necessity to hold the final workshop and review results in terms of expected outputs and activities, and compile lessons learned and experience gained with respect to the adoption of LADA methodologies in other countries. The final workshop was scheduled on 13 and 14 December 2013 in Chiang Mai, Thailand. The venue is the Imperial Chiang Mai Resort & Sports Club in Chiang Mai.

2. Objectives of the Final Workshop

The main objectives of the final workshop were to:

- 1) review and assess overall results in terms of expected outputs and activities completed during the project;
- 2) compile experience gained and lessons learnt with respect to adoption of LADA tools and methodologies as well as sustainable land management (SLM) in the three countries;
- 3) review and compile recommendations for policy decisions to enable use of LADA tool for future assessment and monitoring LD and develop and identify best practices for reducing SLM; and,
- 4) discuss modes of continuation of LADA tools assessments and monitoring for sustainable land management after the current project is completed, and plan for future needs.

In addition, the workshop also aimed to discuss the formation of inter-country technical working groups for networking among the three project countries, as well as the six pilot countries for information sharing. It also aimed to discuss the expansion of experiences with and promoting efforts among other countries to reduce LD, enhance productivity of agricultural lands, food security and livelihoods of farming populations.

3. Main activities

The main activities of the final workshop comprised of opening session followed by regular sessions (four sessions in total) to present and discuss project results, lessons learnt and recommendations. The last half of the second day was used for an observational visit to a SLM adopted site. The following describes the main activities of the workshop. The program of the final workshop is in Annex 1.

3.1 Participation

Twenty persons attended the workshop - three continuing participants and two policy level persons participating from each country, except from Bangladesh (only the Additional Secretary to the Ministry of Agriculture attended), three members from the National Bureau to Combat Desertification, State Forestry Administration, China, and an Expert from Land Development

Department, Regional Office 6, Chang Mai as a special invitee, Land Management Officer, and International Consultant (SLM) from FAO Regional Office in Bangkok, Thailand. Participants from Bhutan were absent in the final workshop as in the third and fourth workshops. The list of participants is in Annex 2.

The workshop has been planned in such a way that there were presentations on project results, lessons learnt and future planning of LADA and SLM activities in the three countries. The afternoon session on the second day was assigned to will visit Nong Hoi Royal Project in Chiang Mai, where multi-interventions have been developed, tested and successfully implemented towards SLM together with the Land Development Department, Thailand.

3.2 Opening Session

The meeting was held on the 13 and 14 of December 2013 at the Imperial Chiang Mai Hotel, Chiang Mai, Thailand (Workshop Programme is in Annex 1). Dr. Yuji Niino was expected to deliver welcome speech of the workshop. However, his arrival plans were deferred due to unavoidable circumstances and, as a result, welcome address was made by the International Consultant on his behalf. The latter welcomed all participants and invitees. He mentioned that the project took off the ground with the inception meeting in Kunming, China five months later than the expected date of commencement in November 2011, and hence had only 19 months to do all expected capacity building, conduct inter-country and national training workshops, collate data and data processing, mapping and report preparation. In the meantime, many national holidays, unexpected political interferences, administrative difficulties hampered the engagement of project activities. With all the participants worked outside official hours to ensure completion of project work. This is truly commendable. He also briefed on the history of the project activities in terms of the conduct of national and technical working group training workshops in chronological order. He thanked everyone for their undue efforts extended to the project, and to him for coordinating the project, which contributed to the success of the project.

Dr. Luo Bin, Deputy Director General of the National Bureau to Combat Desertification (NBCD) , State Forestry Administration (SFA), China expressed his appreciation to the FAO and Thailand as the host country for organizing this workshop. He especially mentioned that the China LADA Experts accomplished the training task with full dedication.

Dr. Luo emphasized that China, similar to other Asian countries, is seriously affected by land degradation, i.e., desertification in the north and rocky desertification in the south. China has made great efforts to build up monitoring and inventory system to grasp the status and trend of various types of desertification. In such process, special thanks were extended for the contribution of LADA, which indeed helped China to enhance the capacity building and create the opportunity to exchange lesson learnt with the international community.

Finally, Dr. Luo expressed his inspirations to expand cooperation to other Asian countries through the platform provided by the FAO, and to call for greater political will among countries to tackle land degradation and climate change impacts.

Although Mr. Promote Yajai, the Director of the LDD Regional Office 6, Chiang Mai was invited as a special guest, he was unable to attend the opening session due to urgent meeting in Chiang Rai. On his behalf, Dr. Kanjana Chuenpichai, an Expert in SLM attended the workshop, and noted that LD is a process that could not be ignored due to its negative influence on food security and well-being of the people. Land Development Department has been continuously monitoring and making every effort to arrest LD in Thailand. Therefore, Thailand has gone a long way not only to reduce LD in the

country, but also has extended the assistance to several countries in the region with long term experience. She expressed fullest corporation to future projects working on reducing LD and developing SLM, and thanked FAO for providing opportunity to participate in the current workshop where lessons learnt, recommendations for future LADA use and policy development are discussed, in particular to learn issues in the region.

At the end of opening session a group photograph was taken and then continued for refreshments.

3.3 Workshop Sessions

In the second session, major activities were to present the terminal statement and conduct discussions. It was necessary to review, improve and agree to the recommendations given in the terminal statement. The International Consultant presented the terminal statement, which included project objectives, outputs and outcomes, activities completed by each country, lessons learnt and recommendations for policy formulations and improvement. The terminal statement presented and agreed is in Annex 3.

Review of four training workshops with respect to Chinese experience of implementing LADA was presented by Mr. Qu Haihua. This presentation was mainly to eliminate doubts regarding the use of tool for LD assessment and monitoring. He invited questions from continuing participants and clarified to ensure future application of LADA tool for reducing LD and adaptation to climate change. The presentation of Mr. Haihua is in Annex 4.

Dr. Zan Guosheng (in Chinese) with the support from Mr. Qu Haihua (English translation given in parallel) provided a technical discussion about LADA implementation (LUS, National Assessment Software and Best Practices collection and compilation, etc). The participants had some doubts on the use of LADA Manual and QM. This presentation provided country participants with clarifications on unclear areas in the overall LADA tool and its application using QM.

The third session was dedicated to presentations and discussions on project performance by the three partnering countries. Dr. Moqbul presented the performance of Bangladesh, and Dr. Kadupitiya and Mr. Subedi for Sri Lanka and Nepal, respectively.

The next session was dedicated to critically examine the lessons learnt from general LD point of view, as well as the appropriateness of the LADA tool for the purpose of assessing LD for future use. Additionally, session focused on identifying specific recommendations from the experiences of the current project to countries, as well as to tool developers for further consideration and improvement. This was a country-wise group activity. The lessons learnt and recommendations included in the terminal statement were provided as a matrix for the three countries. Outputs of these discussions were expected towards land degradation assessments, SLM implementation and institutional and policy support. The findings by each country were presented, discussed and agreed in the morning session of the second day.

3.4 Field Visit

Afternoon on the second day of the program (December 14th) was identified for a visit to an SLM adopted field site, i.e. Nong Hoi Royal Project site with the directive of Mr. Chinapatana Sookvibool, Director, Division of Soil and water Conservation, Land Development Department (LDD) in Bangkok, and with the help of Dr. Kanjana Chenpichai (Expert in SLM) and Mr. Pramote Yajai (Director, LDD Regional Office 6, Chiang Mai).

3.5 Closing Session

The last session focused on discussion on the final report from each country, and future of LADA activities after the project and its support. This discussion required inputs from policy personnel who attended as invitees.

International Consultant, who managed the project on behalf of the Land Management Officer and also the Lead Technical Officer, noted that although the project was meant for a period of two years, the time available to complete all activities was about 19 months. This was remarkable, and could not have been achieved without the fullest corporation of all project personnel. Considering the nature of the project and its contribution to the participating countries, he expressed his due respect and thanks to the FAO, China LADA experts, three continued participants, TWG members and FAO country offices for their excellent corporation to successfully complete all planned activities of the project. He requested everyone to ignore any difficulties and hard feelings, if came across during the project and communications or at any occasion, as that would have occurred when efforts were made for ensuring the successful completion and to reap the benefits of this important project for three countries and also for other countries targeted for future implementation. He also mentioned that it was unfortunate to see that Bhutan participants could not participate in the project activities after the second regional workshop, with all active participation they have taken until June this year, due to unforeseen problems.

Dr. Wickramasinghe, National Project Coordinator of Sri Lanka requested an opportunity to express views on behalf of all three countries, and well as those who were involved in the project throughout its implementation. He noted from his own and also from listening to discussions on other participants' observations that this project gave everyone a valuable tool to intelligently assess land degradation, and to develop measures to arrest it, which is an important need for increasing agricultural production and overall benefits associated with it. He thanked especially the LADA experts for their efforts that provided the opportunity for everyone to learn about this valuable tool, and for being available for future communication. He also appreciated the fine and friendly communication among everyone, their interest in project completion, as well as future networking. He finally thanked to Dr. Yuji Niino for bringing such a useful project to the four countries, and for his facilitation at every point of time in need, and the International Consultant for effective and fine management of the project.

Dr. Yuji Niino stated that he received reports in time from the international consultant, but never anticipated such a fine completion. This is remarkable with the constraints experienced and limited time period. He also requested each country to devise how the tool could be used in the future for reducing LD, and to communicate whenever any further assistance is needed. He thanked all three participants from each country, Steering Committee and TWG members for their efforts and hard work for successfully completing the project activities. Finally, he noted his overall thanks to the International Consultant, Ranamuka without his fine coordination this achievement would have been unimaginable.

The workshop adjourned for participants to join the field trip in the afternoon.

4. Findings

4.1 Presentation of Terminal Statement

International Consultant who coordinated the current project presented in detail, the complete terminal statement, which included project rationale, objectives, outcomes, outputs and activities, performance by each country to accomplish project outputs, overall lessons learnt during project, and recommendations for policy formulation and policy improvement for using the LADA tool for

future sustainable land management. The terminal statement is attached in Annex 5. The expected activities completed under each output by the project countries were presented. The Project had three outputs: 1) Formulating national and regional Land Degradation Assessment and Climate Change Technical Working Groups (TWG) in project countries; 2) Training TWG members in LADA methodologies including the ways to produce LUS, access relevant world databases and tools to establish national LADA databases by QM software; and 3) Creation/preparation of National LADA database and Local LADA assessment in each country and use for climate change impact assessment and planning for national and sub-regional climate change adaptation.

The above outputs were accomplished by completing a number of activities, which are listed in the Terminal report. It was noted that all activities, except the creation of inter-country Technical Working Group, were completed by the three remaining countries. This was deliberately deferred, as the formulation of inter-country TWG needs to be done following the identification and nomination of appropriate members and an active and efficient coordinator by individual countries and informing the FAO Regional Office for Asia and Pacific in Bangkok for networking. Therefore members together with policy personnel were briefed for the selection to be done with the participation of appropriate stakeholders, so as to ensure land management related agencies are sufficiently represented. It was also discussed and agreed that coordination among the inter-country TWGs be done by the FAO RAP Land Management Division until a common mechanism is developed.

Since inputs to the terminal statement were supplied by each country, participants agreed to the content in it without any contradiction. However, international consultant expected each country group to further review and comment on lessons learnt and recommendations from the project for suitable policy formulations and improvement. Therefore, groups undertook further review of the two sections, lessons learnt and recommendations.

4.2 Presentation and Clarifications on LADA Tool and its practical use

On behalf of the China LADA experts, Mr. Qu Haihua presented the Chinese experience of implementing LADA at the national level. His presentation covered three areas, 1) whole picture of LADA and practices adopted in China, 2) institutional arrangement and domestic contribution, and 3) conditions required to mainstream LADA.

In the whole picture of LADA, he mentioned the need to answer several questions. These questions were on the types of LD, location where LD is taking place, the reasons, trends, drivers and impacts, and what has been done and should be done to arrest LD. The core methodology used, DPSIR framework (D=drivers; P=pressures; S= state; I= impact; and R=response), helps understand the whole picture.

He mentioned five steps of doing National LADA: 1) establishment of land use systems (LUS) maps, 2) assessment of LD, 3) assessment of conservation management, 4) expert recommendations, and, 5) local assessments with case studies. Of these five steps, Steps 1 was covered during the first workshop, steps 2-4 were covered in the second and fourth workshops, and the last step was covered in the third workshop.

His presentation illustrated in brief the activities covered. However participants requested clarification on a few unclear areas. One key area was the number of LU units. He mentioned that the number of LU units can vary depending upon the country. He also mentioned that China has around 500 LU Units. But Bangladesh has more than 4000 units. This is acceptable according to Mr. Qu. In fact, there is no hard and fast number on LU units provided that each country identified with the agreement of the TWG members and included in the local assessment manual for continued use.

He presented LD maps prepared for China. These maps showed the LD based on the whole picture. The presentation of Mr. Qu showing all activities adopted in China is presented in Annex 6.

In addition, Dr. Zan Guosheng together with Mr. Qu responded to question related to LADA-Local and QM to ensure participants have properly understood its application.

4.3 Country Presentation of Project Performance

Individual country participants made presentations on activities performed under the project. These activities are also shown in the terminal statement (Annex 5).

Making the presentation for Bangladesh, Dr. Moqbul Hossian mentioned that the presentation includes overall information used in the country. All activities attended were in agreement with the report of terminal statement presented. Maps accessed for weather parameters, drivers and impacts, as well as images of management practices adopted to arrest LD were included in the presentation. Participants agreed to review the lessons learnt and recommendations of the terminal statement from the country's context.

Performance of Nepal was presented by Mr. Tej Bahadur Subedi. His presentation also covered the basic status of the country, as well as project objectives and activities. Detailed activities listed in the Terminal statement were a part of the presentation. In addition, images clarifying the activities conducted, locations and methodologies adopted were presented. Taking the restoration into consideration, the trends in SLM were presented for the period between 1992 and 2012. As lessons learnt and recommendations were pre-exchanged and hence such information remained in the terminal statement. An additional recommendation was the inclusion of SLM into school curriculum, and abandoning planting *Pinus* species in hills due to its negative impacts (i.e. inhibiting the growth of locally adopted species, affecting ground cover formation, and increasing runoff during rainy period leading to heavy soil erosion).

Performance of Sri Lanka was presented by Dr. Wickramasinghe. The information presented included the general situation of the country with respect to agriculture, weather parameters, and the drivers of LD and management practices adopted to arrest LD. The presentation confirmed the contents included in the terminal report. He highlighted the need for formulating an apex body on SLM in the country to drive LADA methodology and SLM activities.

4.4 Group Discussions

The group discussion was primarily arranged among each country group that consisted of three continuing participants and the invited policy personnel. The discussion was oriented towards reviewing and agreeing on both lessons learnt and recommendations included in the terminal statement and suggesting any missing information that should be included. Each country was provided a soft copy containing a matrix of this information. This information was presented during the morning session of the second day.

Based on these presentations, specific missing information on lessons learnt and recommendations for policy formulation and improvement were included in the terminal statement. In addition, less important information was removed. As per information matrix presented and received from each country, participants showed their agreement with the already included information.

4.5 Field Visit

Afternoon on the second day, the participants visited Nong Hoi Royal Project site. Upon arriving at the project site, Mr. Poobet Muangmoon, Chief of the Royal Project in Nong Hoi welcomed the participants. He screened a video for participants to learn about the history of the project.

Nong Hoi Royal project was initiated by His Majesty the King of Thailand for addressing multitude of problems, including peoples hardships associated with difficulty to live without support of required infrastructure and facilities, lack of income generating activities and livelihood opportunities, and unforeseeable future of the inhabitants and their future generations, thus selecting narcotics as a choice for survival, and causing erosion of human qualities, values and degradation of land. The area has been completely transformed towards developing every aspects needed to uplift the well-being of the people with right guidance, and introduction and support on sustainable land management and ecosystem management activities over time. Today, the area is a sample demonstration site in terms of sustainable land management where all essential activities are finely attended and adopted.

Mr. Poobet provided opportunities for participants to be familiar with activities of the Royal Project. He mentioned that farmers are provided with the opportunity of producing farm produce by adopting good agricultural practices (GAP) and selling their produce through the Royal Project, and thus gain a better market and better incomes. On the other hand, Royal Project safeguards consumers by ensuring the quality of the produce.

Answering to questions from the participants, Mr. Poobet mentioned that any farmer can become a member of the Royal Project and agreed to adhere to adopt GAP for which every advice and assistance is provided by the Project. Farm produce is accepted by the Royal Project only from members. This is because the members are required to abide by the conditions stipulated by the project.

With regards to questions posed on pesticide use in fruits and vegetables and its monitoring, Mr. Poobet mentioned that farmers are advised to refrain from pesticide use and adopt IPM practices. The latter does not deny the use of pesticides when there is no other choice. However, Royal project protects consumers by ensuring pesticide residues in produces remain below harmful levels. Two specific groups of pesticides - Organophosphorous and Carbamates, which belong to neurotoxins (both are highly toxic and inhibiting neurotransmission), are regularly monitored in the special laboratory of the Royal Project site with random sampling. The laboratory uses the GT Pesticide Test Kit developed by the Department of Medical Sciences for testing pesticide residues. The produce containing pesticide residues above the safe levels are rejected, and then carefully monitored for production practices. Therefore, certification provided by the Royal Project is accepted by the consumers.

Also the participants had the opportunity to see farm fields in general from Royal Project site, but had no time to visit individual farms. Participants visited the protected cultivation site where crops were grown in net houses, green houses and with hydroponics.

4.6 Future Needs and special suggestions

With respect to future needs, there were several concerns: 1) creation of the inter-country technical working group, and, 2) modalities for continuing LADA activities beyond the current project.

It was felt that networking among the three project countries to share information on LADA and best practices is needed. In addition, six initial pilot countries - Argentina, China, Cuba, Senegal, South Africa and Tunisia have an extensive pool of experience on LADA application. These experiences are important in planning and management for reducing land degradation in other countries. Therefore, creation of inter-country TWG has been included (in Activity 1) in the project document.

As mentioned in the terminal statement, this is the only activity that has not been completed. This was because the identification of right stakeholders and nomination of representatives for an inter-country TWG has to be done by individual countries. Therefore, it was suggested to each country team to take up this matter through the Steering Committee during the presentation and discussion on the terminal statement. The decisions related to who should be nominated and how many people to be appointed have to be taken up by individual countries.

Another concern would be about who should coordinate the inter-country TWG. Most participants think it should be done by the FAO. Yet, like other international committees, coordination role can be given for a country for a few years, and then shift to another country, and FAO can always assist whenever needed.

Second concern was the modalities for continuing LADA activities by individual countries. Several options were mentioned by the country participants, such as mainstreaming the LADA concept into government decision making so that funds for LADA and SLM can be allocated by the governments. This also provides recognition of LADA within the country. The other option is to seek funding from external donors. The three countries already have strong links with external donors. Since the current project has created Steering and TWG committees, already built the national capacities with training, and have a database, it would help continue the current activities for other parts of each country.

The other concern was the completion of a country-level LADA report. Sri Lanka and Nepalese participants have already provided their draft reports, while Bangladesh mentioned that it would be completed and sent within a week.

Based on the communications with country teams, suggestions were received to include two technical persons from each country for the inter-country TWG and the Ministry of Agriculture to be the focal point. However, the former needs to be given due consideration, and one member each from technical and policy areas would seem to be highly cohesive. This would not only allow the technical matters to be handled, but also to identify policy supporting mechanisms to ensure the technical aspects are carried forward effectively.

5. Summary and Recommendations

The TCP Project on Land Degradation Assessment and Monitoring for Sustainable Land Management and Climate Adaptation in South Asia (TCP/RAS/3312) was completed on 30 November 2013. The final workshop of the project was held during 13-14 December 2013 at the Imperial Chiang Mai Resort, Chiang Mai, Thailand. Twenty participants and invitees from Bangladesh, Nepal, Sri Lanka and Thailand attended the final workshop.

Project activities were completed and outputs were achieved by Bangladesh, Nepal and Sri Lanka. However, Bhutan was unable to continue to the end, and hence was not in a position to attend the third Regional Training Workshop and follow up workshops. Bhutan team completed only the formulation of Steering Committee and TWG following the first and second Regional Training Workshops.

The draft terminal statement circulated among participants was presented by the International Consultant, and suggestions were incorporated. Future activities of LADA beyond the current project were discussed.

The three countries completed all project activities successfully, and are currently completing the draft final report.

The participants were provided with the opportunity to become familiar with sustainable land management activities adopted at the Nong Hoi Royal Project in the afternoon of 14th December 2013, and to understand how specific constraints have been addressed by the Royal Project.

The only remaining activity to be completed under this project is the creation of an inter-country Technical Working Group for networking on future LADA activities and exchanging information as and when available. It was suggested to identify the right stakeholders and suitable nominees and to inform the FAO RAP at the earliest. The post-workshop communications have indicated that the Ministry of Agriculture of Bangladesh and Sri Lanka and the Ministry of Agricultural Development of Nepal were chosen to be the focal point, and to appoint two technical representatives from each country to the Inter-country TWG. Taking into consideration the importance of both technical and policy level interventions for implementing sustainable land management practices to reduce land degradation, it is recommended that the composition of each country representation to be such that one member each be appointed from the areas of technical and policy. This would not only allow for technical matters to be handled, but also help identify policy supporting mechanisms to ensure that proposed technical decisions are carried forward effectively with due policy support.

6. Acknowledgments

Yuji Niino (Land Management Officer, FAO RAP) thanked all participants who attended the four regional workshops and the final workshop, and the TWG members for their contributions to the project that led to successful completion of all activities. Special thanks were given to China LADA Experts for training the country representatives on the LADA tool during the four regional workshops, and establishing capacity in the three countries. Appreciation was noted for staff of FAO country offices in Bangladesh, Nepal, Sri Lanka and China for overall communication, timely arrangement of logistics, and assisting regional workshops together with country-level Steering Committee and TWGs, as well as his office secretary Ms. Kanchana Archvaniyut who made it possible to complete the project in time. He also extended his gratitude to National Project Coordinators for efficient coordination within each project country, and completing the project activities including the final report. Finally he thanked S. Ranamukhaarachchi, the International Consultant for coordinating the overall project on his behalf, without whom such a fine completion of the project would not have been imagined.

Annex 1

**Final Workshop of the Project on
“Land Degradation Assessment and Monitoring for Sustainable Land Management
and Climate Change Adaptation for South Asia
(TCP/RAS/3312)”**

Venue:

The Imperial Chiang Mai Resort & Sports Club
284 Moo 3, Don Kaew, Chiang Mai - Fang Rd., Mae Rim,
Chiang Mai 50180 Thailand

13-14 December 2013

Workshop Program

Date and Time (hrs)	Topic	Presenter
13 December 2013	Day 1	
Session 1		
8:30-9:00	Registration	
9:00-9:30	Opening address and welcoming participants	Yuji Niino
	Address by DDG, National Bureau to Combat Desertification, State Forestry Administration, China.	LUO Bin
	Address by Director, Land Development Department	Pramote Yajai
	Workshop objectives, and plan of activities	S. Ranamukhaarachchi
9:30-10:00	Group Photograph and Refreshments	
Session 2		
10:00-10:45	Chair Person: Kanjana Chuenpichai	
	Report on project objectives, outputs and accomplishments	S. Ranamukhaarachchi
10:45-11:15	Review of 4 training workshops and Chinese experience of implementing LADA	Qu Haihua
11:15-11:45	Technical Discussion about LADA implementation (LUS, National Assessment Software and Best Practice collection and compilation, etc)	By ZAN Guosheng , facilitated by QU Haihua-China LADA Team
11:45-12:30	Discussion	
12:30-13:30	Lunch	
Session 3		
13:30-15:30	Chair Person: S.L. Ranamukhaarachchi	
	Presentation and analysis of the LADA results in each country. Bangladesh Nepal Sri Lanka	Bangladesh Nepal Sri Lanka
15:30-16:00	Refreshments	

16:00-17:00 (10 minutes each)	<p>Discussion on lessons learnt throughout the project and suggestions for future adoption of LADA</p> <ul style="list-style-type: none"> - Conducting LADA Assessments - Pilot projects and planning and implementation and experience - National training activities & local assessments - 	<p>NPCs and country participants NPC/Sri Lanka</p> <p>NPC, Bangladesh</p>
17:00	End of the first day	
14 December 2013	Day 2	
Session 4		
9:00-10:00	<p>Chair person : Yuji Niino</p> <p>Group discussion for Future planning for LADA activities in the three countries</p> <ul style="list-style-type: none"> - Land degradation assessments - SLM Implementation - Institutional and Policy support 	<p>Response from three countries and policy level persons</p>
10:00-10:20	Refreshments	
10:20-11:30	Group reporting and plenary discussion and recommendation	All participants
11:30-11:45	Final words and closing sessions	Yuji Niino
11:45-12:30	Lunch break	
12:30-12:45	Checking out (only for those leaving on 14 December)	
12:45	Depart to SLM Demonstration site of LDD in Chiang Mai	
18:00	Return to Imperial Chiang Mai Resort and Sport Club	

Annex 2. List of Participants

Final Workshop on
Land Degradation Assessment and Monitoring for Sustainable Land Management
and Climate Change Adaptation in South Asia (TCP/RAS/3312)

Imperial Chiang Mai Resort and Sports Club
Chiang Mai, Thailand.

13-14 December 2013

List of Participants

	Country and Name	Position and Institutional address	Contact email
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4	Mr. Syed Ali Nasim Khaliluzzaman	Additional Secretary Ministry of Agriculture Dhaka, Bangladesh.	sankzaman@yahoo.com
Nepal			
5	Mr. Surendra Prasad Srivastava	National Project Co-ordinator (NPC), Soil Science Division (SSD) Nepal Agricultural Research Council Ministry of Agricultural Development Nepal	gappu.brj@gmail.com
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Annex 3. Terminal Statement

TECHNICAL COOPERATION PROGRAMME



**LAND DEGRADATION ASSESSMENT AND MONITORING FOR SUSTAINABLE LAND
MANAGEMENT AND CLIMATE CHANGE ADAPTATION**

IN SOUTH ASIA

BANGLADESH, NEPAL AND SRI LANKA

Terminal Statement

prepared for
the Governments of Bangladesh, Nepal and Sri Lanka
by

the Food and Agriculture Organization of the United Nations

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Bangkok, Thailand

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1 INTRODUCTION

1.1 Background

Land degradation, poverty, food security and climate change are few interlinked issues around the world for the last several decades. The Food and Agriculture Organization estimated that nearly 870 million people of the 7.1 billion populations in the world were suffering from chronic undernourishment in 2010-2012, and of which almost all the hungry people (852 million) live in developing countries¹. South Asia alone accounts for 1,476 million of the world's population, of whom 596 million are earning less than USD 1.00 per day. This has already caused pressure on the natural resources and food security of the region.

There is already a total degraded land area of approximately 17.1 million ha in the South Asian region, of which Bangladesh and Nepal constitutes 72% of the total. Together with Bhutan and Sri Lanka, this percentage exceeds 75%. Land degradation (LD) has already led to a decline in agricultural productivity and food production in the region. Other factors contributing to declining agricultural production include deforestation, soil erosion, inappropriate agricultural practices, nutrient mining, and inefficient irrigation water use, which are also the main contributors to LD.

In addition, climate change (CC) also threatens human life and agricultural productivity in many ways. It is continuing and adversely affecting the wellbeing of people around the world. The impacts of climate change, manifested in the form of frequent drought and floods, declining ground cover, sea-level rise and land subsidence, salinization of agricultural lands, changing pest populations and interference with agricultural production are experienced by millions of smallholder farmers in South Asia, as well as around the world. Effects of climate change are also felt by almost every economic sector in South Asia. Therefore, it is necessary to address adaptation to climate change in conjuncture with land degradation in order to benefit already vulnerable populations and future generations. Many Asian countries are attempting to raise agricultural production, but ongoing land degradation continues to hamper such efforts.

This necessitates the implementation of improved, integrated, sustainable and practical farm- and policy-level strategies in the agriculture sector³. The impending uncertainties of CC have further emphasized these requirements, in order to ensure adaptation⁴ (preparedness) and decreased vulnerability of the agriculture sector to CC.

1.2 Outline of Official Arrangements

The TCP covered four countries: Bangladesh, Bhutan, Nepal and Sri Lanka.

In Bangladesh, a combination of geographic location and geomorphological conditions (in particular, its coastline of ~700 km) makes the country one of the most vulnerable countries to inundation from sea level rise and associated soil erosion and salinization of agricultural lands. Within the last few decades, country has experienced increased frequency of floods, changing rainfall patterns, more erratic rainfall patterns and more frequent droughts. Unexpected and sudden heavy rainfall during the monsoon causes sudden high river flows, which in turn cause floods and river erosion. This is aggravated by more than 300 rivers flowing into Bay of Bengal. Government has prioritized three areas to be addressed through this TCP: a) increased salinization of coastal lands and associated

¹<http://www.fao.org/docrep/016/i3027e/i3027e00.htm>

²<http://www.worldhunger.org/articles/Learn/world%20hunger%20facts%202002.htm>

³Defined by the [Intergovernmental Panel on Climate Change](#) as “lands used for agricultural production, consisting of cropland, managed grassland and permanent crops including agro-forestry and bio-energy crops”. Extended here to include the associated surface and groundwater resources, and populations and their socio-economic circumstances therein.

⁴ Adaptation is defined by the UNFCCC as “the adjustment in natural or human systems in response to actual or expected climatic conditions or their effects, which moderates, harms or exploits beneficial opportunities”

rivers; b) river bank erosion that has left millions of people homeless; and c) soil fertility decline in arable lands, unbalanced fertilizer use, reduction of soil organic matter, and high nutrient mining exacerbated by traditional cultivation practice.

In Bhutan, the LD is high due to natural causes (unfavourable geology and monsoon rainfall) and land use. Large rural population, poverty and subsistence farming contributes to LD. Government of Bhutan prioritized to address through this TCP, a) provision of a proven, scientifically based methodology for country-wide and local assessments to be taught to local Government officers, b) to assess and monitor LD in order to provide input into a database of “hotspots” and “bright spots”; and, c) support change in practice to more sustainable and assured production.

In Nepal, being a mountainous country overall, productivity of land has declined annually in most regions despite attempts to introduce several management practices by the government and other agencies. The country had a surplus of cereal production in 1990s, but rapid population growth and climate vagaries have caused food deficits in the country. Decreased agricultural production has been linked to CC in the form of more uncertain and extreme weather patterns such as floods, drought, landslides, cold waves, variation in rainfall patterns. Capacities to address these impacts are low due to poor agricultural extension services, research and development, low input use, and inadequate infrastructure (irrigation, agricultural roads, market access, ICT application etc). Through this TCP, the government prioritized to improve agricultural extension services, research and development, low input use and inadequate infrastructures. The Government has placed emphasis on reducing LD and increase in agricultural production with the climate change adaptation issues, integrated agriculture and forestry development, eventually aiming to increase food production and poverty alleviation. High priority has been given to natural resources management through community participation. Key issues have been the prevention of LD, soil erosion, landslides, alkalinity and salinity in agricultural lands.

Sri Lanka continues to have a variety of LD problems across its recognized 24 agro-ecological zones, due principally to the combination of high population density, low average per capita land availability, mountainous terrain with steep slopes and narrow valleys, relatively high rainfall and prolonged dry periods. In this TCP, Sri Lanka intended to focus more on Central Highlands region that is the heart of water resources of the country, which is subjected to high land degradation caused by soil erosion due to population pressures, deforestation and intensive agricultural activities. These forces threaten water resources, food security and economic development in the country.

This TCP was developed following a Technical workshop conducted at AIT, Bangkok (March 2010) entitled: “Implementation of Improved Agricultural Practices for Sustainable Land Management in South Asia – towards Increased Adaptation of the Agriculture Sector to Climate Change”. Delegates from each country attended, and presented Country Reports that had been written following consultation with all relevant Ministries, Departments and staff in their respective countries. The reports focussed on the current state of LD, the nature and measurement of CC, the apparent links between LD and CC, and current interventions to address both. Facilitated discussion at the AIT workshop led to common agreement on both the general focal areas of the TCP, as well as a prioritisation of the most pressing LD issues in each country, the content of which provides the backbone of this TCP.

Therefore, this TCP was launched in the four countries targeting several stakeholders from each country, with the responsible institutions being the Soil Resource Development Institute (SRDI), Ministry of Agriculture, Bangladesh, the National Soil Services Centre (NSSC), Department of Agriculture, Ministry of Agriculture and Forest in Bhutan, the Agricultural Research Council (NARC), Ministry of Agriculture and Cooperatives in Nepal, and the Natural Resource Management Division, Ministry of Agriculture in Sri Lanka.

1.3 Objectives

The project aimed to contribute in strengthening the national capacity for food security and poverty alleviation through reducing land degradation and promoting sustainable land resource utilization and management.

The above aims were to be achieved by fulfilling the following objectives:

1. Organize the national and inter-country Land Degradation Assessment and Climate Change Technical Working Group (TWG);
2. Commence collation (database) and interpretation of already available (i) historic climate data and (ii) land degradation data for the selected Project areas in each country;
3. Organize workshops for training in the LADA methodology of land degradation assessment towards commonality and networking between national systems of measuring, reporting and verification of key land indicators.
4. Achieve initial outputs:
 - a. synthesised and interpreted databases on Land Degradation Assessment composed of the best of local and LADA methodologies;
 - b. internationally accepted interpretation of the collated climate data for defensible statements on climate change in the selected countries.
5. Create pilot sites for monitoring and locals' awareness raising through farm days and relevant media, to improve farmer knowledge of impacts of farm practice on land quality and productivity;
6. Assure life beyond the TCP, by utilising project results to strengthen existing land and climate assessment methodologies for wider implementation and capacity building, through new projects, funded from sources both in-country and donors (external).

1.4 Project Outcome and Outputs

1.4.1 Project outcomes

The project has four major outcomes:

- (i) the LADA system of LD assessment with a standardized, well researched and tested, global to farm-level applicable set of methodologies applied;
- (ii) protocols of measuring LD that are "field applicable but scientifically supported" that can be used to establish benchmark field sites for monitoring and future assessment; to ensure the four participating countries gain current best consideration of LD assessment and database creation;
- (iii) networking of LADA-based methodologies between the four participating countries and the current 6 LADA-implementing Nations, to ensure information sharing and support; and,
- (iv) the development of new protocols within LADA that will define methods and analysis of weather data collection towards defensible statements of the nature, scale and direction of Climate Change indices, required to correctly apportion LD to anthropogenic or climate-related influences.

1.4.2 Project Outputs

There are three main outputs of the current project:

Output 1: Formulating national and regional Land Degradation Assessment and Climate Change Technical Working Groups (TWG) in project countries-

Output 2: Training TWG members in LADA methodologies including the ways to produce LUS, access relevant world databases and tools to establish national LADA databases by QM software,

Output 3: Creation/preparation of National LADA database and Local LADA assessment in each country and use for climate change impact assessment and planning for national and sub-regional climate change adaptation

2. RESULTS AND CONCLUSIONS

2.1 Output 1: Formulation of national and regional Land Degradation Assessment and Climate Change Adaptation Technical Working Groups (TWG) in project countries

Activity 1.1. Formulate national and an inter-country TWG, composed of nominated members from each of the four participating countries.

Both the Steering Committee (SC) and the TWG were formulated in each country. The SC was headed by the Secretary to the Ministry of Agriculture in each country, which helped steer the TWG of the country to work towards planned activities, including organizing the regional training workshop and follow up national workshops and adopting LD assessments and mapping.

Although national TWGs were formed in each country, inter-country TWG was not yet formulated. During the project period, opportunities were provided to three selected members in each country to participate in all four regional training workshops. This was to avoid repeating training materials that were necessary to be known by participants as pre-requisites in order to follow the training materials and activities in the follow up training workshops, to provide the three continuing members a wide knowledge of LADA protocols, QM software, data management and sustainable land management (SLM) activities, and to use them as resource persons in national training of LADA Technologies, and to complete all planned training activities within agreed time period of the project.

Yet, an inter-country TWG was not formulated. It is expected that discussions on formulating inter-country TWG be taken up at the final workshop of the project. In order to ensure smooth running of the LADA activities among the project countries, FAO will coordinate inter-country TWG, while the NPC or an active member from the current participating group and the Secretary to the Ministry of Agriculture or his nominee will be included in the inter-country TWG. Details of formation of SC and TWG are shown in Table 1.

Activity 1.2. Organize national and inter-country TWG meetings to discuss and agree with the framework and focused targets and activities.

National TWG Meetings were organized by each country. The TWG Meetings were held first in order to plan the Regional Technical Workshops (RTW) in each country. Since the RTWs were held at different time periods, formation of SCs and TWGs were delayed in countries that held RTWs later (Table 1). Accordingly, Sri Lanka hosted the first RTW in Kandy during 28-31 August, 2012, for whom the SC and TWG were formed in June 2012. Nepal hosted the second RTW in March 2013, and therefore SC and TWG were appointed in January 2013. Bangladesh appointed the TWG first and hosted the third RTW in July 14-18, 2013, but SC was formulated in September 2013. Bhutan appointed SC and TWG, in April 2013, but withdrew from the project after the second RTW in Nepal due to unforeseen reasons. As a result, Sri Lanka hosted the fourth workshop during 29 September-2 October 2013.

After the third RTW, countries became active to organize local training, data collection and mapping.

No inter-country TWG was formulated so far. The subject is planned to be discussed and inter-country TWG formulated during the final workshop, to be held in Chiang Mai during December 2013.

2.2 Output 2: Training TWG members in LADA methodologies including the way to produce LUS, access to relevant world database and tools to establish national LADA databases by QM software.

Activity 2.1. Conduct a Project Inception workshop for nominated staff of the four countries, where LADA concepts and technologies will be taught -

The inception meeting was held in Kunming China during 16-18 March 2012, for which two representatives from Bangladesh, Bhutan, Nepal and Sri Lanka attended. In addition, six experts of the LADA team from the National Bureau to Combat Desertification, State Forestry Administration, China and two members who have been engaged in LADA training in the six pilot countries (previously mentioned), the international consultant to the project on sustainable land management (SLM), and the land management officer from FAO Regional Office for Asia and the Pacific attended. The country representatives made presentations on the existing status of land degradation and drivers, impacts of LD on the countries' food production, as well as practices used for arresting land degradation and improving land productivity. LADA Experts presented the LADA methodology and experience gained from six countries including, introducing multi-level LADA approach that collects, synthesizes and interprets LD and vegetation data from the newly formulated Global Land Degradation Information System - GLADIS from sub-National (where National level assessments of LD are conducted) to the LADA-local detailed field-level assessments of soil, vegetation and social conditions are assessed and monitored. The titles of presentations are listed in Table 2. The participants were also provided the opportunity to visit sites and become exposed to LADA activities and SLM practices developed in China. Finally, the members prepared tentative workplans to be revised later, with the completion of the formulation of SC and TWG in each country. Areas visited were extremely large in comparison to the areas affected in the four countries, and also more complex in terms of the extent of the damage of LD. Although drivers of LD are recognized, development and adoption of SLM practices seemed more complex in the sites visited. Management of such sites needs large investments, particularly for mechanization of SLM activities. This may hinder LD assessments and SLM development in the four countries. However, participants realized that it is inevitable to remain vigilant on LD and its drivers, as the impacts could lead to more complex issues, if not attended to and rectified with suitable measures. Discussions also led to realization that, drivers of LD in the four countries, being located in humid regions, are diverse and need efforts from multidisciplinary teams.

Activity 2.2. Conduct National LADA workshops in each country, where the country staff trained during the Inception Workshop will train up to 10 local staff in LADA protocols.

The National workshops will include the uses of LADA methodologies at selected field sites that have the potential to become Project pilot sites for future LADA monitoring. An important aim was to seek commonalities and network between national systems of measuring, reporting and verification of key land indicators relevant for LD.

Project conducted four regional training workshops for LADA training in a sequence. Specific training activities were conducted at each workshop. The title of each presentation is listed in Table 3. Three participants from each country attended all four regional workshops, except Bhutan, which participated only in the first and second regional workshops. Bhutan withdrew from the project after the second regional workshop due to unforeseen reasons. Since then, remaining three countries continued until the end.

In addition, during national workshops each country identified demonstration field visit sites for a one day visit. This provided the opportunity for both overseas and host country participants to visit the identified site in each country, examine the status of land use and the extent of LD, drivers of LD and impacts, and discuss issues associated with land degradation and management practices adopted. Table 4 presents the sites identified by each project country and their characteristics.

National LADA Workshops - the three countries held national workshops for training, which are shown in Table 5. The opportunity was availed for the TWG members when preparing to host the regional training workshop (RTW) for their respective countries. In addition, at each RTW, a brief review of the past activities, mainly the Regional Training adopted and countries' activities performed were presented by the international consultant, training experts and NPCs. This made all participants aware of the activities completed so far in the project. Furthermore, at TWG meetings foreign participants and those from the host country were provided the opportunity to interact and discuss the issues of LD in each country. The discussions during RTWs showed that TWG members are

experienced in LD, as well as in mitigation measures. Many practical suggestions were made by the participants. TWG members being selected from different institutions such as Departments of Agriculture, Meteorology, Environment, Irrigation, Forestry, and provincial departments, private sectors (NGOs) as well as policy-level personnel, engaged in the exchange of ideas, networking and agreements for arresting LD, which contributed towards achieving project outcomes.

Activity 2.3. Collate appropriate country available and LADA-derived data into databases, as required by individual countries as a repository for historic collection of these data towards interpretation, in terms of change in extent, degree and nature of LD.

The countries used available data and also gathered field level data, which included meteorological, soil, vegetation and socio-economic data. In addition, Land use and cropping pattern data were gathered (Table 6).

2.3 Output 3: Creation/preparation of National LADA database and Local LADA assessment in each country and their use for climate change impact assessment and planning for national and sub-regional climate change adaptation –

Activity 3.1. Collate currently available historic weather data for selected regions of each country (e.g. designated “hotspots”) towards critical appraisal of the utility of these data for creation of (internationally) defensible statements of the nature, degree and trend in Climate Change data.

Each country gathered historic weather data. The participants from the Department of Meteorology provided country-wide met data in all three countries, while data available in the Soil Resources Development Institute (SRDI), Bangladesh, Department of Agricultural Development (DoAD) in Nepal and Natural Resource Management (NRM) Division of the Department of Agriculture (DoA) in Sri Lanka were used for creating National and Local databases.

In addition, hydrometeorological data from study area were collected by the Nepal project team to find its relation with the state of land vegetation and water resources.

Both historic and recent data available have been used for the database in each country. These data are now available for future use for monitoring LD status, as well as CC and its impacts. Data availability through improved accessibility and exchange has been facilitated by the inclusion of many stakeholders in the steering committee and TWGs. Several databases have already been compiled as shown in the Table 7.

District level map of climate change vulnerability of Sri Lanka is available with compiled temperature, rainfall, relative humidity, and historical data.

Activity 3.2. Relay project results to both country policy and land use officers / departments as well as selected focus areas (farm level) in project areas through Government Department workshops, farm days, involving relevant media, pilot demonstrations of land assessment methods, to improve farmer knowledge of impacts of farm practice on land quality and productivity.

Many policy personnel were among the represented stakeholders. This made it easier during regional and national training workshops to convince them regarding the status and importance of LD and its impact on food production, food security and natural resources of the countries. Since policy personnel attended, they gained access and opportunity to become a part of the trainees/observers to specific situations identified by each country. Lists of participants in each regional workshop presented in workshop summary reports provide witnesses to this fact.

The pilot demonstrations sites identified for further testing and monitoring LD represent areas needing urgent attention. Identification of hot spots and bright spots through such pilot activities under LADA

support will also serve as demonstration sites in all three countries. Therefore, the reports completed during such activities would further relay project results at the policy level, as well as to corresponding departments responsible for land management.

Sri Lankan participants have already discussed with the officials of the National Planning Department and National Budget Department at the Treasury. They have agreed to consider provisioning financial support to implement the same programme countrywide.

Activity 3.3. Utilise project results to strengthen the existing land and climate assessment methodologies of each country for wider organised and catalytic implementation, and capacity raising in use of LADA methodologies through SAARC regional centres and other relevant mechanisms and also newly funded projects, aiming for sources both in-country (Government) and donor (external).

In Bangladesh, there are several ongoing foreign funded projects, in parallel, and some of the officers of these projects were already included as members of TWG. Therefore, future potential of continuing LADA activities has been discussed.

In Nepal, experts from the Ministry of Land Reform and Management, Ministry of Forest and Soil Conservation and also from the ministry of Science and Technology have agreed to continue the TWG thus formed and work together for land degradation and management.

Sri Lanka has discussed among stakeholders and agreed to submit a common project proposal to SAARC Secretariat. When the three countries produce with their country proposals, SAARC Secretariat could take the lead, not only to network with the three countries, but also with other countries in the SAARC region.

3. LESSONS LEARNT AND RECOMMENDATIONS

3.1. Lessons Learnt

3.1.1 General lessons:

- Land degradation is a location and area specific phenomenon and is heavily dependent on population pressure, inappropriate land use, climate, soil and water quality degradation, loss of biological diversity, climate, land tenure and other anthropogenic issues.
- LD is often caused by practices adopted by farmers experiencing poverty and socio-economic difficulties; for them, the use of available resources is more important than conservation. Many farmers and inhabitants do not perceive land degradation as a major threat. People living in degraded lands are also not aware, in most cases, about the risks of environmental degradation resulting from present land use. Therefore, sustainable use of land is not a key priority.
- Preservation of land with due qualities for future generations is only a concern among a few in village ecosystems. This is because of the unpredictability of both future and habitats for the current generations resulting from land fragmentation, land tenure systems, urban migrations, lack of employment opportunities, etc. Therefore, most farmers only look at short-term land use and means to reduce their socio-economic hardships rather than long-term sustainable land management.
- Shifting cultivation widely contributes to LD, and cycle of shifting cultivation aggravates land degradation in hilly lands.
- Farmers currently apply various methods to improve crop yields. Some of the practices include irrigation (whenever water is available), control of weeds, management of pests, and application of farmyard manure. Plant nutrient management using balance fertilizers is only carried out by few people in farming areas. Improper use of fertilizers leads to reductions in soil fertility, crop growth and yield, and eventually to poverty, ground cover reduction, soil erosion and land degradation.

- Scarcity of good quality water for drinking as well as for irrigation is a common problem encountered in degraded areas. Seasonal fluctuations in rainfall and extended dry periods affect people's quality of life, food production and land quality.
- Although there are many research based developments, it appeared that new technologies have not reached many of the areas experiencing LD. As a result LD continues, and is most severe in hilly areas due to unsustainable clearance and inappropriate cultivation of hill slopes.
- Although proper land management technologies are suggested for reducing land degradation, such solutions are not implemented due to financial limitations.

3.1.2 Lessons on LADA Tool:

- LADA is a fine tool that has been developed using a comprehensive scientific approach and detailed studies for monitoring LD. The LADA tool emphasizes and values expert judgment, community perceptions and scientific data, which enrich the value of indicators used in assessment.
- Since the LADA approach is largely based on expert judgment, it is highly feasible / applicable for regions where quantitative data are limited and/or are not readily available.
- A clear methodology and comprehensive quantifiable indicators are key strengths of the LADA tool. Yet they need to be further customized to the local context.
- The LADA local manual provides a holistic approach for assessing land degradation status by integrating both socio-economic and biophysical indicators.
- The LADA approach is highly feasible for countries with less heterogeneity. For countries with high heterogeneity such as Asian countries, local level assessments seem to be a cumbersome exercise. Therefore, local assessments for such countries should be based on an on-demand basis, and with precise local level indicators.
- Land related activities are handled by many agencies and these agencies maintain their own databases, resulting in highly variable data sharing practices, data standards and formats. Through the formation of a common database/information management system between government institutes, data sharing and combining is feasible.
- LADA, through wide stakeholder participation, facilitates data sharing, standardizing and developing common formats and preparation of a common data base/information system. This also requires common protocols and standard formats for harmonization among different stakeholders.
- Well-designed field formats and questionnaires provide basic tools for local level information collection.
- The DPSIR conceptual framework covers all dimensions and consequences of land degradation in ecosystems and livelihoods of local people, which helps decision makers remain informed of the impacts of LD and carry out better decision making.
- Implementation of projects without Environmental Impact Assessment (EIA) drastically contributes to land degradation. However, this depends upon the degree and magnitude of the LD types. An EIA may not be required in every case, and an initial environment examination (IEE) may be sufficient in some cases.
- Timely conduct and completion of project activities was often hindered by many national holidays and activities of recipient countries, such as religious holidays, political violence, day-to-day unplanned interference.
- The results obtain from a pilot study in a very small area may not be adequate to generalize the outcome of the study to the whole country of Nepal, Bangladesh as well as Sri Lanka. Therefore further studies on larger areas would be needed at the national level.

3.2 Recommendations

3.2.1 Recommendations for policy decisions

- Poverty alleviation programs should be implemented first for motivating people to use land in a sustainable manner in countries where such programs have not been launched. However, in Bangladesh, such programs are in place, and hence it is imperative that such programs are continued and further strengthened to address communities most vulnerable to LD.
- Motivation and awareness raising among people living in degraded land areas, as well as areas that have a potential for degradation are required. In countries where such programs are already in place, this may require further strengthening in integration. Awareness building should be conducted among people/farmers to use limited land with prior consideration of the risk of degradation.
- Encourage farmers to adopt crop recommendations including optimum seed rates, balanced fertilizer use, promotion of FYM/compost application, and appropriate pest management practices with integrated pest management. This was already observed in Bangladesh and Sri Lanka; however in Nepal, it is important to further strengthen these efforts, together with provisioning of technical support services and inputs.
- Promotion of conservation farming, incorporation of legumes in crop rotation, cover crops and promotion of minimum tillage especially during the rainy season are essential for sustainable soil fertility management and reduction of LD.
- In degraded steep forestlands, such as in Nepal, in addition to tall trees, grass cover should also be promoted to protect the soil during the rainy season. At the same time, planting erosion inducing plant species in vulnerable areas should be prohibited. Promotion of agroforestry, especially grasses and fodder trees in forest areas should be encouraged.
- Documentation and demonstration of sustainable land management practices and good agricultural practices (GAP) in areas vulnerable to degradation should be a priority. This is an area needing further strengthening.
- Special natural issues like acid soils, soil salinity, land tenure issues, etc. should be addressed timely for reducing land degradation.
- Since land degradation is an area specific phenomenon, local level land degradation assessment should be mandatory for the recommendation of land rehabilitation and management. Land degradation mapping should be undertaken at national and sub-national levels, and on a temporal basis to understand the trends of LD.
- Promote and facilitate income-generating activities other than farming in order to uplift social wellbeing of farming populations, and to reduce pressure on land associated with poverty and hardships. Alternative livelihood options need to be identified to decrease dependency on land. Additionally, gender associations in income generation activities should also be considered.
- Indicators defined in the LADA local manual are mainly focused on dryland areas; therefore, customization to the local context of each country is suggested, for which indicators should be developed on the basis of geographical and social features.
- Outcomes of the LADA tool and its guiding principles should be included in national policies and strategies, for which DPSIR model could be a better instrument for policy reforms and formulating intervention packages to mitigate LD, both at the national and local levels.
- Conduct LADA assessment pilot projects across other parts of the country, and for which capacity building should be conducted across all levels of the government for effective LADA implementation.
- Formulation of country specific LADA guidelines is necessary to address issues of LD across all levels of the government. With respect to this, a LADA manual made available in simple and national language would be useful.
- Linking field-level indicators of land degradation to remote sensing and GIS data will add further value to the assessment, and assist in informed decision making.

- Land degradation is a multi-sectoral issue, and requires coherent and harmonized set of policies and strategies to minimize its adverse impacts on our ecosystem services.
- Land related activities are handled by many agencies and these agencies maintain their own databases, resulting in highly variable data sharing practices, data standards and formats. Through the formation of a common database/information management system between government institutes, data sharing and combining is feasible. It would be most beneficial to establish a common institution such as a data bank to manage consistency and data integrity.
- Mainstream land degradation assessment and mitigation within different government agencies dealing with land use and improve coordination among all stakeholders.
- The currently working multidisciplinary TWG should be a permanent network and institutionalized within the existing government mechanism. Further strengthen and maintain the technical working group of LADA and disperse its activities throughout the country.
- Formation of an Apex Body in each country for SLM would help address land management related issue as an overarching committee.
- This is a pilot project to raise awareness and provide training on LADA degradation assessment. It is suggested that project activities and findings are extended to and piloted in other parts of the countries.

3.2.2 General recommendations

- Before undertaking any development project in an area, an EIA should be done for that particular project.
- Successful delivery of quality outputs in these projects requires effective and efficient communication systems and information systems so that adequate allocation of funds could be made.
- Project period of two years is inadequate for a project such as LADA, unless necessary capacity and cooperation is available. If the project contains capacity building and training components, these activities should be conducted early on in the project, so that LADA applications and other planned activities with trained staff can be achieved on time.
- Training components should be completed within the first six months of the project, and the remaining time should be utilized for application of methodologies. To facilitate this country specific training of trainers (ToT) is needed to prepare core trainers at first. Training of staff towards the end of projects will not help accomplish project outputs, unless the project's only aim is to train staff.
- Capacity building of a good number of officers and scientists with overseas and domestic training on LD issues as well as LADA tools is needed.
- In order to assist timely completion of expected outcomes, timely disbursement of funds and timely procurements at all levels are needed. Use of a common and convenient form of fund disbursement to all project recipient countries would eliminate complicity and unexpected delays.
- Inclusion of SLM into school curriculum would build a widespread concern regarding land management.
- Formation of regional/international Technical Working Group to combat land degradation is a need. However, the current project has already discussed this at the final workshop and requested the participants to identify suitable technical and policy level personnel to represent each country and inform the FAO. As the FAO has mandated Land Management as a priority area, it would be advisable for FAO to coordinate the regional/international TWG.

4. RESULTS TABLES

Result tables are presented on pages 30 to 45.

Table 1. Formulation of Steering Committee and Technical Working Groups in Activity 1.1 and 1.2

Activity and Item	Bangladesh	Nepal	Sri Lanka
Activity 1.1. Formulate national and an inter-country TWG, composed of nominated members from each of the four participating countries.			
Formulation of Steering Committee	<ul style="list-style-type: none"> • Held on 15 Sept 2013 at the Head Quarters of SRDI. • 10 members were appointed. • NPC briefed and discussed about the details of the Inception meeting. • Tentative workplan and necessary revisions of the workplan according to the first regional workshop in Sri Lanka were discussed 	<ul style="list-style-type: none"> • Held at the Ministry of Agriculture development (MoAD), Kathmandu, Nepal on 22 February 2013. • 10 members participated. • Also presented the outcomes of Inception Workshop held in Kunming, China. • NPC presented synopsis of LADA and future activities of LADA in National and Regional level. • Endorsed the country level work plan of LADA activities and agreed to host the second Regional Workshop in Kathmandu, Nepal. 	<ul style="list-style-type: none"> • Held in June 2012. • Appointed 15 members covering 8 key agencies. Most of the policy makers included attended the LADA training programmes on Global, National and local assessment. • Presented proceedings of the Inception Meeting. • Discussed organization of the first regional workshop and its workplan.
Technical Working Group	<ul style="list-style-type: none"> • Held on 2 July 2012. • 20 members were appointed to TWG. • Discussed and planned the need of hosting the third regional training workshop in Bangladesh. 	<ul style="list-style-type: none"> • Held on 14 December, 2012 at the MoAD Meeting Hall, Kathmandu. • Participated 15 members. • Discussed and reviewed progress of the ongoing country LADA activities. • Assigned responsibilities to the TWG members for future activities. • All TWG members and some support staffs were present in the meeting. • Status of the ongoing activities 	<ul style="list-style-type: none"> • Formed technical working group with 28 members to make linkages among stake-holders who directly & indirectly involving degradation and conservation oriented activities

		was discussed and agreed.	
Inter-country TWG	<ul style="list-style-type: none"> • Not yet formulated. Awaiting for discussion at the final workshop 	Not yet formulated. Awaiting for discussion at the final workshop	Not yet formulated. Awaiting for discussion at the final workshop
Activity 1.2. Organize national and inter-country TWG meetings to discuss and agree with the framework and focused targets and activities.			
National TWG Meetings and workshops	<ul style="list-style-type: none"> • Two workshops were planned. • First workshop on 14 November 2013 at the SRDI Seminar Room. • Land Degradation in Bangladesh-National Level Assessment, SRDI HQ on 14, November 2013. • Only 10 participated, and participation was low because of Harthal. • Second workshop on WOCAT, Decision Support for Mainstreaming and Scaling up of Sustainable Land Management (planned for 2 times but could not be conducted due to hartal) 	<ul style="list-style-type: none"> • Three National Training Workshops held: • First workshop on 5 Feb 2013 at Soil Science Division, Kathmandu. • Technical discussion about land degradation, degraded sites and conservation practices and improvement works done in the degraded sites in general. • Program planning for field visit to degraded sites • Second workshop on 13 March 2013 at MoAD, Kathmandu. • Discussion for the selection of sites and selection of Piplatar demonstration site in Nuwakot district for field visit of the participants of regional workshop and for implementing LADA activities. • Third workshop on 30 April 2013 at Soil Science Division, NARC, Kathmandu. • Preparation of detailed work plan of LADA activities, Program planning for the implementation of LADA activities and 	<ul style="list-style-type: none"> • Two national training workshops conducted • First workshop held during 18-19 Feb. 2013, Hotel Topaz, Kandy • 48 participated. • Review degradation types and status in Sri Lanka. • Make inventory of available data and sources. • Identify information gaps • Finalize activity plan and procurement plan of LADA project • Second Workshop • Held on 13-14 June 2013, Hotel Thilanka, Kandy. • 42 participated. • Review project progress, and introduced and demonstrated LADA - QM Software, • Input data preparation based on Expert knowledge (better selection of LADA - QM input options) • Planned demonstration sites, • identified gaps and suggestions were discussed for bridging the identified gaps

		preparation of tentative budget required for completion of the activities.	
Inter-country TWG Meetings	<ul style="list-style-type: none"> • Not held yet as the discussions for formulating inter-country TWG has been deferred until the final workshop 	Not held yet as the discussions for formulating inter-country TWG has been deferred until the final workshop	Not held yet as the discussions for formulating inter-country TWG has been deferred until the final workshop

Table 2. Titles of presentations made during the Inception meeting in Kunming, China during 14-16 March 2012.

Content delivered	Presenter
• Introduction of the project	Yuji Niino
• Land degradation and climate change in the project countries	S. Ranamukhaarachchi
• LADA overview and its contribution to Rio Conventions	Jia Xiaoxia
• Country presentations – Bangladesh, Bhutan, Nepal and Sri Lanka	Country delegates
• LADA methodologies and capacity requirements	Wang Guosheng
• National assessment and outcomes in China	Wang Guosheng
• LADA local assessment case analysis	Wang Guosheng
• LADA implementation in China	Jia Xiaoxia
• China's desertification monitoring system and its application	Zan Guosheng
• Establishment of mechanisms for LADA	China LADA Team
• Training programme on four regional training workshops – Discussion	All participants
• Regional and national (country-level) Work plan formulation	Yuji, Jia Xiaoxia and S. Ranamukhaarachchi

Table 3. Regional training workshops held venue and dates, content delivered and the number of participants attended under the Activity 2.2.

Venue and dates of the workshop	Content/topics presented and name of presenter	Number of participants
First Regional Training Workshop - Kandy, Sri Lanka on 28-31 August 2013	<p>LADA Introduction, Global Assessments, Climate data collection and processing</p> <ul style="list-style-type: none"> • LADA: land degradation and LADA project introduction -Yuji Niino and Wang Guosheng • Introduction, and general approach and framework and of LADA - Wang Guosheng • The Conception and Approach of Land Use System mapping - Wang Guosheng • Mapping Land Use Systems at National Level for LADA Analysis - Zan Guosheng • National data analysis - Wang Guosheng • Climate Change & Data compilation - Enrico Paringit • Field visit and discussion on the relationship of land use and land degradation and drivers in different locations in field sites with maps and satellite images. • Available data and gap analysis for implementation of LADA - Country participants • Presentation of group findings - Country participant groups • Suggestions for bridging the identified gaps - China LADA Team • Country-level work planning, group discussions and presentations - Country LADA participants • Discussion on LADA activities, procurements, future training planning - All participants 	Three members each from Bangladesh, Bhutan and Nepal and 27 members from the host country, Sri Lanka, three LADA experts and two FAO Staff.
2 Second Regional Training Workshop -Kathmandu, Nepal on 20-24 March 2013	<p>National assessment, LADA_WOCAT QM , Development of indicator system, Self-study of LADA Manual, and QM software developed by WOCAT Data collection and mapping</p> <ul style="list-style-type: none"> • The framework, methodology, and approaches of national assessments - Wang Guosheng • Mapping and establishment of assessment unit - Wang Guosheng • Presentations by countries on outcome or output of the Land use system mapping and establishment of assessment unit – country participants • Climate data processing and incorporation into mapping- Enrico Paringit • National assessment indicator system - Wang Guosheng • National assessment methodology (QM) (step 1-3) - Wang Junhou • National assessment methodology (QM) (step 4-5) - Wang Junhou 	Three members each from Bangladesh, Bhutan and Sri Lanka and 28 members from the host country, Nepal, two LADA experts and two consultants from FAO and a visitor from IRRI.

		<ul style="list-style-type: none"> • QM software developed by WOCAT- Zan Guosheng, Wang Guosheng & Wang Junhou • Best practices of Sustainable Land management - Wang Guosheng • Rehabilitation of Degraded Land: A case study of Pipaltar Demonstration Site, Nuwakot - Khruchev Shrestha • Assessment Demonstration and Practices - Wang Junhou and Wang Guosheng • Establishment of National assessment data base – data processing and statistical analysis - Zan Guosheng and Wang Guosheng • National assessment analyses - Wang Junhou • National Assessment Report - Wang Guosheng • Identify data gaps for Land Degradation Assessment in the content of National Geographic Information Infrastructure (NGII) in Nepal - Nab Raj Subedi • National and Local Level Assessments: Case study from the Philippines - Erinco Paringit • Discussion on the assessment results and summary - Country staff and Wang Guosheng 	
3	Third Regional Training Workshop - Cox's Bazar, Bangladesh on 14-18 July 2013	<p>Local assessment, Integration, reporting & analysis of national and local work</p> <ul style="list-style-type: none"> • Land degradation and natural resources management in participants' countries - Participants • Assessment planning – Zhang Kebin • Selection of sites for assessment (hot/bright spots) – Zhang Kebin • Selection of assessment areas and plots – Zhang Kebin • Outline of the Report: DPSIR framework – Zhang Kebin • Above ground LD assessment (erosion) – Zhang Kebin • Assessment of LD impacts on soil quality (below ground) – Nie Lishui • Assessment of LD impacts on productivity - Nie Lishui • Assessment of water resources degradation-vegetation/ and pasture assessment – Zhang Kebin • Assessment of ecosystem services – Zhang Kebin • Livelihoods assessment & analysis – Zhang Kebin • Soil Conservation and Watershed Management in Bandarban Field activities - Delaware Hossain Mollah • Trainees: Review manual and prepare suggestions on content, sequence/use of tools, • Integration and reporting for assessing impact of LD on productivity, ecosystem services and livelihoods - Zhang Kebin & Nie Lishui 	Three members each from Nepal and Sri Lanka, and 21 members from the host country, Bangladesh, two LADA experts and FAO consultant. Bhutan withdrew from the project and hence did not attend.

		<ul style="list-style-type: none"> • Training team to visit the target area and identify potential transects, sites and arrange with local informants for interviews - Zhang Kebin, Local Soil Expert & S. Ranamukhaarachchi • Methodology for field level data collection for local assessment and report preparation - Zhang Kebin • Local assessments by three groups: a) Group 1 - Site survey - Above ground land degradation and crop productivity assessment and soil assessment (assisted by Nie Lishui) ; b) Group 2 - Resource Survey Water/vegetation/ pasture/range assessment (assisted by S. Ranamukhaarachchi) ; c) Group 3- Household survey and best practices Livelihoods & land resources (assisted by Zhang Kebin) • Data analysis and preparation of the Local assessment report by each group • Presentation of local assessment reports – By participants • Review of progress and discussion on future activities – full team 	
4	Fourth Regional Training Workshop -Kalutara, Sri Lanka on 29 September-2 October 2013	<p>Local assessment, Integration, reporting & analysis of national and local work</p> <ul style="list-style-type: none"> • LADA-Local Assessments – Zhang Kebin • Soil analysis – Zhang Kebin • Linkage of local and national assessments – Wang Junhou • Presentation of case studies by participants and discussions • Preparation and conduct of local assessments • Presentation of Group Activity Reports of local assessments • Site Characterization Compilation Group Report • Resource Compilation Group Report • Household Status and Best Practices Compilation Group Report • Analysis and integration of national and local assessment reports- Wang Junhou • Analysis and integration of national and local assessment reports- Wang Junhou • Report preparation and discussion –S.L. Ranamukhaarachchi 	Two members each from Bangladesh, and Nepal and 27 members from the host country, Sri Lanka, two LADA experts and FAO consultant.

Table 4. Field demonstration sites identified by each project country and its characteristics

Workshop	Country & dates	Location of demonstration field site	Nature of the field site
First regional training workshop	Sri Lanka 28-31 Aug 2012 (Site visit was on 30 August 2013)	Up country of Sri Lanka – Rikillagaskada, Marassana, Nuwara Eliya	This covered a diverse climatic conditions and land terrain from moderate to steep with elevations ranging from 350-2,500m AMSL. The area had different climatic conditions (several AERs were covered), different cropping systems including from vegetable cultivation, grasslands, forestry and tea plantations.
Second regional training workshop	Nepal 20-24 March 2013 (Site visit was on 22 March 2013)	Pipaltar, Nuwakot district	A steep land subjected to landslides and soil erosion associated with farming and natural land degradation causes. The site was heavily degraded, by restoration adopted for several years by the Dept. of Soil and Water Conservation, Nepal was demonstrated.
Third regional training workshop	Bangladesh 14-18 July 2013 (Site visit was on 17 July 2013)	Rahmatpur, Uttran Somobay Residential Area in Chittagong Division, Cox's Bazar. (Due to country-wide political disturbance as harthal interfered with the visit to field site in Bandarban)	The site was a mixed agriculture-forest area located about 2-3 km from the township of Cox's Bazar. The area has undergone severe land degradation due to intense settlements from in-migrants from Myanmar. Pressures from poor land management, in particular, cutting steep lands for house construction, removal of forests, and agriculture from the in-migrated people have caused land degradation in the study village.
Fourth regional training workshop	Sri Lanka 29 Sep-2 Oct 2013 (Site visit was on 30 September 2013)	Kirala kelle, Matara.	An old highly productive agricultural area that was later turned out to be acidic soils (pH of 2.5-3.5) due to a River diversion for Flood protection purpose. This site provided new experience on acid formation and affecting 800 ha or rice cultivated area, currently abandoned.

Table 5. National training activities accomplished by Bangladesh, Nepal and Sri Lanka under Activity 2.2

Programme/Activities		Venue and date completed	Subject matter covered/No. participated
A. Bangladesh			
	Technical Training for TWG	SRDI HQ on 14, November 2013	Subject: Actor an factor of land degradation in Bangladesh Number Participated: 10 (Number of participants were low because of political unrest situation) Collected filed data on: Soil salinity, water salinity, soil properties, nutrient status, land use, land management practice, land cover, socio-economic data.
	National Training Workshop 1	SRDI Head Quarters in Dhaka on 14, November 2013.	Subject: Land Degradation in Bangladesh-National Level Assessment Number Participated: 10 (Number of participants were low because of political unrest situation, Hartal)
	National Training Workshop 2	Planned twice, but could not hold due to Harthal.	WOCAT, Decision Support for Mainstreaming and Scaling up of Sustainable Land Management
B. Nepal			
1.	Steering Committee Meeting	MoAD Meeting Hall, Kathmandu, January 2013	Agreed on Meeting minutes. NPC presented synopsis of LADA and future activities of LADA in National and Regional level. Also presented the outcomes of Inception Workshop held in Kunming, China. Steering committee also endorsed the country level work plan of LADA activities and agreed to host the second Regional Workshop in Kathmandu, Nepal. Ten members participated in the meeting.
2	TWG Meeting	TWG meeting was held on 14 December, 2012, MoAD Meeting Hall ?	Discussed and reviewed progress of the ongoing country LADA activities. Also assigned responsibilities to the TWG members for future activities. Minutes prepared on agreed agenda. All TWG members and some support staffs were present in the meeting. Status of the ongoing activities was discussed and agreed.
4	Stakeholder experience sharing workshop	Hetaunda, Makwanpur 12-14 May, 2013	The visited site is one of the model sites of management of the degraded land in Nepal. Cross learning and experiences sharing within the groups of rehabilitated sites done. Observed some of the ongoing activities of management practices in the degraded site. The TWG members, Government Officers, farmers participated in the programme, The total no. of participants was 21
5	Technical Training to TWG Members and Government Officers	Kathmandu, Nepal 12-14 September, 2013	Technical training on Methodology and Approaches of LADA on National and local level was dealt in the training programme. The participants were trained on the conceptual framework of LADA and characteristics of LADA tool and its applicability on local level LD assessment. The orientation programme to the survey team was organized in the field to

			introduce them the steps of LADA assessment at local level and to provide hands-on exercise by national resource persons in field level format and questionnaires and survey techniques (FGD, Well-being Ranking and Transects Survey in the case study sites). 21 Participants comprising TWG members, Government Officers from Departments, NARC and pilot districts participated in the training and field level orientation programme.
6	National Workshop	Kathmandu, Nepal 02-03 December, 2013	The workshop commenced with the presentation on overview and implementation status of the accomplished national LADA activities. The national land use classification and its relationship with LADA protocol was presented in the meeting. However, the main focus was on briefing on LADA methodology and approaches used during local level assessment in case study sites (Pipaltar). The preliminary findings and lesson learned from the case study was presented. Intensive discussions were held on indicators and analytical part of the study. participants from TWG, central level, district level government institutions, NARC, field survey team were present in the workshop.
C. Sri Lanka			
	National Workshop 1	Hotel Topaz, Kandy, 18-19 Feb. 2013	<ol style="list-style-type: none"> 1. Review degradation types and status in Sri Lanka 2. Make inventory of available data and sources 3. Identify information gaps 4. Finalize activity plan and procurement plan of LADA project <p>No of participants = 48</p>
	National Workshop 2	Hotel Thilanka, Kandy on 13-14 June 2013	<ol style="list-style-type: none"> 1. Review project progress 2. Introduce and demonstrate LADA - QM Software, 3. Input data preparation based on Expert knowledge (better selection of LADA - QM input options) 4. Planning demonstration sites 5. identify gaps and suggestions for bridging the identified gaps <p>No of participants = 42</p>

Table 6. Details of data types used in LADA assessment and data sources

Data	Description	Source of data
Bangladesh		
Soil salinity,	Survey/Monitoring	SRDI
Water salinity	Survey/Monitoring	SRDI
Soil properties	Survey	SRDI
Nutrient status	Survey, sampling and analysis	SRDI
Land use	Image processing, survey, secondary data-information, compilation, mapping	SRDI, BFD, BWDB, CEGIS, SoB
Land management practice	Survey, Secondary data	SRDI, DAE, BBS
Land cover	Primary + Secondary data	SRDI, BFD, CEGIS, DAE, BWDB, SPAARSO
Socio-economic data	HH survey, secondary data	BBS, SRDI
Climate data	Secondary	BMD
River bank erosion	Secondary	CEGIS, BWDB
Nepal		
Hydrometeorology data	Department of Hydrometeorology	Annual Rainfall and Temperature Data
Satellite image, Ortho photo, Topo Sheet on different layer	Survey Department, Image Supplier	Satellite Image of 0.5 m resolution, Quick Bird and time series data (Orthophoto, Geo-cover etc)
Land use system and administration boundary map	Survey Department	
Crop status report District Agriculture Profile	District Agriculture Development Office, Nuwakot	
Land Management Activity for SLM	Ministry of Forest and Soil Conservation.	
Field Level Survey	Interview with Key informants Focus Group Discussions LADA Manual for Local Level Assessment (Part 1 and 2)	Questionnaire and field format of LADA Manual were slightly customized on local context
Secondary Information from Different Publications	Nepalese Agriculture Statistical Information, 2012, MoAD Agricultural Census Report	
Sri Lanka		
Landuse data	Extracted from digital map layers of land use, water and built-up area from 1:50000 scale topographic map sheets	Survey department of Sri Lanka
Admin boundary map	Admin boundaries for province, District, DSD and GN division has been used for LADA QM mapping unit development	Digital Admin map available at NRMC was used

Forest and wildlife reserve of Sri Lanka	The digital map of forest and reservation areas of Sri Lanka has been used	Department of Forest
Elevation and Slope	Slope map was developed using GIS analysis with 30m Digital Elevation Model	30m data downloaded from ASTGTM website
Paddy area map	Paddy land map updated by Forecasting project of NRMC for Ampara, Polonnaruwa and Batticaloa has been used	Natural Resources Management Centre, DOA.
Climate data	Rainfall and other climate data	Met database, NRMC
Agro-ecological map	Digital map has been Used for LUS boundary adjustments	Natural Resources Management Centre, DOA.
Expert knowledge on land degradation	Expert knowledge and local experiences were included in the LADA-QM approach	Data gathered through guided discussions held in national workshops and informal small group meetings.
Degradation related information	Information on prominent degradation types and affected localities were also used during assessment	Information was extracted from available literature
Erosion hazard maps	Erosion hazard map of central highlands covering central and uva province was also used as a guide map for assess accuracy levels of LADA maps	Natural Resources Management Centre, DOA.

Table 7. Work completed in the Activities 3.1 to 3.3 of Output 3

Item	Bangladesh	Nepal	Sri Lanka
Output 3: Creation/preparation of National LADA database and Local LADA assessment in each country and use for climate change impact assessment and planning for national and sub-regional climate change adaptation –			
3.1 Collate currently available historic weather data for selected regions of each country	<ul style="list-style-type: none"> Collected filed data on: Soil salinity, water salinity, soil properties, nutrient status, land use, land management practice, land cover, socio-economic data. 	<ul style="list-style-type: none"> Hydrometeorological data from study area were collected to find its relation with the state of land vegetation and water resources. These data no doubt can be shared globally. 	<ul style="list-style-type: none"> District level map of climate change vulnerability of Sri Lanka is available. Compiled temperature, rainfall, RH, historical data
Data Collection	<ul style="list-style-type: none"> Batighata Upazilla, Khulna District. Data collected from Dec 2012- April 2013. 	<ul style="list-style-type: none"> Nuwakot and Makawanpur Data collection was done in Pipaltar of Bidur Municipality, Nuwakot during 5-6, 8-10 and 17-24 October 2013. Site selection in close co-ordination with local level experts and national resource persons completed. Orientation training for Survey Team was organized in case study site in order to orient survey team members towards field format, questionnaire and procedures on transect survey, soil, vegetation and water resources assessment, FGD etc. 	<ul style="list-style-type: none"> Gathered and used the following data - Landuse data Admin boundary map Forest and wildlife reserve of Sri Lanka Elevation and Slope Paddy area map Climate data Agro-ecological map Expert knowledge on land degradation Degradation related information Erosion hazard maps
3.2 Relay project results to both country policy and land use officers / departments as well as selected focus areas (farm level) in project areas through Govt Department workshops, farm days, involving relevant media, pilot demonstrations of	<ul style="list-style-type: none"> Steering Committee and TWG included members from the Ministry of Agriculture, Ministry of Environment and several other ministries working 	<ul style="list-style-type: none"> During sharing workshop farmers, field level technicians and other stakeholders were also invited to share the experience and orient them about LADA tools and approached for land 	<ul style="list-style-type: none"> discussed with the officials of the National Planning Department and National Budget Department at the Treasury. They agreed to consider provide financial support to

land assessment methods, to improve farmer knowledge of impacts of farm practice on land quality and productivity.	at policy level. Therefore, policy level dialog has already taken place during SC and TWG as well as during field visits for local assessments, and TWG training visits. This adds a fair understanding among different stakeholders working on LD and land management issues.	degradation assessment and management.	implement the programme countrywide.
Activity 3.3. Utilize project results to strengthen the existing land and climate assessment methodologies of each country for wider organized and catalytic implementation, and capacity raising in use of LADA methodologies through SAARC regional centres and other relevant mechanisms and also newly funded projects, aiming for sources both in-country (Government) and donor (external).	<ul style="list-style-type: none"> • Already linked LD issues with SAARC Secretariat. 	<ul style="list-style-type: none"> • Experts from the Ministry of Land Reform and Management, Ministry of Forest and Soil Conservation and also from the ministry of Science and Technology have agreed to continue the TWG thus formed and work together for land degradation and management. 	<ul style="list-style-type: none"> • Discussed and agreed to submit a common project proposal to SAARC secretariat.

5. List of documents produced during the project

1. Inception Report
2. Workshop Summary Report of the first regional training workshop
3. Workshop report of the second regional training workshop
4. Workshop report of the third regional training workshop
5. Local assessment reports of Rahamatpur, Uttaran is in Cox's Bazar Sadar Upazila (sub-district) under Cox's Bazar District, south-east of Bangladesh.
6. Workshop report of the fourth regional training workshop
7. LADA Local Assessment of Kiralakele, Matara, Sri Lanka
8. Land Degradation Assessment Reports for Bangladesh, Nepal and Sri Lanka (to be received from each country)

6. Abbreviations and Acronyms

AIT	- Asian Institute of Technology
AMSL	- Above Mean Sea Level
BARI	- Bangladesh Agricultural Research Institute
BBS	- Bangladesh Bureau of Statistics
BFD	- Bangladesh Forest Department
BMD	- Bangladesh Meteorological Department
BWDB	- Bangladesh Water Development Institute
CC	- Climate Change
CEGIS	- Center for Environmental Geographic Information System
DAE	- Department of Environment
DoA	- Department of Agriculture
DOAD	- Department of Agricultural Development
EIA	- Environment Impact Assessment
FAO	- Food and Agriculture Organization
FGD	- Focus Group Discussion
FYM	- Farm Yard Manure
GAP	- Good Agricultural Practices
GIS	- Geographic Information Systems
GLADIS	- Global Land Degradation Information System
ICT	- Information and Communication Technology
IEE	- Initial Environment Examination
LADA	- Land Degradation Assessment
LD	- Land Degradation
LDD	- Land Development Department
LUS	- Land Use System
MoA	- Ministry of Agriculture
MoAD	- Ministry of Agricultural Development
MoE	- Ministry of Environment
NARC	- Nepal Agriculture Research Council
NBCD	- National Bureau to Combat Desertification
NGII	- National Geographic Information Infrastructure
NPC	- National Project Coordinator
NRM	- Natural Resource Management
NRMC	- Natural Resources Management Centre
RTW	- Regional Training Workshop
SAARC	- South Asian Agricultural Research Council
SC	- Steering Committee
SFA	- State Forestry Administration
SLM	- Sustainable Land Management
SoB	- Survey of Bangladesh
SPAARSO	- Space Research and Remote Sensing Organization
SRDI	- Soil Resources Development Institute
SSD	- Soil Science Division
TCP	- Technical Corporation Project
ToT	- Training of Trainers
TWG	- Technical Working Group
UNCCD	- United Nations Convention to Combat Desertification
WOCAT	- World Overview of Conservation Application and Technologies