PAKISTAN - AUSTRALIA AGRICULTURAL SECTOR LINKAGES PROGRAM

PROGRAM REVIEW
DECEMBER 2008

Acronym	
ACIAR	Australian Centre for International Agricultural Research
ADS	Australian Development Scholarships
ASLP	Pakistan – Australia Agricultural Sector Linkages Program
AusAID	Australian Agency for International Development
Austrade	Australian Trade Commission
F&VDP	Fruit and Vegetable Development Project
FRI	Fodder Research Institute, Sargodha
Halla	NGO Idara-e-Kissan
IRM	Institute of Rural Management
L&DD	Livestock and Dairy Development Department, Punjab
LDDB	Livestock and Dairy Development Board
MINFAL	Ministry of Food, Agriculture and Livestock
NARC	National Agricultural Research Centre, Islamabad
NGO	Non-Government Organisation
NRSP	National Rural Support Program
NWFP	North West Frontier Province
ORI	Orange Research Institute
PARC	Pakistan Agricultural Research Council
SAU	Sindh Agricultural University
UAF	University of Agriculture Faisalabad
UVAS	University of Veterinary & Animal Sciences

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Pakistan - Australia Agricultural Sector Linkages Program Review 2008

Executive Summary

The Agricultural Sector Linkages Program (ASLP) commenced in July 2005 as a A$6.6m, four year initiative funded through the Australian Agency for International Development (AusAID). ASLP has three goals:

1. To transfer Australian knowledge and expertise to key sectors of Pakistan agribusiness to increase profitability and enhance export potential;
2. To contribute to poverty alleviation of small-holder farmers through collaborative research and development; and
3. To enhance the capacity of the Pakistan research, development and extension system to deliver targeted and practical research outputs to agribusiness and farmers.

These Goals are being delivered through four Components:

1. *Market Linkages ($100,000):* The Australian Trade Commission *(*Austrade) has conducted an agriculture market expansion feasibility mission to Pakistan involving key Australian companies, in order to stimulate bilateral trade and investment;
2. *Academic Linkages ($1,440,000):* AusAID has scheduled seven agriculture research/postgraduate scholarships of up to two years each for Pakistanis to study at Australian institutions under the Australian Development Scholarship (ADS) Program;
3. *Agriculture Linkages ($5,015,000):* The Australian Centre for International Agricultural Research (ACIAR) has implemented a program of technical projects to build linkages between the agriculture sectors of the two countries; and
4. *Linkages Program Review ($45,000):* In November 2008 ACIAR facilitated a joint review of the ASLP, the results of which are the subject of this report.

ASLP, and especially the Agricultural Linkages component, has generally been strategically appropriate, has addressed significant agricultural opportunities for Pakistan, and has capitalised on important Australian strengths. It has proved to be a very high profile engagement achieving a level of recognition well above what would have been expected for its modest scope and budget. The ACIAR-led Agricultural Linkages component (comprising clustered interventions in the dairy, citrus and mango industries) is the centrepiece of the ASLP Program. It receives the majority of funds, and is perceived by most stakeholders as both an innovative and appropriate intervention. Pakistani Government partners reflect that it is one of the few donor engagements where industry issues and concerns are addressed in a practical and targeted manner. Industry also openly and actively professes the success of the program. This is particularly so with the mango sector engagements. ACIAR's hands-on faciliatory management has been instrumental in lifting the profile of ASLP within the Pakistani Agencies, leveraging considerable counterpart commitment, and facilitating linkages between otherwise introverted organisational structures.

The Agricultural Linkages component is focused on significant agricultural industries, with a largely smallholder base, showing considerable potential for domestic and export expansion. Importantly they are also industries where Australian research has a comparative advantage, and where links with current industry-based teams can be effectively established. It is apparent that in all three industries, that relatively simple production and marketing interventions can lift the productivity, quality and return from these industries, with significant impact on smallholder income.

While the review raises concerns about the limited justification for the higher level design logic of ASLP, its lack of defined processes for Program level M&E, and the absence of mechanisms for integration of agency activities, subsequent design of the mango, dairy and citrus sub-projects is not a concern – each has robust, although challenging, objectives and generally sound M&E in line with ACIAR expectations. ASLP has catalysed the clustering of key contributors around priority industry needs, which has facilitated cross linkages between stove-piped organisational structures.

The two mango projects are rated as highly satisfactory by the review, and demonstrate many "best practice" features. Progress has been in full accord with, and at times exceeded, what was planned for in the designs. Reporting has been comprehensive, high quality, prodigious, and has strongly featured Pakistani authors. The projects have already generated outcomes of both scientific and commercial significance. The projects could be strengthened through more purposeful attention to the flow of benefits to the poorer, small-scale farmer.

The dairy extension project is progressing satisfactorily and shows considerable promise to deliver robust outcomes. It can be further strengthens through a broader appreciation of extension delivery for both dairy and non-dairy components of the smallholder farming system.

For citrus, the review considers that progress to date has been marginally satisfactory and that it has struggled when compared to the other three ACIAR interventions. Careful assessment of project management options may alleviate some of these constraints.

During the review many stakeholders took the opportunity to suggest either possible enhancements to existing partnerships, or entirely new opportunities for partnership. Hence the review has grouped these suggestions into two areas:

1. Enhancements or extensions to current ASLP programs: The review recommends a funded extension of the current ASLP up to June 2011. Indicative funding is suggested in the order of $3.6m; and
2. Broader agricultural opportunities that may form the basis of future Australian collaboration. These recommendations identify key lessons arising from ASLP and make suggestions that will guide future Australian bilateral support to Pakistan.

Recommendations

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1. Background

In January 2005, Shaukat Aziz, the then Prime Minister of Pakistan, requested Australian expertise to support agricultural development in Pakistan. It was proposed that this support should be provided through a program that built closer linkages between the agriculture sectors of the two countries. In response, Australia prepared the Agricultural Sector Linkages Program (ASLP) – a four year initiative to be funded through the Australian Agency for International Development (AusAID). This was announced during the Australian visit by Pakistan's then President, General Pervez Musharraf, in June 2005, at which time a MOU was signed. The ASLP has now been running for more than three years. It has had three goals:

1. To transfer Australian knowledge and expertise to key sectors of Pakistan agribusiness to increase profitability and enhance export potential;
2. To contribute to poverty alleviation of small-holder farmers through collaborative research and development; and
3. To enhance the capacity of the Pakistan research, development and extension system to deliver targeted and practical research outputs to agribusiness and farmers.

These Goals are being delivered through four Components:

1. *Market Linkages:* The Australian Trade Commission *(*Austrade) has conducted an agriculture market expansion feasibility mission to Pakistan involving key Australian companies, in order to stimulate bilateral trade and investment;
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3. *Agriculture Linkages:* The Australian Centre for International Agricultural Research (ACIAR) has implemented a program of technical projects to build linkages between the agriculture sectors of the two countries; and
4. *Linkages Program Review:* ACIAR has recently facilitated a joint review of the ASLP, the results of which are the subject of this report.

The total budget for the Program is A$6.6m over the four years up to June 2009. The breakdown of this budget is shown in Table 1.

Component	Description	Value	Percent
Component 1	Austrade Market Linkages	$100,000	1.5%
Component 2	AusAID Australian Development Scholarships	$1,440,000	21.8%
Component 3	ACIAR Agricultural Projects	$5,015,000	76.0%
Component 4	ASLP Review	$45,000	0.7%
Total		**$6,600,000**	**100%**

Table 1: Overall ASLP Budget distribution

Under a Record of Understanding with AusAID, ACIAR agreed to manage and implement the bulk of the Program as covered by Components 3 and 4. An implementation plan for these ASLP Components was approved by AusAID and signed off by Pakistan's Ministry of Fisheries Agriculture and Livestock (MINFAL) during Prime Minister John Howard's visit to Pakistan in November 2005 (ASLP Nov 2005). Since that time, ACIAR has conceptualised, negotiated, designed and commenced implementation of four Agricultural Linkages interventions as shown in Table 2. These four embedded activities include interventions that support mango production, the mango supply chain, citrus production and dairy production. Major events in the implementation of ALSP are summarised in the timeline shown in Table 3.

Name	Budget[1]	Australian Partners	Pakistani Partners
HORT/2005/153: Development of integrated crop management practices to increase sustainable yield and quality of mangoes in Pakistan and Australia	A$1,025,100 (A$1,043,387)	Queensland Department of Primary Industries and Fisheries	National Agricultural research Council (NARC) Agriculture Department, Punjab Agriculture Department, Sindh
HORT/2005/157: Optimising mango supply chains for more profitable horticultural agri-enterprises in Pakistan and Australia	A$1,221,021 (A$1,271,021)	The University of Queensland Queensland Department of Primary Industries and Fisheries Western Australia Department of Agriculture and Food	Pakistan Horticulture Development and Export Board (PHDEB) University of Agriculture Faisalabad
HORT/2005/160: Increasing citrus production in Pakistan and Australia through improved orchard management techniques.	A$651,012 (A$651,343)	New South Wales Department of Primary Industries	National Agricultural Research Council, Islamabad University of Agricultural Faisalabad Agriculture Department, Punjab Agriculture Department, NWFP CABI
LPS/2005/132: Improving dairy production in Pakistan through improved extension services	A$1,197,726 (A$1,197,726)	Charles Sturt University	Livestock and Dairy Development Board Livestock and Dairy Development Department (Punjab) National Rural Support Program Idara-e-Kissan (Halla)

Table 2: ACIAR projects under the ASLP Component 3: Agricultural Linkages.

Review Mission

Component 4 of ASLP envisaged a significant AusAID/ACIAR joint review of the Program. This was originally planned for fourteen days in October 2008, and incorporated parallel assessments of

[1] Original (Current) - (Australia Pakistan Agricultural Sector Linkages Program 2008). The current total budget of $5,151,134 exceeds the original budget of A$5,015,000 by A$91,134. ACIAR will meet the additional cost from its appropriations.

different sub-projects by a large team of reviewers and project staff. Unfortunately this review was postponed due to an increase in security concerns at that particular time. A shorter, less comprehensive review was then proposed involving a nine day visit by a single reviewer, accompanied by two ACIAR representatives, and facilitated by the ACIAR ASLP in-country Program Officer[2]. This abbreviated review involved an intensive program of meetings with over one hundred informants (see Attachment 2: People Consulted). It occurred from the 13 - 24 November 2008 (see Attachment 1: Review itinerary). Unfortunately, due to time constraints, the review focused primarily on the Agricultural Linkages (Component 3).

This report presents the outcomes of the ASLP review. Section 2 discusses the overall program and its management, while Sections 3 to 6 discuss the achievements of the Agricultural Linkages Component and the mango production; mango supply chain; citrus production; and dairy production sub-projects respectively. Sections 7 and 8 briefly discuss the Market and Academic Linkages components. Finally, Section 9 discusses the future of the ASLP, along with the possibilities for other, broader Pakistan-Australia collaboration in the agriculture sector.

[2] ASLP Reviewer - David Swete Kelly; ACIAR South Asia Coordinator - Dr Christian Roth; ACIAR Program Manager (Horticulture) - Les Baxter; and ACIAR ASLP Program Officer - Sosheel Godfrey.

	2005/06				2006/07				2007/08				2008/09				End Date
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Proposed
ASLP Management and Review																	
Partner Consultations	Aug-05																
Implementation Plan approved		Nov-05															
Appoint Pakistan Project Support Officer			Feb-06														
Project Preparation																	
Mango Technical Workshop			Mar-06														
Mango production scoping study				Apr-06													
Mango exposure visit to Australia						Nov-06											
Mango supply chain scoping study				Apr-06													
Dairy scoping study (I)				May-06													
Dairy Scoping Study (II)					Sep-06												
Dairy Knowledge Fair							Feb-07										
Citrus exposure visit to Australia				May-06													
Citrus Technical Workshop					Jul-06												
Citrus scoping study					Jul-06												
ASLP Steering Committee Meetings						Nov-06											
ASLP Website launched						Nov-06											
ASLP Review														Nov-08			
Mango Production																	
Project start							Jan-07										
Project inception visit							Feb-07										
Project implementation							**1/1/07**										**31/12/09**
Mango Supply Chain																	
Project start						Dec-06											
Mango supply chain exposure visit							Jan-07										
Project implementation						**1/12/06**											**30/11/09**
Citrus																	
Project approval								May-07									
Project visits and workshops								May-07				May-08					
Exposure visit and training in Australia										Nov-07							
Project implementation								**1/4/07**									**31/4/10**
Dairy																	
Project approval									Jul-07								
Project inception visit									Jul-07								
Project implementation									**1/7/07**								**31/12/09**
Austrade																	
Austrade Delegation to Australia					Sep-06												
Export of improved dairy cattle							Feb-07			Dec-07	Feb-08			Nov & Dec-08			

ASLP Review

Table 3: ASLP Timeline for ACIAR Components 3 & 4

2. ASLP High Level Management and Oversight

The original justification for ASLP notes Australia's desire to:

create "clever linkages" between Australia and Pakistan that reflect Pakistan's sophistication and move away from traditional aid activities ……. and pursue more enduring institutional linkages. (AusAID FMA 9 Approval)

This general principle has not only been fully embraced by ASLP, but will be shown to have been generally successful. In addition the review will show that ASLP, and especially the Agricultural Linkages component, has generally been strategically appropriate, has addressed significant agricultural opportunities for Pakistan, and has capitalised on important Australian strengths. The focus on agriculture remains valid, as shown by the Pakistan Economic Survey conducted in 2008 (Government of Pakistan 2008). The Economic Survey shows that at 21 percent of GDP, agriculture is the single largest sector and employs 44 percent of the workforce. The survey concludes that"

"more than two-thirds of Pakistan's population lives in rural areas and their livelihood continues to revolve around agriculture and allied activities. As with other developing countries, poverty in Pakistan is largely a rural phenomenon; therefore, development of agriculture is seen as a principal vehicle for alleviating rural poverty." (Government of Pakistan 2008).

Overall, the majority of stakeholders appreciate the approach taken with the ASLP intervention, and consider it to be achieving significant results – in fact most partners were themselves surprised at the profile achieved by such a modest intervention during its relatively short term of engagement. As such, the success of ASLP warrants a close review, especially given that its profile and apparent success is the envy of many larger and longer term interventions. This is further evidenced by the fact that some Pakistani partners see ASLP as a model for other donor engagement[3].

Very early in the review it was apparent that most partners see the Agricultural Linkages (ACIAR) component as the entirety of ASLP, many being unaware that interventions in Market Linkages (Austrade) and Academic Linkages (AusAID Scholarships) are integrated components of the Program. This is understandable given that Agricultural Linkages has the highest profile of the three components, and garners 76 percent of the funding. Nonetheless, it is a credit to the management within ACIAR that the Agricultural Linkages component has been so successful. In fact, throughout the review it was very evident that ACIAR, under the guidance of its South Asia Coordinator, Dr Christian Roth[4], has established a deep understanding of both the technical and partnership opportunities available within the country - ACIAR was universally respected by the stakeholders interviewed. It was also very clear that the strong coordination and management role taken by the South Asia Coordinator, along with the focused in-country support of the ASLP Program Officer, have been instrumental in lifting the profile of ASLP within the Pakistani Agencies, leveraging considerable counterpart commitment, and facilitating linkages between otherwise introverted and somewhat

[3] USAID, which is contemplating a large livelihoods improvement project, have been asked by the Pakistan Planning Commission to consider ASLP experience when developing their approach.

[4] Dr Christian Roth finished his term with ACIAR at the end of November and is now based with CSIRO in Brisbane.

ossified organisational structures. This review considers such a model of faciliatory program management to be one of the key drivers of ASLP success.

Yet while the successes of the program are very apparent, the review must nevertheless raise concerns about the fundamental design logic. The design outlines three goals to be delivered through three agency-specific components (see Figure 1). Yet the rationale for having three components is never clearly explained in the Program documentation. The current understanding is that these three components allowed alignment with Government partners (AusAID, ACIAR and Austrade) and thus demonstrated a whole-of-government response. However, the overall ASLP budget is not only quite small (at least by AusAID standards), but it clearly gives emphasis to Agricultural Linkages as the central element of the program. The other two components are not only much smaller, but support already established initiatives by Austrade[5] and AusAID. A split of this type therefore could be perceived as a token gesture. A more robust response would logically have required greater cross-institutional management and oversight – something that would also have required considerable planning, yet the Program neither identified nor resourced this. The lack of clarity around the overall Program design has led to: minimal ASLP strategic coordination; limited integration of Program components; and a lack of coordinated Program level M&E.

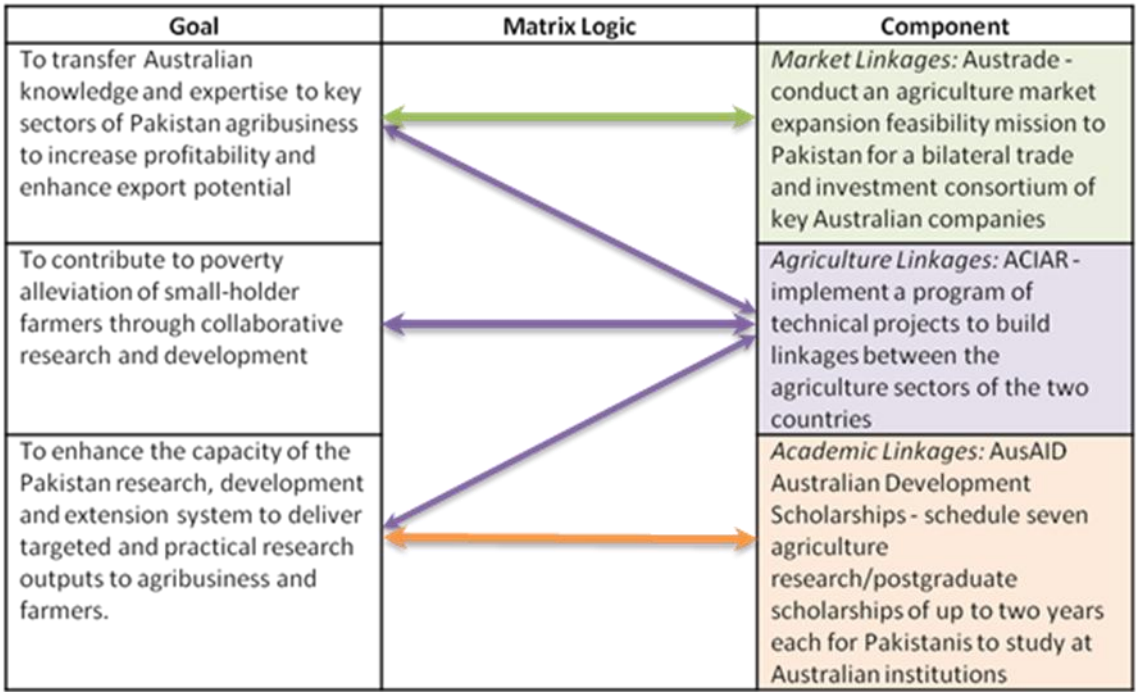

Figure 1: Current logic between ASLP Goals and Components

Nevertheless, at the operational level some degree of integration has occurred. This has been driven from the bottom up, being largely predicated on the enthusiasm, energy and networking skills of on-the-ground project staff. Moreover, it is only as a result of these operational contacts, rather than any foresight in the original design, that Austrade's work in the commercial dairy sector is beginning to achieve some technical links with the smallholder-focused ACIAR dairy intervention.

[5] Although Austrade makes clear that the additional budget and focus allowed them to achieve more and take a broader approach than otherwise would have been possible (see p 22)

Yet, unfortunately, any similar potential for the strategic integration of Australian Development Scholarships has not been achieved – in fact while the concept is sound, its implementation was possibly poorly conceived given the strict procedures to which ADS selection processes are obligated to conform. It remains a moot question then whether more could have been achieved, even if closer strategic integration and management had occurred across the Program.

3. ASLP Agricultural Linkages Component - ACIAR

The ACIAR-led Agricultural Linkages component is the centrepiece of the ASLP Program. It receives the majority of funds, and is perceived by most stakeholders as both an innovative and appropriate intervention. As well as the four larger sub-projects the component includes multiple short term studies and trainings (see Table 3). The sub-projects had been implemented for between 16 and 24 months at the time of the review.

Focus of the ASLP Agricultural Linkages Component

The rationale for selection of the target agricultural interventions - mango, citrus and dairy (see Table 2) - is provided in Annex II of the ASLP Implementation Plan (ASLP Nov 2005). The selection of target interventions involved close consultation with senior officials of both the Ministry for Food, Agriculture and Livestock (MINFAL), and the Pakistan Council for Agricultural Research (PARC). Clear directives on focus and priorities were also obtained from the Minister of Industries, Production and Special Initiatives, and the State Minister of Economic Affairs & Statistics. Input was also sought from a broad cross-section of national and provincial research and extension institutions, as well as the National Rural Support Program, and a number of industry bodies (e.g. Pakistan Dairy Development Corporation). The review noted the strong ownership of all stakeholders in the initiatives identified. Stakeholders reiterated three central principles that were agreed during the planning process:

- Maintain focus – target the assistance to a few areas to ensure significant impacts[6];
- Select established industries with a large smallholder base, where simple improvements to productivity and quality carry with them significant opportunities to alleviate poverty; and
- Only choose industries where Australian research has a comparative advantage, and where links with current industry-based teams can be effectively established.

The justification and basic analysis underpinning the Agricultural Linkages component of ASLP remains valid today. The three industries selected in 2005 all have significant potential, and a strong smallholder base. Interestingly, more recent 2007 data shows that Pakistan has now become the 4th largest milk producer in the world (FAO 2008). Dairy is by far the country's largest agricultural industry (by value), worth an estimated US$5.77 billion (FAO 2008). Nevertheless, the industry is primarily informal, with only 5% of production (at the most) being processed and marketed. The rest arises from traditional production systems involving an estimated eight millions farm families, usually with two to five animals (Pakistan Dairy Development Company June 2006). Of particular note for poverty reduction is the economic scope that dairy offers people with no secure land

[6] There has been a strong backlash in Pakistan against large, integrated, multi-component agricultural and rural development Programs that have promised much, taken ages to establish, but have invariably been perceived to deliver very little.

tenure, as a significant proportion of the landless raise dairy cattle as a major source of income. Given the informal and traditional structure of the industry, 66% of the milk is produced by buffalos, and the majority of products are used for family consumption or traded locally. Hence there remains significant potential to increase productivity, and in this way to appreciably increase food security, alleviate poverty, and broaden formal marketing.

The choices of mango and citrus are also significant. The mango and citrus industries are the country's most important horticultural tree crops, with Pakistan an important global producer and increasingly, exporter. Recent annual statistics for mangoes places production around 2.25 million tonnes in 2007, worth an estimated $334m, making mango one of the country's largest horticulture industries. Production has apparently increased by 113% from the 1.06 million tonnes recorded just three years previously at the start of ASLP in 2004. Prior to 2004, the industry had maintained relatively static production at about 1.0 million tonnes. The area harvested has also doubled since 2004 to 215 thousand hectares. This reflects the increasing importance of the industry in Pakistan.

Mango production arises from small farm holdings in the Punjab and Sindh, and Pakistan is now the world's third largest producer of mangoes after India and China (FAO 2008). Yet despite the high production figures, only 4.7% of the mango harvest was exported in 2006, valued at around US$32 million. This is largely due to poor fruit quality, combined with poor handling and marketing practices. As a result, Pakistan receives the lowest average price per kilogram (US$0.30) of any major mango exporting country.

The mango and citrus industries are currently similar in size and production, with citrus production having remained fairly static over the last three years at about 2.5m tonnes (slightly more than mangoes). However, citrus (at US$113m) is worth substantially less than mangoes. Importantly however, citrus exports are double those of mango - in 2006, 195,000 tonnes were exported at a value of US$42 million. Almost all this is mandarins, primarily the variety *Kinnow*. Pakistan is, in fact, the fifth largest international exporter of mandarins (FAO 2008), approximately one quarter of production being exported. Furthermore, although citrus varieties are grown in all four provinces, Punjab produces over 95% of the crop because of its greater population, favourable growing conditions, and adequate water supply.

In summary: ASLP is focused on significant agricultural industries, with a largely smallholder base, showing considerable potential for domestic and export expansion. It is apparent that in all three cases relatively simple production and marketing interventions can lift the productivity, quality and return from these industries, with significant impact on smallholder income.

Another important reason for selecting the dairy, mango and citrus industries was the comparative advantage Australia has in providing know-how across the entire production systems and supply chains. Clearly this is a unique attribute that has been well received in Pakistan. It should be noted though, that Australia also has significant comparative advantage in other crops of mutual interest (particularly sugar cane and grains). However, both the scale and Australian industry politics surrounding these commodities limits the ease with which an integrated team of technical specialists can be fielded to assist a developing country partner.

Another feature of ASLP that has been greatly appreciated is the flexible and responsive nature of the assistance provided. To further facilitate this, the activities that support the key interventions in mango, citrus and dairy were never rolled into single initiatives. Instead, assistance has been provided as a blend of short-term and long term activities, including:

- Scoping studies and constraints analyses;
- Agro-enterprise exposure and fact finding trips to Australia;
- Technical and scientific workshops;
- Tailored training and capacity building packages delivered in both Pakistan and Australia; and
- 2-3 yr research and development projects.

As a result, the programs have delivered up-front tangible assistance, which has then been used to guide and enhance subsequent interventions. It must be noted, however, that this model has required considerable coordination and management by ACIAR.

Resources allocated for the four larger, long term industry projects (see Table 2) that form the core of the Agricultural linkages component of ASLP are shown in Figure 2. The majority of support is provided to the mango (53%) and dairy (27%) industries. In fact, it was the original intention to keep the modest resources focused on just these two sectors. However a request for some expansion into the citrus industry resulted in a smaller citrus program also being incorporated. Yet while this has been beneficial, it must be noted that "expansionism" – spreading resources too thinly by attempting to respond to all requests - represents a significant threat to the program. Maintaining a strategy of logical, step-wise, targeted interventions is a strength of the current ASLP management, and must be protected.

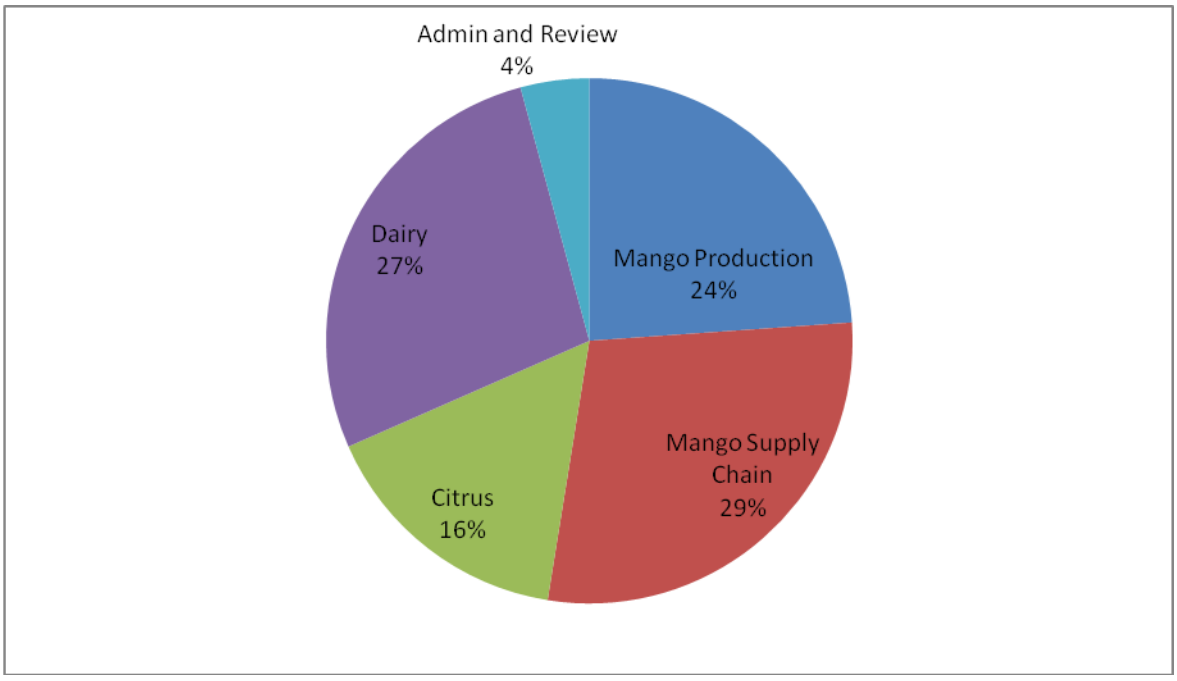

Figure 2: ASLP Budget (Australia Pakistan Agricultural Sector Linkages Program 2008)

ASLP Agricultural Linkages Design

As mentioned, there is limited justification for the higher level design logic for ASLP, no defined processes for Program level M&E, nor any mechanism for integration of agency activities. Given this looseness, ACIAR took the approach in the ASLP Agricultural Linkages Implementation Plan that their component will contribute to all three ASLP Goals. As such they have developed a Logframe for Component 3 (See Attachment 3: ASLP Logframe) that identifies somewhat generic "Purpose" statements along with associated Outputs for the mango, dairy and citrus subprojects (see Table 4). However the subsequent designs of the all sub-projects, while taking on the broad concepts, have disregarded (probably wisely) the specific wording, and instead proposed their own sets of objectives and associated outputs (see example for dairy in Table 4).

ASLP Agricultural Linkages Component Logframe			Example of Subproject Objectives (Dairy Sub-project)
Goal 1: To transfer Australian knowledge and expertise to key sectors of Pakistan agribusiness to increase profitability and enhance export potential	**Component A – Mangos.** Purpose: To transfer Australian mango production and supply chain know-how.	Disconnect in design logic	**Dairy Subproject Objectives** Objective 1: To demonstrate the economic and social benefits of improved extension services to smallholder dairy farmers. Objective 2: To enhance the scope and quality of information used for training extension personnel. Objective 3: To enhance the research capacity of Pakistani scientists in priority fields relevant to the ongoing development of the dairy sector. Objective 4: To promote the benefits of agency linkages and enhanced extension services to National and Provincial research and extension agencies and NGO groups.
	Component B – Citrus. Purpose: To transfer Australian citrus production knowledge and expertise		
	Component C – Dairy Purpose: To transfer Australian dairy production and constraints analysis know-how		
Goal 2: To contribute to poverty alleviation of small-holder farmers through collaborative research and development	**Component A – Mangos** Purpose: To develop improved mango production, certification and marketing techniques		
	Component B – Citrus Purpose: To develop improved citrus production and certification techniques		
	Component C – Dairy Purpose: To develop improved milk production techniques		
Goal 3: To enhance the capacity of the Pakistan research, development and extension system to deliver targeted and practical research outputs to agribusiness and farmers	**Component A – Mangos** Purpose: To develop training modules tailored to the mango		
	Component B – Citrus Purpose: To develop training modules tailored to the citrus sector		
	Component C – Dairy Purpose: To develop training modules tailored to the dairy sector		

Table 4: Purpose statements for ASLP Component 3: Agricultural Linkages

However the end result presents a somewhat confusing picture, especially given that, since inception, the Agricultural Linkages Component has not felt it necessary to update the original

logframe to more appropriately encapsulate the subsequent sub-project designs. Hence while the sub-projects operate within, and report against, their own internal logic, the ACIAR ASLP Program Manager has then been required to reinterpret these reports in a format that aligns with the original logframe. The output of this process (see Attachment 4: ASLP Achievements against the Logframe) is adequate but time-consuming and clumsy. It is clearly undertaken only to comply with inter-agency reporting obligations, rather than adding value to the essential task of assessing outcomes and impacts against the higher level goals.

It is the reviewer's opinion that the core of this problem reflects the differing approaches taken to M&E and outcome reporting by AusAID and ACIAR. ACIAR's focus during implementation appears to be on ensuring projects achieve their milestones and medium term objectives[7]. Assessment of outcome and impacts however is seen as requiring much longer timeframes, and is generally undertaken through separately contracted ex-post evaluations. AusAID on the other hand requires projects to have comprehensive M&E Frameworks that monitor ongoing achievements and regularly assess actual or indicative outcomes throughout the life of the Program. Both approaches have their merits, but the forced mating of the two philosophies is cumbersome and sustains bureaucracy rather than learning.

Given the success of ASLP and the overt benefits of the AusAID/ACIAR partnership, it would be to the advantage of both agencies, if at the start of any new partnership in Pakistan, a clear Program logic could be agreed upon, incorporating a compatible M&E framework and reporting protocol. However, the more immediate concern is the need for AusAID and ACIAR to discuss the merits of revising the logframe of the current phase of ASLP to more appropriately capture subproject objectives, and align these with the goals[8].

> Recommendation 1. AusAID and ACIAR must discuss the merits of revising the logframe of the current phase of ASLP to more appropriately capture subproject objectives, and align these with the goals.

Yet while the design hierarchy and associated evaluation processes could have been clearer, this problem has had little effect on the industry-based sub-projects. Each of the mango, dairy and citrus interventions is well designed, with robust objectives and generally sound reporting in line with ACIAR expectations. The management structures and funding mechanisms for each sub-project have arisen from careful reviews of the institutional capacities of potential partners. Each project structure is unique. This is an important point, and reflects the many months that it took ACIAR and the Australian and Pakistan partners to consider each design, and identify appropriate collaboration and management mechanisms. This "hand-crafted" approach to each intervention has been important in establishing the best opportunities for success. For example, one innovation has been

[7] In addition, projects report generically on "scientific", "capacity" and "community" impacts.

[8] While it is logical to undertake this logframe review, it is not a constraint to sub-project implementation and reporting. The review found that most Pakistan stakeholders do not use or refer to the ASLP logframe, and instead focus on relevance and logic at the sub-project level. The lack of clear high level logic constrains integration between elements of the Program, the higher level M&E, and integrated outcome reporting. However, because it was never clearly defined at the outset, the program does not allocate any resources to facilitate these activities. When considering the merits of a logframe review, a decision to proceed (if agreed) should also identify additional resources to facilitate cross program linkages and improve the higher level M&E processes related to impact reporting.

to use a CGIAR centre's country office to channel project funds directly to implementation teams[9]. This has avoided the often long delays and bureaucracy associated with Pakistan Government systems[10].

The only concern of this review is that many sub-project designs are overly ambitious given the program's timeframe. As seen in Table 3, most sub-projects commenced between November 2006 and July 2007, and thus were 16 to 24 months old at the time of this review. Furthermore, although ASLP commenced on 1 July 2005 and is due to finish on 30 June 2009, most of the ACIAR sub-projects have scheduled end dates between 31 Dec 2009 and 31 April 2010. Clearly an extension of time to the current MOU is needed to accommodate the current implementation timeframe. This extension is discussed further under Section 9 on page 32.

Management of the ASLP Agricultural Linkages Component

As mentioned, the review considers the management model used by ACIAR for ASLP Agricultural Livelihoods to be integral to both the program's success and the strong appreciation of it shown by stakeholders. Figure 3 delineates the nested hierarchy of the management model. At the first level, ACIAR's South Asia Coordinator closely manages stakeholder relationships, regularly discussing strategy, partnerships and implementation. Also at this level, the ACIAR ASLP Program Officer manages the daily operational logistics of the Program, including short term activities and any visits by ACIAR and Australian team members. At the second level, the appropriate ACIAR Program Leader oversees the technical quality, management and specific stakeholder relationships of one or more focused interventions[11]. At the final level, the Australian and Pakistani Team leaders for each intervention interact regularly to implement the technical program.

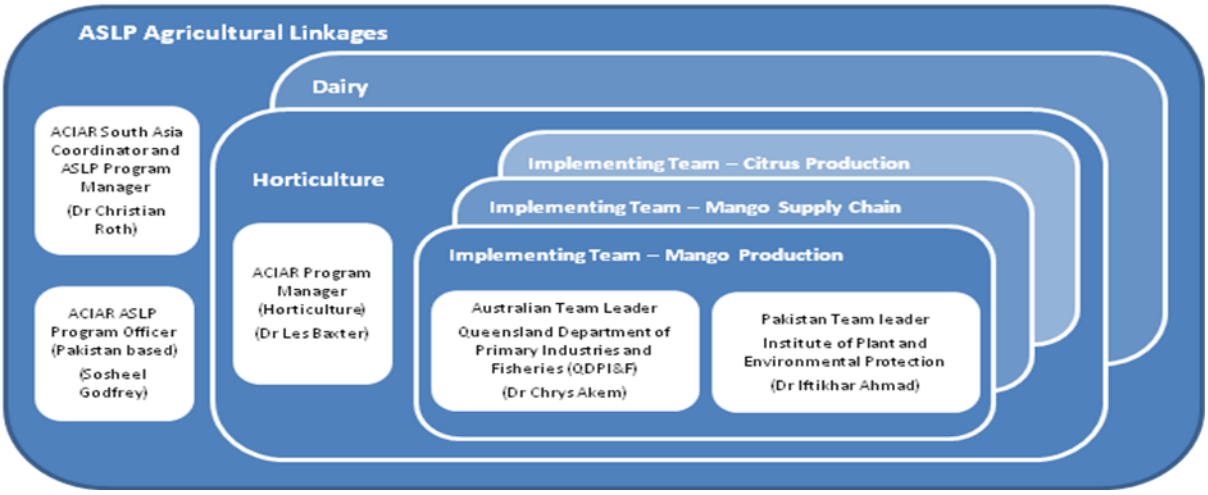

Figure 3: Management structure for ACIAR's ASLP Agricultural Livelihoods component.

[9] The International Centre for Agricultural Research in the Dry Areas (ICARDA) maintains a country office in Islamabad. Initially ICARDA agreed to manage project funds on behalf of ASLP engagements in citrus and mango. However recently ICARDA has indicated that the role cannot be continued, because of the demand placed on its systems and resources by projects not officially under its mandate.

[10] This suggestion was in fact fully endorsed by the Pakistan Agricultural Research Council (PARC) who recognized that delays in their own internal systems for release of project funds were often a serious constraint to timely project implementation.

[11] In the case of ASLP, Les Baxter (Program manager – Horticulture) manages the citrus and mango interventions, while Dr Peter Horne (Program Manager - Livestock Production Systems) manages dairy.

This model has significant strengths, and clearly benefits from the elite professional and scientific calibre of personnel at each of the three levels. The interactions that occur (be they focused on strategy, management or technical issues) are considered mutually beneficial, and a key aspect of the collaboration. In fact, partners appreciate the strategic and management interchanges as much as the core technical links. It must be noted though that the model is resource intensive, and that ACIAR absorbs the associated overhead costs as its contribution to ASLP. Yet such a level of in-house professional oversight has evolved over many years within ACIAR, and is one of the agency's key strengths. AusAID by way of comparison, would find the system difficult to replicate without dependence on externally contracted inputs.

Another strength common to each of the ASLP Agricultural Linkages interventions, is their facilitation of inter-agency collaboration. Partners shared that, in general, little opportunity exists for scientists from different agencies, or different parts of the country, to exchange ideas. This is partly due to funding and communication constraints, but it is also strongly influenced by a culture of inter-agency rivalry, suspicion and competition. Furthermore, Pakistani agencies are strongly hierarchical, and the limited inter-agency interaction that does occur has inevitably involved bureaucrats rather than working scientists and development staff. In consequence, ACIAR has gone to considerable lengths to ensure the wide participation of coal-face workers in all its forums, workshops and technical teams. Partners have found this incredibly useful. ACIAR Managers and Australian Researchers consistently commented that the technical skills of Pakistani scientists and development staff are very good – constraints have rarely been caused by a lack of capacity, but rather by a lack of a culture of interaction and free exchange of ideas.

In summary, ASLP has catalysed the clustering of key contributors around industry issues, and thereby generated cross linkages between stove-piped organisational structures (see text box). The ASLP projects have, to varying degrees, brought together

The Mango Sudden Death Syndrome Experience.

A clear example of the benefits to be gained from inter-agency interaction is the work on Mango Sudden death Syndrome (MSDS). Australian scientists shared that, prior to the commencement of ASLP, all the basic research and studies were in place to clearly understand MSDS. However, there were strongly divergent opinions as to the cause – different groups espoused pathological, insectivorous, or physiological origins for the disease. Inter-agency competitiveness and fear of losing kudos restricted clear dialogue. Hence the ASLP Mango Production project did not "discover" the cause of MSDS, but instead brought key players together so that they could more clearly appreciate the complex interplay of insects, disease, physiology and farm management factors that contribute to this degenerative stress-related syndrome. Appreciating this complex interplay has resulted in Pakistani agencies now being able to provide farmers with much clearer advice on the stress-inducing practices that cause increased susceptibility to infection (primarily by the fungus *Ceratocystus fimbriata*) and the role that bark boring insects play as vectors that specifically target stressed trees.

groups, resulting in greater sharing, integration, partnership, questioning and information exchange.

Yet although the integration of multi-disciplinary teams around industry-specific problems has been a real strength of ASLP, opportunity for cross-industry integration has been more limited. At the Team Leaders meeting held in Canberra prior to the review mission, the four component teams commented that this was the first meeting where they had the opportunity to discuss their programs, and share with other ASLP teams. Subsequently, in Pakistan, the participants of the differing projects also appreciated the opportunity to share and compare experiences. Many of the issues faced by the projects are similar (e.g. security management, extension linkages, training approaches, capacity building, and inter-agency linkages), and hence the sharing of experiences - of what has worked in particular situations, and what has not - has had real benefits. Hence, although the review appreciates that these inter-project exchanges are expensive, logistically difficult to arrange, and possibly of lesser priority, it is recommended that ASLP Agricultural Linkages provides at least one further opportunity for projects to exchange outcomes, lessons and experiences, before ASLP completion.

> Recommendation 2. ACIAR should provide further opportunity for the exchange of outcomes, lessons and experiences between the various ASLP Agricultural Linkages teams.

ACIAR Funding Model

The review noted some misunderstanding, concern and mis-communication of the ASLP funding provided to Pakistan. Greater clarity is needed on this issue to avoid the risk of criticism. ACIAR programs fund *collaborative* research, and hence some of the funds are allocated to supporting the Australian-focused portion of the research agenda. Figure 4 shows the relative allocation of ASLP funds to Australian Vs Pakistani research. This clearly shows that approximately half of the ASLP funds for mango and citrus were actually focused on Australian research outcomes. Dairy on the other hand had no Australian component. In total, A$1.56 million of the A$6.6million ASLP budget supported Australian initiatives.

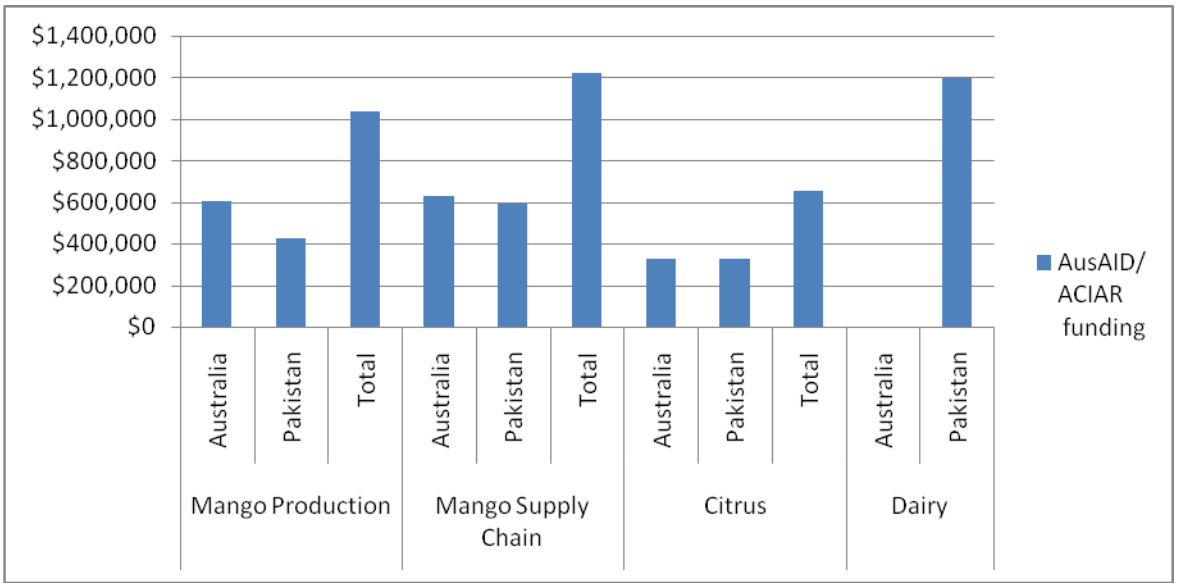

Figure 4: ASLP funding to support Australian Vs Pakistan research

Initially this allocation caused some concern. However, after careful consideration, the review considers that it is fully justified on two counts. Firstly, the allocation of funds for Australian partners leverages access to research, development and extension staff actively working within the Australian industry. Without the flexibility of mutually beneficial research funding, these workers would be unable to justify their involvement. Moreover, it is precisely these active, embedded industry-to-industry links that ASLP aims to generate and sustain. If the funding for Australian partners had not been available, then ASLP would have been forced to depend on research and development partnerships that, however competent, were more peripheral to the Australian industry.

Secondly, the ACIAR model ensures the provision of counterpart contributions from Australian institutions, usually in the form of full-time staff salaries and on-costs. As can be seen in Figure 5, this counterpart contribution substantially compensates for the operational budget directed to Australian research and development. In addition, as noted previously, ACIAR itself has provided significant management and scientific oversight as its own contribution to ASLP, this also substantially compensating for funds spent within Australia.

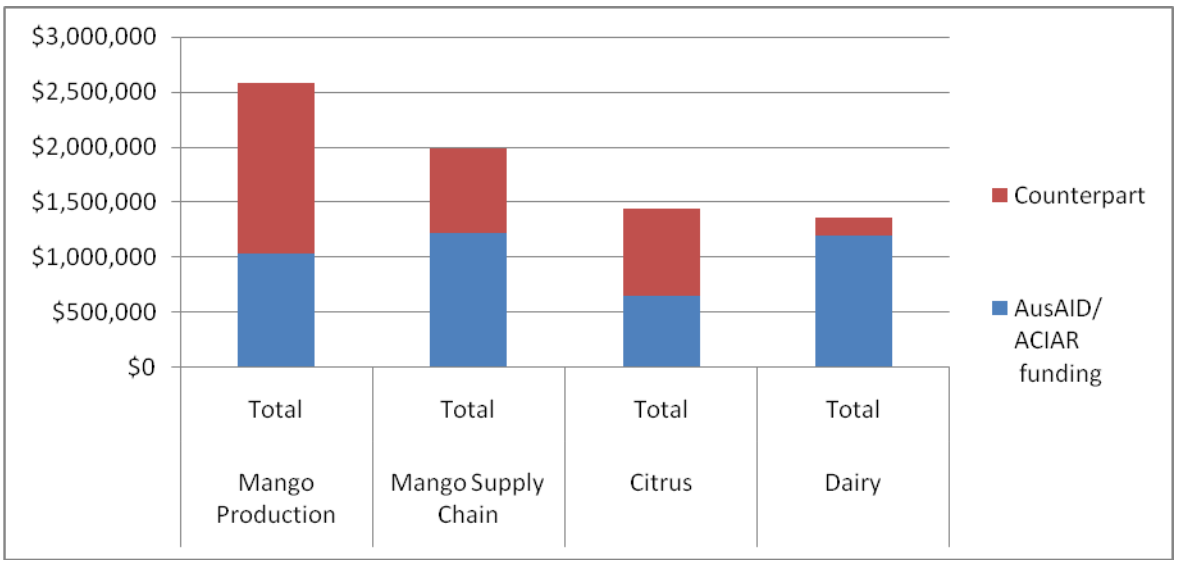

Figure 5: Counterpart contribution attributed to ASLP

In summary: while the review is convinced that this model reflects good sense, it can easily be misunderstood. For instance, AusAID documentation clearly states that ASLP funding is directed to Pakistan, when in fact it is not that simple. While the model that ACIAR presents is quite transparent, some AusAID staff and Pakistan partners, who are less familiar with the more detailed budget structure of the program, have expressed concern. Hence, greater awareness and clearer communication of the precise funding structure of the Program, will hopefully avoid any misinterpretation in the future.

> Recommendation 3. ACIAR should strengthen partner understanding of the collaborative funding structure of the Program and its inherent strengths, in order to avoid any misinterpretation of fund allocation.

4. ASLP Agricultural Linkages Component – Mango Sector Interventions

Two ASLP interventions focus on the mango industry in Pakistan. One concentrates on production and disease issues, while the other is concerned with post-harvest and supply chain issues.

The two interventions were developed in parallel. In March 2006, ASLP delivered a four day mango technical workshop in Multan. This workshop covered all aspects of the Pakistan mango sector, bringing together for the first time Australian and Pakistani specialists in research, extension, the private sector, and marketing[12]. It was reported to be extremely well received, and was identified by some stakeholders as a significant catalyst for their ongoing collaboration. Given its reported success, it is unfortunate that the documentation of the event was very limited[13].

Following on from this workshop, one project team studied constraints within the mango supply chain (Collins, et al. May 2006), and another studied constraints in mango production systems, particularly disease and pest management (QDPI&F May 2006). Pleasingly, open information exchange between the two teams ensured good cross-fertilisation of ideas, as well as the synergy of the two approaches. During the review, both teams stressed the importance of this systems approach as a key principle underpinning these joint interventions.

The links between the two projects have also been strengthened through the decision to produce a joint newsletter (Mango News)[14]. Four editions had been published by the time of this review[15]. Stakeholders were universally appreciative of the newsletter, and the opportunity it provides to document project outcomes, as well as the information it provides on technologies and events across the widely dispersed industry.

Mango Supply Chain Management Project

The Mango Supply Chain Management Project (see box on p 18) commenced in December 2006. The Australian team includes scientists from:

- The University of Queensland;
- The Queensland Department of Primary Industries and Fisheries; and
- The Western Australia Department of Agriculture and Food.

Pakistan partners include:

- The Pakistan Horticulture Development and Export Board (PHDEB) and
- The University of Agriculture Faisalabad (UAF).

[12] The four day workshop included 13 Australians and 35 Pakistan participants.
[13] Documents are available that outline the agenda of the workshop, and a two page summary of outcomes. It is unfortunate that a more detailed record of this significant workshop was not produced.
[14] Importantly, the newsletter is produced by the Pakistani team. It is edited by Nazim Hussain, University College of Agriculture, BZU, Multan.
[15] Issue 1 (April 2007); Issue 2 (July 2007); Issue 3 (Jan-Mar 2008); and Issue 4 (Apr-Jun 2008).

The inaugural project activity was an innovative "Walking the Mango Chain" study tour. Sixteen participants assessed Australian export fruit in the Singapore markets, and then followed the supply chain back to the farm in Australia[16]. From the project's outset, the Australian team has inspired their Pakistani counterparts with their enthusiasm, vision and unity. The Pakistan team has also benefited from the close and faciliatory leadership of the Pakistan Horticultural Export Development Board, who have paved the road through a number of difficulties. The energy developed by the Pakistani and Australian teams is tangible, and the enthusiasm clearly infectious. In fact the commitment of the two teams has led to many successes, and spawned interest from both the Government of Pakistan and international donors to support the dynamism developed. Among its many successes so far are:

Project Title: Optimizing mango supply chains for more profitable horticultural agri-enterprises in Pakistan
Duration: Dec 2006 – Nov 2009

1. To improve and maintain mango quality from harvest to consumption.
2. To identify present market needs and likely future opportunities for Pakistan mangoes, using this information to inform the analysis of existing supply chains and the development of improved supply chain management systems and practices.
3. To work with selected mango supply chains so that they can demonstrate to the rest of the industry the impact of improved supply chain management on competitiveness.
4. To build capacity in Pakistan mango R, D&E institutions to conduct supply chain analysis and implement improved supply chain management practices.

1. Support for the establishment of a world class post-harvest facility at the University of Faisalabad[17] and, more importantly, support to an enthusiastic and productive team of researchers under the direction of Dr Aman Ullah Malik[18]. Studies have already been initiated on optimization of storage temperature, improved post-harvest colour development, and postharvest disease identification and management. Preliminary results have led to the publication of five research papers in international and national journals.
2. The introduction, adaptation and extension of post-harvest de-sapping and lime-wash treatments. This has substantially reduced fruit blemish, improving both quality and returns. The adoption of the techniques by growers has been very rapid, including the fabrication of on-farm equipment. In addition, the technique has been incorporated as a key element of extension programs.
3. Mango maturity and harvesting standards for Pakistan varieties have been developed, published and distributed (these consist of simple colour test guides). The tool allows harvest at optimum maturity, improving quality and shelf life.

[16] The study tour occurred from 20 to 27 January 2007
[17] The laboratory was inaugurated on 27 November 2007
[18] The project has supplied cool store, power and research equipment. In addition fourteen post-harvest research staff were trained, and opportunity provided for three students to undertake postgraduate studies at UAF (1 PhD and 2 MSc); and two UAF researchers to undertake short term post-harvest training in Australia.

4. In-depth studies and documentation have been undertaken for sixteen domestic consignments of fruit (Karachi and Lahore), and thirteen export consignments of fruit (Dubai, UK, and Singapore), as well as studies of the supply chain into China. Domestically, interviews were conducted with 84 consumers and nine retailers plus freighters, exporters, and wholesalers, to examine market response to existing fruit quality, as well to ascertain their aspirations and thereby establish future requirements. The outcomes of these domestic and export market studies were reported in workshops in the mango growing regions. In addition, two controlled atmosphere sea trial shipments to Germany occurred in 2008, to assess the varieties Sindhri (June 2008), and White Chaunsa (Sep 2008).
5. Significant training and workshops in mango producing districts has improved grower understanding of mango postharvest quality and supply chain management issues. More than 1123 people have been trained through practical hands-on activities and demonstrations of postharvest techniques and skills. In addition, techniques have been incorporated into the Farmer Field School extension program of the Government of Punjab, as part of their Fruit and Vegetable Development Project.

Mango Production project

The Mango Production Project (see box) commenced in January 2007. The Australian team includes scientists from the Queensland Department of Primary Industries and Fisheries. Pakistan partners include:

- National Agricultural research Council (NARC);
- The Agriculture Department, Punjab; and
- The Agriculture Department, Sindh.

As with the Supply Chain Project, the professionalism, unity and rapport developed by the Australian and Pakistani teams is impressive, and has ensured a close and responsive professional relationship. In particular, the Pakistani team appreciated the blend of scientific professionalism and on-the-ground practicality demonstrated by the Australian team. Pakistani stakeholders expressed particular appreciation for the intensive trainings provided, and the care taken to ensure that project activities integrated with Government programs. As can be seen in the list of objectives, the focus of the mango production work has been on clean nurseries, good orchard husbandry, the detection and management of MSDS, and capacity building in RD&E.

Traditional in-field nursery practices do not produce

Project Title: Development of integrated crop management practices to increase sustainable yield and quality of mangoes in Pakistan
Duration: Jan 2007 – Dec 2009

1. Facilitate the establishment of mango disease-free nurseries for the Pakistan industry
2. Develop improved tree husbandry and management options to produce quality fruit
3. Develop improved detection and management strategies for the mango sudden death disease
4. Build capacity in the mango industry to undertake integrated crop management research

healthy disease-free seedlings. As such, two model nurseries have been established[19], and a Punjab nursery operator has received training in Australia and subsequently established his own commercial nursery[20]. The project is proposing similar support to an enthusiastic commercial operator from Sindh[21]. Mechanisms for ensuring clean, elite and genetically consistent rootstocks are well in hand, and screening for salinity tolerance has identified 42 potential rootstock lines. Close links have also been established with the National Plant Certification Board. In addition, 75 seeds of a salt tolerant line from Australia (13-1) have been imported for widespread testing. Nursery training has been substantive, and many of the proposed nursery practices are already included in extension materials. Preparation of a nursery manual is on-track for completion in 2009.

Improved canopy management techniques have been demonstrated, and subsequent adoption by the larger commercial growers has been impressive. Farmers have inherently resisted any tree pruning, but this resistance is slowly eroding as farmers see the management and fruit quality benefits in demonstration areas, and on the farms of early adopters. Some commercial pack-houses are now actively extending improved practices to their smallholder suppliers. Vegetative growth regulation using paclobutrazol has been demonstrated, and associated work on nitrogen nutrition is underway.

The project has significantly improved understanding related to the Mango Sudden Death Syndrome (see box on page 14), and has clarified isolation and characterisation processes for the primary pathogen. Throughout this work, the project has maintained close links with the Government's program on "Etiology & Management of Sudden Death in Mango", as well as the National IPM Project. There is a general optimism that the improved understanding should allow significant control of MSDS through management practices.

Training and extension has been a particular strength of this program, and has been significantly amplified through its close links with the Punjab Government's Fruit and Vegetable Development Project(F&VDP). This partnership has been responsible for three large seminars[22]. In addition the project has established ten demonstration farms[23]. Combined with the 36 group trainings and field days, the team estimates that, to date, 3,973 people have been trained by the program, equating to 22,683 person days of training. Demand for further information is high, and the 46 farmer field schools run by the F&VDP have proven very popular. These farmer field schools alone have reached 1150 farmers. Two grower groups have also been formed, and these are meeting regularly. The extension thrust has been further strengthened by provision from the Crawford Fund for a member of the Pakistani team to undertake short-term training in Australia.

Overall therefore, the two mango projects are rated as highly satisfactory by the review, and demonstrate many "best practice" features. Progress has been in full accord with, and at times

[19] One in Punjab at the Mango Research Station in Multan, and the other in Sindh at the Sindh Horticultural Research Institute.
[20] Ongoing support is necessary, as poor germination and high productions costs are clear risks that undermine the sustainability of this initiative.
[21] The Punjab Faiz-a-Aam nursery at Multan has capacity for 20,000 grafted trees per year, while the proposed Sufi Bashir Nursery at Mirpur Khas will have capacity to produce 12,000 grafted trees.
[22] Seminars have included: a) the role of pruning and dormancy in mango production, b) Integrated nutrient management, and c) Mango orchard and nursery management.
[23] Five each in Punjab and Sindh.

exceeded, what was planned for in the designs. Reporting has been comprehensive, high quality, prodigious, and has strongly featured Pakistani authors. The projects have already generated outcomes of both scientific and commercial significance. The review was very impressed by the professionalism and commitment of both the Pakistani and Australian teams. Success has been a catalyst that has helped to improve inter-agency communication, and raised the benchmark for what is achievable. It has also provided a focal point for government extension programs, and facilitated ongoing government and donor support. Almost inevitably, success has also brought some inter-agency rivalry – this was openly discussed by the teams, but the review was reassured that these minor issues are being appropriately addressed by the Pakistani team leaders, as well as by representatives of PARC/NARC.

Nevertheless, the review feels that both mango projects could benefit by strengthening the project links to the poorer, small-scale farmer. Both projects currently have strong traction with innovative (often larger) growers. Although this is absolutely in line with an industry development perspective (as practiced in Australia), from a poverty alleviation perspective more might still be achieved. This issue was discussed with both teams at the time of review. Most considered that, over time, trickle-down impacts will contribute substantially to poverty alleviation. However, in recent years there is a strong body of evidence criticising trickle-down economics (Simms 2008). Time and again, data shows that for the poor to become slightly less poor, the rich have to become very much richer. Furthermore, this rather paradoxical inequity has become more, rather than less pronounced over the last twenty years. Yet there is no clear and easy fix, and the review does not propose a radical change in implementation. Nevertheless, several development programs now espouse the principles associated with the emerging "markets for the poor" philosophy (Ferrand, Gibson and Scott 2004). Many of these programs have similar traits to the mango projects. However they put more creative energy into the design and maintenance of purposeful links that ensure the poor are included in project benefits, minimising

ASIM AGRICULTURE FARM

The Asim Agricultural Farm in Sindh Province works closely with its smallholders and workers. Benefits that have arisen include:

1. Under its previous low input management, Asim employed only three full time staff. It has now trained 70 enthusiastic youth, 30 of whom are now engaged on-farm. The other 40 are working throughout the Sindh.
2. Salaries were originally 70 PKR per day, but the newly trained staff now receive 150 PKR per day, plus performance incentives.
3. During harvest and pruning, up to 100 trained staff are now engaged.
4. Satellite smallholder fruit suppliers have been trained in orchard management and post-harvest handling techniques.
5. At least 15 smallholder suppliers have increased returns from 5,000-15,000 PKR/acre to 30,000-70,000 PKR /acre.

In addition, Asim provides residences, sanitation, potable water, first aid, education, electricity, gas and telephone for their farm staff. Moreover it has upgraded both the training and facilities associated with workplace health and safety.

negative consequences. Moreover, opportunities for such initiatives are plentiful in the Pakistan mango industry. Already, some innovative operators are proactively engaging small farmers and labourers in their operations, to mutual benefit (see box on p 21). Hence, although some consider the issue is peripheral to the project agenda, the review nevertheless recommends that project teams actively seek opportunities and establish incentives in their program that facilitate the flow of benefits to the poor[24].

> Recommendation 4. The mango project should actively seek opportunities and establish incentives in their projects that facilitate the flow of benefits to the poor.

Any future extensions of ASLP should consider the inclusion of a social scientist to work closely with the team to identify the ways in which the projects influence the terms of trade of small farmers. Exercises can then be purposefully planned to ensure that such impacts are always positive.

[24] For example the use of efficient but more labour intensive options than simply importing labour saving technology.

5. ASLP Agricultural Linkages Component – Dairy Sector Intervention

To help define the appropriate Agricultural Linkages support to the dairy sector in Pakistan, ACIAR undertook a multi-disciplinary Scoping Mission in May 2006 (Wynn, et al. June 2006). The team travelled extensively through Punjab and Sindh Provinces. It also consulted widely with Government agencies, the private sector and NGOs in both the Provinces and the national capital, Islamabad. Further in-country consultations with Australian representatives occurred in September 2007, and helped to refine the project's aim, objectives and activities.

The Dairy Extension Project (see box), which commenced in July 2007 as a 2.5 year engagement, is the shortest of the four Agricultural Linkages projects. At the time of review, it had been operating for sixteen months. The Australian team includes scientists from Charles Sturt University and the University of Sydney. Pakistan partners include two government agencies:

- The Livestock and Dairy Development Board (LDDB); and
- The Livestock and Dairy Development Department (LDDD) (Punjab);

as well as two non-government organisations:

- The National Rural Support Program (NRSP); and
- Idara-e-Kissan (more commonly referred to as Halla).

Project Title: Improving Dairy Production in Pakistan through Improved Extension Services
Duration: July 2007 - Dec 2009

1. Develop effective extension material targeted to specific topics of importance to improving milk output from information currently available from within Pakistan.
2. Measure gains in productivity on small-holder dairy operations through improved extension services by conducting a longitudinal survey of co-operating farmers in a relatively well developed and an underdeveloped region of the Punjab province.
3. Facilitate the building of workable linkages between personnel across the animal production spectrum both within Pakistan and between Pakistan and Australia with an emphasis on the development of the next generation of dairy production and extension workers.

Unlike the other Agricultural Linkages sub-projects, the Dairy Extension Project is managed through a project office staffed by a Research Fellow from Charles Sturt University, and two Research Coordinators from the Livestock and Dairy Development Board (three staff in total). Partners made it quite apparent to the review that the firm foundation, impressive networks, and substantial on-the-ground presence so far established by the project, is largely due to the commitment, professionalism, team unity and work ethic of this exemplary team. Nevertheless, the review noted that, unlike in other ASLP engagements, there was a tendency for some stakeholders to "leave it up to the team", seeming to refer to the "project" as a separate entity. Hence both Pakistani and Australian partners must manage the situation to ensure that appropriate

levels of ownership, management and accountability rest with the partners, and that is not relinquished to the team as this will undermine the sustainable impacts of the project.

The project is pleasingly and appropriately focused on the mammoth but too-often neglected needs of small family producers (those with two to twenty cattle). Although these informal producers make up the bulk of the Pakistan dairy sector, information and extension services to this particular group are minimal, due to the massive extension effort needed to reach up to eight million dispersed, low-resource producers. Hence the project is piloting and comparing enhanced extension approaches to be delivered either through local government agencies or two large local NGOs. The testing is targeted to more than 250 farmers in Punjab Province, more than half in the irrigated Okara region, the rest in Bhakkar, in the more arid Barani region[25]. The project is conducting intensive, tailor-made studies of the smallholder systems, preparing simple extension tools, and building agency links throughout the supply chain.

One of the primary tools used to enhance the extension efficiency of government and NGO services has been the provision of incentives - these have been applied to both the supply and demand sides of the extension equation. On the demand side, collaborating farmers have received complementary, high quality, multivalent foot and mouth vaccine, as well as drenches for calves. This incentive is one-off, non-tradable, and is aimed to mellow the ingrained and often justifiable cynicism directed toward extension services, ensuring collaboration until the income and efficiency benefits arising from the improved practices can kick in. Collaborating farmers also benefit from enhanced training, extension messages[26], and discussion groups. Initial results at Okara for the first eight months show a promising 22% adoption rate for the simple technologies being promoted. However adoption at Bhakkar is a more disappointing 5% (Warriach, et al. 2008).

On the supply side, extension services in the past have been dogged with high staff turn-over, poor morale and a focus on veterinary rather that system productivity outcomes. To remedy this, the project supplies monetary performance incentives for extension staff from the LDDD and one NGO, along with extension training and team building for all partners. These performance incentives are creatively scaled to the achievement of output targets, and are also closely monitored. Preliminary outcomes show a huge increase in output, morale and commitment.

During review, the project staff provided strong justification for these incentives. However, the review cautions that the sustainability of the program is solely dependent upon the capacity of government and civil society agencies to agree to, and afford these incentives in the long term. Hence there needs to be a careful analysis of institutional adoption by the agencies involved, to ensure project sustainability.

> Recommendation 5. The dairy project should closely monitor the programs sustainability on two fronts: firstly, to ensure that incentives proposed are well within the capacity of partners to sustain; and secondly, to ensure full ownership, decision making and

[25] In Okara, comparisons are made between LDDD and Halla for a total of 166 farmers from twenty villages. For Bhakkar, comparisons are made between LDDD and NRSP for a total of 107 farmers in eleven villages.
[26] Extension material now includes information on herd recording, water access, cow comfort and housing, calf management, and fodder cultivation and management.

responsibility for the project is embedded with the partner agencies and not relinquished to the project team.

The project has made substantial efforts to integrate disparate information into integrated packages. It aims to develop twelve modules; two have been completed. Information for these packages has been gleaned from over seventeen institutions. In addition, four workshops were held in 2008 (ten are planned in total) to share information and discuss project outcomes. An important feature of these workshops has been the inclusion of farmers and farm workers. Current and planned work also emphasises the importance of farmer level discussion groups concerning productivity and quality issues. Finally, all participants in the high level dairy delegation to Australia in 2008 commented on the value of the visit. Of particular note was the increased appreciation by participants of the central role that forage management plays in dairy production.

A substantial longitudinal survey of participating farmers is currently being completed to evaluate impacts[27]. Not only will this provide information on existing extension approaches, but it will also provide foundational and specific information on the current status of the small farm dairy sector (Hanif, et al. 2008). In the past, only very poor information has been available, but all stakeholders are optimistic that the quality and rigor of this survey will provide the best available data set yet compiled in Pakistan[28].

Interestingly, initial data shows that despite the extensive nature of the Pakistan dairying industry, often it is not the main agricultural enterprise for the families involved. This fact only emphasises the importance, in the case of poor farmers, of an integrated approach that assesses the whole farming system. This has two immediate implications. Firstly, a "whole farm" extension service is plainly preferable to an industry-focused approach. Secondly, the competing demands for time and resources of non-dairy farm activities must be taken into account when assessing the constraints to adoption. Similarly the implications and impact of adoption on non-dairy activities needs some assessment (i.e. what are the trade-offs?).

There are two other areas where further information would prove beneficial. The first of these is the impact of dairy on the landless poor. References have been regularly made to the role dairy can play in improving the lives of this vulnerable group, but little data seems to be available to substantiate this impact. Secondly, the role of women in the dairy industry needs to be strengthened. References have been made to the fact that women farmers often share a broader appreciation than men of the factors that contribute to animal productivity. Yet whether or not this is true, a deeper understanding of gender roles is certainly warranted. For instance, this information would allow the project to specifically target extension messages to women in situations where they assume primary or joint responsibility.

Recommendation 6. The dairy project should keep in mind the implications of a "dairy" extension model within the broader "farming system" extension needs. In addition

[27] The survey uses a herd recording book that, over a two year period will record all aspects of the farm operation including production, feeding, reproduction, animal health, and where possible, farm budgets.
[28] Survey methodology in the past has been plagued with poor quality information. This tool is very different in its design and its application and has overcome many of the reporting irregularities.

> further assessment of project implications for the “landless” poor and women are of significant interest.

Lastly, significant efforts have been made by the project to establish links with the many parallel government and donor programs now in place. In particular, links between the National Livestock and Dairy Development Board, the Provincial Livestock and Dairy Development Department, and the Pakistan Dairy Development Corporation have been sensitively managed, often within difficult circumstances. Further planned initiatives to link outcomes with the PDDC can only be encouraged.

In summary, the dairy extension project is progressing satisfactorily, and promises to deliver robust outcomes.

6. ASLP Agricultural Linkages Component – Citrus Sector Intervention

In May 2006 ten Pakistani delegates[29] visited Australia for a ten day familiarisation study tour (Khurshid and Baxter June 2006). Participants reported that this was well organised, focused, and extremely informative. Subsequently, in July 2006, ASLP undertook a detailed constraints analysis along with a research and development workshop, these being part of a ten day visit of an Australian team to the Pakistan citrus industry (Johnson July 2006). Again the visit was well received and very well documented[30]. Both of these activities helped identify the priorities for further assistance to the citrus industry.

Subsequently, the citrus project (see box) was developed, commencing in May 2007. It is being implemented by a team from the New South Wales Department of Primary Industries in collaboration with scientists from:

1. The Orange Research Institute (ORI), Sargodha, (Punjab Province);
2. The University of Agriculture (UAF), Faisalabad (Punjab Province); and
3. The Agricultural Research Institute, Tarnab (NWFP Province).

Project Title: Increasing citrus production in Pakistan & Australia through improved orchard management techniques
Duration: May 2007 - April 2010

1. To improve nursery production practices and production incorporating procedures for maintaining disease free material and to introduce germplasm to extend the marketing season based on the climatic suitability to specific rowing areas.
2. To demonstrate 'Best Practice' orchard management focusing on tree spacing, crop management, nutrition and irrigation management.
3. To enhance research, extension and production capacity of Pakistan citrus institutions and industry

The review visited both the Orange Research Institute and the University of Agriculture, Faisalabad, and received presentations from each of the project participants. The citrus project is the smallest of the Agricultural Linkages engagements, and the team considered that lack of funds has limited their capacity to implement the project, especially their ability to respond to opportunities and needs as they arise. However, it was not clear to the review how limiting this situation actually was.

[29] Three government officials (MINFAL; Pakistan Horticulture Development & Export Board; Punjab Dept. Agri-marketing), four citrus growers, two citrus processors, and one citrus post-harvest specialist.
[30] The Australian delegation included five Australian citrus R & D specialists, one industry-nominated Australian citrus grower, the ACIAR Horticulture Program Manager, and the ASLP Program Officer.

The citrus project is being implemented through three partners (the UAF and the Provincial Governments in Punjab and NWFP). While the achievements by each of these agencies have been adequate, there appears to be less inter-agency collaboration and integration than in other projects. In addition, it has been a struggle to establish links with other Government programs (e.g. the Fruit and Vegetable Development Project in the Punjab), especially when citrus is compared to the mango projects where similar partnerships have been much more successful. Hence, ACIAR should review any opportunities that can be used to strengthen the national oversight, integration, and problem solving capacity of the citrus program, at least to the level enjoyed by the mango and dairy interventions.

The first objective of the project was to improve both the nursery practices and the germplasm available to the Pakistan industry. Initially, the project proposed to introduce new cultivars to Pakistan based on comparative heat unit mapping data. Yet this proved inappropriate given the comparatively hotter seasonal temperatures experienced in the Pakistan growing areas. Hence in lieu of this, in September 2007, bud wood of 28 citrus cultivars, and seed of eight rootstocks were introduced, the selection seemingly predicated on the best judgement of the citrus specialists based at Dareton[31] - however, it remains unclear what criteria were used to select the varieties provided. Moreover, while the Australian team promised to send detailed cultivar information to Pakistan to help with the assessment of these varieties, it had still not arrived at the time of the review in November 2008. At any rate, the 28 cultivars and eight rootstocks were established in the citrus screen-house at the University of Agriculture, Faisalabad, which appears to be a well run unit. However, the mother plants have yet to mature, and hence no harvesting of bud wood or distribution of material has yet occurred. There were some complaints regarding the delay in distribution of material, however these are not justified as the immaturity of the mother stock was clearly evident at the time of inspection.

A further concern for the review was the lack of any clear strategy to distribute and evaluate this material. Lack of screen-house facilities at the Citrus Research Institute and other potential recipients, poses a significant risk of infection for mother stock, which would obviously compromise both varietal testing and distribution. Yet this has been an ongoing issue that had still not been resolved at the time of review.

In addition, there remains a huge need to establish a workable system for the growing and distribution of disease-free certified planting material within Pakistan. One important aim of the project has been the publication of a nursery production manual. However the Australian team appears to regard this as the responsibility of their Pakistani counterparts. Apart from sending some literature to Pakistan to initiate the drafting process, there has been little apparent progress. Hence this fundamental publication, along with any associated training, has languished.

Nevertheless, in May 2008 a DVD on reworking established orchards was distributed within Pakistan by the Australian team. This aims to assist with the conversion of orchards to the new varieties. However its introduction not only seems somewhat premature, but the logic of reworking potentially diseased trees is not immediately obvious (the production and planting of clean nursery material seems a better focus).

[31] Material included cultivars of thirteen Oranges, nine Mandarins, two Grapefruits and one Lemon.

Work on best management orchard management has also been slow. Some good data has now been collected on crop phenology in both the NWFP and Punjab. Although this still needs to be converted into crop calendars, these should eventually allow both researchers and growers to time interventions to the physiological status of the plant, rather than to a calendar date. Unfortunately, planned pruning trials have also been delayed, as in-country project visits have not coincided with appropriate times for pruning. Very obviously, the visits require better timing. Lastly, irrigation management is now progressing, also after significant delays. Comparisons of flood, furrow, sprinkler and drip systems have now been established, and monitoring using flow meters, flumes and tensiometers is also in place. However, it was apparent to the review that some delays had been caused by disagreements related to system design, irrigation scheduling, and interpretation of results. Closer and ongoing communication between the Australian and local partners is important to resolving these issues - misunderstandings were still prevalent at the time of review.

In November 2007, four Pakistani collaborators visited Australia for approximately ten days. The participants found this to be a very useful study tour, and particularly appreciated the training provided by Dr Nerida Donovan at the NSW DPI's Elizabeth Macarthur Agricultural Institute in Menangle. Yet other than this single delegation, training has been surprisingly limited. Even during Australian team visits to Pakistan, training has been restricted to presentations of the Reworking DVD, and a demonstration on soil pits and the use of tensiometers. In all, only seven trainings have been reported across the two Provinces – three for growers, three for nursery producers, and one in association with the Fruit and Vegetable Development Project in Punjab. Model citrus farms have been nominated in both Provinces, but, to date, these have received only limited use.

The Australian team, though individually capable, appear the most disjointed of the four teams. Reports (e.g. The Project Status Report) are generally of poor quality, only two visits have been made in-country, and training (while quite sound) has been limited. The Australian team points out that travel has been constrained by team availability, sickness, team changes and security concerns[32]. Nevertheless, the level of communication between the Australian and Pakistani partners appears limited at all levels. For instance, email interaction was identified as being well below the frequency established by other projects. Overall, it appears to be a problem of management, and it is recommended that ACIAR reassess the Australian management of the citrus component. Coordination and leadership of the project appears to be well below the standards achieved by other interventions.

Overall, the review considers that progress to date has only been marginally satisfactory, and that the project has struggled, especially when compared to the other three ACIAR interventions.

> Recommendation 7. ACIAR should reassess the Australian management of the citrus component. Coordination and leadership of the project appears below standard. In addition ACIAR should assess opportunities that can be used to strengthen the Pakistani oversight, integration, and problem solving capacity of the citrus project.

[32] Security concerns have limited travel for citrus more than other projects, due to the corporate policies of the NSW Department of Primary Industries.

7. ASLP Market Linkages Component - Austrade

The Australian Trade Commission component of ASLP has helped to deepen Austrade engagements with the corporate dairy industry in Pakistan. Austrade's Regional Development Business Manager (Imran Khan) explained to the review that ASLP has allowed for a more integrated approach to Austrade's focus in the dairy sector. Hence instead of simply linking dairy business ventures in Australia and Pakistan, Austrade has also targeted: a) Australian export of high yielding dairy cattle; b) the provision of information, equipment and technology; and c) the Australian export of animal forage seed. However, it is important to note that Austrade is clearly focused on the commercial mega dairies (i.e. a minimum of 700 cattle), rather than the small farm sector (i.e. the poor).

Initially, Austrade led an agriculture market expansion feasibility mission to Pakistan (with dairy as the primary focus). This mission visited farms in Lahore, Faisalabad and Okara, and meetings occurred with Pakistani companies interested in importing dairy cattle and services.

Subsequently, Austrade organised three[33] buyer missions to Australia, representing interests from Karachi, Quetta and Punjab. These missions included representatives from Engro Food Ltd, Nestle Pakistan, Shafi Leather, the Sapphire Group and the Dewan Group.

By the end of 2008, the program had facilitated the export from Australia of 6,625 dairy cattle (Table 5). This occurred in five shipments using both sea and air transport. The majority of cattle were destined for corporate dairies in the Punjab or Sindh. The dairy cattle were sourced mainly from Victoria, and included Jersey and Jersey-Frisian crosses.

Sea shipments generally take about fourteen days to arrive at Port Muhammad Bin Qasim (Karachi), however the port has poor facilities for animal handling, and poor quarantine. Australian animal welfare lobbyists have raised (legitimate) concerns regarding port handling facilities, inadequate land transport facilities, and the need for the adequate training of animal handlers. Yet many, if not all, of the importers are large corporations. Hence most farms already engage managers of an international standard. Nevertheless, Austrade stresses the need for specialist care and training to ensure that cattle perform to expectations, and animal health is maintained.

Date	Quantity	Mode	Pakistani Importer	Australian Exporter	Comments
Feb 2007	2300 cattle	Sea	Consortium led by Nestle	Australian Rural Exports Pty Ltd (AUSTREX)	Most of the animals were kept in Punjab, mainly at JK Dairies (Rahim Yar Khan) and Sarbaz Farms (Pattoki).
Dec 2007	275 cattle	Air	JK Dairies Rahim Yar Khan.	Hedley John Exporters Pty Limited	
Feb 2008	750 cattle	Sea	At-tahur Dairies Ltd, Kasur district.	Wellard Rural Exports Pty Limited	
Oct-Nov 2008	300 cattle	Air	Sapphire Dairies, Lahore.	Elders International Pty Limited	
Dec 2008	3000 cattle	Sea	Engro Food Ltd, Sukkur.	Australian Rural Exports Pty Ltd	

[33] Some documents say four.

	Evergreen Farms, Lahore.	(AUSTREX)

Table 5: Austrade facilitated exports of dairy cattle to Pakistan under the ASLP program.

To complement the introduction of dairy cattle, Austrade is also supporting:

1. The introduction of Australian forage seed companies to the Pakistani market. Forage issues are a key technical gap in the Pakistani dairy industry, and both production and quality need to be significantly upgraded if competitive animal productivity targets are going to be achieved. To date, Blue Ribbon Seeds Pty Limited and Lefroy Seeds have established market links within the country. Blue Ribbon have also completed rye grass demonstrations at JK Dairies in Rahim Yar Khan District;
2. Improved dairy genetics through links with Genetics Australia Pty Limited, and improved fertility monitoring (heat detection) through Beacon Marketing Pty Limited.
3. Importation of basic dairy equipment, particularly through Daviesway Pty Limited and Elders Pty Ltd., and
4. Improved capability to manage medium to large size cattle farms. Consulting links have been established with individuals and companies engaged in farm design, management and abattoirs. In particular, Elders International Pty Ltd has signed a joint venture agreement with the Dewan Group in Karachi, to develop best practice dairies and provide management services.

As mentioned previously, links with other components of ASLP are limited. However, communication and mutual awareness has led to some technical exchanges (particularly with regard to improved genetics) which will hopefully expand to other areas. However, the commercial dairy sector is very different to the small scale dairy sector, and the likelihood of any substantial links beyond a certain limited amount of technical collaboration is unlikely.

Overall, Austrade sees the initiative as a promising success in developing Australian market access to Pakistan - which is, after all, their mandate. However there is considerably less clarity regarding the ASLP goal which is to increase Pakistani industry profitability and international competitiveness. Not only is it too early to assess any impact in the international arena, but in the end it will be very difficult to gauge ASLP's contribution to this outcome, as the commercial dairy sector in Pakistan is supported by a range of donor and government initiatives. Moreover, many of the players have significant multinational links. In addition, Austrade does not have any evaluation framework in place to assess these changes.

Finally, there is an important question of the propriety of this particular initiative that the Australian Government partners need to debate. The focus and mandate of Austrade is on the commercial sector, on enhancing Australia's exports. It is questionable then whether AusAID development funds are being appropriately used when they feed into Austrade's commercial interests. This surely requires greater justification than any yet provided. After all, there is no evidence that the support will impact on Pakistan's poor, nor reduce income inequities within the country. In fact, as mentioned previously, the argument that trickle down impacts will inevitably occur is very possibly fallacious (see concluding comments under Mango Sector Interventions p 22).

> Recommendation 8. Further engagement between AusAID and Austrade requires closer discussion on alignment of mandates, clearer expectations of impact evaluation and closer integration with all aspects of the program (horticulture linkages).

8. ASLP Academic Linkages Component – Australian Development Scholarships

The ASLP agreement has allocated seven postgraduate scholarships in agricultural research to nominees from MINFAL (Ministry of Food Agriculture and Livestock), the research to involve an issue of priority to the Pakistan agriculture sector. All applicants must, however, meet basic academic and English proficiency standards. Since July 2005, only three Masters-Level scholarships have been awarded. One of these candidates has successfully completed his Masters program, while the remaining two are still studying in Australia.

Identification of further candidates has been very difficult. Three subsequent selection rounds failed to identify any qualified candidates, despite rigorous efforts to alert potential nominees. As a last resort, a final call for candidates in mid-2008 dropped the insistence on English proficiency as a prerequisite. As a result, four potential candidates have now been identified (along with four reserve candidates). Each aspiring student will, however, need to ensure adequate English proficiency before placement. In no case have the candidates selected been closely aligned with any of the other ASLP interventions.

In summary the Academic Linkages initiative has been poorly conceived and its links to the other components of the ASLP program have been constrained by established ADS operating procedures. Despite these difficulties the strengthening of academic linkages within current ASLP engagements offers significant and logical merit. ACIAR has provided support to two candidates directly through its John Allwright Fellowship program and additional training has been supported by the John Dillon Program and Crawford Fund.

If AusAID considers further extensions to the program then supply of funds to provide scholarships under the John Allwright or John Dillon program specifically for scientists affiliated with ASLP engagements has considerable merit. The practicality of this would need to be discussed between AusAID and ACIAR.

> Recommendation 9. As part of further extensions to ASLP AusAID may consider supporting candidates through the more flexible and targeted John Allwright or John Dillon programs rather than ADS.

9. The Future of ASLP and Implications for Further Australian Engagement

During the review many stakeholders took the opportunity to suggest either possible enhancements to existing partnerships, or entirely new opportunities for partnership. Hence the review has grouped these suggestions into two areas:

1. Enhancements or extensions to current ASLP programs; and

2. Broader agricultural opportunities that may form the basis of future Australian collaboration.

Enhancements or extensions to current ASLP programs

The current ASLP engagement is scheduled to finish in June 2009. As noted, the three year time-frames of all of the current Agricultural Linkages activities already extend beyond this date. As seen in Table 3, the Supply Chain project finishes in November 2009, the dairy and mango production projects finish in December 2009, while the Citrus project is not scheduled for completion until March 2010. ACIAR indicates that they have already discussed this with AusAID, and have received in-principle approval for an extension to March 2010 to cater for current projects. Furthermore, Austrade intends to maintain its work in Market Linkages associated with the dairy industry. It should be noted though that any extension would be undertaken within the current budget.

Notwithstanding this extension, the teams also expressed their struggle to achieve some activities within their currently approved 2.5 to three year time-frames, due to travel and implementation delays[34]. Furthermore, success in some areas has identified opportunities for extension and expansion not originally envisaged within the projects.

After some consideration and discussion, the review recommends that AusAID support a funded extension to the current Phase of ASLP through to June 2011.

> Recommendation 10. AusAID consider supporting a funded extension to the current Phase of ASLP through to June 2011.

This is argued on the following grounds:

1. The relative success of ASLP, its momentum and industry commitment provides opportunity to extend its current impact;
2. Design work on any new Australian support to agriculture or rural development will take some time. Even if commencement were both immediate and progressed smoothly, experience shows that it is unlikely to be operating before mid 2010. Furthermore, some overlap of a new program with current ASLP initiatives is warranted;
3. ACIAR would be able to assess and manage extensions to the four current projects on a case by case basis. In effect, successful projects would receive a 12 to 18 month extension to their current time frame.
4. The scope for extending current projects is solid. Clear and achievable opportunities have already been identified. ACIAR would manage the scoping of each engagement. Areas identified during the review are summarised in Annex 5, although any extension would only be able to address a modest selection of these. Hence the majority of opportunities in Annex 5 would need to be integrated into future Australian programs.
5. The extension and additional funds would also allow ACIAR to continue its range of separately contracted short term support initiatives and studies. As mentioned, these have provided ASLP with significant flexibility and responsiveness. Suggestions include conferences, additional study tours, evaluations, and specific studies and/or trainings of

[34] At times security issues have limited travel, and visits have been postponed.

cross program relevance (e.g. extension training, social science assessment of poverty impacts, irrigation efficiency studies, and project leadership and management training).

6. AusAID may also wish to include funds for additional scoping studies that support the development of a future joint AusAID/ACIAR program in Pakistan.
7. AusAID and AusAID may also identify opportunities wherein academic linkages could be strengthened through the supplementary and targeted funding of John Allwright or John Dillon Fellowships for ASLP candidates.
8. Some additional support should also be directed to Austrade to strengthen emerging technical links with the ACIAR Dairy project.
9. Provision should also be made for a joint final review of the project in March 2011.

A purely indicative budget for this extension is provided in Table 6. The relative allocations would be the responsibility of ACIAR to negotiate. Further expansion of the citrus project must be based on effective resolution of management and coordination issues.

Component	Description	Current Value	Additional funding
Component 1	Austrade Market Linkages	$100,000	$110,000
Component 2	AusAID Australian Development Scholarships	$1,440,000	$0
Component 3	ACIAR Agricultural Projects	**$5,015,000**	**$3,480,000**
	• Short Term Initiatives		$500,000
	• AusAID/ACIAR Scoping studies		$250,000
	• Mango Production		$580,000
	• Mango Supply Chain		$720,000
	• Dairy		$690,000
	• Citrus		$240,000
	• John Allwright or John Dillon Fellowships		$500,000
Component 4	ASLP Review	$45,000	$45,000
Total		**$6,600,000**	**$3,635,000**

Table 6: Indicative budget for ASLP extension[35].

Security Concerns

Security issues have definitely been a concern for all teams. This has impacted on the timing, duration and locations of project events. Most teams have worked around these concerns and showed innovation in ensuring project activities are not delayed. This has been more problematic for the citrus project which has had limited time in country – part of the reason for this is the more stringent corporate restrictions on travel imposed by the NSW Department of Primary Industries. ACIAR will need to take this into account when considering future management options for this project. Other projects consider that they will cope adequately provided the current security situation does not deteriorate further. One option which all teams considered to be worthy of further consideration (and one that has worked well in other regional programs) is the use of 3rd country's as a venue for meetings. These are particularly useful if travel can be associated with significant training or awareness raising events. This option is encouraged and should be actively pursued by project partners. However ACIAR may need to discuss and justify the option with national partners as there has been some reluctance to this practice in the past.

[35] Budgets are derived from pro rata extension of current budgets until July 2011 plus some allowance for escalation.

Broader agricultural opportunities that may form the basis of future Australian collaboration

In addition to its review of ASLP activities, the review mission met briefly with the Secretary of MINFAL, the Chair of the Pakistan Agricultural Research Council, the Deputy Chair of the Planning Commission, the Agriculture member of the Planning and Development Division, the Secretary of the Ministry of Local Government and Rural Development, and the Chair of the Zarai Taraqiati Bank.

These meetings explored both the current perceptions of ASLP's performance, and the hopes, expectations, and opportunities for ongoing collaboration. The perceptions and suggestions made to the review mission, were directly inspired by the positive perceptions accorded the current ASLP program.

This brief assessment is not intended to provide a strategy for Australian bilateral partnerships in agriculture or rural development in Pakistan. With regard to this, AusAID is planning to field a team in early 2009 to undertake a more robust evaluation. The opinions and strategies now presented are based on the review's more limited experience, solely with ASLP. Nevertheless, they will hopefully inform the broader mission.

Australia's development assistance program to Pakistan is growing rapidly, from $26 million in 2008/09 to $70 million in 2012/13. Australia is still formulating the partnership strategy to be associated with this expansion, however currently agreed priorities for the program are: education, health and humanitarian relief, with a particular focus on development in the Afghanistan-Pakistan border regions. In line with Australian government priorities, future assistance will need to particularly enhance development in the rural sector. Future strategies will also be strongly influenced by the outcomes of the Donors' Conference on Pakistan, and a meeting of the Friends of Pakistan (FOP) forum in Washington towards the end of January 2009.

Yet as AusAID considers its options in assisting Pakistan, it is worth reiterating the key "design" lessons arising from ASLP.

1. ASLP, and particularly the Agricultural Linkages component, has provided a very high profile engagement achieving a level of recognition well above what would have been expected for its modest scope and budget. Pakistani Government partners reflect that it is one of the few donor engagements where industry issues and concerns are addressed in a practical and targeted manner. Industry also openly and actively professes the success of the program. This is particularly so with the mango sector engagements.
2. ACIAR's model of collaborative research and in-house technical management has worked well in Pakistan. As such, ongoing AusAID collaboration with ACIAR can only be encouraged.
3. Professional, appropriate and respectful faciliatory management of the bilateral relationship is essential to address issues of concern, to mobilise counterpart resources, and to facilitate links between otherwise introverted institutions.
4. Links between Austrade and AusAID have some merit and logic. However opportunities to integrate joint activities within the broader Australian engagement with Pakistan, should ensure that the relationship is based on a clear strategic logic, that it is more appropriately coordinated than it has been within the ASLP context, and that the commercial-development aspects of the double-sided relationship achieve a better balance.

5. Any future ACIAR / AusAID partnership will need to resolve the differing approaches of the two agencies to impact and outcome reporting, and include an agreed M&E framework;
6. The principles of engagement promoted by Pakistani partners, and agreed to in ASLP, were regularly endorsed, and should remain valid:
    a. "clever linkages" between Australia and Pakistan must reflect: Pakistan's sophistication, a rethink of traditional aid modalities, and the pursuit of more enduring institutional linkages;
    b. there is a need to limit focus – target the assistance to a few areas to ensure maximum impact, and to avoid complex, large scale, but often fragmented, interventions;
    c. Select established industries with a large smallholder base, where simple improvements to productivity and quality carry with them significant opportunities to alleviate poverty; and
    d. Only choose industries where Australia has a comparative advantage, and links with effective current industry-based teams can be established.
7. Institutional structures and inter-agency politics in Pakistan are complex and daunting. As such, significant resources must be dedicated to the careful "hand crafting" and ongoing faciliatory management of interventions, to ensure effective agency collaboration and political support. ASLP has proved that this is not only achievable, but that this approach is much better in the long term than the imposition of external teams and structures[36].

It is also worth reiterating some of the systemic constraints facing agricultural development within the country (ADB Oct 2008):

1. The primary production side of the value chain is dominated by numerous, geographically dispersed, and small-scale farm and livestock producers. This, combined with their lack of organisation, contributes to their difficulty in ensuring effective economies of production. The inputs necessary for achieving greater yields are also unaffordable;
2. Equally, such low-capital producers cannot meet the quantity and quality standards required by the trade in agri-based commodities;
3. The production and marketing infrastructure is inadequate and poorly maintained, and associated with very low returns ;
4. The land and water resources are finite – more so perhaps than in many other countries - and the management of these resources is unsustainable. This is coupled with an absence of land and water markets;
5. Human resource development is weak;
6. There is, as yet, only a weak reliance on science and technology as the motor of growth; and
7. Too often, there are inappropriate government interventions in, and weak governance of, agri-based supply chains. Interventions have sometimes been excessive, misguided, redundant, irrelevant, or simply absent. This has only further exacerbated the systemic constraints on production and supply chains.

In response to such constraining factors, the national Agriculture Sector Strategy (ADB Oct 2008) has been formulated to strengthen and reinvigorate those existing agri-based supply chains that show

[36] It also aligns with Australian obligations under the Paris Declaration.

clear competitive advantage. The scope of the Strategy includes existing major commodities (wheat, cotton, rice and sugarcane), as well emerging supply chains principally associated with livestock/dairy products, horticulture and edible oils. It is noteworthy that the approach of this Strategy is consistent with the commodity-specific ASLP engagements, particularly with the "paddock to plate" research integration best typified by the ASLP mango sector engagement.

The National Agricultural Sector Strategy outlines a five point action agenda. One of these five priorities is *to invest in science and technology and innovative ways of disseminating and promoting new technologies* (ADB Oct 2008).

This focus on improving the research, development and extension capacity within Pakistan to work in integrated value chains, clearly aligns with the approach and successes of ASLP. Hence this focus should be actively pursued. Nevertheless, the "commodity" focus proposed in the National Agricultural Sector Strategy, and used within ASLP, is not necessarily the best mechanism to engage with the "numerous, geographically dispersed and small-scale producers", who are usually dependent on integrated farming systems.

The expert economist panel which recently presented the report *Economic Stabilisation with a Human Face* to the Government of Pakistan, also acknowledge the central role that agricultural research and extension plays in its strategy to "accelerate agriculture growth with equity and employment" (Planning Commission 2008). Pleasingly the report specifically acknowledged the need for a farming system's approach as part of its recommendation:

Agricultural research and extension should be guided by a farming systems perspective to modernize agriculture rather than the current crop specific approach. This will improve the design of interventions and increase their cost effectiveness. This approach will facilitate the focus on small and medium farms while designing interventions (the current crop specific focus does not) and thus will increase system-wide productivity growth and will also help achieve equitable growth. (Planning Commission 2008)

In summary, Pakistani agencies have clearly identified increased agricultural R&D as a key element in their efforts to enhance economic growth, stability and food security. Partners in Pakistan also fully appreciate that agricultural R&D is one of Australia's strengths. Furthermore, the ASLP interventions have been clear demonstrations of the solid medium term impact of R&D, as well as the under-pinning that can be provided by long term linkages. In addition, Pakistani stakeholders are very cautious about broad, rural development/rural livelihood interventions, and would prefer to see a modest donor such as Australia continue to concentrate its efforts, and not be overly ambitious in any of its proposals.

Broadly speaking, there are two possible intervention philosophies whose primary difference is the choice of entry point: either an intervention can target a specific commodity (wheat, dairy etc); or an intervention can target a particular farming system (irrigated, dryland, rangeland etc). Yet in either

case the approach taken should be systemic, and interventions should target surmountable difficulties at strategic points along the entire value chain[37].

Based on the assessment of this admittedly limited review, the following suggestions are made regarding future Australian engagement in agriculture and rural development in Pakistan.

1. The lessons learnt and principles (see above) derived from ASLP experience are still strongly advocated by stakeholders and should be embedded within future programs.
2. An integrated value chain approach should form the basis of engagement, whether this is based on a single "industry" approach or on a cluster of industries that make up a smallholder farming system.
3. Agricultural Research and Development is a central strategic thrust of the government. Research, development and extension support to value chains offers huge scope for ongoing impact. Pakistan partners would encourage Australia to maintain this focus.
4. Clearly the partnership with ACIAR has worked well in the case of ASLP. The ACIAR collaborative research model offers significant management flexibility and under ASLP has provided important value-added faciliatory management. It is strongly recommended that the Agricultural Research and Development partnership with ACIAR be maintained.
5. An agricultural R&D thrust focused on key supply chains would be clearly compatible with the strategic thrust of AusAID's emerging rural development initiative.
6. The review mission suggests three specific focus areas for AusAID 's consideration. These are:
    a. To focus on the rangelands and farming systems of Balochistan with a particular emphasis on a) livestock and extensive forage species, b) grain crops (sorghum, pearl millet and barley), associated with water harvesting for fragile areas, or c) temperate fruits and nuts. An important component of this focus should be the ethnic and social implications of introduced farming practices. The significant risk would be ongoing security in the target area. Nevertheless, Balochistan offers the best opportunity for a focus on development in the Afghanistan-Pakistan border regions. Furthermore, potential exists in the area for strong collaboration with the programs of ICARDA. The experiences arising from the immanent completion of the USAID/FAO initiative to Improve Agricultural Practices in Balochistan should also be taken into consideration. This could also open up other opportunities for co-funding[38].
    b. To further expand work on horticultural value chains in Pakistan. The significant success in tree crops could be expanded, although other opportunities exist in vegetables and fruits such as banana. Pest and nutrient management issues will need particular attention. Moreover, in order to be effective, work should probably extend into related areas, such as improving access to credit, water and land, particularly by the poor. Links with the Pakistan Horticultural Export Development

[37] In the case of farming systems, the work would occur on the component product (and factor) value chains central to a specific farming system.

[38] The USAID funded project Improving Agricultural Practices in Balochistan ran from November 2004 to December 2008 with funding: $6,335,239. It was implemented through the Food and Agriculture Organization of the United Nations and the Ministry of Food.

Board should be expanded. Additionally, collaboration with the Zarai Taraqiati Bank (Agricultural Development Bank) should be investigated, as this group has a particularly dynamic vision for investing in agricultural development.

c. To further expand work with livestock. Further integration of dairy work with other key players should be encouraged. In addition, work on small ruminants would undoubtedly prove profitable. However, in all cases, work should fully integrate forage testing and livestock nutrition, in order to amend the current institutional divide in Pakistan between animal health and forages.

Recommendation 11. AusAID consider the lessons learnt and program options arising from the ASLP review in its future programming.

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Wynn, P, D Harris, R Moss, B Clem, R Sutton, and P Doyle. *ASLP - Report on the Dairy Mission to Pakistan 1 - 20 May 2006.* Mission report, Canberra: ACIAR, June 2006.

Attachment 1: Review itinerary

The review team from Australia included:

1. Mr. David E Swete Kelly, AusAID Reviewer
2. Dr. Christian Roth, Research Program Manager (Land and Water Resources) & ACIAR Regional Coordinator South Asia
3. Mr. Les Baxter, Research Program Manager (Horticulture), ACIAR
4. Contact Person: Sosheel Godfrey, Program Officer ASLP (ACIAR), Australian High Commission, Diplomatic Enclave No. 1, Islamabad

Tel: 051-8355367 / 051-2820418 / Mobile: 0301-8554740

Day & Date	Itinerary, Contacts and Accommodation
Thursday 13/11/2008	Review team briefing with AusAID
Friday 14/11/2008	Review workshop with Australian Project leaders in Canberra
2. Saturday 15/11/2008	ACIAR RPMs Mr. Les Baxter and Dr. Christian Roth plus AusAID reviewer Mr. David Swete Kelly arrive in Lahore by TG 0345 at 2250hrs *Stay at Avari Hotel, 87, Shahrah-e-Quaide-Azam, Lahore* *Ph: :+92-42-111-282-747, Fx:+92-42-6365367*
3. Sunday 16/11/2008	**0800-1000:** Travel to Okara **1000:** Arrive LDDD Village 11 1AL - Meet with Local Extension worker and visit some farms working in the project. Small discussion with farmers regarding project/progress/future as well as issues and problems with local extension services. Drive to next village. **1200:** Arrive Chak 69 Village - visit to farms of motivated farmers and farmers yet to take actions on their farm. See fodder field plot and discuss the success of this program. Discuss farmer's progress/problems and pros/cons of the project and local extension services. Drive to Okara city. **1430:** Arrive Okara City. Meet for lunch with Dr Anies (former Senior Scientific Officer of LDDDept and other senior staff if available) and discuss involvement of LDDDept, current progress of project and future needs of the dairy sector. **1530-1930:** Lunch and then review team travel to Multan. David and dairy team travel back to Lahore. *Stay at Fortalice, 9, Lalazar Colony, Old Bahawalpur Road, Multan.* *Ph: +92-61-4784006-7 Fx: +92-61-454 6105*
4. Monday 17/11/2008	**0800-1200** Travel to Mango Research Station, Shujabad (Ph: 061-4396576 / 6004884) Meeting and discussions with the research team and see the research trails (joined by Mr. Khalid DD F&VD project, Mr. Shafqat Ali Syed

	Horticulturist MRS, Mr. Tariq, Mr. Ghaffar, Mr. Ikhlaq from MRS; Dr. Shafqat, Mr. Nazim, Mr. Asad from BZU) + (Mr. Muzaffar Khakwani & Maj. Tariq)+ (Dr. Atta Soomro & Mr. Hadi Leghari) (Khalid with reference to capacity building, Shujabad & BZU team with regards to experiments, Dr. Atta with reference to research experiments, Hadi with respect to farmer's capacity building) **1200-1230** Lunch at MRS **1230-1430** Visit one FFS of mango project **1530-1630** Visit to Faiz-e-Aam Nursery, Mr. Ejaz Malik nursery owner shows the nursery and gives briefing on achievements so far Informal dinner with ASLP team members *Stay at Fortalice, 9, Lalazar Colony, Old Bahawalpur Road, Multan.* *Ph: +92-61-4784006-7 Fx: +92-61-454 6105*
5. Tuesday 18/11/2008	**0700-1200** Travel to Faisalabad **1200-1330** Lunch with Prof. Dr. Iqrar Ahmad Khan, VC University of Agriculture, Faisalabad Ph: 041-9200200 (Dean Agri & Dean Economics, Director Horticulture, Dr. Khalid Mustafa, Dr. Aman Ullah Malik , Dr. Jaffer Jaskani, Dr. Sajjad Khan & Dr. Bhatti) **1330-1500** Inspection of Citrus sanitation Lab and germplasm sent from Australia (Dr. Hafeez ur Rehman & Dr. M. Jaffar Jaskani to make presentations) **1500-1630** Inspect UAF post harvest lab-mango supply chain team briefs on post harvest work (research component presentations by Dr. Khalid Mustafa & Dr. Aman Ullah Malik respectively. Sohail to join from Lahore) *Stay at Serena Hotel, Club Road Faisalabad Tel:041-111-133-133* *Fax:041-2629235*
6. Wednesday 19/11/2008	**0730-1030** Travel to ORI Sargodha **1030-1230** -At ORI inspect drip Irrigation system plus tensiometers, furrow irrigation site, pruned trees plus phenology trails sites if time permits + (Dr. Ghulam Nabi & Mr. Abdul Rehman OR Mr. Abdul Aziz to make presentations) **1230-1400** Working lunch (joined by Ch. Niaz Ahmad, Mr. Abdul Rehman, Mr. Abdul Aziz & Mr. Owais from ORI; Mr. Tariq Mahmood Cheema, from F&VD project; Haji Muhammad Azam, Mr. Tiwana, Mr. Hamid Saleem Warriach, Mr. Qasim Aijaz & Dr. Waqar) **1400-1630** Travel to Roshan Enterprises & visit GA trials **1630-1900** Proceed to Lahore *Stay at Avari Hotel, 87, Shahrah-e-Quaide-Azam, Lahore* *Ph:+92-42-111-282-747, Fx:+92-42-6365367*
7. Thursday 20/11/2008	**0930-1130** Meeting with Mr. Javed Iqbal Awan, Secretary, Agriculture Department, Government of Punjab, Civil Secretariat, Lahore Ph: 042-9210130 / 9210499 / Mr. Bashir, Staff Officer 0300-9211975

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& technical discussions with CEO PARB, DG Research, DG Extension, PD F&VD project, DD Multan, RYK and Sargodha, Director Horticulture, Director Post Harvest, Director ORI and MRS as well as Chief Planning Cell.
1200-1600 Meeting with PHDEB regarding ASLP Mango Supply Chain Project (2nd Floor, 126-Y, Commercial Area, Phase-III, D. H. A) Lahore Ph: 042-9264177 & 111-111-742
Presentations from Mr Muhammad Iqbal (Project Coordinator); Mr Mahmood Nawaz Shah (Grower); Mr Waheed Ahmad/ Mr Khalid Ejaz (Exporter); Mr Javid Iqbal (F&V Project R.Y. Khan); Mr Mansoor Saeed (Metro experience); and ASF (Support and funding). Then after lunch and prayer, we will continue with the open discussion
<table>
<tr><th>Growers</th><th>Exporters</th><th>Govt. Official</th><th>Metro Cash & Carry
+ ASF</th></tr>
<tr><td>1. Mr Imdad Nizamani (Sindh)
2. Mr Mahmood Nawaz Shah (Sindh)
3. Mr Anwar Bachani (Sindh)
4. Mr Mujib Arjmand (R.Y. Khan)
5. Mr Asim Nisar Bajwa (Lodhran)
6. Mr Tariq Khan (Multan)</td><td>1. Mr Khalid Ejaz (Karachi)
2. Mr Waheed Ahmad (Karachi)</td><td>1. Mr Javid Iqbal (R.Y. Khan)</td><td>1. Mr Mansoor Saeed
2. Mr Adeel Javid Qazi
1. Mr Shafqat Saeed/ Mr Muzaffar Khan</td></tr>
</table>
Stay at Avari Hotel, 87, Shahrah-e-Quaide-Azam, Lahore
Ph:+92-42-111-282-747, Fx:+92-42-6365367
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<td>8. Friday
21/11/2008</td>
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0730-0830 Mr. Imran Saeed from Austrade to join at breakfast and brief on dairy cattle import component)
0900-1030 Meeting Mr. Mohammad Jehanzeb Khan, Secretary, Livestock & Dairy Development Department, Government of Punjab, Civil Secretariat, Lahore Ph: 042-9210526 / 9210527
& technical discussion with DG Extension, DG Research, Director Livestock Farms, Director LRI, Director VRI, DS Planning & Technical
1100-1200 Meeting with Prof. Dr. Muhammad Nawaz, VC, University of Veterinary & Animal Sciences, Outfall Road, Lahore Ph: 042-9211476 and staff. Discuss collaborations with UVAS completed and upcoming. Students involvement and staff involvement.
1230-1500 Lunch meeting with PDDC to discuss collaborations (students, information), the successes of their program, lessons learned so far and get ideas about how they think the best ways to spend aid money for the future.
1500-1930 Leave for Islamabad.
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	Stay at Serena, Khayaban-e-Suhrawardy, Islamabad *Ph: +92-51-287 4000 & 111-133-133*
9. Saturday 22/11/2008	**Stakeholder meetings in Islamabad expected to be joined by representatives from all the four provinces** **1000-1130** Meeting with Dr. Zafar Altaf, Chairman, Pakistan Agricultural Research Council, Islamabad Ph: 9203966 / 9202101 and relevant federal and provincial stakeholders **(this meeting may merge into the one above with PARC)** **1200-1330** Meeting with Mr. Muhammad Zia-ur-Rehman, Secretary, Ministry of Food, Agriculture and Livestock, Government of Pakistan, B-Block, Pak Secretariat, Islamabad Ph: 051-9210351 (joined by AS-1, JS Plan, DS, SO-IC-III, ADC, Commissioner Minor Crops, AHC, Member Agriculture P&D, DG NARC, CEO LDDB, COO PHDEB, Pak project coordinators plus reviewers, Australian ACIAR and project teams) **1330-1430** Lunch Followed by Meeting with Mr. Zaka Ashraf, Chairman, Zarai Taraqiati Bank Limited (ZTBL), Islamabad Ph: 051-9252727 / 0300-8459215 (Bilal Agha, PSO to President Cell: 0321-5009925) **1900-2100** Meeting / interaction with ASLP Pakistan project leaders / coordinators at dinner *Stay at Serena, Khayaban-e-Suhrawardy, Islamabad* *Ph: +92-51-287 4000 & 111-133-133*
10. Sunday 23/11/2008	Reviewer report drafting and/or AusAID/ACIAR/reviewer interactions *Accommodation arrangements same as above* Les departs for Lahore by PK687 at 1600hrs & then by TG346 from Lahore at 2355hrs
11. Monday 24/11/2008	**0900-1000** Meeting with Mr. Mark Tattersall, First Secretary, Development Cooperation, Australian High Commission Islamabad Ph: 051 8355 354 **1030-1200** Meeting with Dr. M. E. Tusneem, Member (Agriculture), Planning & Development Division, Government of Pakistan, P-Block, Pak Secretariat, Islamabad Ph: 9201974 (followed by meeting with the Deputy Chairman Planning Commission as per availability) **1230-1400** Lunch **1400-1500** Meeting with Mr. Saleem Khan Jhagra, Secretary Ministry of Local Government and Rural Development Government of Pakistan, G-5/2, Opposite ILO Building, Islamabad, Ph: 051-9202080 Fx: 9245509 **1800** Meeting with Ms. Zorica McCarthy, Australian High Commissioner, Islamabad Christian & David depart by TG350 at 2335hrs

Attachment 2: People Consulted

First Names	Surname	Role	Agency	Contact
Mohammad Nadeem	Afzal	Chief Executive Officer	Livestock and Dairy Development Board, MINFAL	+92 41 8861981 Nadeem.afzal@dadex.com.pk
Bilal	Agha	PSO to President	Zarai Taraqiati Bank Limited (ZTBL), Islamabad	0321-5009925
Iftikhar	Ahmad	Deputy Director General	Institute of Plant and Environmental Protection, NARC, Park Road, Post Office NIH, Islamabad	
Mahmood	Ahmad	Deputy Director, P&E Cell	Agriculture Department, Government of Punjab	
Waheed	Ahmad	Exporter	Karachi	
Rai Niaz	Ahmad	Director, Water Management Research Centre	University of Agriculture, Faisalabad	+92 41 9200201 niazrai@yahoo.com
Sarder Muhammed	Akbar	Deputy Director, Agriculture R.Y. Khan	Agriculture Department, Government of Punjab	
Chrys	Akem	Principal Plant Pathologist (Team Leader ASLP Mango Production Project)	Queensland Department of Primary Industries and Fisheries	+61 7 4783 0411 Chrys.Akem@dpi.qld.gov.au
Rafiz	Akwtan		DAI, Lahore	
Nek	Alam	Grower	R.Y. Khan, Punjab	
Zafar	Altaf	Chairman	Pakistan Agricultural Research Council, Islamabad	9203966
Babar	Aman	Deputy Secretary (Administration)	Livestock and Dairy Development Department, Government of Punjab	
	Anies	Senior Scientific Officer	Livestock and Dairy Development Department, Punjab	
Mujib	Arjmand	Mango Grower	R.Y. Khan	

First Names	Surname	Role	Agency	Contact
	Asad		BZU	
Aadia	Asghar	Program Officer, Australian Development Scholarships	Australian High Commission	+92-51-2824-345 ext 368 aadia.asghar@dfat.gov.au
Muhammad Zaka	Ashraf	President	Zarai Taraqiati Bank Limited (ZTBL), Islamabad	051-9252717 presidentztbl@ztbl.com.pk
Muhammad Iqman	Auran	Director of Horticulture, Ayub Agricultural Research Institute	Agriculture Department, Government of Punjab	
Javed Iqbal	Awan	Secretary	Agriculture Department, Government of Punjab	
Abdul	Aziz	Citrus Research Institute, Sargodha	Agriculture Department, Government of Punjab	
Muhammad Anwar	Bachani	Mango Grower	Tando Allah Yar, Sindh	
Asim Nisar	Bajwa	Mango Grower	Lodhran, Multan	
Babar Ehasan	Bajwa	Manager Technical	Pakistan Horticulture Development and Export Board, Ministry of Commerce	+92 42 111111742 behsan@phdeb.org.pk
	Bashir	Staff Officer	Agriculture Department, Government of Punjab	0300 9211975
Les	Baxter	Research Program Manager (Horticulture)	ACIAR	baxter@aciar.gov.au
	Bhatti		University of Agriculture, Faisalabad	
Muzaffer Sharif	Bhutta	Investment Adviser and Company Secretary	Agribusiness Support Fund (ASF), ADB	+92 42 5749083 Musaffer.bhutta@asf.org.pk
Rebecca	Bryant	Director	AusAID	+61 2 6206 4020 Rebecca.Bryant@ausaid.gov.au
Denise	Burrell	National Extension manger	Dairy Pakistan (Pakistan Dairy development Company)	+92 42 9262065 deniseburrell@ppdc.com.pk
Russell	Bush	Lecturer	University of Sydney	
Jodie	Campbell	Horticulturist (Postharvest), Horticulture &	Queensland Department of	+61 7 38969865

First Names	Surname	Role	Agency	Contact
		Forestry Science	Primary Industries and Fisheries	Jodie.campbell@dpi.qld.gov.au
Niaz Ahmad	Chaudhary	Director, Citrus Research Institute, Sargodha	Agriculture Department, Government of Punjab	+92 48 3719812
Tariq Mahmood	Cheema		Fruit and Vegetable Development Project	
Ray	Collins	Professor (Team Leader ASLP Mango Supply Chain Management Project)	School of Natural Resource Systems Management, University of Queensland	07 54 601 328 rcollins@uqg.uq.edu.au
Patricia	Duggan	Director	AusAID	+61 2 6206 4549 Pat.Duggan@ausaid.gov.au
Khalid	Ejaz	Exporter	Karachi	
	Ghaffar	Mango Research Station, Shujabad	Agriculture Department, Government of Punjab	
Jeremy	Giddings	Irrigation Officer	NSW Department of Primary Industries	
Mushtaq Ahmad	Gill	Executive Director	South Asian Conservation Agriculture Network (SACAN)	+92 300 4206225 mushtaqgill@gmail.com
Sosheel Solomon	Godfrey	Program Officer ASLP	ACIAR	+92 51 8355367
Saadia	Hanif	Research Coordinator, ASLP Dairy Project	Livestock and Dairy Development Board, MINFAL	0345 4471449
Catherine	Hanley	Program Assistant, Livestock Production Systems	ACIAR	+61 2 6217 0545 hanley@aciar.gov.au
Natiq	Hussain	Chief, P&E Cell	Agriculture Department, Government of Punjab	
	Iftikhar	Deputy Secretary (Planning)	Livestock and Dairy Development Department, Government of Punjab	
Ahmad	Ikhlaq	Mango Research Station, Shujabad	Agriculture Department, Government of Punjab	

First Names	Surname	Role	Agency	Contact
Javid	Iqbal	Deputy Director (Technical)	Fruit and Vegetable Development Project, R.Y. Khan, Punjab	
Muhammad	Iqbal	Director LPRI	Livestock and Dairy Development Department, Government of Punjab	
Muhammad	Iqbal	Project Coordinator, ASLP Mango Supply Chain Management Project	Pakistan Horticulture Development and Export Board, Ministry of Commerce	+92 42 111111742 miqbal@phdeb.org.pk
Muhammad Jaffar	Jaskani		University of Agriculture, Faisalabad	
Saleem Khan	Jhagra	Secretary	Ministry of Local Government and Rural Development, Government of Pakistan	051-9202080
Munawar Raza	Kazmi	Senior Scientific Officer, National Integrated Pest Management Programme (National Coordinator, ASLP Mango Project)	National Agricultural Research Council, Islamabad	+92 51 9255359 smrazakazmi@yahoo.com
Mahmood	Khalid	Deputy Director, Fruit and Vegetable Development Project, R.Y. Khan, Punjab	Agriculture Department, Government of Punjab	
Imran Saeed	Khan	Regional Business Development Manager	Australian Trade Commission	+92 42 5313676 Imran.saeed@austrade.gov.au
Muhammad Asif	Khan	Project Director	Fruit and Vegetable Development Project, Lahore	
Mujeeb Arjumand	Khan	Manager	JDW orchards, Sadiq Abad	
Mohammad Jehanzeb	Khan	Secretary	Livestock & Dairy Development Department, Government of Punjab	042 9210526
Mahammad Tariq	Khan	Chief Executive	Lutfabad Mango Farms, Multan	+92 61 6222735 tariqkhanismailzai@yahoo.com

First Names	Surname	Role	Agency	Contact
Sajjad	Khan		University of Agriculture, Faisalabad	
Iftikhar Ahmad	Khan	Dean, Faculty of Agriculture	University of Agriculture, Faisalabad	+92 41 9200581 deanagriuaf@yaho.com
Mohammad Mumtaz	Khan	Professor	University of Agriculture, Faisalabad	+92 41 9201099 Mumtaz59pk@hotmail.com
Iqrar Ahmad	Khan	Vice Chancellor	University of Agriculture, Faisalabad	+92 41 9200200 vc@uaf.edu.pk
Tahir	Khurshid	Research Physiologist (Citrus Multiplication), Science and Research	NSW Department of Primary Industries	+61 3 50198433 Tahir.khurshid@dpi.nsw.gov.au
Hadi Bux	Leghari	Technical Manager	Asim Agriculture Farm, Tando Soomro, Sindh	+92 22 3898222 hadileghari@hotmail.com
Mick	Lloyd	ADB Consultant	Agribusiness Support Fund (ASF), ADB	
Ejaz	Malik	Manager	Faiz-e-Aam Nursery	
	Malik	Director, Livestock Farms	Livestock and Dairy Development Department, Government of Punjab	
Aman Ullah	Malik	ASLP Mango Postharvest Asst. Professor Horticulture	University of Agriculture, Faisalabad	+92 41 2602171 Malikaman1@yahoo.com
Muhammad Imtiaz	Malik	Executive Vice President, Credit Division	Zarai Taraqiati Bank Limited (ZTBL), Islamabad	+92 51 9252720
Mohammad Sohail	Mazhar	Project Development Officer, ASLP Mango Supply Chain Management Project, Postharvest Research Laboratory	University of Agriculture, Faisalabad	
Zorica	McCarthy	Australian High Commissioner	Australian High Commission, Islamabad	
David	McGill	Research Fellow (ASLP Dairy Project Manager)	Charles Sturt University	+92 42 5914740 0308 4121 153 dmcgill@csu.edu.au

First Names	Surname	Role	Agency	Contact
Ghulam	Nabi	Assistant Horticulturist, Agriculture Research Institute, Tarnab	Agriculture Department, Government of North West Frontier Province	
Muhammad	Nawaz	Vice Chancellor	University of Veterinary & Animal Sciences, Lahore	042 9211476
	Nazim		BZU	
Naveed	Niazi	Provincial Coordinator	Livestock and Dairy Development Department, Government of Punjab	
Imdad Ali	Nizamani	Managing Director	Asim Agriculture Farm, Tando Soomro, Sindh	+92 22 3898222 Imdad_nizamani2001@yahoo.com
	Owais	Citrus Research Institute, Sargodha	Agriculture Department, Government of Punjab	
Khalid Ejaz	Qureshi	Chairman (Export)	Roshan Group	+92 42 5855324 kharlideijaz@roshan.com.pk
Abdul	Rahman	Plant Pathologist, Citrus Research Institute, Sargodha	Agriculture Department, Government of Punjab	
Hafeez ur	Rahman	Coordinator Citrus Project, Institute of Plant & Environmental Protection	National Agricultural Research Council, Islamabad	
	Rashid	Director, Veterinary Research institute	Livestock and Dairy Development Department, Government of Punjab	
Paul	Roche		AusAID	Paul.Roche@ausaid.gov.au
Christian	Roth	South Asia Coordinator	ACIAR	0408226747
Shamoon	Sadiq	Chief Executive Officer	Pakistan Horticulture Development and Export Board, Ministry of Commerce	
Mansoor	Saeed	Project Manager Exports	Metro Cash and Carry, Lahore, Pakistan	+92 42 7509656 Mansoor.saeed@metro.pk
Abdul	Samad	Research Officer, Agriculture Research Institute,	Agriculture Department,	+92 91 296403

First Names	Surname	Role	Agency	Contact
		Tarnab	Government of NWFP	tarnab@paknet2.ptc.pk
	Shafqat		BZU	
Mahmood Nawaz	Shah	Manager	Shah Agricultural Products, Sindh	+92 22 3863324 mahmood@alumni.gwu.edu
Atta Hussain	Soomro	Director Agricultural Research Institute Sindh, Tandojam	Agriculture Department, Government of Sindh	+92 22 2765505 attasmr@yahoo.com
Bill	Stevenson	General Manager, Farm Production	Dairy Pakistan (Pakistan Dairy development Company)	+92 42 9262065 Billstevenson@ppdc.com.pk
Shafqat Ali	Syed	Horticulturist, Mango Research Station, Shujabad	Agriculture Department, Government of Punjab	
	Tariq	Mango Research Station, Shujabad	Agriculture Department, Government of Punjab	
Mark	Tattersall	First Secretary	AusAID	+92 51 8355 354
Shoaib	Tayyab	Senior Program Manager	AusAID	Shoaib.Tayyab@dfat.gov.au
M E	Tusneem	Member (Food and Agriculture)	Planning Commission, Government of Pakistan	+92 51 9201974 mtusneem@yahoo.com
Geoff	Walker	Chief Executive Officer	Dairy Pakistan (Pakistan Dairy development Company)	+92 42 9262061 geoffwalker@ppdc.com.pk
Hassan	Warriach	Research Coordinator, ASLP Dairy Project	Livestock and Dairy Development Board, MINFAL	0333 4315107
Aurora	Watts	Program Officer Pakistan	AusAID	62064714 aurora.watts@ausaid.gov.au
Kent	Weston-Arnold	General manger, Community Farms	Dairy Pakistan (Pakistan Dairy development Company)	+92 42 9262065 kentweston@ppdc.com.pk
Bob	Williams	QDPI&F ASLP Manager	Queensland Department of Primary Industries and Fisheries	
Peter	Wynn	McCaughey-CSU Professor of Animal Production, School of Agriculture and Veterinary Sciences (Team Leader, ASLP Dairy Project)	Charles Sturt University	+61 2 6933 2938 pwynn@csu.edu.au
Muhammad	Zahid	Director General (Extension)	Livestock and Dairy Development	+92 42 9201117

First Names	Surname	Role	Agency	Contact
Irfan			Department, Government of Punjab	m.irfanzahid@yahoo.com
Muhammad	Zia-ur-Rehman	Secretary	Ministry of Food, Agriculture and Livestock, Government of Pakistan	051-9210351

Attachment 3: ASLP Logframe

Project description	Indicators	Means of verification	Outcomes/applications
GOAL 1: TO TRANSFER AUSTRALIAN KNOWLEDGE AND EXPERTISE TO KEY SECTORS OF PAKISTAN AGRIBUSINESS TO INCREASE PROFITABILITY AND ENHANCE EXPORT POTENTIAL	Increased frequency of mutual exchanges; increased productivity, value adding and export of selected agricultural products	Impact assessment; adoption studies	Pakistan farmers and agri-businesses improving their profitability; increased export underpinning economic growth and rural employment
COMPONENT A – MANGOS. **Purpose: To transfer Australian mango production and supply chain know-how.**	Workshops, expert exchanges and exposure visits occurring; increased productivity, value adding and export of mango products	Project, trip and workshop reports; regular liaison of ACIAR ASLP coordinator with Australian and Pakistan teams	Pakistan mango farmers and agri-businesses improving their profitability; increased mango export underpinning economic growth and rural employment
Output A.1.1: Disease agents for mango dieback and malformation identified and documented	Consensus between Australian and Pakistan experts	Peer reviewed research reports; scientific papers accepted for publication	Design of appropriate disease management protocols; input to A.1.4
Output A.1.2 : Workshop proceedings providing synopsis of mango production problems and recommendations for R&D	Attendance of Australian (15) and Pakistan mango experts (25); key research and development priorities identified	Workshop report; workshop participation by ACIAR ASLP coordinator	Linkages established between Australian and Pakistan mango researchers; research priorities form input to A.1.4 and A.1.5 and to PARC research agenda
Output A.2.1: Supply chain analysis identifying key bottlenecks to improved post-harvest management and marketing	Relevant actors in the supply chain engaged and their feedback obtained; key technical leverage points quantified; institutional and policy barriers articulated	Consultancy report; policy briefs	Linkages established between Australian and Pakistan supply chain and market analysts; research priorities form input to A.2.4 and to PARC research agenda
Output A.2.2: Awareness in Pakistan of Australian mango production technologies and marketing procedures	Pakistan mango business leaders and peak industry representatives (10) visit Australia; potential linkage with Austrade initiatives	Trip reports; feedback from hosting agencies in Australia	Linkages established between Australian and Pakistan mango agri-enterprises; input by industry peak bodies to policy formulation

COMPONENT B – CITRUS. **Purpose: To transfer Australian citrus production knowledge and expertise**	Expert exchanges and exposure visits occurring; increased productivity, value adding and export of citrus products	Project and trip reports; regular liaison of ACIAR ASLP coordinator with Australian and Pakistan teams	Pakistan citrus farmers and agri-businesses improving their profitability; increased citrus production underpinning economic growth and rural employment
Output B.1.1: Recommendations from Australian citrus experts on priority actions and focus of component B.1.5	Expert exchange carried out (5 Australians)	Trip reports	Linkages established between Australian and Pakistan citrus researchers; input to design of B.1.5
Output B.1.2: Workshop proceedings providing synopsis of citrus production problems and recommendations for R&D	Attendance of Australian (15) and Pakistan citrus experts (25); key research and development priorities identified	Workshop report; workshop participation by ACIAR ASLP coordinator	Linkages established between Australian and Pakistan citrus researchers; research priorities form input to B.1.5 and to PARC research agenda
Output B.1.3: Awareness in Pakistan of Australian citrus production technologies and marketing procedures	Pakistan citrus business leaders and peak industry representatives (10) visit Australia; potential linkage with Austrade initiatives	Trip reports; feedback from hosting agencies in Australia	Linkages established between Australian and Pakistan citrus agri-enterprises; input by industry peak bodies to policy formulation
COMPONENT C – DAIRY **Purpose: To transfer Australian dairy production and constraints analysis know-how**	Consultancies, expert exchanges and exposure visits occurring; increased animal productivity and improved supply of better quality milk products	Project, trip and consultancy reports; regular liaison of ACIAR ASLP coordinator with Australian and Pakistan teams	Pakistan dairy farmers and agri-businesses improving their profitability; increased dairy production underpinning economic growth and rural employment
Output C.1.1: Constraints analysis identifying key bottlenecks to improve unit animal milk productivity and enhance milk supply chain; recommendations for targeted R&D	Relevant actors in the supply chain engaged and their feedback obtained; key technical leverage points quantified; institutional and policy barriers articulated; research priorities identified	Consultancy report; policy briefs	Linkages established between Australian and Pakistan dairy supply chain and systems analysts; research priorities form input to C1.2 and to PARC research agenda
Output C.1.4: Awareness in Pakistan of Australian dairy production technologies and marketing procedures	Pakistan dairy business leaders and peak industry representatives (10) visit Australia; linkage with Austrade initiatives	Trip reports; feedback from hosting agencies in Australia	Linkages established between Australian and Pakistan dairy agri-enterprises; input by industry peak bodies to policy formulation

Output C.1.5: Australian Friesian Sahiwal germplasm / bulls transferred to Pakistan; seeds from a range of improved legume and non-legume forage species sourced and provided to Pakistan R&D institutions	Animal and forage germplasm made available to relevant research institutions in NARC	Testing of animal and forage germplasm in activity C.1.6 implemented	Integration of Australian germplasm in Pakistan breeding and selection programs
GOAL 2: TO CONTRIBUTE TO POVERTY ALLEVIATION OF SMALL-HOLDER FARMERS THROUGH COLLABORATIVE RESEARCH AND DEVELOPMENT	Pilot schemes tested and practical technology packages developed that address farmer needs	Results documented and communicated to extension agencies and industry bodies	Pakistan farmers and agri-businesses improving their profitability; increased export underpinning economic growth and rural employment
COMPONENT A – MANGOS **Purpose: To develop improved mango production, certification and marketing techniques**	Mango research projects implemented; improved production techniques tested	Research proposals developed and signed off	Increased mango production through application of improved technology
Output A.1.4: Improved and practical mango disease management techniques; effective certified nursery program	Observed reductions of disease incidence; certified, clean planting material available;	Annual research reports; technical briefs; project inspections by ACIAR staff	Increased mango production; professionalised, certified nursery sector implemented; outputs form inputs to A.1.3
Output A.1.5: Improved orchard and water management techniques developed in a participatory mode involving end-users	Observed yield increases; observed higher nutrient and water use efficiencies; reduced input costs	Annual research reports; technical briefs; project inspections by ACIAR staff; cost/benefit analyses	Increased mango production; higher income streams for mango farmers; outputs form inputs to A.1.3
Output A.2.4: Supply chain groups identified and product and information flow mapped; storage and QA protocols developed	Relevant actors in the supply chain engaged and their feedback obtained; key technical leverage points quantified; institutional barriers articulated	Annual research reports; technical briefs; project inspections by ACIAR staff;	Increased mango production; higher income streams for mango harvesters and agri-business; outputs form inputs to A.1.3
COMPONENT B – CITRUS **Purpose: To develop improved**	Citrus research project implemented; improved production techniques tested	Research proposals developed and signed off	Increased citrus production through application of improved technology

citrus production and certification techniques			
Output B.1.5: Improved orchard and water management techniques developed in a participatory mode involving end-users; effective certified nursery program	Observed yield increases; observed higher nutrient and water use efficiencies; reduced input costs; disease free planting material available	Annual research reports; technical briefs; project inspections by ACIAR staff	Increased citrus production; higher income streams for citrus producers and agri-business; outputs form inputs to B.1.4
COMPONENT C – DAIRY **Purpose: To develop improved milk production techniques**	Dairy research project implemented; improved production techniques tested	Research proposals developed and signed off	Increased dairy production
Output C.1.2: Feed budgets matched to lactation cycles based on locally available fodders; improved milk collection, storage and marketing procedures	Increased unit animal milk production; higher profits for dairy farmers; improved milk collection, storage and marketing	Annual research reports; technical briefs; project inspections by ACIAR staff; cost/benefit analyses	Higher income streams for dairy farmers; increased milk production and improved delivery of higher quality milk to urban centres; outputs form inputs to C.1.3
Output C.1.6: Selection of desirable traits in Australian Friesian Sahiwal; introduction of improved genetic material into dairy cow breeding programs;	Integration of introduced animal and forage germplasm into breeding and selection programs underway	Annual research reports; technical briefs; project inspections by ACIAR staff	Increased productivity from improved dairy cows and better quality and quantity of forages; integration of forages into farming systems to better address salinity and drainage management problems; outputs form inputs to C.1.3
GOAL 3: TO ENHANCE THE CAPACITY OF THE PAKISTAN RESEARCH, DEVELOPMENT AND EXTENSION SYSTEM TO DELIVER TARGETED AND PRACTICAL RESEARCH OUTPUTS TO AGRIBUSINESS AND FARMERS	Government and industry stakeholders express greater satisfaction with Pakistan NARES; maintained or increased research funding	Impact assessments; adoption studies; review reports	Sustained ability of the Pakistan NARES to conduct research that delivers practical outcomes on the ground; high returns on R&D investments
COMPONENT A – MANGOS **Purpose: To develop training modules tailored to the mango**	Training modules being delivered to project teams and to a cross-section of the mango research and	Training handbooks; documented modules; training materials	Greater relevance of mango research projects and improved levels of end-user adoption

sector	extension institutions		
Output A.1.3: Participatory principles and appropriate extension methodologies adapted for mango researchers, extensionists and farmers	Participatory research methodologies being applied in the design and conduct of A.1.4 and A.1.5; no. of trainees	Training handbooks; documented modules; audio-visual training materials	Increased levels of farmer adoption leading to higher production; more efficient delivery of improved mango production techniques from A.1.4 and A.1.5
Output A.2.3: Participatory principles and appropriate extension methodologies adapted for supply chain groups	Participatory research methodologies being applied in the design and conduct of A.2.3; no. of trainees	Training handbooks; documented modules; audio-visual training materials	Increased levels of agri-business adoption; more efficient delivery of improved supply chain designs and procedures from A.2.3
COMPONENT B – CITRUS **Purpose: To develop training modules tailored to the citrus sector**	Training modules being delivered to project teams and to a cross-section of the citrus research and extension institutions	Training handbooks; documented modules; training materials	Greater relevance of citrus research projects and improved levels of end-user adoption
Output B.1.4: Participatory principles and appropriate extension methodologies adapted for citrus researchers, extensionists and farmers	Participatory research methodologies being applied in the design and conduct of B.1.5; no. of trainees	Training handbooks; documented modules; audio-visual training materials	Increased levels of farmer adoption leading to higher production; more efficient delivery of improved citrus production techniques from B.1.5
COMPONENT C – DAIRY **Purpose: To develop training modules tailored to the dairy sector**	Training modules being delivered to project teams and to a cross-section of dairy research and extension institutions	Training handbooks; documented modules; training materials	Greater relevance of dairy research projects and improved levels of end-user adoption
Output A.1.3: Participatory principles and appropriate extension methodologies adapted for dairy researchers, extensionists and farmers	Participatory research methodologies being applied in the design and conduct of C.1.2; no. of trainees	Training handbooks; documented modules; audio-visual training materials	Increased levels of farmer adoption leading to higher production; more efficient delivery of improved dairy production techniques from C.1.2

Attachment 4: ASLP Achievements against the Logframe[39]

Project description	Achievements to date	Outcomes/impacts	Comments
GOAL 1: TO TRANSFER AUSTRALIAN KNOWLEDGE AND EXPERTISE TO KEY SECTORS OF PAKISTAN AGRIBUSINESS TO INCREASE PROFITABILITY AND ENHANCE EXPORT POTENTIAL			
COMPONENT A – MANGOS. Purpose: To transfer Australian mango production and supply chain know-how	All the initial activities (scoping studies, industry exposure visits, workshops) were successfully carried out as planned in the ASLP implementation plan. Domestic profile was high, with most visits by Australian experts widely covered in local and sometimes national media, as well as websites such as the PHDEB's E-Newsletter. Proceedings and reports have been made widely accessible through dedicated editions of ASLP mango newsletters and the ASLP website.	These activities have not only succeeded in establishing a plethora of linkages between researchers in both countries, but have also initiated private sector exchanges between both countries. Arguably, the biggest impact has been on breaking down barriers between research institutions in Pakistan as well as linking researchers to farmers and the private sector, which was only very limited before the ASLP. Key Pakistan government officials, stakeholders, researchers, private sector entrepreneurs (exporters) and commercial mango farmers have now obtained a very good appreciation of the innovation potential in mango production and marketing and how these innovations can potentially deliver significant economic returns.	As result of the ASLP, a routine engagement between ACIAR and the Planning Commission, the Federal Ministry of Food, Agriculture and Livestock (MINFAL), the Pakistan Agriculture Research Council (PARC) and the Punjab and Sindh Depts. of Agriculture is enabling a much broader exchange of expertise between Pakistan and Australia. This extends beyond the ASLP's immediate emphasis on horticulture and dairy to issues of water management and diseases threats (avian influenza, wheat stem rust Ug99), as well as to broader capacity building support, by helping Australian universities link with partner universities in Pakistan and by helping place Pakistan funded postgraduates in Australia.
Output A.1.1: Disease agents for mango dieback and malformation identified and	Initial scoping study visit identified *Ceratocystis fimbriata* as the main causal agent of the mango dieback	Research on the epidemiology and management of mango dieback has unified researchers in the research	At the preparation of the project proposal following the scoping study visit, it was decided that the project

[39] Prepared by Dr Christian Roth from information supplied by ASLP Team Leaders.

Project description	Achievements to date	Outcomes/impacts	Comments
documented	disease in Pakistan. Subsequent sampling and isolations by Pakistan scientists have clearly established that this fungus is indeed the main causal agent of the disease and all research is now focusing on understanding the epidemiology of the disease and how to manage it sustainably.	institutions with university colleagues. All researchers involved are now using common methodologies in their research. Peer reviewed research scientific papers on the disease are in preparation for publication	focus should be mainly on mango dieback and not malformation which has been widely studied through earlier national projects. A follow up phase could evaluate sustainable management strategies for malformation.
Output A.1.2: Workshop proceedings providing synopsis of mango production problems and recommendations for R&D	The mango workshop held in Multan in March 2006 was attended by 13 Australian researchers including an expert grower and more than 30 Pakistan mango experts as well as administrators, growers, contractors, exporters and other mango industry stakeholders. The workshop report clearly identified issues needing attention to increase productivity and quality of Pakistan mangoes and also prioritized and recommended those that needed to be addressed immediately through a follow-on project. Proceeding were documented and posted on the ASLP website. Since the initial mango workshop, five project work-shops have taken place with various stakeholders.	This workshop was the first ever of its kind for the mango sector in Pakistan, for the first time bringing together lead growers, researchers, extensionists and private sector representatives. Amongst other things it led to the development of the two mango research projects along priorities endorsed by all the stakeholders at the workshop, including the Federal Minister of MINFAL. It was also instrumental in forging the key partnerships forming the basis of the two mango projects.	It is becoming clear that a larger focus needs to be placed on postharvest issues including PH disease management, handling and temperature controls as these are critical to produce quality mango for the developing export markets. Postharvest disease management would need to receive continuing emphasis in any follow up project or phase.
Output A.2.1: Supply chain analysis identifying key bottlenecks to improved post-harvest management and	A mango supply chain scoping study and constraints analysis was carried out in early 2006, in conjunction with the disease diagnosis study (A.1.1) and	The main outcome of this activity was that a very targeted mango postharvest and supply chain development R&D project was able to be designed and	

Project description	Achievements to date	Outcomes/impacts	Comments
marketing	the mango workshop (A.1.2). The study involved all relevant actors in the supply chain and identified weakness in poste harvest handling and poor quality fruit as one of the main constraints. It also identified key intervention points to improve the overall efficiency of the supply chain, both for domestic and for international markets.	implemented, involving all players in the chain as collaborators as well as tackling the key postharvest management issues.	
Output A.2.2: Awareness in Pakistan of Australian mango production technologies and marketing procedures	A team of more than 25 Pakistan mango business leaders and peak industry representatives have visited Australia on 2 initiatives, first as part of an industry familiarisation study and the next as part of 'Walking the Chain' (a 10 day training exercise tracing supply chain performance of Australian mangoes from various points of sale in Singapore back to the farm in Bundaberg, Queensland), and have established strong linkages with Australian research institutions and businesses to help progress the Pakistan mango industry. Two Crawford-funded training visits to Australia have strengthened the research and management skills of an extension officer and equipped a commercial nursery operator with the know-how on the establishment and	Strong internal linkages have been established between the ASLP mango production project and the Punjab Fruits and Vegetable Production project following the visit of its Director for Extension Training. A modern commercial mango nursery has now been set up in Multan following the visit of its owner to Australia for training and soon clean planting material will be available to growers in establishing new farms with less spread of diseases. Pakistan mango farmers and agri-businesses are improving their profitability (some industry feedback has indicated 20% increased profitability). Asim Fruit Farm, one of the demonstration farms, achieved a farm gate price of 30Rs/kg in 2008, 100% higher than the15Rs/kg average	The implementation or use of some of these new production technologies are now limited by capital input. A cooperative approach may be needed by growers to establish regional or district packing shades to improve handling, processing and movement of fruits to appropriate markets. Reduction in through chain losses will improve economic efficiency – to be monitored and quantified during the 2009 season.

Project description	Achievements to date	Outcomes/impacts	Comments
	management of a modern commercial nursery. Between the two mango project teams a series of workshops have been held in the main mango production areas to help local stakeholders understand mango postharvest quality and supply chain management issues. Participants were given practical demonstrations and hands-on activities on various postharvest techniques and skills.	farm gate price at the same time in the same area with the same variety. An increased number of on-farm pack houses, e.g. JDW Orchards and better postharvest handling practices, e.g. IAC and Roshan, will increase the export volumes of Pakistan mangoes, which will result in employment for more local people in the industry.	
COMPONENT B –CITRUS. Purpose: To transfer Australian citrus production knowledge and expertise	All the initial activities (scoping studies, industry exposure visits, workshops) were successfully carried out as planned in the ASLP implementation plan. Domestic profile was high, with most visits by Australian experts widely covered in local and sometimes national media.	As in the case of the mango component, these activities have succeeded in establishing linkages between researchers in both countries and have also initiated private sector exchanges between both countries, but at a lower level than for mangos (mainly due to the smaller project). There is also some evidence of barriers between research institutions being weakened as well as increased linkage between researchers, farmers and the private sector.	The inability for the Australian project team to travel to the NFWP due to the Level 5 DFAT travel advice has meant that this purpose has not been as effectively achieved as for the other components.
Output B.1.1: Recommendations from Australian citrus experts on priority actions and focus of component B.1.5	Five Australian citrus experts visited Pakistan in July 2006 and gave advice to researchers and growers in the Sindh, Punjab and NWFP in citrus diseases, crop management and irrigation and water management. A program of consultation with industry,	In conjunction with B.1.2, this scoping and consultation activity ensured broad engagement and endorsement by key Pakistan stakeholders in targeting the highest priority citrus production issues within the constraints of a fairly modest resource base.	

Project description	Achievements to date	Outcomes/impacts	Comments
	government, researchers and growers was undertaken and consisted of field visits, group meetings, mini-workshops and culminating in a major workshop which was held in Islamabad.		
Output B.1.2: Workshop proceedings providing synopsis of citrus production problems and recommendations for R&D	A citrus workshop was held in conjunction with B.1.1 above. The major workshop was attended by over 70 Pakistani citrus industry representatives and was held over two days. This workshop brought together all of the information from previous consultations and developed a focussed group of R&D priorities. These outputs are documented in workshop proceedings which were documented and published in a report provided on the ASLP website.	As for B.1.1. The main outcome of this activity was the development of a targeted R& D project on increasing citrus productivity. It also consolidated the initial linkages developed in B.1.3.	
Output B.1.3: Awareness in Pakistan of Australian citrus production technologies and marketing procedures	11 Pakistan citrus business leaders and peak industry representative visited Australia in May 2006 for a 10-day awareness and familiarisation visit. Major citrus production areas in Queensland and New South Wales were visited together with associated enterprises such as the wholesale markets and research facilities. The outcomes of this visit are documented in trip reports and feedback from individual participants.	The main outcome of this activity was the establishment of initial linkages between relevant partners in Pakistan and Australia as well as providing key input into activities B.1.1 and B.1.2.	
COMPONENT C – DAIRY.	All the initial activities (scoping studies,	From these trips there has been	Over the remainder of the ASLP,

Project description	Achievements to date	Outcomes/impacts	Comments
Purpose: To transfer Australian dairy production and constraints analysis know-how	industry exposure visits, workshops) were successfully carried out as planned in the ASLP implementation plan. Subsequently, numerous Australian expert trips have been completed to Pakistan. On these trips the experts have been engaged with local Pakistani scientists to gain key contacts as well as an overview of current research and dairy bottle necks to determine key areas needing research.	continuing communication and involvement between Australian academics with Pakistani academics and students. Good informal linkages have also been established between the Livestock Dairy Development Board and Pakistan Dairy Corporation, and the various public and NGO extension providers.	there will be a steady flow of selected dairy specialists from Australia to Pakistan, conducting specialist reviews of and training in key technology gaps (eg. forages; genetics, health, herd management, farm financial analysis etc).
Output C.1.1: Constraints analysis identifying key bottlenecks to improve unit animal milk productivity and enhance milk supply chain; recommendations for targeted R&D	A dairy scoping team travelled to Pakistan in May 2006. The scoping mission included Austrade expert Robert Sutton (Manager Agribusiness and Consumer) to help facilitate links between the ASLP Linkages and Market components. The final report has been widely circulated and is available on the ASLP website. This initial scoping mission was followed by a further project development mission later in 2006.	The report received a high degree of acceptance by Pakistan dairy stakeholders, in particular MINFAL and the NRSP. It enabled all the critical initial linkages to be identified and established between relevant Australian research organisations and the main Pakistan partners in government, research and extension. The key outcome was that the report clearly established that low milk productivity was not so much a reflection of lack of research knowledge, but of a rather dysfunctional knowledge dissemination system. It also clearly established that enhanced germplasm was not the appropriate strategy to increasing small-holder milk production, but that the	This activity also helped establish the relative areas of focus of the ACIAR dairy project and the Austrade dairy activities. While the ACIAR project is targeted towards small-holders and poverty alleviation, the Austrade component targeted the corporate dairy sector, where one of the primary strategies has been to import high performance dairy cows from Australia.

Project description	Achievements to date	Outcomes/impacts	Comments
		focus needed to be on better nutrition and health of prevailing small-holder breeds.	
Output C.1.4: Awareness in Pakistan of Australian dairy production technologies and marketing procedures	The Austrade and the ACIAR technical teams have both facilitated delegation trips of Pakistanis to Australia. The ACIAR sponsored technical team consisted of 5 high level dairy personnel and policy makers who were involved in a 2 week trip in 2008 to key dairying areas in Australia. Findings and lessons from this trip were focused on fodder production, quality fodder seed availability, farmer discussion groups and a functional breed improvement programs. Concurrently, Austrade has commissioned Pakistani personnel to visit Australia and vice versa which has resulted in sales as well as the development of linkage and market capability relating to seed and dairy animals of high genetic quality.	As Pakistan dairy companies started importing improved dairy cattle it was recognized that the importers would need technical support in order to ensure these high performance cattle could thrive under the harsh conditions in Pakistan. In response ACIAR and Austrade organized a joint Dairy Knowledge Fair and Technical Workshop in February 2007 in an attempt to backstop this private initiative with adequate technical information targeting high performance dairy cattle. The dairy knowledge fair component provided a forum to bring in Australian private sector providers from the dairy sector. The workshop specifically targeted management of high performance cattle, and the high end of commercial dairy production with the key motivation to minimise / address the risks associated with performance of the imported cattle in Pakistan.	Another delegation tour of approximately 8 young Pakistani scientists with an interest in nutrition and fodder will be visiting Australia in early 2009. The focus of this tour will be to learn advanced nutrition technologies as well as basic fodder production and conservation techniques from a fodder specialist who has recently visited Pakistan.
Output C.1.5: Australian Friesian Sahiwal germplasm / bulls transferred to Pakistan; seeds from a range of improved legume and non-	Although Australian Friesian Sahiwal genetics are no longer available in Australia, Holstein Friesians of superior genetic quality have been transferred to Pakistan. Austrade has organised	A total of 3325 cattle have arrived in Pakistan over the last 2 years. These have arrived in three separate consignments in February 2007, December 2007 and February 2008.	A breeding and genetic specialist from Genetics Australia will be visiting Pakistan in February 2009 as part of the ASLP Dairy project to determine and propose a program

Project description	Achievements to date	Outcomes/impacts	Comments
legume forage species sourced and provided to Pakistan R&D institutions	three buyer missions of dairy livestock from 2006-2008. The members of these missions were private sector importers from Karachi, Quetta and districts of the Punjab. Some of the important customers have been Engro Food Ltd., Nestle Pakistan, Shafi Leather, Sapphire Group and Dewan Group.	Two more consignments are due to arrive later in 2008 (300 in each). Fodder seed (both summer and winter varieties) will also be very important to the development of the Pakistani dairy sector. Austrade has successfully introduced two Australian forage seed companies in Pakistan; Blue Ribbon Seeds Pty Ltd and Lefroy Seeds. Blue Ribbon has carried out some rye grass seed trials with JK Dairies in Rahim Yar Khan in the Punjab. These trials have had great success in producing fodder from low quality land.	for the Pakistani dairy sector to follow to best utilise their current genetic stock whilst also incorporating useful genetics from outside the country. At this time he will be able to incorporate how to best utilise the exported Australian dairy genetics within Pakistan.
GOAL 2: TO CONTRIBUTE TO POVERTY ALLEVIATION OF SMALL-HOLDER FARMERS THROUGH COLLABORATIVE RESEARCH AND DEVELOPMENT			
COMPONENT A – MANGOS. Purpose: To develop improved mango production, certification and marketing techniques	Both mango R&D projects were implemented in late 2006/early 2007 and are fully operational. The mango supply chain project is ahead of project schedule while the mango production project is tracking according to project plan.	Both R&D projects are starting to provide key technical data and new knowledge which will be instrumental in delivering technologies and processes that will enhance productivity and increase returns to farmers and other actors in mango supply chains.	The achievements have been obtained despite occasional travel restrictions due to security problems. As per ASLP risk management plan, this has meant projects have taken a flexible approach, with some planned activities either taking place in third countries or in Australia. However, it is credit to the very strong Pakistan teams in each project that such excellent progress has been made by both projects.
Output A.1.4: Improved and practical mango disease management techniques; effective certified nursery	Factors enhancing the development and spread of the mango dieback disease have been established. Charts showing the systematic symptom	Growers already adopting some of the improved and practical mango disease management techniques such as pruning are already reporting increased	Project is in second year of operation and component control methods are just being integrated for testing and validation in pilot and model

Project description	Achievements to date	Outcomes/impacts	Comments
program	development of the disease have been produced with recommendations of action required at each symptom development stage. Trials are in place to identify other interventions such as the use of fungicides, activators and other cultural interventions that can further slow the initiation or spread of the disease. The outline of a mango nursery production manual has jointly been produced by officers of the National Seed Certification Board, the Fruit and Vegetable Development Program and the ASLP mango production project team. This is the first step in the establishment of a manual that will be used in an effective certified nursery program.	productivity of quality mango fruits. A number of on-going programs or projects have agreed to work together on the production of a national mango nursery production manual. Prior to the project, all these programs and projects were competing with one another to achieve the same goal. Field disease surveys into more than 400 mango orchards across the different production districts in Punjab and Sindh have shown reduction in sudden death incidence of more than 25% in orchards already adopting improved crop management practices such as pasting, pruning, and trunk ringing, all linked to the disease.	orchards A completed nursery manual and a Certified nursery program were all programmed to be achieved during the last year of the project and are on target to achieve this.
Output A.1.5: Improved orchard and water management techniques developed in a participatory mode involving end-users	The 10 pilot and model farms established in grower orchards across production districts of Punjab and Sindh are evaluating and validating improved orchard management techniques such as pruning to reduce tree height and density, nitrogen application and timing and application of effective pesticides for increased productivity of quality mangoes. There is reported increase in yields	Prior to the ASLP there was widespread resistance of adoption of canopy management procedures after wrong initial application of techniques. The pruning approach recommended by the project and the results to date have largely help overcome this resistance. Mango growers have become more trusting in the research results.	These early encouraging results are likely to provide a solid basis for more widespread productivity gains as the results are consolidated towards the end of the project and more widely disseminated. Despite the importance of proper irrigation and drainage management, the limited resources available to the project have not allowed for a more in-depth study. This is being

Project description	Achievements to date	Outcomes/impacts	Comments
	following sequential pruning and appropriate application of required nutrients. Nutrient type and timing of application has been demonstrated to play a major role in yield increases of quality fruits. The focus is mainly on canopy management and improved use of plant nutrition as these relate to the incidence of postharvest diseases and the production of quality fruits. These are participatory evaluations with growers and in close collaboration with the Supply Chain project which uses these farms as sources for its export fruits research.		addressed by a new ACIAR project planned for 2010 on Pressurised irrigation systems to minimise waterlogging and salinity and to optimise nutrition of mango and citrus orchards in Pakistan and Australia.
Output A.2.4: Supply chain groups identified and product and information flow mapped; storage and QA protocols developed	A market research team conducted domestic market research in the three largest cities of Pakistan (Faisalabad, Labore and Karachi). Pakistan mango freighters, exporters, wholesalers, retailers and consumers were interviewed to examine market responses and requirements. Market research on existing export markets Dubai, UK and Singapore was carried out by Australian team members on their way to and from Pakistan. In addition, China has been identified as a potential new market for Pakistan mangoes, given the permission of the	Application of the research results and knowledge acquired by the project is now being used to build mango demonstration supply chains targeting both domestic and international markets. These chains will use the best current postharvest knowledge and practices coming out of the project work to supply consumers with mangoes from Pakistan of the best quality possible. Since the beginning of 2008, planning and coordination has been carried out for developing five demonstration chains, three targeting international markets and two domestic	All the results and activities outlined have a single focus - to improve the supply chain system so as to reduce postharvest losses and improve the quality of Pakistan mangoes in the hands of the consumer. If this can be achieved, the total value of the crop will increase through existing and new market development. This represents net economic benefit to all players in the supply chain, but particularly to farmers.

Project description	Achievements to date	Outcomes/impacts	Comments
	Chinese government in 2005 to allow Pakistan mangoes into its market with zero import tax. In September 2007 in-market research was conducted in China following desktop research. The research team investigated issues of market access, consumers' perceptions towards Pakistan mango, importer and wholesaler requirements, competitors for Pakistan mango in the market, optimum supply season, and possible channels for Pakistan mango to reach the targeted market and financial feasibility. All market research findings have been documented and results have been circulated according to the project communication plan to relevant individuals and organizations. Results were also disseminated through various workshops held in growing regions. The poor performance of the Pakistan mango industry is reflected in high postharvest losses and fruit quality attributes that do not meet international market requirements. To identify the causal factors, existing postharvest practices were monitored. Two monitoring studies were conducted for domestic markets and three export markets were targeted.	markets. A workshop for the supply chain core group was held in Karachi on 21 June. Supply chain management principles and best postharvest practices derived by the project and responsibilities of each member in the chain were reinforced during this workshop and initial consignments of mango to each market were planned. Application of the simple de-sapping techniques aimed at increasing the shelf life and the quality of mangos through the practice of lime washing has positioned the Pakistan Horticulture Development and Export Board (PHDEB) to target the high end European market. Initial batches of high quality, lime washed mangoes have achieved 3- to 5-fold higher prices and have positioned the PDHEB to enter new export markets in Germany. This will help increase volume and value of mango exports from Pakistan and contribute to poverty alleviation of small-hold farmers.	

Project description	Achievements to date	Outcomes/impacts	Comments
	Research teams followed fruit from tree to end consumers in both domestic and international markets including Singapore, UK and Dubai. Information was also collected from relevant actors in these supply chains. A range of controlled postharvest experimental studies have been conducted, including: - lab scale studies on optimization of storage temperature and postharvest colour development - laboratory simulation studies on ripening procedures of Sindhri and Chaunsa varieties - assessment of harvest maturity of Sindhri and Chaunsa mangoes - lab scale postharvest disease identification and management - test of commercial lime as a cheap, safe and easy to use technology for desapping mango fruits.		
COMPONENT B – CITRUS. Purpose: To develop improved citrus production and certification techniques	The citrus R&D project was implemented in mid 2007, somewhat behind schedule. This slippage has meant that the project is only about half way through its cycle.	See comments for B.1.5 below.	
Output B.1.5: Improved orchard and water management techniques developed in a participatory	Despite slippage in start dates of this project, leading to the project cycle becoming desynchronised with tree growth cycles, a range of experimental	It is too premature to make any assessments about impacts. The main outcome of this activity to date is that the ground work ahs been laid to	

Project description	Achievements to date	Outcomes/impacts	Comments
mode involving end-users; effective certified nursery program	activities have successfully taken place: - superior citrus germplasm (budwood and rootstocks) has been sent to Pakistan and has now been established there pending propagation and field testing - phenology trials have been established and data is being collected for modelling and analysis - best practice trials including irrigation management, pruning, nutrition and crop husbandry have been established in the Punjab and NWFP provinces - trials aimed at developing recommendations for micro-irrigation (to replace furrow irrigation) have been established in both Provinces	develop improved citrus production techniques using innovative approaches introduced from Australia.	
COMPONENT C – DAIRY. Purpose: To develop improved milk production techniques	The dairy R&D project was implemented in July 2007 and is directly working with dairy farmers, two local NGOs, extension and research workers of Livestock Dept. in Okara and Bhakkar districts of Punjab. It is fully operational and has progressed very well; it is currently ahead of schedule in some areas. A significant feature of this project is that it has an Australian project coordinator based in country, working very closely with a dedicated Pakistan project team. Travel restrictions have not	Very valuable insights are being obtained as to what the real constraints are to increased dairy productivity at the small-holder level (1-10 animals). This information was not available before. It has provided the foundation for spawning off a range of data and knowledge integration and packaging activities, underpinned by a very strong extension (including research into extension) and training emphasis.	This was a very complex project to establish, as it differs somewhat from the more traditional R&D format in that it was deliberately designed to be flexible in terms of response to technical inputs if and when they were required during the life of the project. There were also difficulties in changing lead Australian organisation midway during project development which further complicated the implementation of the project.

Project description	Achievements to date	Outcomes/impacts	Comments
	affected this project as much as the others, which has contributed to its good progress.		
Output C.1.2: Feed budgets matched to lactation cycles based on locally available fodders; improved milk collection, storage and marketing procedures	Pakistani small-holder dairy farmers are generally not familiar with the concept of herd recording and hence have no means of feed budgeting for their enterprise. Consequently, rather than immediately launching into feed budgeting, the ASLP dairy project has focussed its attention on determining actual feeding and animal husbandry practices through the extensive longitudinal survey study commenced 9 months ago and involving about 200 farmers. However, this survey has yet to complete a full 12 month cycle before feed budgeting can be undertaken. Two fodder demonstration plots in each survey region were completed to demonstrate to farmers and extension workers the best practice procedures for fodder production in each area. High quality winter fodder seed has been provided and sown in each village the project is working in. This aims to provide more local demonstration of the important winter fodders.	The data being collected in the longitudinal survey will provide an invaluable tool in helping develop feeding options and feed budgets. At the same time as the survey will provide the benchmark data against which sensible and affordable feeding regimes can be developed and recommended to farmers, the survey is also the primary engagement and training vehicle for 200 farmers. As a result of the survey related engagement farmers have started making easy to implement changes like providing free access to water. Early results from the survey are showing evidence of increased water uptake by dairy animals can lead up to a 20% increase in lactation.	In the original design of the dairy component, the ASLP plan foreshadowed that the dairy project would also address some of the collection, storage and marketing procedures. During the various scooping missions, these issues were subsequently seen as too ambitious and the focus of the project against this output was narrowed to just nutrition and health. At the same time, ACIAR planned to implement a small policy analysis project to cover off on some of the other issues, which unfortunately did not get implemented.
Output C.1.6: Selection of desirable traits in Australian	Dairy animals (Holstein Friesian) of high genetic merit have been brought	Access to these improved animals and genetics will enable corporate dairy	In terms of the small holder dairy farmer these genetic solutions are

Project description	Achievements to date	Outcomes/impacts	Comments
Friesian Sahiwal; introduction of improved genetic material into dairy cow breeding programs;	to Pakistan and after some initial complications have been placed on appropriate farms and are producing well. Similarly, some Australian forage species are being trialled on farms.	farms with adequate resources and infrastructure to increase the production of their animals.	not appropriate to improve their production or to alleviate poverty. Small-holder dairy farmers are producing milk from 1-10 cows and do not have the resources or infrastructure to sustain animals of high genetic merit. Due to this the ASLP Dairy project is advocating the use of local dairy breeds with better feeding and management practices to improve milk production. Hence there is no trait selection work being carried out by the project.
GOAL 3: TO ENHANCE THE CAPACITY OF THE PAKISTAN RESEARCH, DEVELOPMENT AND EXTENSION SYSTEM TO DELIVER TARGETED AND PRACTICAL RESEARCH OUTPUTS TO AGRIBUSINESS AND FARMERS			
COMPONENT A – MANGOS. Purpose: To develop training modules tailored to the mango sector	Annual training courses have been delivered each year to researchers, extension officers, growers and contractors in Pakistan on field canopy management, extension research methodologies, disease identifications, and management and nursery establishments. Two sets of individual training visits have taken place in Australia, one involving project leaders to strengthen their project management skills and the other a nursery and an Extension expert to improve their skills in nursery management and extension.	Researchers and growers are now using integrated approaches to increase productivity and quality of mangoes. Model farms being set up are as a direct result of these training workshops. The individual training has resulted in the set up of a model commercial nursery in one of the production districts.	More training activities are planned and it is hoped that the security environment will improve to enable this to take place.
Output A.1.3: Participatory	Six training modules on disease	The linkage of the project to the FVDP is	Due to the limited funding available

Project description	Achievements to date	Outcomes/impacts	Comments
principles and appropriate extension methodologies adapted for mango researchers, extensionists and farmers	identification and management, orchard canopy management, nutrient application timings and Train the-trainers techniques needs have been developed and more than 18 training courses, 21 workshops and seminars conducted across a range of mango stakeholders in the 2 production provinces of Punjab and Sindh. Ten brochures highlighting various mango production aspects have been produced in English and local languages and distributed to growers. Two Extension-focused training courses have been delivered to Extension officers in Pakistan. The Chief Extension officer, Mr Mahmood Khalid, who is also the Director of the Fruit and Vegetable Production (FVDP) project in Punjab, was trained in extension methodologies in Australia and is now using the train- the-trainer approach to extend the training to his project subordinates charged with this role in the project so that they can train farmers on mango production practices through the Farmer Field Schools. Training handbooks; documented modules; audio-visual training	achieving a lot of impact in Extension activities mainly through the Farmer Field Schools which is the model that FVDP is using to reach its many growers.	for this project, extension activities were carefully focussed at the beginning of the project. This meant that it was not possible to carry out some extension activities which could have greatly enhanced the impact of the outcomes from the other project components. This was disappointing for both the Australian and Pakistan teams. It is anticipated that a greater focus on extension shall be applied in a follow up phase, to pass on achievements from phase 1 of the project. Individual degree training in Australia has not been achieved due to consistent inability to get a single JAF-funded scholarship to Australia despite massive campaigns and encouragement of candidates to apply. Some dedicated awards need to be made available to the project if this is to be achieved in future.

Project description	Achievements to date	Outcomes/impacts	Comments
	materials have been produced and distributed to extension officers.		
Output A.2.3: Participatory principles and appropriate extension methodologies adapted for supply chain groups	A postharvest laboratory has been set up at the University of Agriculture Faisalabad has operated effectively for mango postharvest quality research. The equipment was installed with help from the Australia team. Pakistan participants have been trained in equipment operation as well as experimental design, measurement and analysis. Results have been fed back to stakeholders through workshops, seminars and publications. Two Pakistani technicians from PHDEB and UAF spent 17 days in Australian with the Department of Primary Industries and Fisheries for training in mango handling practices and mango research techniques, disease collection, ethylene work, fruit storage, ID work, building a ripening room, CA work and literature collection. They also attended discussions at The University of Queensland Gatton on supply chain management principles. A junior lecturer from the University of Agriculture Faisalabad has begun his PhD under a John Allwright Fellowship at The University of Queensland. He is undertaking an evaluation of the whole	Setting up the postharvest laboratory at UAF and providing training in its operation provides longer term capacity to undertake the scientific research necessary to underpin commercial industry development. Training trainers helps to ensure that scientific research is interpreted and delivered so as to produce practical outcomes. Participatory training modules help to ensure that the right questions are asked in the first place, and that stakeholders remain engaged over time in improving the commercial performance of the industry. The above approaches to ensuring that mango postharvest and supply chain research remains focused and are applied in practical ways, help to generate high returns on R&D. As a result of the supply chain related training of trainers about 876 people have been trained, including extension workers and staff from Universities and officers from government. Participants received the activities of this project and PHDEB positively and showed keen interest in the continuation of these types of practical exercises in the future.	

Project description	Achievements to date	Outcomes/impacts	Comments
	of supply chain approach being adopted in this project. Training has also been given to three Pakistan colleagues on in-market research investigation methods in China and two UAF lecturers have been trained in how to undertake domestic market research. Participatory principles and appropriate extension methodologies have been developed and adapted for mango researchers and extension agents in a cross-section of the mango research and extension institutions. A range of field guides has been produced, including display charts, training handbooks, documented modules, and formal training materials including audio-visual training materials. These have been distributed across the Pakistan mango industry. During the 2007 visit to Pakistan, the Australian team identified some practices in pack-houses that needed to be improved for ensuring quality mango through the demonstration chains. Sponsored by 15 commercial partners in Pakistan and the ASLP mango supply chain project, Mr. Rob Vennard, an experienced Australian mango industry expert, spent 10 days	The two technicians trained in Australia have held workshops to train others. Across the whole project so far, 1125 participants have received training in postharvest fruit handling, supply chain management, quality assurance and how to apply market research findings, through participatory activities such as hands-on farm demonstrations and taking participants to overseas markets, as well as through traditional information channels such as seminars and publications. The core supply chain group has also been actively engaged in developing its own activities based on the support, guidance and information provided through the project.	

Project description	Achievements to date	Outcomes/impacts	Comments
	in Pakistan. Liaising closely with the project team in Australia and Pakistan, Mr. Vennard conducted training activities through working closely with 3 existing pack houses to address the issues of poor understanding of the correct uses of equipment, and lack of quality control systems. New procedures were documented with pack house staff so they have a hard reference copy to keep. Two seminars on pack house design and operation were conducted in the Sindh and Punjab production areas.		
COMPONENT B – CITRUS. Purpose: To develop training modules tailored to the citrus sector			
Output B.1.4: Participatory principles and appropriate extension methodologies adapted for citrus researchers, extensionists and farmers	Participatory training activities have been carried out for irrigation management, plant propagation and nursery production, nutrition and crop management in both the Punjab and NWFP. The average attendance at these workshops (14 held to date) has been 17-40 growers on each occasion. In addition Pakistani researchers and extensionists have received extensive training in these skills in hands-on session in Australia. Additional outputs include:	As already indicated at B.1.5, it is too premature to make any assessments about impacts. The main outcome of this activity to date is that the Pakistan project partners have been exposed to better ways of engaging with farmers and have been inducted into new ways of extending research to farmers. In time this enhanced capacity is likely to increase the effectiveness of citrus research n and delivery of improved citrus production techniques in Pakistan.	Development of citrus cultivar and rootstock factsheets is underway as is the development of a comprehensive nursery production manual.

Project description	Achievements to date	Outcomes/impacts	Comments
	- plant propagation and tree pruning and training DVDs that have been developed and distributed extensively in Pakistan - irrigation books and technical guides have been distributed to technical collaborators in the Punjab and NWFP - grower demonstration blocks which are being managed to best-practice recommendations have been established in the main production areas of the Punjab (7 sites) and NWFP (6 sites)		
COMPONENT C – DAIRY. **Purpose: To develop training modules tailored to the dairy sector**			
Output C.1.3: Participatory principles and appropriate extension methodologies adapted for dairy researchers, extensionists and farmers	For the past year the project team has worked to initiate the project, data collection and build strong relationships with farmers and extension workers (EW) within the project. During this time approximately 3 farmer training days and 4 EW training days have been held (reaching out to ~200 farmers in total and ~25 EWs), each focusing on a participatory approach on the topics of basic principles in herd recording, fodder production, nutrition and reproduction.	From the training days carried out so far we have seen encouraging results with 20% of farmers making changes on their farms. These changes generally include untying their animals and providing free access to water. This has shown an increase in milk production of over 20% on some farms. Through the longitudinal survey we expect to be able to quantify these improvements resulting from project interventions.	In the second year of the project focus will move to the training of extension workers (EW) in communication and training methods so that they can then deliver their own training at the farmer doorstep. To initiate this, the project will utilise the training expertise of the Institute of Rural Management (IRM) (an affiliate of NRSP) to carry out the "Training of Trainers". This will be followed by the technical courses and modules developed by the project which will

Project description	Achievements to date	Outcomes/impacts	Comments
	Extension material has been developed throughout the year. Currently farmer fact sheets (in a simple format with pictures and key messages in the local language) and EW modules are being developed which outline the key farmer messages in greater detail. These fact sheets and modules will be utilised within our training and farmer discussion groups to reinforce the messages being delivered at our seminars.		be delivered with the assistance of appropriate universities and research institutes. The project field manager will work closely with these newly trained staff to implement farmer discussion groups at the farmer doorstep. Throughout this process, the training regimes for both the EW and farmer will remain flexible to implement changes as lessons are learnt.

Attachment 5: Potential areas for extension or expansion of current ASLP engagements.

ASLP Agricultural Linkages	Extension and Phase Two Investment.
Mango Production	• Identify and acquire mango varieties with vital stress attributes (ongoing). • Develop integrated MSDS management strategies that include the role of the bark beetle vector. • Identify and acquire varieties with some resistance to MSDS and incorporate into the mango research program as root stocks. • Undertake studies on irrigation impacts on mango production and quality. • Undertake a study of the major mango insect pests currently limiting productivity and quality. • Develop and evaluate options for the sustainable management of mango malformation disease. • Identify the impact of specific field management practices on yield and fruit quality. • Focus on the improvement of extension practices. • Ongoing capacity building.
Mango Supply Chain	• Verify the commercial application of 1st phase findings with the industry. • Develop commercial protocols for sea freight export of mangos • Develop commercial protocols for ethylene and non-chemical mango ripening. • Support infrastructure investment initiatives including cool rooms, ripening rooms, transport, pack houses, and disinfestation facilities (e.g. Sindh has requested specific assistance to support government investment in a mango processing plant). • Improve post-harvest disease management and food safety. • Ongoing assessment of commercial opportunities in international & domestic markets • Demonstrate the flow & equitable sharing of economic benefits of supply chain improvements to mango growers. • Ongoing capacity building (e.g. small farmer engagement, mango conference, 'Walking the Chain', Aust-based training).
Dairy	• Increase the emphasis on milk quality. • Improve marketing systems and practices for milk. • Focus on strengthening village-level co-operative farmer groups focused on improved productivity and quality; • Concentrate on and strengthen training activities for women's production groups. • Improve the simplicity, effectiveness and availability of materials for extension workers. • Improve smallholder dairy animal nutrition by integrating better fodder crop cultivars associated with concentrate feeding. • Promote the use of certified, high quality fodder seed from reliable sources in Pakistan. • Establish clearer recommendations on calf rearing. • Ongoing capacity building
Citrus	• Establish a properly integrated system for the sustainable commercial supply of certified disease free planting material.

ASLP Agricultural Linkages	Extension and Phase Two Investment.
	• Evaluate and commercially release a seedless Kinnow mandarin. • Evaluate the imported Australian citrus germplasm (Scion and Rootstocks). • Introduce of insect pest management. • Evaluate high density orchards (through pruning & dwarf rootstocks) as an alternative to intercropping. • Improve water use efficiency through furrow and pressure irrigation systems (including nutrient and fertigation studies). • Ongoing capacity building.
Austrade	• More Customer-Client interaction for the development of dairy industry • Invitation mission to Australia • Sustainable farming system • Australian Commercial Mission to Pakistan • Initiatives for a JV to set-up a model dairy farm • Enhanced exports of Forage seed • Promote Technical education • Quality dairy livestock genetics • Dairy development experts for Tier 1 positions

Attachment 6: ASLP Review Terms of Reference

13 TO 24 NOVEMBER 2008

1 BACKGROUND

Over two thirds of Pakistanis live in rural areas, 70% of whom are employed in the agriculture sector. This represents 40% of the total labour force with four million young people entering the labour market annually. The rural poor are particularly vulnerable to unexpected events including ill health, droughts and increasing exposure to volatile international markets.

Rural poverty has been increasing despite strong economic growth (including agricultural growth). A handful of big landholders own a disproportionate amount of land and about 80 per cent of the farming community is made up of landless labourers. Sharecroppers who work land belonging to large-scale farmers are often in debt to their employers and therefore take a smaller share of the crops.

The World Food Programme has stated nearly half of Pakistan's 165 million people are at risk of food shortages due to a surge in prices. It is estimated that as a result of the food price increase, the number of people with inadequate food consumption (< 2,100 kcal/capita/day) rose from 72 million (45 per cent of the total population) in 2005-06 to 84 million (51 per cent) in 2008. Food production is declining because of increasing water shortages, climate change, deforestation, soil erosion, natural calamities, decreasing land available for staple crops (ie, wheat) and their low yield per unit area. The regional disparity index reflects that North West Frontier Province (NWFP) is the worst affected province followed by Sindh.

Key constraints to development in Pakistan's rural development sector include a lack of access to: finance and business development services, basic and vocational education, health services and infrastructure. In addition, land ownership is skewed in favour of the elite, institutional practices are obsolete and wasteful, there is increasing pressure on availability of water resources for irrigation, and inadequate coverage, quality, and reliability of water supply and wastewater treatment.

Australia's development assistance program to Pakistan is growing in size from $26 million in 2008/09 to $70 million in 2012/13. The agreed priorities for the program are assistance to education, health and humanitarian relief, in particular focused on development in the Afghanistan-Pakistan border regions. In line with Australian government priorities, future assistance will include enhanced assistance to the rural development sector.

In future it is anticipated Pakistan's rural development program could focus on (but not be limited to) the following deliverables under Australia's key policy objectives:

- ***Lifting Agricultural Productivity***: improving crop yields, reducing post-harvest crop losses, improving water resource use, delivery and management; investment in research and technology
- ***Improving Rural Livelihoods***: increasing income for the poor through enhancing access to assets and supporting well functioning markets (ie. Formation of farmers organizations, public-private partnerships); and

- ***Building community resilience***: supporting social safety nets, provision of micro-finance, increased food security eg. through diversification of crop production (ie. higher value crops including oilseeds, vegetables and fruits, livestock), and empowerment of women.

Current ongoing support to Pakistan's Rural Development Sector comprises the Agriculture Sector Linkages Program (ASLP), which is the subject of this review.

Agriculture Sector Linkages Program (ASLP):

In May 2005, the Government of the Islamic Republic of Pakistan and the Government of Australia agreed to establish the ASLP. The purpose of the ASLP, as defined in the agreed ASLP Plan (Annex 1) is to build linkages between the agriculture sectors of Australia and Pakistan. With a total budget allocation of 6.6M AUD over 4 years, ASLP has been structured into four components:

Recommendation 1. *Market Linkages:* Conduct an agriculture market expansion feasibility mission to Pakistan for a bilateral trade & investment consortium of key Australian companies. *This mission is led by Austrade.*

Academic Linkages: A total of seven agriculture research/postgraduate scholarships limited to a maximum duration of 24 months placed in key Australian institutions on issues of priority to the Pakistan agriculture sector. *The seven scholarships are managed by AusAID in accordance with the Australian Development Scholarship Program.*

Agriculture Linkages: Implementation of a program of technical activities (up to 3 years in duration), comprised of projects to build linkages between the agriculture sectors of the two countries. *This component constitutes the main thrust of the ASLP (5.06M AUD) and is managed by ACIAR.*

Linkages Program Review: A joint review to be commissioned in year three of the initiative. The review will analyse each of three program components and compile outcomes and provide comment on the impact the initiative is having on strengthening linkages between Australia and Pakistan. *This component is to be managed by ACIAR.*

Under a Record of Understanding with AusAID, ACIAR agreed to manage and implement components 3 and 4 above. These ToRs directly relates to component 4. An AusAID – managed rural development consultant will participate as part of the review team under the supervision of ASLP Coordinator Dr Christian Roth. The review will be conducted in Australia and Pakistan from 13 to 24 November 2008.

2 OBJECTIVES

The objective of the ASLP review is to evaluate the progress and impact of the ASLP, its implementation and its ability to foster linkages between Australia and Pakistan. This will form the basis for recommendations to AusAID and other stakeholders on modifications to the current program and possible future initiatives.

In line with AusAID's rural development objectives in Pakistan, the review team will ensure adequate attention is paid through the review to the development impact of the ASLP, with a particular focus on poverty alleviation and food security. The team will assess the advantages and shortcomings of the ASLP in responding to food security and poverty alleviation goals, and, where possible, provide

recommendations as to how the design of a possible second phase of the program could be improved to maximize impact in these areas.

Plans for the ASLP review were disrupted by security concerns in Pakistan and, as a result, a substantially reduced review team will conduct the review over a shorter period. This will necessarily impact on the breadth and depth of the review team's research and recommendations.

3 SCOPE OF SERVICES:

The review team will:

Recommendation 1. Consult with AusAID and ACIAR staff, in Canberra and Islamabad, and other stakeholders as appropriate, including participating in a pre-departure briefing to discuss the objective, scope and implementation of the mission.

Review relevant background materials in relation to the Agriculture Sector Linkages Program and other relevant documentation

Undertake an in-country mission to:

- Assess whether:
    - planned activities and outputs are in line with and logically structured to progress implementation towards achievement of the overall goal and objectives, including those related to poverty alleviation, economic growth and rural employment;
    - governance or institutional arrangements for planning and implementing the program are sound and in place;
    - activities are viable and achievable within set timeframes;
    - linkages are established between the three components of the overall program (ie Austrade market linkages; scholarships; ACIAR managed ASLP) and between activities;
    - linkages are established between the program and other interested organisations in Australia (both government and non-government) to ensure compatibility with Australian expertise and interests.
    - counterpart ownership and endorsement with regard to program implementation is established and the consultation processes employed to ensure joint control over outcomes are adequate.
    - higher level goals related to poverty alleviation, economic growth and rural employment are being achieved
- Assess whether the M&E strategy and reporting is adequately defined to enable assessment of progress, outcomes and impact against the broader objectives of the program (are indicators, the means of verifying these and key risks adequately defined across the various program levels ie. goal down to activities).
- Make broad recommendations related to the scope, focus and term of a possible second phase of the project with the explicit aim of achieving long term sustainability and an increased focus on food security and poverty alleviation outcomes in Pakistan:

4 WORKPLAN AND TIMEFRAME

The review will take place from 13th to 24th November 2008 and will commenced with a pre-departure briefing to be held in AusAID Canberra on the afternoon of 13 November, to be followed by a one-day review workshop with Australian Project leaders in Australia on 14 November.

5 KEY STAKEHOLDERS AND PARTNERS

The review team will consult with key stakeholders including Government of Pakistan counterparts and non government counterparts. Depending on time constraints these may include, but will not be limited to the following:

- Federal Ministry for Food, Agriculture and Livestock, Islamabad
- Central Planning Commission, Islamabad
- Federal Ministry of Local Government and Rural Development
- Pakistan Agriculture Research Council, Islamabad
- Livestock and Dairy Development Board, Islamabad
- Pakistan Horticulture Development and Export Board, Lahore
- Punjab department of Agriculture, Lahore
- Punjab Department of Livestock Development, Lahore
- Pakistan Dairy Development Company, Lahore
- Sindh Department of Agriculture
- University of Agriculture, Peshawar
- Bahauddin Zakariyah University
- University of Veterinary and Animal Sciences
- National Rural Support Program and Halla or Idara-e-Kissan

6 OUTPUTS AND REPORTS

The review team shall submit the following report as part of this exercise:

- A review report of no more than 30 pages (excluding attachments) addressing the Scope of Services and including supporting documentation delivered within 30 days of the review.
- The report should be submitted electronically to AusAID in (MS Word) format within ten and thirty days respectively of completion of the field mission.
- A final review report incorporating any further AusAID revisions will be completed within 4 days of receiving AusAID comments on the detailed review report.