



**Ministry of Agriculture Irrigation and Livestock
Emergency Horticulture and Livestock Project**

پروژه عاجل باغداری و مالداري
دباغداری او مالداري بيړني پروژه

PEST MANAGEMENT PLAN

پلان مدیریت آفات و امراض
دآفاتو او امراضو دپلان مدیریت

Afghanistan

افغانستان

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Executive Summary

Background

The Emergency Horticulture and Livestock Project (HLP), funded by the World Bank, is being implemented by a number of partner organizations in eleven provinces in the central and northern regions of Afghanistan: Kabul, Parwan, Panjshir and Kapisa in the centre and in Sari-Pul, Jawzjan, Balkh, Samangan, Baghlan, Kunduz and Takhar in the north. The horticulture component is concerned with four principal crops: almond, apricot, grape and pomegranate specifically the rehabilitation of existing orchards ('productivity') and the planting of new orchards ('production').

The train and visit extension system is implemented by 100 extension workers (reduced from 200 in June 2009 during restructuring of the project) and based on training 'lead farmers' each of whom has a demonstration orchard sustained by the supply of free and subsidized inputs. Each lead farmer has contact with 25 radial farmers in the form of a Horticultural Interest Group. Elements of the Farmer Field School methodology are slowly being built into the extension system.

The project is monitored by its own M&E team attached to the project management unit. This document is a redraft of the Pest Management Plan presented to HLP in June 2008.

Pest Management Approach and use of Pesticides

The pest management approach is based on identifying and controlling the main economic pest of each crop.

Crop	Disease		Insect	
	English Name	Latin Name	English Name	Latin Name
Apricot	Bacterial canker 'Gummosis'	<i>Pseudomonas syringae?</i>	WesternTent Caterpillar	<i>Malacosoma indica</i>
	"Shot hole" Stigmata blight	<i>Stigmata carpophila</i> AKA <i>Wilsonomyces carpophilus</i>	Brown Tail Moth	<i>Euproctis chrysorrhoea</i>
Almond	Gummosis	<i>Pseudomonas sp</i>	Western Tent Caterpillar	<i>Malacosoma indica</i>
	Shot hole disease	<i>Stigmata carpophila</i>	Black Veined White Butterfly	<i>Aporia crataegi</i>
			Brown Tail Moth	<i>Euproctis chrysorrhoea</i>
Pomegranate			Fruit borer - 'Carob' Moth	<i>Ectomeylois ceratoniae</i>
Grape	Powdery Mildew	<i>Uncinula necator</i>		

Pesticides classified according to WHO as belonging to groups Ia and Ib (extremely hazardous and highly hazardous) are not permitted for use in the HLP project. Pesticides

recommended for use are in WHO Class II, III and less hazardous. Cultural control methods are encouraged in order to preserve and augment populations of natural enemies and reduce the need for application of pesticides. In general, the pest management strategy involves the use of pesticides to reduce populations of the target pests during the dormant season. During the cropping season control of pest outbreaks by mechanical and cultural means is preferred to the use of pesticides. Pesticides are only recommended as a last resort, and where possible, as spot sprays only. In 2009, the HLP supplied 39.93 MT of seven different pesticides to farmers costing a total of USD 59,191 (see table below). Application equipment and protective clothing were also supplied.

Name of Product	Active Ingredient and formulation	Toxicity WHO Class	Quantity ordered	Unit price USD	Total USD
Abamectin	Bio-insecticide & Acaricide EC	III	47.5 litres	100	4,750
Sulphur Dust	Inorganic Chemical	U	22.75 MT	500	11,375
Horticultural Oil	Refined Petroleum Oil EC	U	2,120 litres	3.78	8,013
Copper Sulphate	Inorganic Chemical	U*	4.72 MT	4240	20,012
Cupravit Blue	Copper Oxychloride WP	III	2.215 MT	6000	13,290
Calcium Oxide	Inorganic Chemical	U	7.97 MT	20	159
Captan	Dicarboximide WP	U	106 kg	15	1,590

* WHO class II when formulated as Bordeaux Mixture

Policy, Regulatory Framework and Institutional Capacity

Afghanistan is not a member of the IPPC (International Plant Protection Council) nor signatory of the various conventions that control the distribution of banned pesticides, notably the Rotterdam Convention and its system of notification "Prior Informed Consent". Afghanistan has a Pesticide Law written in 1979 which is being redrafted under the HLP project using international consultants technically backstopped by FAO's legal unit. The final version of the new law should be prepared and submitted to the Ministry of Justice by the end of 2009.

The current state of the pesticide trade is essentially subject to the whims of commerce and unregulated. There is no functioning system to register new products, importers, distributors or vendors. The governmental body responsible for pesticide regulation is the Plant Protection and Quarantine Department (PPQD) of the Ministry of Agriculture, Irrigation and Livestock (MAIL). PPQD does not possess the capacity either in terms of laboratory hardware or trained personnel to implement and/or regulate the pesticide trade. A survey of the Agrochemical market will be carried out by HLP at the end of 2009 and the results published in early 2010.

HLP also contains a phytosanitation component intended to produce laws to safeguard the interests of fruit growers, exporters and consumers. With the proposed changes to HLP structure from 2010, this component will be addressed under separate MAIL programs.

خلاصه اجرایی

سابقه

پروژه عاجل باغداری و مالداری تمویل شده توسط بانک جهانی همراه با تعدادی از موسسات همکار در یازده ولایت مرکزی و مناطق شمالی افغانستان اجراء می گردد. در مرکز کابل، پروان، پنجشیر، کاپیسا و در شمال سرپل، جوزجان، بلخ، سمنگان، بغلان، کندوز و تخار میباشند. بخش باغداری مربوط به چهار محصول مهم که عبارتند از: بادام، زرد آلو، انگور و انار میباشند، مخصوصا احیای مجدد باغ های موجود (حاصل خیزی) و نهال شانی باغ های جدید (تولیدات) است. سیستم پرورش و ترویج توسط 100 کارمند ترویج اجرا گردید. (از 200 کارمند ترویج در ماه جون 2009 در جریان ساختار مجدد پروژه تنزیل یافته است) به اساس آموزش سر دهقانان که هر کدام شان باغ نمایشی که توسط عرضه وسایل رایگان و کمک مالی نگهداری شده، دارند. هر سردهقان با 25 تن از دهقانان محوری به طور گروپ علاقمندان باغداری در تماس می باشد. عناصر روش مکتب ساحوی دهقان به تدریج به سیستم ترویجی میدل میگردد.

پروژه توسط بخش بررسی و ارزیابی خود پروژه نظارت گردیده است. این سند باز نویسی پلان مدیریت آفات و امراض پیشکش شده به پروژه باغداری و مالداری در ماه جون 2008 می باشد.

روش مدیریت آفات و امراض و استفاده ادویه ضد آفات

روش مدیریت آفات و امراض وابسته به شناسایی و کنترل آفات عمده اقتصادی هر محصول می باشد.

محصول		امراض		حشره	
		نام لاتین	نام انگلیسی	نام لاتین	نام انگلیسی
زرد آلو	باکتریال کنکر	سیدومونس سیرینگایی؟	وسترن تینت کرم صد پا	مالاکوسوما اندیکا	
	گوموسیس				
بادام	شات هول سنگمینا	سنگمینا کارپوفیلا ای کی ای	حشره دم نسواری	ابوپروکتس کرایسوریا	
	گوموسیس	ویلسونومایسیس کارپوفیلس			
انار	گوموسیس	سیدوموناس اس پی	وسترن تینت کرم صد پا	مالاکوسوما اندیکا	
	مرض شات هول	سنگمینا کارپوفیلا	رگه های سیاه پروانه سفید	اپرویا کرتیجی	
انگور	کیپک	یونسینولا نیکتر	حشره دم نسواری	ابوپروکتس کرایسوریا	
			سوراخ کننده میوه حشره کاروب	ایکتومبالیوس سیراتونیا	

ادویه ضد آفات مطابق هو (WHO) وابسته به گروپ های I ای و I بی (به شدت خطرناک و زیاد خطرناک) در پروژه باغداری و مالداری اجازه استفاده از آن ها نمی باشد. استفاده ادویه های ضد آفات در صنف III, II و کمتر خطرناک هو (WHO) پیشنهاد شده است.

روش سنتی کنترل برای حفظ و افزایش تعداد دشمنان طبیعی و کم کردن استفاده ادویه ضد آفات تشویق شده است.

بطور کلی استراتژی مدیریت آفات و امراض شامل استفاده ادویه ضد آفات غرض کم کردن تعداد آفات مورد توجه در

دوران زمستان گذرانی می باشد.

در جریان موسم رفع حاصل کنترل شیوع آفات توسط طریقه میخانیکی و وسایل سنتی ترجیح داده می شود. ادویه ضد آفات آخرین وسیله پیشنهاد گردیده و در صورت امکان باید به طور نقطه ای دواباشی گردد. در 2009 پروژه باغداری و مالداري 39.93 متریک تن از هفت نوع ادویه ضد آفات را به دهقانان به قیمت مجموعی 59.191 دالر امریکایی عرضه نمود (به جدول ذیل مشاهده نمایید). وسایل قابل استفاده و لباس محافظوی نیز عرضه گردیده بود.

اسم تولید	اجزای فعال و تشکیل	سمیت صنف دبلیو اچ او	مقدار سفارش شده	قیمت به دالر امریکایی	مجموع به دالر امریکایی
ابامیکتین	بیو انسیکتیساید و اکاریساید ای سی	III	47.5 لیتر	100	4.750
سلفر دست	مواد غیر عضوی	U	22.75 متریک تن	500	11.375
روغن باغداری	روغن پترول تصفیه شده ای سی	U	2.120 لیتر	3.78	8.013
کاپر سلفیت	مواد غیر عضوی	U*	4.72 متریک تن	4240	20.012
کاپریویت بلو	کاپر اکسی کلوراید دبلیو پی	III	2.215 متریک تن	6000	13.290
کلسیم اوکساید	مواد غیر عضوی	U	7.97 متریک تن	20	159
کپتن	دای کاربوکسیمید دبلیو پی	U	106 کیلوگرام	15	1.590

صنف II هو WHO * وقتی به طور مخلوط ورودو تشکیل می گردد.

پالیسی تنظیمی چارچوب ظرفیت نهادی

با در نظر داشت میثاق روتردام و سیستم آگاه سازی آن "موافقت اطلاع قبلی"، افغانستان عضو IPPC (شورای بین المللی حفظ نباتات) نبوده و نه امضا کننده میثاق های مختلف که توزیع ادویه ضد آفات ممنوع را نماید. افغانستان قانون ادویه ضد آفات را که در سال 1979 نوشته شده است، دارد. که تحت نظر مشاورین بین المللی پروژه باغداری و مالداري و بخش حقوقی FAO باز نویسی شده است. نسخه نهایی قانون جدید باید تا ختم سال 2009 آماده و به وزارت عدلیه تسلیم گردد.

وضعیت فعلی تجارت ادویه ضد آفات وابسته به تغیر ناگهانی و غیر قابل کنترل در تجارت می باشد. هیچ سیستم در حال کار برای ثبت و راجستر تولیدات جدید، وارد کننده گان، توزیع کننده گان یا مشتریان نمی باشد. اشخاص حکومتی مسؤل تنظیم ادویه ضد آفات برای حفاظت نبات و دیپارتمنت قرنطین (PPQD) وزارت زراعت آبیاری و مالداري می باشند. حفاظت نبات و دیپارتمنت قرنطین (PPQD) لابراتوار و پرسونل فنی جهت اجراء و یا تنظیم تجارت ادویه ضد آفات ندارند. مطالعه و بررسی مارکیت ادویه زراعتی توسط پروژه باغداری و مالداري در ختم سال 2009 اجراء و نتیجه آن در اوایل 2010 نشر می گردد.

پروژه باغداری و مالداري یک بخش فوتوسنتیثین نیز داشته که قصد ایجاد قانونی را بخاطر حفظ علاقمندی تولید کننده گان میوه، صادر کننده گان و مصرف کننده گان دارد. با تغییرات پیشنهاد شده به پروژه باغداری و مالداري از 2010، این بخش تحت برنامه جداگانه وزارت زراعت، آبیاری و مالداري خواهد بود.

دکړنو خلاصه:

د پروژې معرفت

د باغداری او مالدارۍ بیړنۍ پروژه چې دنړیوال بانک لخوا د یوشمیر موسساتو په مرسته دافغانستان په یوولسو مرکزي اوشمالی ولایاتو کی تطبیق کیږی. چی په مرکزی برخه کی عبارت دی له کابل، پروان، پنجشیر، کاپیسا او په شمالی برخه کی دسرپل، جوزجان، بلخ، سمنگان، بغلان، کندز او تخار.

د باغداری څانګه په څلورو مهمو محصولاتو پوری اړه لری. چی عبارت دی له بادام، زردآلو، انگور او انارو څخه. چی په خاصه توګه د اوسنیو باغونو بیا رغونه (حاصل اخستل) دنیالګیو کینول او دنورو باغونو منځ ته راوړل (تولیدات) دی.

دروزی او ترویج سیستم د سلو ترویجی کارکونکو لخوا پرمخ وړل کیږی.

دجون دمیاشتی ۲۰۰۹ کال کی دغه تعداد د ۲۰۰۰ څخه راکم شوچی په دی اساس سره تربیه شوی سر دهقانان چی هر یو یی نمایشی باغ لری چی ځینی وسایل په وریا توګه ورکول کیږی او یوه اندازه مالی مرسته هم ورسره کیږی.

چی هر سردهقان د ۲۵ علاقمندو دهقانانو سره په گروهی توګه نمایش لری.

دسیمیزو دهقانانو دمکتب دعنصر وکړنی ورو ورو په ترویجی سیستم بدلیری.

دپروژې څارنه دڅارنی او ارزیابی تیم لخوا چی دپروژې ادارې یونټ پوری اړه لری اجراکیږی. دغه اسناد دآفاتو او امراضو د پلان مدیریت لخوا بیا ولیکل شو او ایچ . ایل . پی دباغداری او مالدارۍ پروژې ته د ۲۰۰۸ کال دجون په میاشت کی وړاندی شو.

د امراضو او آفاتو دمدریت طریقه او د آفاتو دضد دواګانو څخه استفاده:

د امراضو او آفاتو دمدریت طریقه د آفاتو پیژندنی او کنترول پوری اړه لری چی دهر محصول عمده اقتصاد دی.

حشره		مرضونه		محصول
لاتینی نوم	انګلیسی نوم	لاتینی نوم	انګلیسی نوم	
مالاکوسوما اندیکا	وسترن ټینټ کرم صد پا	سیدومونس سیرینګایی؟	باکتریبیل کنکر گوموسیس	زرد آلو
ایوپروکتس کرایسوریا	حشره دم نسواری	سټیګمینا کارپوفیلا ای کی ای ویلسونومایسیس کارپوفیلس	شات هول سټګمینا بلایت	
مالاکوسوما اندیکا	وسترن ټینټ کرم صد پا	سیدوموناس اس پی	گوموسیس	بادام
اپرویا کرتیجی	رګه های سیاه پروانه سفید	سټیګمینا کارپوفیلا	مرض شات هول	
ایوپروکتس کراسوریا	حشره دم نسواری			انار
ایکتومیالیوس سیراتونیا	سوراخ کننده میوه حشره کاروب			
		یونسینولا نیکنتر	کپک	انګور

دآفاتو ضد دواګانی چی د دبلیو . ایچ . او (WHO) مطابق I او I (شدیدی خطرناکی او زیات خطرناک دی) چی دباغداری اومالدارۍ پروژه کی ورته د استفادی اجازه نشته. دآفاتو ضد دواګانو څخه استفاده کول چی د III، II صنفونو پوری تړلی دی کمی خطرناکی دی چی (WHO) پیشنهادکړی دی.

محلی طریقی دحفاظت او طبیعی دښمنانو دکنترول لپاره د آفاتو ضد دواگانو استعمال کمول نشویږي. دحاصلاتو دموسم په جریان کښی دآفتونو دکنترول لپاره میخانیکي او محلی وسایلو ته ترجیح ورکول کږیږي. دآفتونو ضد دواگانو اخرنی وسیله وړاندیز شوی ده او دامکان به صورت کی باید په نقطوی شکل دواپاشی شی. په ۲۰۰۹ کښی د مالداري او باغداری پروژه د ۳۹.۹۳ میتریک ټنه د آفتونو ضد ۷ ډوله دواگانو د ۵۹.۱۹۱ امریکایی ډالرو په بدل کښی دهقانانو ته وړاندی کړ (لاندی جدول ته کتنه وکړی). داستفادی وړ وسایل او محافظوی لباس هم دهقانانو ته وړاندی شوی وه.

د تولید نوم	فعالی اجزای او تشکیل	سمیت صنف د بلیو اچ او	سفارش شوی مقدار	په امریکایی ډالرو قیمت	په امریکایی مجموعی قیمت
ابامیکتین	بیو انسیکتیساید و اکاریساید ای سی	III	47.5 لیتر	100	4.750
سلفر دست	مواد غیر عضوی	U	22.75 متریک ټن	500	11.375
روغن باغداری	روغن پترول تصفیه شده ای سی	U	2.120 لیتر	3.78	8.013
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کاپریوبت بلو	کاپر اکسی کلوراید د بلیو پی	III	2.215 متریک ټن	6000	13.290
کلسیم اوکساید	مواد غیر عضوی	U	7.97 متریک ټن	20	159
کپتن	دای کاربوکسیمید د بلیو پی	U	106 کیلوگرام	15	1.590

پالیسی، تنظیم، چارچوکات او انسټیټوشنل ظرفیت:

دروتودام دسیستم د تعهداتوپه نظرکی نیولو سره افغانستان نه د (IPPC) (دنباتاتو دساتنی بین المللی شوری) عضو او نه د مختلفو تعهداتو دامضاء کونکو او دافتونو ضد دواگانو دتوزیع کونکو عضو وه. افغانستان دافتونو ضد قانون چه په ۱۹۷۹ کال کښی نوشته شوی وه عضویت لری چه دباغداری او مالداري پروژي او FAO دبین المللی مشاورینو تر څیرنی لاندی لیکلی شوی ده باید د ۲۰۰۹ کال تر اخره پوری بشپړه نسخه وزارت عدلی ته وسپارل شی.

دافتونو ضد دواگانو اوسنی تجارتي حالت په تجارت کی ناخبره او نه کنترول کیدونکی دی. چه دهیڅ ډول ثبت او راجستر، نوی تولیدات، واردونکی، توزیع کونکی او یا د پیریدلو سیستم وجودلری.

دافتونو ضد دواگانو مسولیت دحکومتی شخصیتونو چه دنباتاتو دساتلودڅانگی (PPQD) دزراعت وزارت دمالداري او اوبولگولو په غاړه ده چه دنباتاتو دساتونکو قرنطین څانگی لابراتوار او مسلکی پرسونل دافتونو ضد دواگانولپاره نلری. دزراعتی دواگانو دمارکیټ مطالعه او څیرنه دباغداری او مالداري پروژي په واسطه د ۲۰۰۹ کال تر پایه پوری باید عملی او دهغوی نتیجه د ۲۰۱۰ کال په اوایلو کشی خپره شی.

دباغداری اومالداري پروژه یوه بله څانگه د فوتوسنتیثین په نوم هم لری چه دمیهه تولیدونکی، څادرونکی او مصرف کونکی قانونی بڼه ځان ته غوره کوی چه دغوښتل شوی تغیراتو سره سم دباغداری او مالداري پروژه به په ۲۰۱۰ کال کی دغه څانگه په مستقله توگه دوزارت زراعت اومالداري برخه وی

1 Introduction and Background

1.1 Purpose

The purpose of the plan is to analyse the pest management situation related to the implementation of the Horticulture and Livestock Project and specifically its associated targeted perennial fruit crops and to ensure that through the adoption of integrated pest management practices (IPM) adequate efforts are being made to reduce the reliance on pesticides and to reduce the risks associated with pesticide use.

1.2 Agriculture in Afghanistan

Agriculture is central to the Afghan economy: the sector contributes an estimated 53% to the GDP and agriculture provides employment for 67% of the labour force. Nearly 80% of the Afghan population lives in rural areas which also harbour the highest incidence of poverty. Agricultural performance is therefore pivotal for overall economic growth and poverty reduction and offers the only significant prospect for raising farmer incomes, contributing to food security, providing rural employment and reducing the vulnerability of resource poor rural people. Development of the agriculture sector is a central pillar of the Government's strategy for economic growth and poverty reduction.

However, Afghanistan's agriculture has suffered badly from thirty years of prolonged conflict and civil unrest. The main drivers of agricultural growth and rural poverty reduction – roads, markets, irrigation, technology, information and education – have all deteriorated due to social conflict, lack of maintenance for infrastructure and collapse of technical information and market systems. This situation has been exacerbated by frequent droughts. Between 1979 and 2004 agricultural production grew at 0.85% per annum, compared to 1.1% per annum in the pre-conflict period of 1964 to 1978. To enable faster overall economic growth and also to significantly reduce rural poverty, agriculture needs to grow at a minimum rate of 5% per annum over the next decade (source MAIL Master Plan 2005).

1.3 The Emergency Horticulture and Livestock Project (HLP)

The Emergency Horticulture and Livestock Project (HLP) is part of a longer term program for agricultural development in Afghanistan. The main objective of the HLP is to stimulate, in focus areas, the marketable output of perennial horticulture and livestock enterprises by improving the incentive for private investment in the sector and by strengthening institutional capacity in agriculture. It is being implemented in focal districts in eleven provinces in the central and northern regions of Afghanistan: Kabul, Parwan, Panjshir, Kapisa in the centre and Sari-Pul, Jawzjan, Balkh, Samangan, Baghlan, Kunduz and Takhar in the north.

The project has three components:

- Increasing horticultural production and productivity
- Increasing marketable output of livestock products
- Farmer Organisation Development, Capacity Building and Management Implementation

This Pest Management Plan relates primarily to the horticulture component. However, as the livestock extension service is developed in 2010 and 2011, the PMP will be updated to reflect any pesticide activity in the livestock component.

2 Pest Management Approach

2.1 Current and anticipated pest problems relevant to the project

The HLP horticultural component focuses on four perennial fruit crops: apricot, almond, grape and pomegranate. A survey of insects and diseases found in the four principal crops in the eleven provinces of HLP was carried out in October 2008 and is reported in Table 1. The correct taxonomic determination of most of these is required and the economic status of most of them considered insignificant.

During the 2009 season, IPM field staff has made monthly visits to all provinces and recorded incidence and severity of pests and diseases, as well as beneficial insects. Updated pest and disease calendars will be presented by HLP in November 2009.

Table 1 - Plantation size of HLP (ha) per crop in October 2009 and common insects and plant pathogens present in the HLP 11 Provinces.

Crop	Orchard Area (ha)		Insects and fungal diseases commonly present	
	Existing ¹	New ²	English Name	Latin Name
Apricot	700	285	Bacterial canker 'Gummosis'	<i>Pseudomonas sp?</i>
			"Shot hole" Stigmata blight	<i>Stigmata carpophila</i> AKA <i>Wilsonomyces carpophilus</i>
			Wilt diseases	?
			Western Tent Caterpillar	<i>Malacosoma indica?</i>
			Brown Tail Moth	<i>Euproctis chrysorrhoea</i>
			Black veined White	<i>Aporia crataegi</i>
			Eggar/Lackey Moth	<i>Eriogaster amygdale</i>
			Bark Beetle "Shothole"	?
			Wood boring beetles	?
			Aphids	?
			White Grub (nurseries)	<i>Polyphylla sp</i>
Almond	3,500	330	Gummosis	<i>Pseudomonas sp?</i>
			Leaf Spot	<i>Cercospora circumscissa</i>
			Shot hole disease	<i>Stigmata carpophila</i>
			Wilt diseases	?
			Red Leafblotch	<i>Polystigma ochraceum</i>
			Western Tent Caterpillar	<i>Malacosoma indica</i>
			Brown Tail Moth	<i>Euproctis chrysorrhoea</i>
			Black veined White	<i>Aporia crataegi</i>
			Eggar/Lackey Moth	<i>Eriogaster amygdale</i>
			Limb (Brown Peach) Aphid	<i>Pterochloroides persicae</i>
			Scale insects	?
			Aphids	?
			Mites	?
Longhorned Beetle	<i>Aeolesthis sarta ?</i>			

			White Grub (nurseries)	<i>Polyphylla sp</i>
Pomegranate	500	15	Leaf Spot	<i>Alternaria sp</i>
			Fruit borer	<i>Ectomeylois ceratoniae?</i>
			Aphids	?
Grape	5,300	75	Powdery Mildew	<i>Uncinula necator</i>
			Downy Mildew	<i>Plasmopora viticola</i>
			Anthraco nose	<i>Elsinae ampelina</i>
			Crown Gall	<i>Agrobacterium tumesfasens; A. vitis</i>
			Fruit Rot	?
			Berry Moth	<i>Endopiza viteana ?</i>
			Leafroller	<i>Archips subsidiaria ?</i>
			Mealybug	<i>Pseudococcus sp ?</i>
			Cicada	?
			Termites	?

- Existing orchards are generally mixture of varieties, so figures for rehabilitation by crop are indicative only and based on the total estimated rehabilitation orchards of 10,000 ha.
- New orchards planted in February to March 2009.

Those insects and diseases which are considered of economic significance are those that feature in the pest management strategy. The determination of a pest's economic significance is based on the fact that it impacts significantly on a farmer's income whether it is endemic and widespread affecting the whole plant (e.g. powdery mildew of grapes) or whether it affects that part of the plant that is sold (e.g. pomegranate fruit borer). The following pests are currently considered of economic significance. This list may be amended with consequent changes in implementation strategy, as HLP develops, for example when a crop's ability to compensate for pest damage is better understood or when new agronomic practices have an impact on pest status (use of water for example).

Table 2 - Diseases and Pests determining pest management strategy in each crop

Crop	Disease		Insect	
	English Name	Latin Name	English Name	Latin Name
Apricot	Bacterial canker 'Gummosis'	<i>Pseudomonas syringae?</i>	WesternTent Caterpillar	<i>Malacosoma indica</i>
	"Shot hole" Stigmata blight	<i>Stigmata carpophila</i> AKA <i>Wilsonomyces carpophilus</i>	Brown Tail Moth	<i>Euproctis chrysorrhoea</i>
Almond	Gummosis	<i>Pseudomonas sp</i>	Western Tent Caterpillar	<i>Malacosoma indica</i>
	Shot hole disease	<i>Stigmata carpophila</i>	Black veined White Butterfly	<i>Aporia crataegi</i>
			Brown Tail Moth	<i>Euproctis chrysorrhoea</i>
Pomegranate			Fruit borer - the 'Carob' Moth	<i>Ectomyelois ceratoniae</i>
Grape	Powdery Mildew	<i>Uncinula necator</i>		

2.2 Current and proposed pest management practices

Afghan farmers have little knowledge about pesticides and particularly the risks associated with their use and have little understanding of the agro-ecology of their crops. They tend to seek diagnostic advice from pesticide vendors and from staff of the Plant Protection and Quarantine Department of the MAIL: both sources of information are often misinformed. As a result farmers frequently receive incorrect diagnoses and inevitably a prescription for the use of pesticides. Many of the pesticides prescribed are inappropriate, and/or in formulations beyond expiry date or that may be classified (WHO classification) as extremely hazardous and highly hazardous (WHO Ia and Ib). Such practices lead to the misuse of pesticides.

Farmers carry out various crop husbandry practices. In grapes most farmers use fertiliser and animal manure each year. They are aware of the method to control powdery mildew with Sulphur and the benefits of green pruning to improve aeration and exposure of fruits to the sun. However, many farmers despite having this knowledge do the minimum. In apricot and almond orchards cereal, vegetable and forage intercrops are grown and, as a result, farmers over water their trees leading to the spread of canker disease and root rots. Most farmers do not bother with pest control or pruning and harvest fruit by hitting the branches with a stick thus leading to damaged boughs that are ideal sites for pest infection. In pomegranate farmers rarely practice either basic orchard hygiene or the application of mud into the calyx to disrupt the behaviour and survival of the Carob moth.

The proposed HLP implementation strategy is to gain the confidence of farmers by being available, by offering trustworthy regular advice thus reducing the demand for and the use of pesticides and standardising the products used. Those pesticides recommended for use by farmers will only be those in WHO classification II, III or less hazardous still. This will be done at the same time as building capacity (through training in the classroom and field) in project extension staff.

Under HLP, extension workers will prepare and facilitate training modules for farmers groups; each extension worker will work with an average of 8 lead farmers each of which will be associated with 25 radial farmers. During the cropping season each extension worker will have the opportunity to work with the lead farmers at least twice per month. Extension workers will interact with HLP regional centres and MAIL provincial offices and be technically backstopped once per month by national experts technically backstopped by an international IPM specialist.

Implementation of pest management in HLP will follow the general tenets of IPM in co-operation with the horticultural component that will simultaneously be looking at cultural methods. Pest management activities will be based upon good horticultural practice (cultural controls) to reduce pest incidence and a pest management strategy for each crop that will be transmitted to lead farmers by the extension workers. Annex 1 is a general list of tools available to an integrated pest management programme.

2.2.1 Cultural controls in the HLP Orchard System

In order to reduce the incidence of pests and diseases the following may be adopted:

- Selection of varieties and rootstocks resistant or tolerant to pests (to be undertaken in conjunction with the EC-funded Perennial Horticulture Development Project (PHDP))
- Appropriate soil preparation and planting density
- Growth of healthy plants able to resist attack and able to compensate for any pest and disease damage through:

- management of the soil-nutrient relationship to maintain appropriate nitrogen levels in the plant
- management of soil-water relations to reduce stress on the plant and to avoid water-borne diseases
- Conservation of populations of natural enemies by planting appropriate cover crops in the orchard. These will also assist soil fertility and add value to the orchard e.g. leguminous forage crops such as Alfalfa
- Farmers will be encouraged to walk their crops on a regular basis (at least once a week) to observe changes that are taking place in the trees/vines and take appropriate proactive rather than reactive action.

2.2.2 The HLP Pest Management Strategy

- Proper identification of insects and diseases
- Identifying and concentrating on controlling pests (insects, mites and diseases) of economic significance
- Development of pest 'calendars' (to be completed by November 2009)
- Determination of control methods based on local knowledge and the experience of other countries
- Crop walks by extension workers at each Farmer Field School session. Extension workers will be trained and technically backstopped by national plant protection officers (NPPO). NPPO will in turn be supported by an international IPM Specialist
- Non-chemical control and mechanical methods will be supported wherever feasible
- Specification of allowed pesticides (WHO Class II , III and less hazardous allowed)
- Specification of required application equipment and protective gear
- Adaptability to modify the application of and to reduce use of harmful pesticides as lessons are learnt

2.3 Pest Management under HLP

To reduce to a minimum environmental damage the control strategy using pesticides is based on dormant sprays targeting major economic pests and mechanical control and spot sprays of pest outbreaks during the growing season.

2.3.1 Grapes

The main problem in grapes is Powdery Mildew (*Uncinula necator*).

A dormant spray of Lime Sulphur is made against Powdery mildew, which also reduces mealybug populations. New growth is protected against Powdery mildew with applications of sulphur dust or wettable sulphur beginning 2 weeks after bud burst and then to protect new growth at approximately 15-day intervals. A minimum of three applications are made.

Spot sprays of copper fungicide in April are used to control Anthracnose.

Mechanical control of insect pests (Cicadas for example) will be encouraged and methods developed accordingly.

2.3.2 Pomegranate

The main problem is the fruit borer: the larva of the Carob moth (*Ectomyelois ceratoniae*) which is believed to enter the young pomegranate via the calyx at flowering. This moth has

been identified from pomegranates in Afghanistan, but the biology of the moth in the pomegranate is poorly understood. Orchard sanitation is used to reduce the number of infected fruit in the orchard and the population of the moth. Mechanical control can also be employed – a plug of mud placed in the calyx of the very young fruit acts as a physical barrier and prevents the larvae entering.

The use of pheromones for mating disruption is to be trialled by the IDEA-NEW project (funded by USAID) and will be supported by HLP in focus districts in the northern provinces.

2.3.3 Almonds and Apricots

In Afghanistan, there is a high incidence of bacterial canker and gummosis in both almond and apricot trees. This is a chronic infection which can kill the tree and which is believed to be associated with the combination of cultivation of intercrops in the orchards and the overuse of water particularly the flood irrigation methods that are used. Copper has some impact in slowing the development of the disease. A dormant spray of Copper (Bordeaux Mixture) is applied to the tree and Bordeaux paste is applied directly to lesions and pruning cuts. The copper spray also offers some protection against shothole disease.

A dormant spray of winter oil is used to reduce populations of insects overwintering as sedentary stages or eggs, in particular aphids, scales and mites.

Mechanical control is used to remove nests of tent caterpillars (defoliating Lepidopteron larvae) which can be burnt either *in situ* or after being pruned out of the tree.

Mechanical control will be used to control local pest outbreaks during the crop season. Spot sprays of pesticides will be used to control local pest outbreaks, but only as a last resort.

2.4 Relevant IPM Experience in Afghanistan and within the Project Area

The government institution concerned with plant protection matters is the Plant Protection and Quarantine Department (PPQD) of the Ministry of Agriculture, Irrigation and Livestock (MAIL). The HQ and diagnostic laboratories of PPQD are in the ministry compound in Kabul and it is represented in the provinces by Presidencies of Agriculture with one or two pest officers. The current national Head of PPQD is an experienced plant protection professional, who worked for the ministry before the conflict. Since then, he has worked for international agencies, including FAO and is fully aware of the significant impact the adoption of IPM by Afghan farmers can have on crop production in Afghanistan. He is also very aware of the gaps in human capacity that need to be addressed in order for the full adoption of IPM to be possible in Afghanistan. His salary is paid by MAIL.

In Afghanistan Integrated Pest Management and IPM are terms generally understood with its original generic meaning i.e. the use of a variety of agronomic tools to control pests and to reduce reliance on and the use of pesticides in crops. However, with the evolution of its method of implementation IPM has become much more than that: it is now a farmer lead exercise, a form of adult education. Nevertheless, HLP is implementing a top-down extension system based on a train and visit methodology implemented over a very wide area. This particular vision of IPM is common in Afghanistan where most projects are generally extension and technology driven and where extension workers transfer information regarding a piece of technology – this may be associated cultural methods and agronomic practices, plant varieties, pesticide use or the adoption of a piece of equipment. The implementation of these projects is usually associated with the supply of free or subsidised inputs to aid the adoption process.

2.5 Improving the proposed pest management approach

Development is a slow process that is done using only small steps. The objective of the pest management approach is to get farmers to a certain basic understanding of what is being attempted by HLP and why, in terms of IPM and the dangers associated with pesticide use, and to help farmers become better farmers. Given the general level of education and lack of capacity amongst extension staff and amongst farmers it is very likely that it will take some time in order to develop the extension staff to a level of commitment and motivation and technical skills that would bring about major changes. This is the challenge for HLP and will be attempted through classroom training in winter and field training during the cropping season.

IPM refers to a mix of farmer-driven, ecologically based practices that seek to reduce the use of pesticides. Within this mix there is plenty of scope to improve and change in a step by step manner what the farmers are doing:

- the use of cultural controls: IPM begins with the crop and initially with the preparation and management of the soil; of soil nutrient levels and of soil-water relations to produce a healthy plant able to resist pest attack and/or able to compensate for pest damage and thus to reduce the incidence of pest damage
- the creation within the cropping system of environments and habitats that will conserve and augment populations of beneficial insects (predators and parasitoids) that naturally control populations of pestilential insects.
- the use of non-chemical (mechanical) means to remove pests from crop plants
- the use of pesticides only as a last resort to control pest problems and then only as spot sprays to control immediate targets. Such pesticides must be those that are least damaging, whether chemical or bio-pesticides, in order to reduce adverse effects on beneficial organisms, humans, and the environment.

The objective of the IPM implementation will be to build capacity in the national staff and extension workers to enable them to implement the project. Ultimately local input suppliers will become important stakeholders in the sustainability of the recommendations of the project and have an important role to play in making available inputs recommended by HLP. During the dormant winter season extension workers will receive classroom based technical training on pests and diseases and on pesticides supported by reference handouts. During the cropping season the extension workers will receive field based training on the monitoring of pest and disease status in orchards and demonstration plots. In addition they will receive regular field based reinforcement training through field visits of national plant protection specialists who will be backstopped by the international team leader. Extension material where relevant will be developed over the course of the implementation. Mechanical control and farmer familiarity with his crop through regular crop walks will be encouraged, pesticide use only as the last resort and only as spot sprays will be recommended. The use of pesticides and the strategy employed for their use will be reviewed each year based on lessons learnt. Farmer's field days should be held at the end of each season whereby farmers, extension workers, input suppliers, other stakeholders and national experts can get together and share their experiences of the previous cropping season. Farm visits where farmers from one area visit those of another are recommended for the successful implementation of the HLP project.

There is no doubt that the best facilitators for transfer of knowledge are the farmers themselves. The HLP extension system reaches the community of farmers through lead

farmers and demonstrations. Each lead farmer is expected to work with 25 radial farmers who together form a 'Horticulture Interest Group'. The lead farmer and his demonstration orchard act as the focal point for the facilitation and training process through which knowledge and skills are transferred to the community. It is essential that any jealousies between individual farmers caused by the distribution of subsidised or free inputs to only lead farmers does not prevent the transfer of information to as wide an audience as possible in each community. As part of the restructure of HLP, from 2010 a second male lead farmer will be chosen to assist each HIG/Producer group, and in selected focus districts a female lead farmer and associated group will be formed.

It is important that farmers understand what is trying to be achieved. The strength of the extension system depends as much on the participation of farmers as it does on the selection, skills and motivation of the extension workers and on the selection, motivation and charisma, facilitation and training skills of the lead farmers.

A weakness of the extension workers is their lack of field experience and their inability to identify insect pests and to diagnose accurately plant diseases. Regional offices in Kabul and Mazar will be equipped with microscopes, and with the participation of national experts will establish a diagnostic component to the project in each region. It is planned to field a Plant Pathologist to develop some diagnostic capacity among HLP extension workers and in MAIL/PPQD staff. There are a total of 60 extension workers in the northern region (Takhar, Kunduz, Baghlan, Samangan, Balkh, Jawzjan, Sari-Pul) and 40 extension workers in the central region (Parwan, Kabul, Kapisa, Panjshir). There is one female extension worker per province to ensure activities and training for female farmers are available.

3 Pesticide Management

3.1 Pesticide use under the HLP

Based on the areas to be rehabilitated the HLP will procure, for horticulture, quantities of those pesticides recommended by the IPM component. For 2009 the donor required that these pesticides be given free to lead farmers and the least hazardous products will be selected. In 2010 it is planned that the subsidy will be reduced to 25-50% and by 2011 the subsidy will have been removed, any inputs supplied will be done so at full cost recovery. The basic strategy for pesticide use is to use one dormant season spray followed during the growing season by spot sprays applied as a last resort. Availability of the necessary application equipment and protective clothing will also be provided free by the project to lead farmers.

The project will encourage farmers to use cultural methods to conserve populations of natural enemies and to use mechanical control methods prior to the use of spot sprays. The project will train extension workers who will advise lead and radial farmers on the preparation, application and timing of an appropriate pesticide for identified pest and disease problems. Pesticides procured will exclude all products classified as WHO Ia and Ib and the selection procedure for candidate pesticides will use a strategy of avoiding any possible negative impact on populations of natural enemies, pollinating insects and other beneficial organisms.

In addition, the project will also support the development of clear regulations and policies concerning the use of crop protection chemicals to protect the interest of the consumers and farmers and set the necessary regulatory background for export certification. Under the regulatory component of HLP that is concerned with pesticide legislation the project will

create a database of pesticides currently in use in Afghanistan or likely to be imported in the future, containing information on efficacy, toxicity and environmental impact, to provide the basis for decision making by the registration committee. Any pesticide used in the project will be in conformity with the provisions of the FAO Code of Conduct on the Distribution and Use of Pesticides.

3.2 Type and quantity of pesticides to be financed by the project

In 2009, the HLP supplied 39.93 MT of seven different pesticides to farmers costing a total of USD 59,191 (see table below). Application equipment and protective clothing were also supplied.

Table 3 – Pesticides selected for HLP in 2009. The only significant change for 2010 will be the inclusion of wettable sulphur instead of sulphur dust

Name of Product	Active Ingredient and formulation	Toxicity WHO Class	Quantity ordered	Unit price USD	Total USD
Abamectin	Bio-insecticide and acaricide 0,15 ec	III	47.5 litres	100	4750
Sulphur Dust	Inorganic Chemical	U	22.75 MT	500	11375
Horticultural Oil	Refined petroleum oil EC	U	2,120 litres	3,78	8013,6
Copper Sulphate	Inorganic Chemical	U*	4.72 MT	4240	20012,8
Cupravit Blue	Copper Oxychloride fungicide 50WP	III	2.215MT	6000	13290
Calcium Oxide	Inorganic Chemical	U	7.97MT	20	159,4
Captan	Dicarboximide fungicide 50WP	U	106 kg	15	1590

* WHO class II when formulated as Bordeaux Mixture

Since Afghan farmers generally fall into two groups those that use and those that don't use pesticides, a successful HLP project with high adoption rates will tend to increase the use of pesticides. All pesticides are poisons and all have the potential to damage the environment and create risks for those that use them and the public at large. However, the project will reduce these risks by only using pesticides as a last resort and to demonstrate and recommend pesticides that are classified as being less damaging to the environment and to train extension workers and farmers in their safe use and storage.

3.3 Pesticide Use and Risks Associated with their use by Farmers

The use of all pesticides poses a risk to public health. The project will reduce this risk by choosing those pesticides that are considered less hazardous. In this case only 7 pesticides were ordered 5 of these are inorganic chemicals which are not classified under the WHO scheme. Copper Sulphate when formulated as Bordeaux mixture has a WHO classification of II. The bio-pesticide Abamectin and the fungicide Captan are both classified in group III.

Sulphur is used with Calcium Oxide to make lime sulphur. Calcium Oxide and Copper Sulphate are mixed to make Bordeaux Mixture and Bordeaux Paste. Lime Sulphur, Bordeaux Mixture and Horticultural Oil are used as sprays applied during the winter

(dormant sprays) so their impact on the environment is reduced i.e. it might be considered better targeted even though such sprays are indiscriminate. Bordeaux Paste is used as fungicide to protect pruning cuts and also as a bactericide when applied on certain lesions during both dormant and growing seasons.

During the growing season Captan and Copper Oxychloride are used as fungal sprays and Sulphur dust was used as prophylactic fungicide in 2009. However, based on overseas experience, wettable sulphur was used in a number of areas for powdery mildew control, with good results. Due to lower environmental risk that sulphur dust, wettable sulphur will replace most of the dust in 2010. Abamectin is used as a spot spray for sedentary insects and mites.

Afghan farmers' general habit is not to use protective clothing. The HLP will supply protective clothing to lead farmers, to include hats, goggles, gloves, overalls, Wellington boots and masks and will encourage input supply shops to stock the same.

The only product in the HLP recommendations that is in WHO classification II is Bordeaux mixture. Training of all extension workers and lead farmers on the safe production and use of the Bordeaux mixture was undertaken in 2009, and will be repeated in late 2009/early 2010. Training will include how to care for and check safety equipment distributed by the project. HLP does not make available any products to farmers other than lead farmers, but is working with both the ASAP and IDEA-NEW projects (both US funded) in the north and central regions to ensure recommended materials and information is available to all farmers.

HLP training materials on IPM are made available to other projects also to ensure information dissemination occurs.

3.4 Risks associated with handling of packaged products

In general, the public health risk is assessed as low regarding the handling of the selected packaged chemicals and pesticides providing the normal precautions are taken in their handling and storage.

Table 4 – Risks associated with the main products used by HLP

Chemical	WHO Class	Packaging	Size	Potential Hazard	Comments
Sulphur Dust/Wettable sulphur	U	Nylon Sacks	25 kg	Torn sacks – dust	Possible health hazard
Copper Sulphate	U	Nylon Sacks	50 kg	Torn sacks – dust	Possible health hazard
Calcium Oxide	U	Nylon Sacks	28 kg	Torn Sacks - dust	Possible health hazard
Cupravit Blue	III	Plastic Bags	1kg	Spillage	Reduced hazard
Captan	U	Plastic Bags	1 kg	Spillage	Reduced hazard
Abamectin	III	Plastic Bottles	250ml	Spillage	Reduced hazard
Horticultural Oil	U	Plastic Bottles	1 litre	Spillage	Reduced hazard

Extension workers will receive training in disposal of pesticide containers and other

packaging. There is a tendency for Afghan farmers to discard plastic bottles where they use them without taking precautions to discard them safely and to protect the environment and the public at large. The objective of the training is to inform farmers about the risks the discarding of pesticide containers pose to the environment and the public at large in order to change their habits.

3.5 Actions to reduce the risks associated with specific products

Sulphur dust needs to be kept in dry stores and should be applied with a dusting machine in the cool of the day and under weather conditions when there is no wind and the crop is dry. Applying sulphur in the heat of the day in the middle of the summer will lead to burning of the crop. Hand throwing of Sulphur risks burning of skin and should be avoided. Storage life of Lime Sulphur is about 20 days after which it loses its character and needs to be discarded safely in a shallow pit away from water courses.

Horticultural Oil should be used only with protective clothing since it burns if in contact with the skin.

Abamectin is used at very low concentration rates so it is important to be able to decant accurately. This is best done with syringes which are available from input supply shops. Syringes should be bought at the same time as the pesticide. Abamectin should only be applied with well maintained application equipment in association with the wearing of protective clothing.

Calcium Oxide should be kept dry and when wet avoid skin contact, similarly with Cupravit Blue. When handling these chemicals protective clothing, in particular gloves, should be worn. During the preparation of Lime Sulphur gloves and masks should be worn to avoid skin contact and inhalation of sulphurous fumes.

3.6 Selection of alternatives to the chosen pesticides

The substitution of selected products with less hazardous ones is clearly one objective of the project. Impediments to the sustainability of this strategy are the availability of biopesticides and "botanicals", the sustainability of their supply and the generally high cost of these products. This should not however, prevent substitution trials taking place or alternative control strategies being designed and experimented with. It is anticipated that demand for alternative products will increase when farmers make higher returns on their crops and see the benefits of the advice given by the HLP project.

4 Policy, regulatory framework and institutional capacity

4.1 Policies on plant protection and IPM

The government of Afghanistan has not, as yet, adopted IPM as a national policy, as the country's preferred method of tackling crop protection issues. On the contrary, the application of pesticides by MAIL staff, is still used as a means, justified by political expediency, to show to the public at large that the government is doing something for the farmers and the agricultural sector. A typical example of this is the response of MAIL when pressure is put on it by complaints from provincial governors that insufficient is being done to control, on behalf of farmers, pests such as Colorado Potato Beetle, Baluchistan Melon Fly, Moroccan and Italian Locusts, Sunn pest and Brown Tail Moth. In the absence of an alternative long-term strategy involving farmers the MAIL is obliged to implement reactive centrally controlled spray programmes using the staff of the plant protection department.

4.2 Description of capacity to implement IPM

The general level of capacity in country to implement IPM, if described in terms of access to information, skills and understanding of the concepts of IPM is generally low. Support for the PPQD through pro-active projects which tackle pest problems will remove the need for reactive emergency interventions currently being implemented. In addition the building of human capacity within the ministry staff will in time assist the move away from the prescribing of pesticides towards more sustainable approaches to pest management such as IPM.

Since 2002 various FAO emergency projects have been implemented for the control of locusts and Sunn pest and through these and other funding sources eg RAMP (Rehabilitation of Agricultural Marketing Programme) laboratories at the Kabul HQ of PPQD have been rehabilitated and re-equipped at a modest level. However, the technicians need training and mentoring to be at the appropriate professional standard to be able to offer accurate diagnostic and technical services to farmers.

At provincial level offices and stores in some northern provinces have been rehabilitated, but there are no laboratory facilities. Some in-country training was provided through the FAO emergency funded projects and some staff benefited from participation in project activities, but these have been confined to the north. A workshop for all provincial heads of plant protection held in Kabul in December 2005 revealed a wide range of technical ability, but many do not have expertise in the sector. Many provincial appointments were made by local authorities during the conflict period and the status of these is uncertain.

4.3 Legal, institutional and human capacity to control the pesticide trade

In most countries pesticide regulations exist to control the availability of crop protection chemicals and to protect the interests of users, rural communities, the public at large and the environment. New pesticides being introduced to any country for the first time normally undergo a registration procedure, and for use on specific crops would undergo efficacy trials in the field. Phytosanitary regulations are used to protect domestic consumers against the importation of infected produce and planting material. Similarly export markets must be confident Afghan horticultural produce destined to be exported is free from infection by pests, diseases and pesticide residues. Annex 2 is a list policy elements that may or may not impact positively on the implementation of IPM programmes. HLP will field consultants to look at the regulation and control of the trade in pesticides and at the phytosanitary legislation to provide Afghanistan with a regulatory framework that will support the implementation of integrated pest management in general and help to protect Afghanistan's environment, farmers, consumers and the public at large.

Under HLP three consultants were planned to be fielded: a pesticide regulation specialist and plant quarantine specialist together with a plant pathologist. The purpose of their work will be to assess the current situation and to design relevant implementation strategies for pesticide regulation and for phytosanitation and the implementation of their recommendations by the end of the project. These interventions will go hand in hand with the implementation at field level of the pest management component, the overall task of which is to reduce dependence on and the use of pesticides and to enable Afghan farmers to export produce free of pests, diseases and pesticide residues. Each consultant will cover his subject to include all stakeholders, particularly investigating farmer's attitudes and needs.

As of October 2009, only the Pesticide Regulation Consultant has been in country, and is near to completing draft legislation. Due to changes in the project structure from January

2010, the phytosanitary and plant pathology consultants will not be fielded, and work on these topics is to be covered by other MAIL programmes.

There currently exists in Afghanistan Pesticide Legislation that was drafted in 1979 and passed again through the parliament in 2000 (under the Islamic Emirate of Afghanistan). There is currently no capacity to implement or enforce this legislation. Under a separate FAO TCP project a Phytosanitary Law has been drafted (April 2009) and is currently with the Ministry of Justice awaiting submission to parliament for review.

The pesticide regulation consultant was fielded in October 2008 to carry out an initial assessment mission on the regulation of the trade in pesticides and their use in Afghanistan. In February to April 2009 he made a second visit and redrafted the pesticide law. In October and November 2009 he will make a third and final mission leading to the final drafting and submission of a new Pesticide Law to the Ministry of Justice. This new Pesticide Law and associated rules should be up to date legislation applicable to the management of pesticides in the new century and the successful implementation of IPM. It is anticipated that the new Pesticide Law will be submitted to the Ministry of Justice at the end of 2009. The Plant Protection and Quarantine Department (PPQD) of the Ministry of Agriculture, Irrigation and Livestock (MAIL) is responsible for the overall administration of pesticides and their quality control, but it does not have an equipped laboratory nor trained technicians to carry out its functions. The implementation of any new quarantine of pesticide law will require considerable investment in capacity building.

The consultant's initial assessment mission revealed that there is neither quality control of pesticides nor any effective regulation in place. Traders are bringing all kinds of products to Afghanistan. Some of these products are repackaged in-country and falsely marketed as various other products. Farmers buy pesticides mostly based on the recommendation of the vendor. Vendors often have little knowledge of the products they are selling. Although one trader owns a chain of shops, present in 300 districts selling exclusively agrochemicals and veterinary medicines, often vendors are shopkeepers selling food products from the same shelves. Traders' pesticide stores are also inconsistent with any international code of practice such as the FAO code of practice on the distribution and use of pesticides. All in all the pesticide market in Afghanistan is depicted as being unregulated and subject to the whims, fancies and profit margins of the traders and vendors. Traders variously estimated the demand for pesticides to be 1500-3300MT per annum. A market survey of the Agrochemical trade will be carried out under the TORs of the pesticide regulation consultant. This survey will be carried out in the 11 focal districts and main bazaars of the HLP implementation area and will determine the volume, types of products being sold and for what purpose and the types of vendors and distribution networks associated with this trade. It is scheduled to take place for three months starting mid-October 2009. The results should be published in 2010.

The handling, storage, re-packaging, transport and application of pesticides pose a significant challenge to environmental management and health in Afghanistan. Given the porous nature of Afghanistan's borders it is still possible (as was once common) for chemicals such as Methyl Parathion and Methamidophos, trade in which is subject to the Rotterdam Convention, to be freely imported from neighbouring countries. Such products are sold in Afghan bazaars by traders with little technical knowledge of pesticides. Such products are a hazard to those who handle or use them, aggravate pest problems by killing natural enemies and reduce the value of export products which may be contaminated by them. Pesticide misuse may have consequences that directly impact on farmers and communities causing specific and non-specific health problems and killing natural enemies

of pests thus creating further pest problems and often further dependence on the use of pesticides.

The trade and transport of certain hazardous chemicals is subject to the Rotterdam Convention and its procedure of Prior Informed Consent (PIC) which was introduced February 24th 2004. The objective of this procedure is to ensure that importing parties are aware of the hazards of certain chemicals before export/import takes place. If a party is exporting a product that is restricted or banned in his own country he must inform with an export notification to the importing party. Afghanistan is not a signatory of the Rotterdam Convention and in the recent past many compounds on the list of banned or restricted compounds were commonly available in Afghanistan. There is currently no legal way to prevent the dumping of such banned pesticides on the Afghan market. Afghanistan is not yet a member of the IPPC (International Plant Protection Council) the international body that monitors the regulation and use of pesticides in its member countries.

4.4 Proposed strategy to strengthen capacity

In order to protect itself from becoming a dumping ground for banned pesticides it is necessary for Afghanistan to become a member of the international organisations and signatory to the conventions controlling the distribution and use of pesticides. The drafting of new and relevant legislation by consultants fielded by HLP will go a long way to providing a national framework able to support Afghanistan's future international commitments in this regard.

The work to produce new Pesticide Legislation is well in progress the draft of the new Pesticide Law already prepared should be ready for submission to the Ministry of Justice by the end of 2009. In addition a market survey of the agrochemical trade is to be made in the project area in late 2009. The HLP project will also field a plant quarantine specialist (together with a plant pathologist) to investigate the development and implementation of quarantine laws to control the import of planting material and the export of fruit associated with the project. However, this element has not taken place as yet due to the inability to find a suitable candidate willing to work in Afghanistan. Both these components include capacity building elements regarding the training and supply of hardware. This may not include procurement of items by HLP but will lead to recommendations for implementation of the acts that necessitate specific hardware and skills that will require the building and equipping of laboratories and purchase of hardware and training of personnel and a budget within in MAIL to support these activities in a sustainable manner. Any strategy for the development of human capacity should include temporary as well as long term solutions. Any temporary solution involves the retraining of existing staff. Ultimately, however, the long term future of Afghanistan lies with the youth of the country so it is important to give the young the necessary training opportunities at the appropriate international standard.

Under HLP those implementing IPM represent a mix of government and non-government employees. The latter are young people (mainly male) employed as extension workers. They have generally low levels of education and little experience of working with farmers. The former are largely middle aged (many approaching retirement) educated to degree level some 30 years ago and with little access to training or work in their profession during the intervening period. The HLP project offers classroom and field training to extension workers in pest management. During the cropping season monthly field visits by senior national plant protection specialists offers the opportunity for extension workers to reinforce and refresh the classroom training received during the winter months.

5 Implementation

5.1 Institutional arrangements

The overall responsibility of project implementation rests with the Ministry of Agriculture, Irrigation and Livestock (MAIL). The MAIL will manage HLP through an Implementation and Management Support Team (IMST), provided under contract by GTZ-International Services. The IMST reports to the General Director, Programme Implementation and Coordination Unit (PICU) of MAIL, representing H.E. Minister of MAIL.

The IMST will have safeguard responsibilities, implemented as part of the Environmental and Social Safeguards Framework developed by HLP-IMST in October 2009. Technical and field implementation of HLP is undertaken through a number of Facilitating Partners, including the FAO for the IPM activities. Facilitating Partners are supervised under the technical component specialists in IMST.

5.2 Monitoring and Evaluation

An independent Monitoring and Evaluation (M&E) unit within HLP is responsible for overseeing the impacts of implementation including its impact on cross cutting issues such as gender, counter narcotics and the environment. One of the M&E specialists under HLP will also be assigned as Safeguards Focal Officer and will be responsible for overseeing the implementation of the Environmental and Social Safeguards Framework.

Following is a simplified Results Framework of the main activities under the PMP.

Activity	Expected Results	Indicators	Risks
Monthly survey and collection of samples of pests and diseases from farmers fields	Proper identification of pests and diseases Preparation of pest and disease calendars	Number of requests for IDs at international taxonomic centres	Security situation allows monthly surveys to go ahead as planned Absence of Budget Provision
Determination of schema for pesticide use	Reduced use of harmful pesticides	Class of pesticide recommended for use – using WHO classification Use of non-chemical methods by farmers for pest and disease control Number of pests and diseases targeted for chemical control Amongst user communities and their livestock number of cases of ill health associated with the primary or secondary use of pesticides.	Farmers prefer to use pesticides and are reluctant to use non-chemical methods of control. Pesticides given free by donor undermine other non-chemical methods of control.

Classroom and field based training, of extension workers; monthly meetings and technical backstopping of EWs and lead farmers	Improved capacity of extension workers	Increased appreciation of extension workers by farmers	Farmers always know more than extension workers
Fielding of Pesticide Regulation Consultant	Appropriate pesticide legislation drafted and passed through parliament Afghanistan joins/ signs the Rotterdam convention	List of approved pesticides published and updated Strict rules applied to traders and vendors of pesticides Pesticides in WHO classification Ia and Ib and some in Class II banned from use in Afghanistan	Impossible to police and implement any pesticide legislation Afghan borders remain porous No capacity to implement technical aspects of the legislation
Fielding of Plant Quarantine and Plant pathology consultants	Legislation drafted and passed through parliament regarding the importation of planting material and export of fruit Import of planting material and fruit exports free of quarantine associated problems	Parliamentary Records Effective system of plant quarantine in place with trained staff Records of fruit exports Records of imports of planting materials	Not possible to find a suitable consultants Legislation passed but impossible to implement.

5.3 Specific responsibilities under the project will be as follows

MAIL - Department of Policy and Planning and the Programme Implementation and Coordination Unit (PICU): overall HLP implementation; participate in capacity building activities; participate in developing the IPM regulatory framework. At a provincial level the Agriculture Directors also play a role in coordinating activities of HLP with other programmes of MAIL.

IMST – Implementation Management Support Team: the (GTZ-IS) management unit which manages the implementation of the project on behalf of MAIL

M&E unit within IMST: M&E of implementation of all components of the HLP including the pest management plan.

Annex 1. Examples of available tools in the IPM toolbox

(Source 'Pest Management Guidebook' <http://web.worldbank.org>)

There is a wide variety of techniques that can be applied under IPM approaches. Applicability of individual techniques depends on various factors, including: the crop, the cropping system, the pest problems, the climate, the agro-ecological conditions, etc. Generally, IPM involves a combination of techniques. Some examples of such techniques:

Cultural practices that can help prevent build up of pests:

- Crop rotation
- Inter-cropping
- Field sanitation and seed bed sanitation
- Use of pest-resistant crop varieties
- Managing sowing, planting or harvesting dates
- Water/irrigation management,
- Soil and nutrient management (including mulching, zero/low tillage, fertilizer management)
- Practices to enhance the build up of naturally existing predator populations
- Hand-picking of pests or hand-weeding
- Use of traps or trap crops
- Post harvest loss prevention

Biological inputs

- Biological control through release of predators, parasites or pathogens
- Biological control through fish, ducks, geese, goats, etc.
- Release of sterile male insects
- Bio-pesticides
- Biological preparations (e.g. Neam extract)

Chemical inputs

- Chemicals that disrupt insect behavior (e.g.: pheromones)
- Growth-regulators
- Conventional pesticides

Annex 2. The “DO” and “DO NOT DO” of IPM policy

(source ‘Pest Management Guidebook’ <http://web.worldbank.org>)

DO NOT DO – Examples of elements that may contribute to a policy environment that encourages reliance on pesticides

- Pesticide use is directly or indirectly subsidized
- Inadequate pesticide legislation or weak enforcement of legislation to control import, distribution and use of pesticides
- Requesting/accepting donor support in the form of pesticide donations, (i) without adequate assessment of actual requirements, (ii) without paying adequate attention to non-chemical alternatives, (iii) without appropriate pricing of these pesticides to avoid unnecessary use induced by availability at below-cost prices
- Government agricultural programs and associated budget allocations emphasize input supply more than farmer training in IPM
- Absence of IPM extension, as a result of which farmers have little or no access to information about alternative approaches that reduce reliance on chemical control
- Extension schemes/programs/messages are oriented towards chemical control
- Agricultural advisory services for extension staff and/or farmers have a financial interest in selling pesticides (e.g.: extension advice is provided by private sector entities that sell pesticides; extension staff receive commissions on pesticide sales)

DO - Examples of policy elements that reduce biases towards chemical control

- Social and environmental costs internalized in prices through polluter pays tax
- Enforcement of pesticide legislation
- Enforcement of food safety legislation regarding pesticide residues
- Enforcement of environmental protection legislation
- Emphasis on development of agro-ecosystem management skills and knowledge
- Establishment of formal policies on IPM covering inter-agency coordination and common agenda's, incentive systems, regulatory and information systems for sustainable agriculture, generation and dissemination of appropriate approaches and technologies
- Encouraging research on the economics and the environmental and health impact of different plant protection approaches and make this information
- Development of an effective regulatory framework to enhance food safety and to reduce risks related to the distribution and use of pesticides
- Orienting agricultural research in general to be more demand driven and with greater beneficiary participation.