REPORT

Technical Workshop

on Locusts

in Caucasus and Central Asia (CCA)

Astana, Kazakhstan

14 - 18 November 2016

Food and Agriculture
Organization of the
United Nations

Participants in the “Technical Workshop on Locusts in Caucasus and Central Asia”

Astana, Kazakhstan, 14 - 18 November 2016

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TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

AELGA	Assistance for Emergency Locust/Grasshopper Abatement (USAID/OFDA)
AGPMM	Plant Production and Protection Division (FAO)
a.i.	Active ingredient
ASDC	Automated System of Data Collection
CAIAG	Central Asian Institute for Applied Geoscience, Kyrgyzstan
CBS	Cross-border surveys
CCA	Caucasus and Central Asia
CFI	Call of interest
CIO	Information Technology Division (FAO)
CIT	*Calliptamus italicus* (Linnaeus 1758), Italian Locust
CNLAA	National Centre for Anti-Locust Control, Morocco
DCPP	Department of Chemicalization and Plant Protection, Kyrgyzstan
DMA	*Dociostaurus maroccanus* (Thunberg 1815), Moroccan Locust
EC	Emulsifiable concentrate
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (FAO)
ET	Economic Threshold
FAO	Food and Agriculture Organization of the United Nations
FTPP	FAO-Turkey Partnership Programme
GARD	Generator of Aerosol of Regulated Dispersion
GIS	Geographic Information System
GPS	Global Positioning System
ha	Hectare
IGR	Insect Growth Regulator
JICA	Japan International Cooperation Agency
KNAU	Kyrgyz National Agrarian University
LMI	*Locusta migratoria migratoria* (Linnaeus 1758), Asian Migratory Locust
LV	Low Volume
LW-CCA	Locust Watch in Caucasus and Central Asia (FAO)
MAIL	Ministry of Agriculture, Irrigation & Livestock, Afghanistan
MAM	Ministry of Agriculture and Melioration, Kyrgyzstan
MKI	Milieukontakt International
MoA	Ministry of Agriculture

INTRODUCTION

1. The Technical Workshop on Locusts in Caucasus and Central Asia took place in Astana, Kazakhstan, on 14-18 November 2016. It was organized by the Food and Agriculture Organization of the United Nations (FAO) in the framework of the "Programme to improve national and regional locust management in Caucasus and Central Asia (CCA)".

2. The following ten countries participated in this Technical Workshop: Afghanistan, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan and Uzbekistan. The total number of participants, including countries' representatives, FAO staff, resource persons and observers, was 43. The List of Participants is given in Annex I.

3. The Technical Workshop started with an opening speech of Mr Mars Almabek, Deputy Director, State Inspection Committee in the Agricultural Sector, Ministry of Agriculture, Kazakhstan. He indicated that Kazakhstan is one of the leading grain producers in the world. Therefore, the presence of three locust species in the country represents a serious threat. Sharing experiences is fundamental for capacity strengthening in order to fight locusts, as well as carrying out joint activities, as locusts have no borders. He indicated that Kazakhstan has agreements with neighboring countries, i.e. China, Russia and Uzbekistan, stressing that coordination of activities is essential in the management of these agricultural pests. He concluded his speech wishing participants of the workshop a success in collective efforts on locust management.

4. Ms Annie Monard, Senior Officer, Team Leader "Locusts and Other Transboundary Plant Pests and Diseases" (AGPMM), FAO, welcomed the participants to the eighth annual meeting on locusts in Caucasus and Central Asia. She thanked Kazakhstan for hosting the workshop and reminded that this was the second locust meeting organized in the country. The first one was held in Almaty in 2009, when the FAO Programme on locusts in CCA was agreed upon. She expressed her pleasure to meet again the delegates from the all ten countries and also introduced the two donors' representatives present at the meeting, from the Japan International Cooperation Agency (JICA) and the United States Agency for International Development (USAID), as well as the FAO Agricultural Officer recently recruited under the JICA project. As done during previous years, the workshop would offer opportunity to report on activities and achievements for Year 5 of its implementation, discuss a number of technical issues as well as Workplan for Year 6. She emphasized that the Workshop would provide a platform to review the results that have been achieved since the Programme was launched in 2011 and define the way forward. She indicated that the structure of the workshop would be similar to those from previous years with the contribution of various resource persons, directly or during video conference. She indicated that this workshop was organized with financial support from the projects funded by USA (GCP/INT/134/USA) and JICA (GCP/INT/238/JPN) and the FAO Regular Programme. She concluded her speech by wishing an interesting and fruitful workshop to everybody.

OFFICERS OF THE SESSION

5. The following officers were elected:

Chairperson:	Mr Mukhtar Zhanabayev (Kazakhstan)
Vice-Chairperson:	Mr Norik Barsegyan (Armenia)
Drafting Committee:	Mr Dmitrii Govorov (Russian Federation)
	Mr Mohammad Iqbal Karimi (Afghanistan)
	Ms Annie Monard, Senior Officer, Team Leader, AGPMM (FAO)
	Ms Marion Chiris, Locust Programme Officer, AGPMM (FAO)
	Mr Alexandre Latchininsky, Senior Locust Expert, International Consultant (FAO)
	Ms Nadiya Muratova, GIS Expert, International Consultant (FAO)
	Ms Greta Graviglia, Operations Expert, International Consultant (FAO)

AGENDA

6. The Agenda, as adopted, is shown in Annex II.

SESSION 1: NATIONAL LOCUST CAMPAIGNS IN 2016 AND FORECASTS FOR 2017

National locust campaigns in 2016 (Item 4)

7. All delegates made comprehensive presentations on their national 2016 locust campaigns. The surveyed, infested and treated areas per country as well as the outstanding points from the presentations are presented below.

Table 1. Surveyed, infested and treated areas in 2016

Country	Area (hectares - ha)		
	Surveyed	Infested	Treated
Afghanistan	156 500	> 160 000	136 313
Armenia	53 360	33 277	400
Azerbaijan	704 237	141 127	16 592
Georgia	113 000	26 000*	23 600
Kazakhstan	27 922 100	3 878 100	1 901 800
Kyrgyzstan	76 291	60 391	59 881
Russian Federation	14 131 510	2 251 190	854 670
Tajikistan	470 000	90 034	57 437
Turkmenistan	369 362	83 059	83 059
Uzbekistan	712 500	412 900	399 800

*Above Economic Threshold

**Including non-swarming grasshoppers

8. The Delegate from Afghanistan explained that the Moroccan Locust *Dociostaurus maroccanus* (DMA) is by far the most important locust species in the country. To control this pest, chemical pesticides were sprayed in 12 provinces by the Plant Protection and Quarantine Department of the Ministry of Agriculture, Irrigation and Livestock. The Department is staffed with 70 technical specialists in the capital; besides, 50 locally recruited operators and 800 volunteers participate in the campaign. Largest areas treated were in Samangan, Takhar, Balkh, Baghlan and Kunduz provinces. Italian Locust *Calliptamus italicus* (CIT) has limited distribution mostly affecting Nemroz province. Two pyrethroid and one Insect Growth Regulator (IGR) pesticides, both in water-based Emulsifiable Concentrate (EC) and Ultra-Low Volume (ULV) formulations, were used against locusts in 2016. They were applied by hand - held, backpack and vehicle-mounted sprayers (11 units available). The main obstacle to the campaign consists in security problems in the northern provinces, which preclude from proper DMA monitoring and control. In general, the year 2016 experienced a slight decline in locust-treated areas in Afghanistan compared to 2015.

9. The Delegate from Kazakhstan presented a comprehensive overview on locust management in 2016, including human permanent and temporary resources, vehicles, aircraft, pesticides etc. He reported that monitoring of pests which fall under the category of “especially dangerous” is executed by the State Enterprise “Republican Methodical Center of Phytosanitary Diagnostics and Forecasts.” In 2016, the center involved 1,204 people and 674 vehicles in locust monitoring. Locust control is funded entirely by the central government

while grasshopper control is funded from local budgets. Pesticides used in 2016 included neonicotinoids, IGRs and combination of different pesticides (e.g. organophosphate plus pyrethroid). The bulk of treatments were done against CIT (72%) followed by Asian Migratory Locust *Locusta migratoria migratoria* (LMI, 18%) and DMA (10%). In 2016, incidences of CIT and LMI continued to decline while DMA showed some increase in two southern oblasts (regions) of the Republic.

10. The Delegate from Kyrgyzstan indicated that in 2016, DMA started to hatch on 11 March, which is the earliest in the last 10 years (due to early, wet and warmer than usual spring). Abundant spring precipitation contributed to good vegetation growth, which limited DMA dispersion. In the south provinces DMA and CIT produced joint infestations, which resulted in repeated treatments of the same areas. The total surveyed, infested and treated areas in 2016 were almost the same as in 2015. The bulk of the treatments was done against DMA (94.8%) followed by CIT (4.3%) and grasshoppers (0.9%). High infestations of DMA continued for the fourth year in a row, which appears unusual for this pest. Some infested areas had complicated relief, which required treatments by ultra-light aircraft (24%). Other treatments were applied by vehicle-mounted Ultra-Low Volume (ULV) sprayers (68.2%) and tractor sprayers (7.8%). The Delegate produced cost comparisons of using different spraying platforms which showed that the cheapest treatments were done from vehicle-mounted ULV sprayers (1.80 USD/hectare) while the most expensive ones were from tractor sprayers (2.60 USD/hectare) and aircraft (2.40 USD/hectare). Pesticides used were pyrethroids and chlorpyrifos. The total cost of the anti-locust campaign from national budget was of USD 382 300. Main constraints identified were the lack of trained personnel and insufficient 4x4 vehicles for monitoring as well as field equipment for the campaign (tents, sleeping bags, etc.).

11. In Tajikistan, areas of locust infestations in 2016 declined as compared to 2015. At the same time, areas infested by grasshoppers and katydids increased. Locust control in the Republic is thoroughly planned and well organized and implemented by the State Entity “Locust Control Expedition” which is funded through centralized budget. Control operations involved 732 seasonal workers and required 15 300 liters of pesticides, 36 tractor, three vehicle-mounted ULV and 520 handheld or knapsack sprayers. Pyrethroid and organophosphate pesticides were used (the latter, with Chlorpyrifos as active ingredient and in ULV formulation, was donated by Morocco through FAO triangulation). Most of the control operations were carried out against DMA.

12. The Delegate from Turkmenistan reported that in 2016 locust infested areas continued to decline as compared to previous years. Two pyrethroid pesticides were used to control DMA (58%), Large Saxaul grasshopper *Dericorys albidula* (24%) and other grasshoppers (18%). Vehicle-mounted ULV sprayers showed high efficacy rate. The plant protection service has 175 centralized staff members who participate in anti-locust activities.

13. The Delegate from Uzbekistan reported that in 2016, significant changes was made to the structure of locust management. Currently, locust control services are established in 12 regions of the Republic in addition to the city of Tashkent. Locust-infested areas were slightly higher than in 2015. DMA was the predominant economic pest followed by LMI and CIT. Infestations of CIT and grasshoppers occurred in all regions of the Republic. Treatments used domestically-manufactured pesticides which were applied by tractor, vehicle-mounted ULV, knapsack sprayers and ultra-light aircraft. The Delegate reported that cross-border

migration of DMA between Khatlon region of Tajikistan and Surkhandarya region of Uzbekistan is a serious constraint that should be addressed.

14. The Delegate from Armenia said that in 2016 the locust situation in the country remained calm. The main locust pest –CIT– was observed at very low densities, and locust control was implemented on a very limited area.

15. The Delegate from Azerbaijan reported that locust management is well planned and organized. DMA, the main locust pest in the country, continued to decline in 2016. Anti-locust treatments were done with pyrethroid insecticides this year. ULV sprayers AU8115 mounted on a pick-up truck proved highly efficient in Azerbaijan.

16. The Delegate from Georgia reported that CIT was the dominant locust species. Its infested areas continued to decline. Anti-locust treatments were implemented only with ground equipment. ULV technology with vehicle-mounted sprayers is increasingly used.

17. The Delegate from the Russian Federation reported that in general, the locust situation in 2016 was calm. Yet in 12 administrative areas emergency situations were declared because of high locust infestations. For such cases, there is federal pesticide reserve, which can be moved to critical areas if needed. In Lower Volga area, because of high flooding levels, many LMI areas became inundated and prevented locust development. Unexpectedly, DMA swarms appeared in Southern Russia, particularly near the Black Sea, requiring treatments against adults. In total in 2016 over 750 spraying units were used including 74 aircraft. Bilateral surveys with Kazakhstan continued on extensive areas on both sides of the common border. To facilitate locust monitoring and management, it is planned to create two coordinating centers, one in Orenburg, the other in Stavropol.

Locust forecast for 2017 and preparation of the next campaign (Item 5)

18. The countries provided locust forecast for 2017 in terms of the areas subject to treatment as follows (in ha):

Table 2. Forecast for 2017: areas to be treated

Country	Area (ha) - subject to treatment
Afghanistan	165 000 – 200 000
Armenia	5000
Azerbaijan	55 000 – 65 000
Georgia	35 000
Kazakhstan	1 882 130*
Kyrgyzstan	55 000
Russian Federation	169 000*
Tajikistan	97 100
Turkmenistan	200 000
Uzbekistan	531 000

* including non-swarming grasshoppers

** no less than; the surveys still continue

19. Maps of treated areas in 2015 and 2016 and forecast for 2017 in CCA countries is inserted in Annex III.

SESSION 2: IMPLEMENTATION OF THE PROGRAMME TO IMPROVE LOCUST MANAGEMENT IN CAUCASUS AND CENTRAL ASIA

Programme in 2016: overview on implementation and funding situation (Item 6)

20. The FAO Locust Programme Officer, AGPMM, provided an overview of the implementation of the "Programme to improve national and regional locust management in Caucasus and Central Asia (CCA)" during Year 5 of the Programme, from 1st October 2015 to 30th September 2016.

    The main achievements for Year 5 were summarized as follows:

    - **Result 1 – Regional cooperation developed**. National and regional bulletins on locust situations and management issued on a monthly basis from April to September 2016, including from Turkmenistan, for the first time; Technical Workshop on Locusts in CCA held on 26-30 October 2015 in Pushkin, Russian Federation, allowing information and experience exchanges between the concerned countries.
    - **Result 2 – National capacities strengthened.** Training-of-Trainers (ToT) on locust management, including two regional sessions and 12 national sessions (organized from February to October 2016) to the benefit of 225 Experts from Afghanistan, Kyrgyzstan and Tajikistan (and Uzbekistan during the regional sessions only); Monographs on the Italian Locust (CIT) and on the Asian Migratory Locust (LMI) sub-finalized and monograph on the Moroccan Locust (DMA) under finalization; Two Practical Guidelines under preparation, one on the three locust pests in CCA and one on risk reduction of locust control operations on human health and the environment; Internship organized in February 2016 to the benefit of two Experts from Afghanistan and Kyrgyzstan in the National Center for Anti-Locust Control of Morocco (CNLAA)[1]; Fellowships: one PhD started with 2015/16 academic year and new call for interest issued[2] for two Masters with selection ensured by the E-Committee/FAO and arrangements undertaken with hosting institutions in view of their organization (2016/17 academic year).
    - **Result 3 – Locust issues better anticipated.** Technical assistance provided in August2016 to assess LMI situation in the Aral Sea area, Karakalpakstan, Uzbekistan, including on-the-job training delivered to 12 Locust Experts; Survey equipment delivered (including GPS, satellite phones, entomological kits and office equipment) or procurement ongoing (vehicles, motorcycles) to Afghanistan, Kyrgyzstan and Tajikistan; Five joint or cross-border surveys (CBS), involving 50 Locust Experts, organized from May to August 2016, as follows: Armenia/Azerbaijan/Georgia/Russia (joint survey in Georgia), Kyrgyzstan and Uzbekistan, Kyrgyzstan and Tajikistan, Afghanistan and Tajikistan (joint survey in Tajikistan) and Tajikistan and Uzbekistan (joint survey in Uzbekistan) – one more CBS planned between Turkmenistan and Uzbekistan was eventually organized without Programme assistance; Regional Workshop on Locust Contingency Planning in CCA held on 21-23 October 2015.

[1] *Centre National de Lutte Antiacridienne* (CNLAA), Morocco.

[2] Following last minute renouncements of two students, whose PhD and Master were supposed to start with 2015/16 academic year.

Concerning the development of the Automated System for Data Collection (ASDC) and Locust Geographical Information System (GIS) in CCA: (a) ASDC: finalization, availability in ten languages and introduction in additional three countries, Afghanistan, Kyrgyzstan and Tajikistan; (b) Locust GIS in CCA (basic functions): database and its management system (basic functions) available and under test during the 2016 locust campaign; (c) Locust GIS in CCA (advanced functions): technical specifications developed (based on the work of the E-Committee composed of forecasting experts from CCA countries).

- **Result 4 – Response mechanisms to locust outbreaks improved.** Control equipment delivered (including ULV sprayers, EC sprayers, pumps and tractors) or procurement ongoing (vehicles, camping equipment) to Afghanistan, Kyrgyzstan and Tajikistan; 10 000 liters of Chlorpyrifos 240 g/l (in ULV formulation) triangulated from Morocco to Tajikistan in May 2016.
- **Result 5 – Impact on human health and the environment mitigated.** Technical and operational support provided to the Human Health and Environmental Monitoring Teams in Tajikistan and Kyrgyzstan (established during the 2016 locust campaign for the latter); Technical assistance provided by an FAO International Consultant, Pesticide and Empty Container Management Expert, to Tajikistan in June 2016; Report on empty container management of pesticides used for locust control in CCA prepared; Minimum list of information to be included in extension material for local populations developed; Following presentation of the results of the Study on the "Fate of insecticides used for locust control on pasture in Kyrgyzstan" (October 2015), terms of reference prepared for a review of the vegetation extraction procedure by the toxicology laboratory in Bishkek.
- **Result 6 – Public information and awareness increased.** FAO Website "Locust Watch in CCA" updated with monthly bulletins during the duration of the locust campaign; As far as resource mobilization is concerned, operational start in December 2015 of the three-year project, of USD five million, funded by Japan/JICA to the benefit of Afghanistan, Kyrgyzstan and Tajikistan; in this context recruitment of an FAO Agricultural Officer based in Dushanbe, Tajikistan, to facilitate project implementation in the three countries.

21. With respect to the Workplan for Year 5, one activity was cancelled under Result 3, the regional workshop on locust monitoring to be organized in Orenburg by the Russian Federation, in early April 2016, to the benefit of all CCA countries. This was due to some initial delays because of a misunderstanding on the initiator of the meeting (FAO or the Russian Agricultural Center) and then the fact that the locust campaign started earlier than expected in 2016, thus reducing availability of national experts to organize and participate in such workshop. Overall, the main constraints met was related to the organization of fellowships, which proved to be difficult, especially the preparation and finalization of contracts between FAO and the hosting institutions/ universities.

22. Afterwards, the Locust Programme Officer presented the funding situation of the Programme as of 30 September 2016. She indicated that it had an initial budget of USD 7.8 million for all ten CCA countries. At the end of Year 5, a total of USD 8.3 million was available for the Programme thanks to contributions from USAID, FAO [Regular Programme and Technical Cooperation Programme (TCP) – two projects], the FAO-Turkey Partnership Programme (FTPP) and Japan/Japan International Cooperation Agency (JICA). This is presented in the below table 3.

Table 3. Programme funding situation (USD) as of 30th September 2016

Project	Amount (USD)	Beneficiaries	Starting & ending dates	Funding sources
GCP/INT/134/USA	1 660 000	All ten CCA countries	November 2011-April 2017 *(ongoing)*	USAID
TCP/KYR/3305	367 000	Kyrgyzstan	February 2012-December 2013 *(completed)*	FAO TCP
TCP/TAJ/3401	367 000	Tajikistan	August 2012-November 2014 *(completed)*	FAO TCP
GCP/SEC/004/TUR	600 000	Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan	March 2014-February 2019 *(ongoing)*	FTPP
GCP/INT/238/JPN	5 000 000	Afghanistan, Kyrgyzstan and Tajikistan	December 2015-December 2018 *(ongoing)*	Japan/JICA
FAO Regular Programme	300 000	All ten CCA countries	October 2011-September 2016 *(ongoing)*	FAO
Total	8 300 000			

23. It was indicated that such contributions did not equally concern all CCA countries; the reason was both the baseline situations, which were different depending on the countries, and the various countries covered by the different project. In fact, not all activities of the Programme Roadmap had been funded over the past years (a large share of Japan/JICA project being actually for equipment delivery). It was said that with the forthcoming completion of the USAID project (April 2017), the only one covering all ten CCA countries, and after review of the results achieved as well as agreement on the way forward during the 2016 Workshop (see Items 16 & 17), countries and FAO should engage jointly in resource mobilization for the Programme, should it be considered as necessary. It was once again reiterated that CCA countries could act not only as beneficiaries but also as donors and that efforts of all national locust experts are required to advocate and mobilize resources in their own country, both towards their national authorities and donors.

24. The Locust Programme Officer then presented the expenditures for Year 5 of the Programme (estimates only, subject to accountability adjustments during projects' implementation and at their closure). In total, the expenditures for Year 5 amounted USD 1 845 892 (see table in Annex IV). Details were then given for each funding source.

25. Concerning the USAID project (GCP/INT/134/USA), USD 212 816 were spent, representing 77 percent of the initial budget of USD 278 000 for Year 5. The main reasons for lower expenditures than initially planned was the cancellation of the regional workshop scheduled in Orenburg under Result 3 (Activity 3.1.1) and the fact that the Technical Support Services (TSS) were not claimed during Year 5 (it was decided to wait for the last months of project

implementation to do so). In addition, it was indicated that: under Result 2 (Activity 2.1), the project allowed the participation of Uzbekistan in the regional sessions of ToT on locust management; under Result 2 (Activity 2.2-c), it contributed to the preparation of the Practical Guidelines on the three locust pests in CCA; under Result 3 (Activity 3.1.2), the negative amount corresponds to accountability adjustments with respect to procurement of survey equipment; and under Result 5 (Activities 5.1.1 and 5.2.1), the amount provided concerns the training session on mitigating and monitoring the impact of locust control operations on human health and the environment, held in Uzbekistan in August 2015 (this activity was conducted towards the end of Year 4 however part of the related expenses appears in the table of expenditures for Year 5, i.e. when such expenses were charged in the financial system).

26. As far as the FTPP project (GCP/SEC/004/TUR) is concerned, only USD 80 064 were spent, representing 30 percent of the annual budget of USD 267 409. The main reason for this under-expenditure was related to the organization of the fellowships, which amounted USD 5 638 only for Year 5 (against annual budget of USD 141500), including the work of the E-Committee and expenses related to the translation and advertisement of the call for interest (December 2015-March 2016). However, there are no expenses directly related to the studies yet: although the contract with the hosting institution for the PhD in Kyrgyzstan was signed in July 2016, the first payment is due by 1st December 2016 and thus not yet inserted in the financial system. The other two fellowships have not started yet. The other envisaged activity, i.e. technical assistance to assess the LMI situation in Uzbekistan under Result 3 (Activity 3.1.1), was conducted as planned and under Result 5 (Activity 5.2.3), a small contribution was also provided by this project for the operational expenses of the Human Health and Environmental Monitoring Team in Tajikistan during the 2016 locust campaign.

27. The FAO Regular Programme contributed to Programme implementation during Year 5 with an envelope of USD 51 200 (representing 126 percent of the initially envisaged contribution of USD 40 500). This included a support to the preparation of the regional bulletins on locust situations and management, a contribution to the organization of the regional Workshop on Locust Contingency Planning in CCA and of the Technical Workshop on Locusts in CCA, both held in October 2015 in Pushkin, Russian Federation, and Programme coordination.

28. As of 30 September 2016, the expenditures for the Japan/JICA project (GCP/INT/238/JPN) amounted USD 1 501 812 (against a budget of USD 4 194 691 for project Year 1 - but covering a longer period, i.e. from 3 December 2015 to 2 December 2016). It was said that detailed comments would be provided at the occasion of the second Project Steering Committee, which will be organized after completion of the first project year. In the meantime, the following was indicated: the apparently low expenditures was due to the still ongoing delivery of motorbikes and vehicles, which represents a high share of such activities and of the overall budget, and to the fact that some other activities, such as the ToT, were still in progress as of 30 September 2016.

Regional cooperation in 2016 (Item 7)

Regular information sharing: monthly bulletins in the coming years (Item 7 a)

29. The Senior Officer, Team Leader, AGPMM, introduced the topic, thanking all countries for the preparation of the national monthly bulletins during the 2016 locust campaign. She highlighted that a major achievement this year had been the regular receipt of monthly bulletins from Turkmenistan. She recommended that this dynamics be pursued even if no more financial incentive would be provided by FAO to CCA countries in the future. The Senior Officer indicated that, if needed, face-to-face meetings with the delegations could be held during the week to highlight the rooms for improvements, according to the specific features of each country. The chairperson insisted on the need to pursue the regular sharing of the monthly national and regional bulletins in the coming years, indicating that his statement reflected the opinion of all countries.

Cross-border or joint surveys (Item 7 b)

30. The Delegate from Georgia presented the joint survey that took place in Kakheti, Eastern Georgia, on 11-13 May 2016, with the participation of 13 Experts from Armenia, Azerbaijan, Georgia and the Russian Federation. Mr Yeneneh Belayneh, Senior Technical Adviser, Pests and Pesticides, AELGA Manager, USAID/OFDA, participated as an observer. The survey targeted CIT egg-beds and hatching places in the areas adjacent to Georgian borders with the Russian Federation and Azerbaijan. Totally, 1 800 ha were surveyed by the team. Media (TV) covered the activity. The Delegate from Russia thanked FAO for the support provided and indicated that the Russian specialists, which had been selected from areas adjacent to Georgia, has deemed this joint survey as extremely fruitful. The Delegate from Azerbaijan indicated that a lot had been achieved during the past five years, including thanks to the joint surveys which had allowed exchanging information and improving relations with other countries. He stressed how important it was to continue to develop such regional cooperation and also mentioned the need to better communicate also with Iran.

31. The Delegate from Kyrgyzstan presented the cross-border survey (CBS) that was carried out between Kyrgyzstan and Uzbekistan on 21-28 May 2016, involving 12 Experts (six per country) and with an increased duration of one day with respect to previous year. The survey covered an area of 31 000 ha in three Kyrgyz oblasts (Osh, Batken, Jalal-Abad) and three Uzbek oblasts (Andizhan, Namangan, Fergana) in Fergana valley. The main target was DMA nymphs (3rd and 4th instars), which were found on 4 100 ha in Kyrgyzstan and 2 100 ha in Uzbekistan. Uzbek side agreed to treat, if necessary, the DMA infestations on the Kyrgyz side. Both countries indicated that the relations had much improved in the bordering areas, with exchanges almost on a weekly basis during the campaign. It was stressed that such annual CBS allowed to better prevent or avoid the worsening of locust infestations and that they needed to be pursued. It also played a key role on suppressing tensions between countries. In addition, such cooperation should be further increased, in particular though the conclusion of a high-level bilateral agreement between the two countries. The Delegate from Kazakhstan mentioned the successful example of the bilateral agreement concluded between his country and Russia, as well as China.

32. The Delegate from Kyrgyzstan also reported on the survey held between Kyrgyzstan and Tajikistan on 9-16 June 2016, with the participation of eight Experts (four per country). It took place in three Kyrgyz oblasts (Osh, Batken, Jalal-Abad) and one Tajik oblast (Sughd). The survey targeted DMA hoppers, which were mostly in third and fourth instars. In total, 18 000 ha were surveyed. DMA densities ranged from 12 to 26 per square meter. Survey data were entered in ASDC. As a result of the survey, 1 815 ha were treated in Kyrgyzstan and 3 100 ha in Tajikistan. Thanks to the survey, the threat of a transboundary migration of DMA was lowered. It was mentioned that a bilateral agreement between the two countries was currently under signature.

33. The Delegate from Tajikistan described the joint survey carried out by ten Experts from Afghanistan and Tajikistan (five per country) on 27-29 July in Khatlon oblast, Tajikistan. In total, 25 800 ha were subject to egg-laying. The timing of such survey was discussed and it was stressed that it could be held in different periods throughout the campaign, especially during expected hatching periods. In addition, the possibility of organizing a CBS on both sides of the border was considered but was subject to the evolution of the insecurity conditions in Afghanistan.

34. The Delegate from Tajikistan also reported on the joint survey held between Tajikistan and Uzbekistan in the Tashkent, Djizak and Syrdarya oblasts of the latter country on 3-5 August 2016, with the participation of seven Experts (three Tajik and four Uzbek people). A total of 12 000 ha were surveyed, mostly against CIT and other *Calliptamus* spp. It was stressed that it was a very positive meeting and the need of bilateral collaboration on locusts, through a Memorandum of Understanding, was emphasized by the two concerned countries. This would help overcoming visa issues.

National capacities' development in 2016 (Item 8)

Internship on locust management (Item 8 a)

35. The Delegate from Kyrgyzstan reported about the internship organized in the National Anti-Locust Control Centre (CNLAA) in Agadir, Morocco, from 31 January to 17 February 2016, to the benefit of two Experts from Afghanistan and Kyrgyzstan: Mr Mirjan Hemat, Head, Emergency Pest Action Department, Plant Protection and Quarantine Department (PPQD), Ministry of Agriculture, Irrigation & Livestock (MAIL), Kabul, Afghanistan; and Mr Salavat Mambetakunov, Chief Specialist, Department of Plant Protection and Pesticide Registration, Department of Chemicalization and Plant Protection (DCPP), Ministry of Agriculture and Melioration (MAM), Kyrgyz Republic. The Delegate from Kyrgyzstan emphasized that the National Anti-Locust Control Centre was an excellent hosting centre for such an activity with many very high professionals able to share their experience in the best possible way. Theoretical and practical information was received on the management of an anti-locust centre and a locust campaign with a particular focus on Ultra-Low Volume (ULV) technology and monitoring of locust control operations on human health and the environment and mitigation of their impact. Field visits were organized to carry out surveys in Moroccan Locust habitats and become familiar with related tools and in pesticide warehouses to see the functioning of a drum-crusher.

36. The Delegate from Kyrgyzstan informed that his colleague had transferred knowledge gained to other Experts, especially during the work he had carried out in the various oblasts during the 2016 locust campaign and will be able to act as a Master-Trainer. The Delegate from Afghanistan also expressed his satisfaction for such internship, insisted on the need to pursue it and mentioned that they also would like to receive training on biopesticides.

Training-of-Trainers on locust management (Item 8 b)

37. In 2016, a Training-of-Trainers (ToT) on locust management was organized in the framework of the Japan/JICA project for the participation of experts from Afghanistan, Kyrgyzstan and Tajikistan and with a contribution of the USAID funding for the participation of the experts from Uzbekistan. The Delegate from Tajikistan, which had hosted the two regional sessions, reported on their organization, held in partial presence of the Senior Officer, Team Leader, AGPMM, as follows:

- Regional session on locust spraying and pesticide risk reduction: delivered by Mr S. Lagnaoui, Spraying Expert, and Mr H. Van der Valk, Environmental Expert to the benefit of eight Master-Trainers from Afghanistan, Kyrgyzstan, Tajikistan and Uzbekistan on 22-27 February 2016 in Dushanbe; Ms N. Muratova, GIS Expert, participated in the last day;
- Regional session on locust monitoring and information management: delivered by Mr A. Latchininsky, Senior Locust Expert, and Ms N. Muratova, GIS Expert to the benefit of eight Master-Trainers from Afghanistan, Kyrgyzstan, Tajikistan and Uzbekistan on 29 February – 4 March 2016 in Dushanbe; the Representative from JICA assisted in the opening session.

38. In addition, Delegates of Afghanistan, Kyrgyzstan and Tajikistan reported about the 14 national sessions held up to October 2016, as follows:

- Five national sessions on locust monitoring and information management delivered by the Master-Trainers to a total of 92 locust experts in April/May 2016, in Afghanistan, Kyrgyzstan and Tajikistan[3];
- Two refreshing courses on the use of the Automated System for Data Collection (ASDC) delivered by the GIS expert to three Tajik Master-Trainers on 9 July 2016 and to four Afghan Master-Trainers on 18-19 July 2016, in Dushanbe, Tajikistan;
- Three national sessions on use of the Automated System for Data Collection (ASDC) organized by the Tajik Master-Trainers in presence of the GIS Expert (acting as a Coach), to the benefit of 38 Tajik locust experts, as well as four Afghan Master-Trainers, in July 2016[4];
- Four national sessions on locust spraying and pesticide risk reduction: delivered by the Master-Trainers to a total of 67 locust experts in September/October 2016, in Kyrgyzstan

[3] Afghanistan (28 locust experts): one session on 29-31 May 2016 (Balkh);
Kyrgyzstan (30 locust experts): one session on 11-13 April 2016 (Batken);
Tajikistan (32 locust experts): three sessions on 12-13 April 2016 (Khatlon), on 16-17 April (Dushanbe) and on 6-7 May (Sughd).

[4] National sessions on ASDC use in Tajikistan: 11-12 July (Khujand), 15-16 July (Khatlon) and 20-21 July 2016 (Dushanbe). The four Afghan Master-Trainers participated in the national session held on 20-21 July 2016.

and Tajikistan[5]; two national sessions, one in Kyrgyzstan and one in Tajikistan, were held in presence of a Coach, Mr Otar Skhvitaridze, who was thanked by the countries for the valuable technical assistance.

39. During the discussion, the beneficiary countries highlighted the quality of the training received as well as the usefulness of such ToT, allowing to have national Master-Trainers and to train a relatively high number of staff in a short of time. They were some discussions about the age and gender of participants; in this regard, the Delegate from Tajikistan indicated that SE-LCE had been able to recruit young people and the Delegate from Kyrgyzstan that two women had participated in the ToT in his country. The Locust Programme Officer, AGPMM, informed about the recommendations of the trainers following the regional session on locust spraying: in addition to paying very careful attention to spraying parameters, it was recommended to organize on-the-job training of (young) mechanics/technicians on maintenance, calibration and functioning of ULV spraying equipment, including in countries outside CCA having a long experience in locust control with ULV equipment. Another recommendation following the regional sessions concerned further assistance to the Master-Trainers during the national sessions, which was not initially planned. This resulted in the organization of two refresher courses on ASDC use for the Afghan and Tajik Master-Trainers as well as a coaching of Master-Trainers on ULV spraying. The Locust Programme Officer also briefly presented the national sessions still to be held, i.e. the sessions on ASDC use in Afghanistan and Kyrgyzstan (as soon as tablets are delivered and before the start of the 2017 locust campaign) and the session on ULV spraying in Afghanistan as well as one-day briefing sessions to the benefit of control operators (at 2017 campaign start). On behalf of FAO, she eventually thanked Tajikistan for having hosted the regional sessions to the benefit of all countries as well as for having welcomed Afghan Experts for refresher course or during national sessions.

Assessment of the Asian Migratory Locust situation and on-the-job training, Uzbekistan, August 2016 (Item 8 c)

40. The Delegate from Uzbekistan reported on the survey which took place on 7-19 August 2016 in the autonomous Republic of Karakalpakstan, with the main objective to assess the LMI situation, and with the technical assistance of the FAO International Consultant, Senior Locust Expert, Mr Latchininsky. Field survey took place over 115 300 ha in the Amudarya delta, in Muynak, Kungrad, Chimbay and Kegeili districts. It was possible to visit eight out of nine subdivisions covered by the Karakalpak Locust Control Service (Kungrad, Ali-Aul, Shege, Aspantai, Porlatau, Bashir-Shiel, Shakhaman, and Kazakdarya). LMI infestations covering about 30 000 ha were found in three subdivisions, Kazakdarya, Shege and Porlatau. The highest adult LMI densities (5-6/m2) were detected on 15 500 ha in Kazakdarya subdivision. Access to many potentially infested areas was difficult because of the high level of flooding, which impeded the survey from the vehicle: about 50 000 ha were totally or partially flooded in Kazakdarya, Shege and Porlatau subdivisions. It was indicated that hatching from these areas could occur later in the season when the water would recede. It was thus necessary to continue monitoring in August and September with special attention to drying areas. The Delegate from Uzbekistan indicated that lots of adult LMI populations were observed. The

[5] Kyrgyzstan (30 locust experts): one session held on 26-30 September 2016 (Bishkek); Tajikistan (37 locust experts): three sessions held in October: 3-7 October 2016 (Dushanbe), 12 16 October (Khatlon) and 19-23 October (Sughd).

shortage of 4x4 transportation means constitutes a major constraint to conduct appropriate surveys. The Senior Locust Expert added that the local anti-locust service suffered from staff shortage. Both human and operational capacities thus need to be strengthened in Karakalpakstan. In reply to a question from the Delegate from Uzbekistan about possible FAO assistance, it was replied that the first step would be to send an official request of assistance to FAO, which would serve as a basis for funds mobilization. It was indicated that vehicle purchase may be possible within certain donor-funded projects, depending on donor rules and requirements.

Update on fellowships on locust management (Item 8 d)

41. The FAO Locust Programme Officer, AGPMM, introduced this item by reminding that the FTPP project included three fellowships, one for Doctor of Philosophy degree (PhD, three years) and two for Master of Science degree (MS, two years). Such fellowships are open to nationals of the countries having signed the project document, i.e. Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. She reminded that when the project became operational (in March 2014), the E-Committee on fellowships -composed of CCA and FAO Experts- was activated in order to issue two calls for interests (CFI), for students and hosting institutions (HIs), from January to April 2015. Such calls defined the selection criteria, including 11 themes of common interest for all ten CCA countries, that fellows could address. The E-committee selected three students for the academic year 2015/16 The first selected candidate was Mr Almaz Alakunov (Kyrgyzstan) for a PhD on "Application of satellite images and Geographic Information Systems (GIS) to locust monitoring, risk assessment and forecasting", to be pursued jointly in the Kyrgyz National Agrarian University (KNAU) and Central Asian Institute for Applied Geoscience (CAIAG), Bishkek, Kyrgyzstan. The second and third selected candidates, respectively from Tajikistan and Kazakhstan, renounced in August and September 2015. As a consequence, the next-ranked candidate for the Master, Mr Sorboni, a national from Tajikistan, was granted a Master on "Locust control tactics and strategies" in the Kazakh Agrarian University, Almaty, Kazakhstan. However, because the academic year 2015/16 had started already, it was decided to postpone the course to the next one, should the fellow confirms his interest.

42. A second call for interest was issued, from December 2015 to March 2016, for two Masters starting with academic year 2016/17. The selection process took place in April/May 2016. As done the previous year, a matrix was filled to ensure a transparent and competitive selection of the students, on the basis of the eligibility and selection criteria of the call for interest. Considering that the above-mentioned national from Tajikistan confirmed his willingness to pursue a Master, only one place was left. The FAO International Consultant, Senior Locust Expert, who had coordinated the work of the E-Committee, then informed the Delegates of the following: out of four candidatures received from students, only three were complete and thus considered as valid. The three candidates were from Tajikistan, Kazakhstan and Uzbekistan, all males. As two candidates scored equally, further examination was required by the E - Committee. The first rank was given to the national from Uzbekistan; his work experience as well as the importance and uniqueness of the subject, on locust biological control, were the main reasons for this decision. The other candidate, from Kazakhstan, who had initially obtained the same score, had proposed a very interesting topic related to GIS but which was similar to the topic of the fellow already selected in 2015. In the interest of all CCA

countries it was deemed as more appropriate to support a variety of topics amongst the selected fellows.

43. The FAO Locust Programme Officer explained that the FAO Sub-regional Office for Central Asia, based in Turkey, as project budget holder, had then liaised with the hosting institutions in Kazakhstan and Uzbekistan to organize the fellowships. This involved discussions with the concerned universities to obtain their in-principle agreement, as well as to prepare ad-hoc contracts with the universities. As of mid-November 2016, the contracts with the Kazakh Agrarian University, Almaty, Kazakhstan, and the Tashkent State Agrarian University, Uzbekistan, had not been finalized yet, putting these activities at risk. Maximum effort was being done to resolve the situation and discussions were held with the Programme national focal points to look for all possible solutions and allow the students to start the courses as soon as possible.

44. Last, the PhD fellow, Mr Almaz Alakunov, who was participating in the Workshop as one of the two Delegates from Kyrgyzstan, provided information about his admission in KNAU and entrance exams passed as well as on the practical training courses that he had held so far on GIS basic concepts and software as well as remote sensing methods, tools and data processing.

Update on the monographs of the three locust pests (Item 8 e)

45. The FAO International Consultant, Senior Locust Expert, presented the situation on the monographs and on the Practical Guidelines on the three locust pests in CCA, highlighting the difference between the two types of documents: the monographs are addressed mainly to researchers and students while the Practical Guidelines are intended to be a practical tool for the daily work of the practitioners. Besides the Practical Guidelines are intended to be made of several volumes, the first one being on the three locust pests (another is under preparation – see Item 12 c).

46. The CIT monograph, which had been presented to countries during the last annual workshop, is available on FAO website. The other two monographs on LMI and DMA are close to be completed.

Practical guidelines on the three locust pests in CCA (Item 8 f)

47. The outline of the Practical Guidelines was dispatched to the participants and it was indicated that the draft text, which would be completed with illustrations at a later stage, would be shared on a memory key. Participants were invited to review it and send to the Senior Locust Expert any comment and/or suggestion on its structure and contents.

48. Participants from several countries emphasized the importance and necessity of both monographs and Practical Guidelines and estimated the number of copies of each publication for each country.

Equipment delivery to strengthen operational capacities in CCA (Item 8 g)

49. The FAO International Consultant, Operations Expert, presented an overview on the locust equipment provided under the Japanese funded project entitled "Improvement of locust management in Afghanistan, Kyrgyzstan and Tajikistan" (GCP/INT/238/JPN). The equipment

represents about 70 percent of the total project budget of USD 4.8 million. Considering the high volume of procurement under this project, it was reminded that FAO undertakes procurement on the basis of competition and the fundamental principles of Best Value for Money, fairness, transparency, economy and effectiveness. The equipment was defined during the project preparation phase thanks to intensive exchanges with the three countries and based on their respective needs. The technical specifications were developed by FAO in collaboration with the recipient countries. Most tenders have been issued both at national and international levels; the offers have been evaluated to determine their compliance with the technical requirements and the award granted to the financially lowest technically responsive offer. A monthly update on procurement status is shared by FAO with the concerned countries and the donor.

50. The equipment delivered from December 2015 to October 2016 to the three countries under Programme Result 3 "Locust monitoring improved" includes GPS devices, entomological kits, satellite phones and office equipment. It was indicated that the procurement of motorcycles and vehicles (both for locust survey and control) was under finalization in late October 2016 and would be available for the next locust campaign. Tablets for ASDC use were provided to the Master-Trainers of three of the countries which participated in the regional sessions of the Training-of Trainers, held in Tajikistan in early 2016. Additional tablets were delivered to Tajikistan and will be provided soon also to Afghanistan and Kyrgyzstan.

51. Under Programme Result 4 "Locust control operations supported", tractors, EC sprayers, pesticide pumps and gasoil for rinsing of empty containers have been provided to Tajikistan, as well as conventional pesticide donated from Morocco (triangulation process); ULV sprayers were delivered to the three countries. The procurement of camping kits is planned to start soon while prefabricated houses for meeting purposes in Tajikistan will be provided next year.

52. Under Programme Result 5 "Risk reduction on human health and environment ensured", Personal Protective Equipment (PPE) kits will be delivered to the three countries. In 2017, it is also planned to supply human health and environmental monitoring equipment to Kyrgyzstan and Tajikistan as well as analytical standards for the pesticide residue analysis by the Bishkek laboratory (impact assessment of locust control operations). Some laboratory equipment will also be provided to Kyrgyzstan in 2017.

Programme of work during Year 6 (2017) (Item 9)

53. The FAO Locust Programme Officer presented the proposed Workplan for Year 6 (1st October 2016 to 30 September 2017) and related budgets. She started by indicating that four funding sources were available, as follows:

- USAID project (GCP/INT/134/USA): in the considered period, the project would be implemented up to its end, in April 2017, to the benefit of the ten countries.
- FTPP project (GCP/SEC/004/TUR): this project, approved to the benefit of six countries, could be implemented so far only in those having signed both project document and agreement, i.e. Kyrgyzstan, Tajikistan and Uzbekistan[6], the two first countries having

[6] With the exception of fellowships, which were open to nationals of countries having signed at least one of the two documents, i.e. Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan.

received the larger share of activities from project start. In addition, in early November 2016, a waiver had been obtained from the relevant FAO Divisions to implement the project also in Azerbaijan considering that this country had signed the project document as well as a Host Country Agreement including all necessary provisions on privileges and immunities and other required ones. Such waiver could not be extended to Kazakhstan, which had also signed the project document but whose Host Country Agreement did not include all required provisions. Last, Turkmenistan has signed none of the two documents. During the discussions, it was agreed with the Delegates from Kazakhstan and Turkmenistan that FAO would send them all necessary documents after the workshop in order to further support the signature process. As a result of the above, the FTPP project could be implemented in Azerbaijan, Kyrgyzstan, Tajikistan and Uzbekistan for the time being.

- Japan/JICA project (GCP/INT/238/JPN): it was indicated that the budget for this project was not inserted in the presented table for two reasons; on the one hand, the budgets were covering project year (the first one ending in early December 2016); on the other, the project activities were already decided, with little margin of discussion, for Afghanistan, Kyrgyzstan and Tajikistan. Last, such budget would be presented to the three concerned countries during the second Project Steering Committee meeting (in early 2017). However, even with no mention of the budget, Table 4 indicated which activities would be carried out against this project during Programme Year 6.
- FAO Regular Programme (RP): as in the past year, there would be a FAO contribution, especially -if possible- for countries not covered by any funding sources from May 2017 onwards.

54. As a result of the discussions, all participants endorsed the Workplan presented in the below Table 4, which includes the following activities for Year 6, with tentative period or dates (funding sources indicated in brackets):

- **Under Result 1:**
  - Activity 1.1.1. Preparation of monthly regional and national bulletins: it was agreed by all countries that this activity would continue in the absence of any funding for the monthly national bulletins (*translation and publication of the monthly bulletins covered by FAO Regular Programme*).
  - Activity 1.1.2. Organization of the annual Technical Workshop held in November 2016 in Astana, Kazakhstan (*USAID, Japan/JICA and FAO RP*).
- **Under Result 2:**
  - Activity 2.1. Ongoing Training-of-Trainers on locust management in Afghanistan, Kyrgyzstan and Tajikistan, i.e. remaining national sessions and one-day briefing sessions (*Japan/JICA*).
  - Activity 2.2. Finalization of the three monographs on each the three locust pests present in CCA and translation into English of at least one of them (*FAO RP*).
  - Activity 2.2. Finalization of the practical guidelines on the three locust pests present in CCA and on pesticide risk reduction (*FAO RP*).
  - Activity 2.3. Organization of the three fellowships on locust issues (*FTPP*).

- **Under Result3:**
  - Activity 3.1.1. Organization of a training on locust monitoring, including ASDC and GIS, in Azerbaijan, in April 2017 (*FTPP*).
  - Activity 3.1.1. Organization of a training on locust monitoring, including ASDC and GIS, in Uzbekistan, possibly in August 2017 (*FTPP*).
  - Activity 3.1.2. Delivery of 15 to 20 tablets for ASDC use to Azerbaijan (USAID) as well as to Afghanistan and Kyrgyzstan (*ongoing delivery of respectively 36 and 16 tablets – Japan/JICA*).
  - Activity 3.1.2. Delivery of survey equipment and transportation means to Afghanistan and Kyrgyzstan (*ongoing – Japan/JICA*).
  - Activity 3.2. Organization of four joint or cross-border surveys[7]: Caucasian countries and Russian Federation (joint survey, late March/early April, Russian Federation); Tajikistan-Uzbekistan (11-18 April, Khatlon, Tajikistan and Surkhandarya, Uzbekistan) - (*USAID*); Afghanistan-Tajikistan (24-30 April, either joint survey in Khatlon, Tajikistan, or cross-border survey, depending on security conditions) and Kyrgyzstan-Tajikistan (3-10 May, Osh, Batken and Jalal-Abad in Kyrgyzstan and Sughd in Tajikistan) - (*Japan/JICA*).
  - Activity 3.3. Support to the operational use of ASDC and development of the "Locust GIS in CCA" in Caucasus and the Russian Federation, including through the joint organization, by FAO and the Russian Federation, of a sub-regional workshop on locust monitoring, use of ASDC and introduction of the "Locust GIS in CCA", in late March/early April 2017, with the participation of Armenia, Azerbaijan, Georgia and the Russian Federation (*USAID*).
  - Activity 3.3. Support to the operational use of ASDC and introduction of the "Locust GIS in CCA" in Afghanistan, Kyrgyzstan and Tajikistan (*Japan/JICA*).

- **Under Result 4:**
  - Activity 4.2. Delivery of control equipment and transportation means to Afghanistan, Kyrgyzstan and Tajikistan (*ongoing – Japan/JICA*).

- **Under Result 5:**
  - Activity 5.1.2. Delivery of Personal Protective Equipment to Afghanistan, Kyrgyzstan and Tajikistan (*ongoing – Japan/JICA*).
  - Activity 5.1.4. Development of extension material for Afghanistan and/or Kyrgyzstan and/or Tajikistan (*ongoing – Japan/JICA*).

[7] As in previous years, Kazakhstan and the Russian Federation will carry out a CBS; Turkmenistan and Uzbekistan have indicated that they will conduct a CBS as well.

- Activity 5.2.2. Delivery of monitoring equipment and cholinesterase kits to Kyrgyzstan and Tajikistan as well as laboratory equipment to Kyrgyzstan (*ongoing – Japan/JICA*).
- Activities 5.2.2 & 5.2.3. Development of an integral system for human health and environmental monitoring in Azerbaijan and delivery of related small monitoring material (*FTPP*).
- Activity 5.2.3. Technical and operational support to the Human Health and Environmental Monitoring Teams in Kyrgyzstan and Tajikistan (*Japan/JICA*).
- Activity 5.2.4. Pesticide residue analyses, including review of the processes and procedures used at the Bishkek laboratory for handling, extraction and analysis of residues in vegetation samples in February 2016 and related delivery of analytical standards (*Japan/JICA*).

• **Other:**

- Allocation of a financial envelope for the supervision, coordination and implementation of the Programme (*FTPP*).
- Technical Support Services and Evaluation costs (*USAID*).

55. Last, it was indicated by the FAO Locust Programme Officer that all efforts would be done to organize an annual workshop in 2017, including all CCA countries and subject to available funding.

Table 4. Workplan for Year 6 of Programme implementation and related budget

Res. & Act.	Description - Activities envisaged for Year 6	Beneficiaries countries					YEAR 6	TOTAL BUDGET for Year 6 (USD)	AVAILABLE FUNDS FOR YEAR 6 (as of October 2016)		
		Year 1	Year 2	Year 3	Year 4	Year 5	(JPN-funded activities indicated into brackets)		USAID Nov. 2011-Apr. 2017	TURKEY Mar. 2014-Feb. 2019	FAO Regular Programme
R1 - Regional cooperation								**103,000**	**85,000**	**0**	**18,000**
1.1. Facilitate regional exchanges to manage locust situations		all	all	all	all	all		**103,000**	**85,000**		**18,000**
1.1.1. Create/maintain regular regional information sharing of standardized data (Nat. Cslt for bulletins)		all	all	all	all	all	all	3,000			3,000
1.1.2. Allow direct experience exchange (technical workshop)		all	all	all	all	all	all	100,000	85,000		15,000
1.2. Develop coordination, including through transboundary policy		all	all	all	all	all		**0**			
1.3. Identify the best long-tem solution for sustainable regional cooperation		(year 3)	(year 3)	(year 3/year4)	all	all		**0**			
R2 - National capacities								**55,000**	**0**	**50,000**	**5,000**
2.1. Training-of-Trainers (ToT) programme - locust management		*no funding*	*no funding*	*no funding*	*no funding*	AFG-KYR-TAJ (UZB)	(AFG-KYR-TAJ)	**0**			
2.2. Make available/accessible background documentation on locust pests		all	all	all	all	all	all	**5,000**			**5,000**
a	Biblio & Material to be made available (e-committee)	all	all	all	all	all	all				
b	Monographies	all	all	all	all	all	all	5,000			5,000
c	Guidelines	all	all	all	all	all	all				
2.3. Allow internships and post-graduate formation								**50,000**		**50,000**	
a	One-month internship	KAZ	KYR+RUS+ TAJ+UZB	AZE/GEO	no funding	AFG-KYR	no funding				
b	Fellowship: 2 or 3-year diploma for 3 students & E-committee	*none*	*none*	*3 students*	*3 students*	*3 students*	*3 students*	50,000		50,000	
2.4. Promote and support applied research		*no funding*	*no funding*	*no funding*	*no funding*	*no funding*	*no funding*	**0**			
a	Two grants for applied research	*no funding*	*no funding*	*no funding*	*no funding*	*no funding*	*no funding*				
b	Entomological and chemical equipment for 6 laboratories	*no funding*	*no funding*	*no funding*	*no funding*	*no funding*	*no funding*				
R3 - Locust issues and disasters better anticipated and mitigated								**95,000**	**15,000**	**80,000**	**0**
3.1. Improve survey operations for better field locust monitoring								**80,000**		**80,000**	
3.1.1. Strengthen human capacities (techn. consultations on survey)		AFG-TAJ-KYR	RUS&KAZ	UZB	ARM-AZE-GEO	none	AZE, UZB	60,000		60,000	
3.1.2. Strengthen operational capacities (survey equipment)		all	none	none	none	AFG-KYR-TAJ	Tablets AZE (AFG-KYR-TAJ)	20,000		20,000	
3.2. Organize regular cross-border surveys		4	4	2	3	5	2 (+2)	**10,000**	**10,000**		
3.3 Develop monitoring and analyzing systems		all	all	all	all			**5,000**	**5,000**		
3.3.1. Extend use of Geographical Information System and remote sensing		all	all	all with 2 pilot countries	all with 3 pilot countries	all	all, incl. sub-regional workshop Caucasus/ Russia (AFG-KYR-TAJ)	5,000	5,000		
3.3.2. Improve forecasting		(year 5)	(year 5)	(year 5)	(year 5)	none	none				
3.4. Enhance preparedness for risk reduction - contingency plans		(year 5)	(year 5)	(year 5)	(year 5)	all	none	**0**			

Res. & Act.	Description - Activities envisaged for Year 6	Beneficiaries countries Year 1	Year 2	Year 3	Year 4	Year 5	YEAR 6 (JPN-funded activities indicated into brackets)	TOTAL BUDGET for Year 6 (USD)	AVAILABLE FUNDS FOR YEAR 6 (as of October 2016) USAID Nov. 2011-Apr. 2017	TURKEY Mar. 2014-Feb. 2019	FAO Regular Programme
R4- Improved response mechanisms to locust outbreaks								**0**	**0**	**0**	**0**
4.1. Allow early reaction and appropriate control operations								**0**			
4.1.1. Strengthen human capacities (techn. consultations on control)		AZE	TAJ-KYR	KAZ	none	none	none				
4.1.2. Strengthen operational capacities (control equipment)		all but RUS	TAJ-KYR	KYR	none	AFG-KYR-TAJ	(AFG-KYR-TAJ)				
4.1.3. Enhance public-private partnership		*none*	all	all	all	all	all				
4.2. Promote less harmful pesticides and alternatives to conventional pesticides								**0**			
4.2.1. Develop ULV formulations and related techniques		all	all	all	all (video)	all	none				
4.2.2. Propose alternatives to conventional pesticides (demonstration)		all	all	all	all (video)	all	none				
4.2.3. Encourage registration of more pesticides		all	all	all	all	all	none				
R5 - Impact on human health and the environment mitigated and monitored								**22,000**	**0**	**22,000**	
5.1. Mitigate impact of locust control operations on human health and the environment								**0**	**0**	**0**	
5.1.1. Strengthen human capacities (techn. assistance)		none	7 countries	none	UZB	none	none				
5.1.2. Strengthen operational capacities (PPE)				none	none	AFG-KYR-TAJ	(AFG-KYR-TAJ)				
5.1.3. Pesticides and empty containers management		all but RUS	GEO-KAZ-KYR-TAJ	KYR	E-Committee	E-Committee TAJ	none				
5.1.4. Produce extension material for mitigating impact of locust treatments		*no funding*	*no funding*	*no funding*	*no funding*	AFG-KYR-TAJ	(AFG-KYR-TAJ)				
5.2. Monitor impact of locust control operations on human health and the environment								**22,000**	**0**	**22,000**	
5.2.1. Strengthen human capacities (techn. assistance)		none	none	none	UZB	none	none				
5.2.2. Strengthen operational capacities (Testmate, environmental material, etc		none	none	KYR-TAJ	none	AFG-KYR-TAJ	AZE (AFG-KYR-TAJ)	2,000		2,000	
5.2.3. Develop integral system for environmental and health monitoring		none	none	TAJ	TAJ (team) & KYR (system)	KYR-TAJ (teams)	AZE	20,000		20,000	
5.2.4. Facilitate impact assessment & analysis of material (residue analysis)		none	none	KYR	none	KYR-TAJ	(KYR-TAJ)				
R6 - Public information and awareness increased								**0**	**0**	**0**	
6.1. Develop awareness and education among local populations		*no funding*	*no funding*	*no funding*	*no funding*	*no funding*	*no funding*	**0**			
6.2. Enhance visibility of locust issues and management and of related donor support								**0**			
6.2.1. Prepare and implement a communication plan		*no funding*	*no funding*	*no funding*	*no funding*	*no funding*	*no funding*				
6.2.2. Create and update a website on locusts in Caucasus and Central Asia		all	all	all	all	all	all				
Other								**174,000**	**90,000**	**84,000**	**0**
Supervision, coordination, management of Five-year Programme		all	all	all	all	all	all	78,000		78,000	
Evaluation		(year 5)	(year 5)	(year 5)	(year 5)	all	all	15,000	15,000		
TSS		all	all	all	all	all	all	81,000	75,000	6,000	
Sub-total								**449,000**	**190,000**	**236,000**	**23,000**
Support cost								45,680	15,000	30,680	0
Total								**494,680**	**205,000**	**266,680**	**23,000**

SESSION 3: DEVELOPING MONITORING AND ANALYSING SYSTEMS (GEOGRAPHICAL INFORMATION SYSTEM)

Developments of the Automated System of Data Collection (ASDC) (Item 10)

56. The FAO International Consultant, GIS Expert, reminded that, following the recommendations formulated by FAO and the three pilot countries, i.e. Georgia, the Russian Federation and Uzbekistan after the testing phase (2014/15), ASDC fields had been modified and endorsed by the ten CCA countries during the Technical Workshop on Locusts in CCA held in October 2015. The GIS Expert indicated that, in early 2016, the endorsed changes had been introduced in the system. The updated version was then tested at the occasion of a regional Training-of-Trainers on locust management held in Tajikistan in late February/early March 2016 to the benefit of Afghanistan, Kyrgyzstan, Tajikistan and Uzbekistan. A few additional changes were identified, such as drop-down lists (for natural enemies and hopper stages) and sections headlines ["Locust information (including egg-pods)" and "Hoppers (scattered)"]. On this basis, the ASDC was finalized in English and in Russian in late March 2016.

57. In parallel, new possibilities were also developed for users, as follows: (a) in addition to tablets, ASDC can also be installed on mobile phones supporting Android; (b) the WEB-operator's application of ASDC can now run on desk computers and laptops with any operational system (Windows or Mac) and installed Flash plug-in. This means that the CCA Locust Experts who do not have tablets can also use a mobile phone or, alternatively, fill the paper form in the field and then enter field data on a desk computer or laptop once they are back in the office. In April 2016, all countries were informed both that the final ASDC version was available in English and in Russian for the 2016 locust campaign and of the new existing possibilities (instructions were provided on "Installation and start of the ASDC", both on tablet or mobile phone and via WEB interface).

58. In addition, thanks to the translation of the ASDC fields and interface by the CCA Locust Experts, ASDC was made available, in July 2016, in Azeri, Georgian, Kazakh, Kyrgyz, Persian, Tajik, Turkmen and Uzbek languages. The Persian and Tajik versions were tested at the occasion of the national sessions on ASDC use, organized in Tajikistan in July 2016 by the Tajik Master-Trainers to the benefit of 38 Tajik Locust Experts as well as four Afghan Master-Trainers. During the practical exercises, inaccuracies in the translation of some terms into Tajik and Persian were identified and changes were introduced accordingly in both versions of the interface of ASDC program and FAO standard forms.

59. Last, draft ASDC User Manuals were prepared both in English and Russian and made available in July 2016 to countries (http://locust.kz/engine/HTMLHelp/). The explanation on how to install a special programme "Multilink keyboard" from "Google Play Market" and to activate the necessary keyboard was provided on the same site.

60. During the 2016 locust campaign, ASDC was used by five countries, including: two of the three initial pilot countries for ASDC testing, i.e. Georgia and the Russian Federation that

continued to use the system as well as three new countries, namely Afghanistan, Kyrgyzstan and Tajikistan. More specifically, a total of 165 reports were received from these five CCA countries. Afghanistan produced eight reports during locust survey operations carried out on an area of 226 ha from 24 July to 23 August. Out of 14 reports made by Georgia, 11 records were registered during locust survey operations carried out on an area of 7 035 ha from 14 June to 19 July, and three records during control operations. Kyrgyzstan made 24 reports during locust survey operations carried out on an area of 12 000 ha from 10 to 25 May and six records during control operations. Russian Federation made 59 reports, which were registered during locust survey operations carried out on an area of 10 163 ha from 19 May to 10 August. Tajikistan made 72 reports during regional and national sessions. As far as the other five CCA countries are concerned, no reports were received during the 2016 locust campaign despite interest showed in October 2015, which would need to be further discussed.

61. The GIS Expert concluded her presentation by indicating the following: the overall objective was that, in the coming five years, all CCA countries would be able to fill in the forms and use ASDC, have the necessary means to do so (tablets, mobile phones and/or computers) and would operationally use the system. In FAO opinion, a number of activities were required to that end. Such activities were planned already for the three countries benefitting from the Japanese project, i.e. Afghanistan, Kyrgyzstan and Tajikistan, including: assistance to cover mobile Internet access in the three countries during the 2017 and 2018 locust campaigns; organization of the national sessions on ASDC use in Afghanistan and Kyrgyzstan (upon delivery of tablets); refresher courses (if possible with coaching of the Master-Trainers) to the benefit of national Locust Experts at locust campaign start; and remote FAO technical assistance on a continuous basis. For the other countries, the following was recommended: organization of a Training-of-Trainers on filling in the standard Locust Survey and Spray Monitoring Forms and using ASDC; availability of the required tablets for ASDC use; delivery of annual refresher courses by the identified Master-Trainers (including with coaching formula, depending of each country situation and taking advantage of the experience gained by Georgian and Russian experts since the pilot phase); provision of FAO remote technical assistance to the countries for challenge or difficulty met during operational use. The implementation of such recommendations is subject to the availability of additional funds for the Programme as well as possible in-kind inputs provided by the countries.

62. During the discussions, the Delegate from Kyrgyzstan, referring to the introduction of ASDC in his country in 2016, highlighted that they were translation errors in Kyrgyz language, mentioned some difficulties encountered in filling ASDC forms in the field and reminded that national sessions on ASDC use would be organized soonest as part of the ToT on locust management. The Delegates of Azerbaijan and Armenia underlined the importance of ASDC and requested FAO assistance for tablets provision and related training. The Delegate from Georgia also mentioned that tablets would be needed in each district. The Delegate from Tajikistan expressed his positive opinion on the start of ASDC use in 2016, in all oblasts where locust surveys are conducted and emphasized the importance of refresher course for Locust Experts at the beginning of the next locust campaign. In reply to the question of the FAO Locust Programme Officer about the absence of ASDC data from some countries in 2016, the following was added: the Delegate from Kazakhstan reiterated his interest in the system however he suggested to

select two pilot oblasts to train local experts and present the results to management before overall introduction at the country level; The Delegate from Turkmenistan informed that it had not been possible to procure tablets in 2016 for a question of time and he indicated his intention to start using ASDC in 2017; and the Delegate from Uzbekistan underlined local issues with Internet access, especially in the field, and requested ASDC training using paper Forms and WEB-operator application. It was underlined that with the completion of the USAID project (which had covered most of the work related to ASDC to the benefit of the ten countries) and in addition of the Japan/JICA project covering three countries, more funds would be needed to continue supporting the introduction, up to the operational use, of this important tool. All CCA countries requested more training on locust monitoring in order to properly use ASDC and the Locust GIS in CCA.

Developments of the Locust Geographical Information System (GIS) in CCA (Item 11)

63. The FAO International Consultant, GIS Expert, indicated that, as agreed during the previous annual Workshop, the Locust GIS in CCA – basic functions (data import, query, display, output), i.e. the database and its management system, had been developed by the Institute of Space Technique and Technologies, Almaty, Kazakhstan, in March 2016. She reminded that the ASDC functionalities had been widened so that Locust Experts could enter information into the database not only from tablets but also from mobile phones and desk computers and laptops (based on paper forms filled in during field survey and control operations). She also indicated that the GIS national users had been divided into several categories, with related rights: (a) the "Operators" (scouts and control operators who can fill in, save and edit forms as well as view all forms from all countries); (b) the "Privilege Operators" (experts who review and validate all data); and (c) the "Authorized Operator" (the national focal point(s) for ASDC, who can also grant the status of "Privilege Operator" to an ASDC user in the country and register tablets). Besides, the “System Administrator", at the regional level, can also edit the reference books and appoint and create new roles if the need occurs.

64. During the 2016 locust campaign, the Locust GIS in CCA (basic functions) was tested by Georgia and Kyrgyzstan. Georgia inserted 11 reports resulting from locust surveys and three from control operations into the database; Kyrgyzstan inserted respectively 24 and six reports. The database was also tested during the three national sessions held in July 2016 in Tajikistan in the framework of the Training-of-Trainers on locust management, in presence of the GIS Expert. This included the registration of the 40 available tablets and attribution of the various roles: the Authorized Operator (a FAO staff who played this role), the Privileged Operators (three Master-trainers) and the Operators (Locust Experts/Scouts, each tablet being linked to a person). The lessons learnt from this exercise could be used as an example of structural organization in the countries, which are benefitting from the Training-of-Trainers in 2016/17 (i.e. Master-Trainers acting as Privileged Operators); in the other countries, the same principle could be applied (training with identification of Master-Trainers who would also act as Privileged Operators for certain administrative territorial units).

65. Regarding the development of the Locust GIS in CCA – advanced functions (summary, analysis and forecast algorithms), considering that a close concertation with the users is

essential, a E-Committee (data analysis and forecast) was set up, composed of the GIS Expert and Forecasting Experts from the CCA countries as well as FAO Experts and the Database Programmer. The Terms of Reference of the E-Committee were developed and sent in May 2016 to all CCA countries. Its main tasks were as follows: (1) collect from all CCA countries the relevant information on the full list of country administrative units (first level – oblasts or others) in Russian, English and national languages as well as locust historical (starting from 2000) and statistical reports (first level – oblasts or others) including: infested area (ha); infested area (ha) with densities exceeding Economic Threshold (ET); and treated area (ha) for CIT, DMA and LMI separately; and (2) on this basis, define the algorithms for locust forecasting (by Skype meetings or mail exchanges), thus allowing preparing the technical specifications for the advanced functions.

66. Material was received from eight countries: Afghanistan, Armenia (partial information), Azerbaijan (partial information), Georgia, Kazakhstan, Kyrgyzstan, Russian Federation and Tajikistan. During the discussion, it was agreed that Uzbekistan and Turkmenistan would send such material after the workshop.

67. Six Skype meetings or exchanges with Experts from Georgia, Kazakhstan, Kyrgyzstan, Russian Federation and Tajikistan as well as with the Database Programmer and FAO Experts (September/early October 2016) allowed:

    1) Selecting the following parameters of the Locust Survey Form to reflect the locust situations: egg-pods density (/m²); hopper average density (/m²); presence of hopper bands; imago average density (/m²); and presence of swarms.

    2) Defining thresholds, i.e. critical values, in order to qualify the locust situation as: Red – danger; Yellow – caution; Green – calm.

    3) Defining a number of GIS output products for analyzing Italian (CIT), Moroccan (DMA) and Asian Migratory (LMI) locusts data and preparing forecasts, as follows:

        - Product N° 1 – “Monthly map of locust densities”
        - Product N° 2 – “Maps of areas infested above Economic Threshold (ET): recent trends and average”
        - Product N° 3 – “Maps of treated areas above ET”
        - Product N° 4– “Map of the level of threat”
        - Product N° 5 – “The forecast of hatching periods”

68. Such products, which are presented in details in Annex V, were discussed by the CCA Delegates with the objective to agree on all parameters and products. It was concluded that: (1) the average egg-pod density (/m²) will be classified as danger if over 1, as caution if less than 1, and calm if equal 0; (2) the hopper/imago average density (/m²) will be classified as danger if over 5, as caution if equal to 3-4, and calm if of 0-2; and (3) the presence of hopper band or locust swarm will be classified as danger. Concerning the products, the Delegates and the FAO International Consultant, Senior Locust Expert, agreed: (1) to compare the value of infested/treated hectares with density above ET during the current year with the respective averages calculated for the last decade; (2) to use the word “increase” instead of “danger”, “decrease” instead of “caution”, “on

the same level" instead of "calm"; (3) to determine the value of thresholds equal to 15 percent.

69. The GIS Expert also informed that during a meeting of FAO Experts from AGPMM and Information Technology Division (CIO) held in August 2016, the switch from the presently rented server to the FAO server, starting from 2017, was discussed and in-principle agreed (see Annex V). Last, she informed that the advanced functions of CCA Locust GIS would be ready for deployment in early 2017 and that several accompanying documents would be prepared, including: the ASDC Operator Guide; the User Manual to obtain GIS analysis and forecast products; and a Guide on "Technical Service and Administration of the Locust GIS in CCA." The countries would be informed so that the testing phase (advanced functions in addition to the basic ones) could start. Technical assistance was already planned for the three countries covered by the project GCP/INT/238/JPN while solutions would need to be identified for other countries. The Delegate from Georgia reiterated the interest of his country to be involved in the testing phase.

SESSION 4: RISK REDUCTION FOR HUMAN HEALTH AND THE ENVIRONMENT

Mitigating impact of locust control operations (Item 12)

Pesticide and Empty Container Management, Tajikistan, July 2016 (Japanese-funded project) (Item 12 a)

70. The Delegate from Tajikistan made a presentation on the activities undertaken during the visit of Mr Diallo, Expert on Pesticide and Empty Container Management (23 June-3 July 2016) and more generally on pesticide and empty container management in his country. The above-mentioned mission had taken place in the context of the delivery of 10 000 liters of conventional pesticides in ULV formulation (Dursban 240 UL – active ingredient: Chlorpyrifos), which were triangulated from Morocco to Tajikistan in May 2016 thanks to the Japan/JICA project. Besides the discussion with the Head and Experts of State Entity "Locust Control Expedition (SE-LCE), the mission had included visits to the central and regional pesticide warehouses and to sites treated during the 2016locust campaign. It allowed reviewing pesticide, empty pesticide container and storage warehouse management and formulating a number of recommendations, including on: pesticide use; storage conditions; management of full and empty pesticide containers; transport of pesticides; and spraying equipment. The Delegate from Tajikistan also reported on the measures already taken after the mission, including the triple-rinsing and puncture of the empty 200-liter metal drums resulting from the triangulation, in view of their forthcoming disposal. In this regard, the FAO Agricultural Officer (Plant Protection/Locusts; duty station: Dushanbe) informed on the envisaged incineration of such triple-rinsed drums in a foundry in Dushanbe.

71. During the discussion, the importance of paying particular attention to the improvement of the national lists of registered pesticides was stressed. The FAO International Consultant, Senior Locust Expert, reminded all participants that recommendations had

been formulated in this regard by an E-Committee on pesticides, set up in the framework of the Programme (2012). The Delegate from Tajikistan indicated that the Tajik list of registered pesticides dated from 2012 and that it would need to be updated. In reply to a query from the Delegate from Russia, he also added that all triple-rinsed and punctured metal drums were stored in pesticide storage facilities while empty plastic drums from pesticides used during the past locust campaigns had been stored and locked, awaiting available funding for their disposal. The Delegate from Georgia also raised a question regarding the position of the Pesticide Referee Group (PRG) on organophosphates, and more specifically Chlorpyrifos. To be noted that the PRG refers to suggested dose rates for two species only other than the Desert Locust, i.e. the Malagasy Migratory Locust and the Moroccan Locust, in the absence of less harmful alternatives when crops are under immediate threat. The FAO Senior Officer, Team Leader, AGPMM, underlined that, as repeated at a number of occasions, the best way to combat locusts was early reaction, possibly against hoppers. When this was not achievable, due to a number of possible circumstances, then it was important to use pesticides of different families, if feasible. She provided the example of the response to the locust plague in Madagascar: about 70 percent of the control operations were carried out against hoppers with Insect Growth Regulators; locust adults were treated with Chlorpyrifos; biopesticides were also used, especially in environmentally sensitive areas. She added that when there was no other choice than using conventional pesticides, the best way to limit their negative impact was to ensure proper spraying (as mentioned by the Delegate from Tajikistan in his presentation) and appropriate protection of workers as well as to adopt all other necessary precautionary measures (management of pesticides and empty drums, information of local populations, etc.)

Conclusions of the E-Committee on empty pesticide container management (Item 12 b)

72. The representatives from “Milieukontakt International” (MKI) reported via Skype to all countries on the work carried out to review and analyze the management of empty containers of pesticides used for locust control in CCA, with the objective to identify main features, challenges and needs and to formulate recommendations to improve it. The main conclusions of the report were thus presented regarding the existing legislative framework and its implementation, the current practices on the management of empty containers and the existing infrastructures for their collection. The recommendations included: the detail review and improvement of the national waste and the plant protection legislative frameworks; the development of long-term national strategies in line with the internationally available best management; the appropriate pesticide registration process as well as the adequate selection of pesticides and drums starting from procurement; the need to consider all empty pesticide containers as solid waste and not classified hazardous waste (because requirements for hazardous waste management are needlessly expensive and unaffordable); the implementation of best practices for empty drums handling, transportation, storage and spraying; the recycling of metal or plastic containers into waste-to-energy fuels or feedstock in post-consumer remanufactured products that are not to be used in the food or consumer products sectors; and the implementation of a pesticide stock and empty drums management system. It was also recommended to implement a pilot project for sound management of empty containers used for locust control in one or more CCA countries.

73. During the discussions, the Locust Programme Officer indicated that the draft report had been sent in early November to all countries for comments, together with a request for additional information (replies had already been received from Armenia, Azerbaijan and Kyrgyzstan). In reply to a question, she also indicated that the implementation of the pilot project would be subject to available funding. Two countries, Kyrgyzstan and Kazakhstan, expressed their in-principle interest to participate in such pilot activities. The Chairperson conveyed his appreciation for having addressed such an important issue and urged all participants to review the report and send their comments to FAO; the deadline to do so was set up for 30 November 2016.

Practical guidelines on pesticide risk reduction (Item 12 c)

74. The FAO International Consultant, Environmental Expert, presented (by Skype) the Practical Guidelines on pesticide risk reduction for locust control in CCA, which are under preparation. He indicated that such Practical Guidelines should be based on international standards and tailored to the specific practices and conditions of locust control in the region. Three main target audiences will be addressed by the Guidelines, as they require each specific guidance: the decision makers and campaign organizers (organizational aspects of risk reduction before, during and after the campaign); the locust control staff (best practices and risk reduction measures, mainly during the campaign); and the monitoring staff, i.e. the dedicated Human Health and Environment Monitoring Teams (best practices for monitoring efficacy as well as human health and environmental aspects of locust control operations). The Guidelines will be organized according to the main stages of a locust control campaign (before, during and after) and, for each topic, the target audiences and their responsibilities will be clearly indicated. The Guidelines will be accompanied by a number of "best practice" cards –or Standard Operation Procedures, SOPs (e.g. sturdy plasticized material), that will be available separately to be used in the field by specific target groups.

75. Participants were invited to review the outline of the Practical Guidelines (provided in the working paper) and to provide further suggestions on its structure and contents. In particular, participants were invited to identify topics relevant for insecticide risk reduction, which were not yet covered in the outline or indicate in case some topics currently included in the outline were considered as not relevant for the region. The Delegates of Kyrgyzstan and Tajikistan thanked the Environmental Expert for the whole support provided over the recent years in their countries, which had acted as pilot countries for developing an integral system for monitoring the impact of locust control on human health and the environment. The Environmental Expert added that many measures were already implemented in these countries and that the Practical Guidelines were developed as a means to bring together the experiences gained in all countries. Last, it was agreed that the participants would send their comments to FAO regarding the outline as early as possible after the workshop.

Minimum list of information to be included in extension material for local populations (Item 12 d)

76. The FAO International Consultant, Environmental Expert, introduced the minimum list of information to be included in extension material for local populations, which represents a very important aspect of risk reduction of locust control. This list aims at summarizing the minimum information that should be provided to local populations according to target group(s) that lives or works in or close to treated areas: shepherds; beekeepers; inhabitants of houses/villages; and local authorities. It was noted that information can be released using a number of different supports, such as flyers, brochures, posters, local information sessions, radio or television broadcasts, telephone messages, etc.; extension material can target one specific group or several. The Environmental Expert concluded by indicating that such list was developed to serve as a basis to complete existing extension material or develop new ones and that comments would be welcome.

Monitoring impact of locust control operations (Item 13)

HH & ENV Monitoring Teams (Item 13 a)

77. The Delegates from Tajikistan and Kyrgyzstan reported on activities carried out by the Human Health and Environment Monitoring Team in their respective countries during the 2016 locust campaign, for the second consecutive year in Tajikistan and for the first time in Kyrgyzstan, as well as on the lessons learnt and recommendations.

78. In Tajikistan, the Team, composed of two specialists and a driver, conducted six missions in Khatlon and Sughd oblasts (three per oblast) in May, June and July. During the missions, more than 70 staff were trained or informed about good practices and pesticide risk reduction. A total of 50 staff also received the insecticide use passport. The Monitoring Team tested three times the levels of acetyl-cholinesterase in the blood of all operators involved in pesticide handling/spraying and did not detect any inhibition exceeding 20 percent (the trigger value indicating exposure). It was also mentioned that pesticide empty drums had been triple-rinsed and punctured. Overall, there was no pesticide-related incident reported. Vegetation samplings were collected for subsequent pesticide residue analysis. Replying to the question from an observer, the Delegate explained that although the analytical laboratory has not been established in the country yet, it was very useful to practice vegetation sampling for the future; in addition, it is also planned to conduct such analysis in the Bishkek laboratory as part of the Japan/JICA project. Eventually, it was recommended to develop formal instructions for health and environmental monitoring and to continue such monitoring in the future.

79. In Kyrgyzstan, four missions were executed by the Monitoring Team composed of four specialists; in total, eight people were involved in this activity. Training and awareness raising were conducted in 14 districts, reaching up to 810 persons, including members of beekeeper associations. The insecticide use passport was used for four staff. Levels of acetyl-cholinesterase were checked for 14 operators. No inhibition of cholinesterase exceeding 20 percent was observed; in one case a 19 percent inhibition was detected and the staff was stopped from working with insecticides for two weeks. Ecological

monitoring concentrated on non-target impact of anti-locust treatments. From over 80 photos, 27 dead non-target arthropods belonging to seven insect orders (beetles, butterflies, orthopterans, flies, etc.) as well scorpions, and also lizards and starlings were documented. Also, the Monitoring Team ensured that 4 554 empty five-liter plastic pesticide containers were not re-used by local populations. It was indicated that a solution to recycle these containers for pipe manufacturing would be explored in the near future. Recommendations concerned the preparation of extension materials for local populations and purchase of Personal Protection Equipment. Following this positive experience, it was indicated that the work of the Human Health and Environment Monitoring Team will continue in the future on a regular basis.

80. The FAO International Consultant, Senior Environmental Expert (by Skype), expressed his appreciation of the excellent work carried out by the two specialized Monitoring Teams, who operated independently from locust control staff. The results, with very few health- and environment-related adverse effects associated with locust control, showed that the two countries were doing a good job. He noted the impressive number of missions carried out in Tajikistan despite the small size of the Team. He also underlined the quality of the report prepared by the Kyrgyz Monitoring Team. Finally, considering that both teams had collected an even more important number of data, he proposed to prepare a joint report on their activities, to be dispatched to all CCA countries for experience and information sharing. To that end, he requested both countries to send all data collected to analyze them more in detail. In turn, Delegates from Tajikistan and Kyrgyzstan thanked the Senior Environmental Expert for the trainings delivered in the recent years and encouragement and affirmed that they were ready to provide more information for the joint report. The Senior Environmental Expert recommended that this successful experience be extended to other CCA countries.

<u>Impact assessment of control operations and pesticide residue analysis (Item 13 b)</u>

81. The FAO International Consultant, Environmental Expert, presented this item (by Skype), which aims at facilitating impact assessment of locust control operations through pesticide residue analysis. It was reminded that a study had been conducted in 2014/15 by the Central Control & Toxicology Laboratory (Ministry of Agriculture and Land Reclamation), in Bishkek, Kyrgyzstan, to assess residue degradation on grassland of several insecticides used in locust control. As a follow-up of this study, it had been agreed that the Central Control & Toxicology Laboratory would conduct, with FAO assistance, a critical review of the processes and procedures for analysis of residues on vegetation samples. More specifically, the support of two consultants was envisaged: an Expert in pesticide residue analysis and residue laboratory quality assurance schemes, with extensive experience and knowledge of the related international standards; and an Expert in pesticide residue analysis, from a pesticide residue laboratory located in CCA (bilingual in Russian and English). The final objective of the review, scheduled in February 2017, is to ensure that these processes and procedures follow international standards and result in precise and reliable residue estimates. This work was deemed to be useful not only for Kyrgyzstan but for the region as a whole. The Terms of Reference of the review had been prepared (as provided in the related working paper) and it was indicated that any comments or suggestions would be welcome.

Progress made on safety and environmental precautions (Item 14) & on spraying technologies products and biopesticides (Item 15)

82. Countries reported on the progress achieved on spraying technologies, equipment, pesticides and biopesticides as well as in human health and environmental safety.

83. The Delegate from Kyrgyzstan explained that in 2016, the permission to use Ultra-Light Aircraft (ULA) for locust spraying was granted by the concerned authorities after several years of ban due to fatal accidents. This was an important step forward allowing to treat remote locust breeding areas with complicated relief. The Delegate confirmed that FAO spraying monitoring forms were used on a regular basis. The establishment of a Human Health and Environmental Monitoring Team, focusing on the impact of locust control operations (see item 13 a), was a big step forward.

84. The Delegate from the Russian Federation informed that in 2016, the so called "cold foggers" aerosol generators (GARD) were tested for locust spraying in Dagestan. They proved efficient and economic allowing to treat up to 1 200 ha per night. Delegate from Uzbekistan commented that this technology has been tested in his country a while ago but was banned from use because of potential negative environmental impact. The Delegate from Russia then informed that a new biopesticide, "Green Barrier" had continued to be tested and was registered in ULV formulation in 2016. It would be used mainly against Asian Migratory Locust near water bodies. Responding to questions from the audience, he explained that its active ingredient is the fungus *Beauveria bassiana* whose spores are enclosed in protective micro-encapsulated nano-granules. The biopesticide was tested against CIT in Chelyabinsk region and showed 64 percent locust mortality seven days post-treatment and 89 percent mortality 21 days post-treatment. A discussion among the delegates on the use of biopesticides ensued. The Delegate from Tajikistan questioned the low and slow efficacy of the biopesticide; the Delegate from Russia responded that, although it would not be realistic to use the biopesticide during mass outbreak, it could be very useful for treating locusts in ecologically sensitive areas and for outbreak prevention. The Delegate from Uzbekistan commented that another biopesticide based on the fungus *Metarhizium acridum* had been tested in his country several years ago, for the first time in CCA. The biopesticide proved efficient in wetlands against CIT and LMI but showed low efficacy against DMA in hot and dry semi-desert conditions. Currently the work on improving biopesticide formulations continues in Uzbekistan. A discussion also took place on the temperature range and effect of humidity for biopesticide efficacy.

85. The Delegate from Tajikistan informed that the ULV technology is more and more used in his country. During the 2016 locust campaign, 11 percent of the total treated area were treated with Chlorpyrifos ULV (triangulated from Morocco by FAO). Quality control of treatments is ensured, related information is entered in ASDC using the tablets. The Human Health and Environmental Monitoring Team (see item 13 a), set up in 2015 and whose work continued in 2016, was the most important progress achieved in human health and environmental safety issues.

86. The Delegate from Turkmenistan said that aerial treatments are not authorized in his country and all anti-locust treatments are done with ground equipment. ULV is increasingly used with pyrethroid insecticides, the only chemical group used in the

country; they proved efficient and economic. Seminars on the use of ULV are organized before the campaign. Local populations are always informed about the treatments. Recently, a Law on Plant Protection was adopted providing legal foundation for pest control.

87. The Delegate from Uzbekistan informed that about 50 ULA (hang-gliders) are involved in anti-locust treatments in the country. Pesticides from different chemical groups such as neonicotinoids and pyrethroids are used, and for ecologically sensitive zones (wetlands), IGRs are purchased through centralized budget. Aerosol generators are not used and ULV is deemed too expensive. Chlorpyrifos is banned. The Delegate emphasized the lack of transportation means for locust monitoring and control in Karakalpakstan and inquired about the possibility of FAO assistance in this matter.

88. The Delegate from Georgia informed that in 2016, 21 000 ha were treated with ULV and 2 000 ha with EC formulations; IGRs were applied on 40 ha of pastures. New tractor sprayers were used in remote and difficult-to-access areas. Before the campaign, the newly hired seasonal staff were trained and local populations informed. Personnel use disposable personal protective equipment (PPE). All data are entered in ASDC using tablets. There was neither new pesticide registration nor biopesticide testing in 2016. The main problem consists in replicated treatments of same areas infested by successive hopper bands at different times. Another problem is the utilization of empty pesticide containers, which are currently stocked at a facility.

89. The Delegate from Afghanistan informed that ULV technology is widely used in the country. Biopesticide *Metarhizium acridum* was tested against DMA and showed good results; it was decided to purchase more of this biopesticide in the future.

90. The Delegate from Armenia said that there was nothing new in terms of pesticides or spraying technologies used in the country in 2016.

91. The Delegate from Azerbaijan informed that anti-locust treatments are done using ground equipment, including ULV sprayers (Micronair and Scout sprayers). IGRs have also been used over the past two years. One week before the campaign, local populations are informed about the impending treatments and personnel are trained and equipped with PPE (purchased from centralized budget). Obsolete pesticides and containers are managed by pesticide distributors. There is a special site ("polygon") for obsolete pesticides. Biopesticides are not used in the country because locust infestations occur close to crop-producing areas and pesticides with high speed of action are needed to prevent the damage.

92. The Delegate from Kazakhstan informed that there is a large park of different spraying platforms in the country, from hand-held to airplanes. Pesticides spraying is subject to licensing. The necessity to obtain sprayer certification process is being developed. During pesticide tenders, pesticide transportation is a requirement. Legal basis for pesticide management is being updated. Obsolete pesticide dumping is not permitted, such pesticides are being detoxified or destroyed. Empty containers are collected and utilized by local authorities supervised by MoA specialists. For two years in a row, biopesticides (a.i. *Beauveria bassiana* and *Metarhizium sp.*) are being developed by local researchers in collaboration with Russian colleagues but the formulations are not yet operational. Such biopesticides would be used in ecologically sensitive areas.

93. The Senior Officer, Team Leader, AGPMM, summarized the discussions by noting the important progress made in the use of ULV, IGRs and biopesticides in CCA. The Delegate from Kazakhstan referred to the "EXPO-2017 Future energy" to be held in Astana, indicating that there would be a specific exhibition/presentation on pesticide disposal and inviting all attendees to participate.

SESSION 5: PROGRAMME TO IMPROVE LOCUST MANAGEMENT IN CAUCASUS AND CENTRAL ASIA

Results achieved (Item 16) & the way forward (Item 17)

94. The FAO Locust Programme Officer introduced these two items aiming both at reviewing the activities realized and the results achieved over the 2011-2016 period and at discussing activities that would require further support. It was indicated that the completion of the USAID project, i.e. the initial funding source -which had allowed Programme start in October 2011- and the only one covering all ten CCA countries, provided the opportunity to conduct such a review but that the Programme was still in progress, with two projects under implementation and a contribution of the Regular Programme. It was recalled that the Programme overall objective was to reduce the occurrence and intensity of locust outbreaks in CCA, thus limiting threat or damage to crops and rangelands and safeguarding food security and livelihood of rural populations, as well as minimizing impact on human health and the environment. Its immediate objective was to develop regional cooperation and to strengthen the national capacities. This Programme was part of the FAO EMPRES[8] approach and therefore inspired by the key concepts of the locust preventive control strategy and lessons learnt from other geographical areas and locust species.

95. All Programme results were then reviewed. For each of them, the baseline (as per the Analytical Report on locust situations and management in CCA, FAO, 2009[9]), the objective, the activities and achievements were presented and discussed. Overall, a lot appeared to have been achieved over the considered period (although Programme activities had not been fully implemented, depending on available funding) and the feedback from all stakeholders was extremely positive. Amongst the main achievements was the now existing regional cooperation with the creation of an active technical network on locusts in CCA as well as the strengthening of capacities on a wide range of locust-related topics.

96. Concerning the way forward, the definition of future activities to be implemented took into account the initial brainstorming on the way forward conducted by countries in October 2015, the assessment of results achieved and other indications given by

[8] Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases, whose Desert Locust component is successfully implemented around the Red Sea area (central region of the Desert Locust distribution area) since 1997 and in Northwest/West Africa (western region of the Desert Locust distribution area) since 2006 under the aegis of the two FAO regional Desert Locust commissions.

[9] http://www.fao.org/ag/locusts-CCA/common/ecg/1084/en/Analytical_Report-_Locusts_in_CCA.pdf.

countries during the past annual workshops. Overall, it was considered that focus should be put on three main directions in the forthcoming years: the sustainability of the existing regional cooperation, the implementation of an effective preventive locust control strategy and further harmonization and increase of knowledge and best practices.

97. More specifically, the below tables and paragraphs summarize, for each result: the main activities and achievements over the 2011-2016 period; the related discussions held during the workshop; and the resulting main activities envisaged for the coming years. More details can also be found: on the achievements, in Working Paper 16 & 17[10]; on the future activities, in Annex VI of this report.

Table 5. Result 1 - Summary of achievements (2011-2016) and future required activities

RESULT 1 - REGIONAL COOPERATION DEVELOPED FOR BETTER LOCUST MANAGEMENT	
Baseline: *Some bilateral agreements in CCA but few or no contacts for locust matters despite vicinity, both in Caucasus and Central Asia.*	
2011-2016	**Forthcoming years**
Achievement: Regional cooperation developed thanks to the now existing technical network on locust issues gathering CCA countries	**Further objective**: Sustainability of such regional cooperation on locusts in CCA ensured
Related activities:	Related activities:
○ Regular information exchanges ensured, contributing to early warning and reaction, i.e. facilitating locust management at national and regional levels and implementation of appropriate measures, through the production of national and regional monthly bulletins on locust situations (thanks to Programme funding)	○ Continue to produce monthly bulletins on locust situations at national (by countries, on national budgets) and regional (by FAO) levels
○ Technical Workshops on Locusts in CCA organized annually, which played a key role in: sharing experience and information, including on lessons learnt from last campaigns and preparation of the forthcoming ones; discussing developments on a number of technical issues; and creating a team spirit, based on common interest	○ Pursue annual information and experience sharing thanks to yearly Technical Workshops on Locusts in CCA
○ Intra-regional assistance developed as part of regional cooperation, with very positive cases over the considered period	○ Further promote joint activities and intra-regional assistance, including by increased transfer of competencies within the region as well as cross-border movements of teams and transfers of equipment from one country to another if needed

[10] http://www.fao.org/ag/locusts-CCA/common/ecg/1191/en/Items_16_17-_Results_achieved_(2011-2016)_the_way_forward_FINAL_EN.pdf.

○ Study on possible mechanisms for long-term regional cooperation on locusts in CCA produced, providing with an analysis of the various options to facilitate the identification of the best long-term solution for regional cooperation and locust management	○ Identify, refine, agree upon and implement the best possible mechanism to ensure sustainable regional cooperation on locusts in CCA, i.e. the mechanism which appears as the most appropriate at technical, institutional, financial and any other relevant levels

98. During the discussions, all countries stressed that the difference between the initial situation, at Programme start, and the one in 2016 was huge with respect to regional cooperation, which had made impressive progress. While some countries had no or very few or tensed contacts despite vicinity, regional cooperation was now effective and extremely useful: countries were now aware of the locust situations in their neighboring countries, could communicate at any time on latest developments, conduct joint assessments of locust situation in border areas, meet and exchange experience and information on a regular basis, etc. This was deemed as a major breakthrough with respect to locust crises prevention. Countries warmly expressed their gratitude to the work carried out by and together with FAO to that end. The discussion also concerned the maintenance of the now existing regional cooperation in the long-run. Some countries expressed the wish to have a coordination body in the future and others stressed that any decision on such mechanism would need to be taken at a higher level, but it was agreed by all of them that FAO umbrella was required in the coming years both to support such cooperation and to identify an appropriate mechanism. In this respect, the Chairperson urged all CCA countries to discuss the matter with the national high-level authorities and come up with some recommendations, possibly by the end of 2016.

Table 6. Result 2 - Summary of achievements (2011-2016) and future required activities

RESULT 2 - National capacities strengthened	
***Baseline**: Technical expertise, including in research centres, varied significantly between countries. Constraints encountered by CCA countries, which concerned all aspects of locust management, included lack of well-trained human resources, efficient methodologies and modern tools and guidelines.*	
2011-2016	**Forthcoming years**
Achievement: National capacities strengthened on all aspects of locust management (cross-cutting Result).	**Further objective**: Knowledge and practices further increased, taking advantage of the existing situation (i.e. theoretical, operational and field knowledge already present) as well as the world-wide recognized best practices, with a view to disseminate, harmonize and update competencies and technologies.
Related activities:	Related activities:
○ Training delivered to 478 Experts from nine countries, though: - nine internships on locust management organized in performing Anti-Locust Centres outside CCA (Australia and Morocco); and - 33 regional and national training sessions delivered, including a Training-of-Trainers on locust management in 2016 (the latter for three countries and partially for a fourth one)	○ Allow additional internships outside CCA; ○ Extend the Training-of-Trainers approach to all CCA countries, covering all main topics related to locust management ○ Identify trainers within CCA and develop the coaching formula between CCA Experts
○ Post-graduate fellowships launched: one PhD on GIS and remote sensing in progress in Kyrgyzstan and two Masters being launched, one on locust control and the other on biopesticides	○ Follow-up on the ongoing studies
○ Background documentation prepared to be made available on the FAO website "Locust Watch in CCA": three monographs on each of the three locust pests present in CCA under finalization; two practical guidelines under preparation, one on the three locust pests and the other one on risk reduction of locust control operations on human health and the environment	○ Ensure the translation, print-out and dispatch to CCA countries of the Monographs and Practical guidelines currently under finalization or preparation; ○ Complete the series by preparing additional practical guidelines on: survey; information management and forecast; control; and campaign management
○ Applied research not planned in view of the breakdown of the available funding sources	○ Allow applied research on topics of common interest for all CCA countries, including on issues such as more precise identification and description of the hotspots of the three locust species, impact of climate change on the bio-ecology of the locust pests, etc.

99. During the discussions, all countries stressed the progress made on a wide range of topics and there was a consensus about the importance to continue strengthening capacities through the organization of further training sessions in the framework of the Programme. The need to increase the number of Master-Trainers, both at regional and national levels, was also mentioned, as well as of the importance of background documentation. The usefulness of the internships outside CCA was underlined, allowing to see how other countries perform locust control and have valuable exchange of experience. Last, the need for applied research on topics related to better anticipation and forecast, which had already been mentioned during this workshop and previous ones, was reiterated, including on the impact of climate change on locust pests.

Table 7. Result 3 - Summary of achievements (2011-2016) and future required activities

RESULT 3 - Locust issues and disasters better anticipated and mitigated	
Baseline: *CCA countries performed one to four annual ground surveys to monitor locust populations. Main constraints included lack of: human and technical resources to adequately monitor the potentially locust-infested areas; equipment such as GPS (in use in three countries only); efficient methodology for locust survey and data analysis; modern tools (GIS); in addition to insufficient communication and joint activities (such as joint surveys) on locust situation between countries.*	
2011-2016	**Forthcoming years**
Achievement: Locust issues better anticipated thanks to strengthened human and operational capacities as well as joint or cross-border surveys; monitoring and analyzing tools developed from scratch to the benefit of the ten countries; and contingency planning approach introduced – in addition to regular regional exchange of information (see Result 1)	**Further objective**: Locust issues much better anticipated and mitigated thanks to more accurate locust monitoring; enhanced analysis, forecast and reporting capacities, including with operational use of ASDC and locust GIS in CCA by all countries; and increased preparedness - this is crucial for the effective implementation of the locust preventive control strategy
Related activities:	Related activities:
○ Human capacities strengthened on locust monitoring: 209 Locust Experts from nine countries trained during four regional sessions, seven national ones and on-the-job training on the basics of the locust biology, ecology, monitoring and forecasting, including use of the FAO Locust Survey Form and GPS; ○ Technical assistance provided twice to assess the Asian Migratory Locust situation in western Uzbekistan (Aral Sea area)	○ Continue strengthening human capacities for locust monitoring, possibly using the already-mentioned ToT and coaching formula
○ Operational capacities strengthened on locust monitoring: delivery of a limited number (for demonstration purpose) of survey, positioning (GPS) and communication equipment to most countries; substantial assistance also being provided to Afghanistan, Kyrgyzstan and Tajikistan (2016/17)	○ Strengthen operational locust monitoring capacities for the in-need countries as necessary equipment is essential to conduct adequate survey operations and monitor locust situation.

○ As a major breakthrough, 18 joint or cross-border surveys (CBS) organized with Programme assistance, involving 182 Locust Experts from the ten countries, allowing to jointly collect data and evaluate the locust situation in border areas, thus contributing to prevent worsening of the locust situation, reduce tensions regarding the sources of locust invasions and to build the regional network of technical experts	○ Pursue joint and cross-border surveys, with gradual inclusion into the national budgets (envisaged co-funding with the Programme).
○ Automated System for Data Collection (ASDC) developed, tested, finalized and available in ten languages for use on tablets, smartphones and computers; training delivered on its use to the three pilot countries (2014/15) and ASDC introduced to three additional countries (2016) ○ Locust GIS in CCA, entitled "Caucasus and Central Asia Locust Management System" (CCALM): - Basic functions (data import, query, display and output): database developed and testing started during the 2016 locust campaign - Advanced functions (summary, analysis, forecast): technical specifications developed in late 2016 based on the work of a E-Committee made of CCA Forecast Experts and FAO staff/consultants aiming at gathering the required information on the three locust pests and defining the forecasting algorithms	○ Support the operational use of ASDC in all ten countries through: the delivery of required equipment (tablets); and technical assistance both for adequate completion of the forms by all national survey teams and for use of the system itself. ○ Support the development and then the operational use of CCALM in all ten countries with strong technical assistance and a reasonable timeframe of five additional years to do so. ○ Organize a workshop on locust forecasting to train Experts and allow them to take the best possible advantage of the GIS.
○ Contingency planning approach introduced for locust management during an ad-hoc workshop held in October 2015, in Pushkin, Russian Federation; common reflection held and methodological and practical tool available for managing locust-related risks, that each country can adapt and use at national level	○ Possibly implement a pilot activity on the preparation of a national contingency plan in one or more countries.

100. During the discussions, countries reiterated what had already been stressed at many occasions over the past years: the joint and cross-border surveys represented one of the most useful part of the Programme, both in terms of regional cooperation and better locust monitoring in border areas, thus preventing uncontrolled development of infestations. Countries agreed that such joint or cross-border surveys should absolutely be pursued. It was also repeated that FAO role had been key in making possible such activities, i.e. overcoming existing political tensions. It was said that FAO assistance was still needed to that end and some countries also indicated that such activities could be gradually included into the national budget, with a co-funding from the Programme.

101. Regarding the work carried out on ASDC and CCALM, several countries stressed that such tools represented the future and that the Programme had allowed creating a system for data collection, which was available in all languages and had been finalized with their contribution. It was of course recognized that this was an ongoing process and

indicated that support was required until both ASDC and CCALM be operationally used in all countries. Such support includes training as well as tablet delivery. Some discussions took place on the opportunity to use tablets rather than mobile phones or computers but in any case, it was said that all possibilities were now available for users to take into account a wide range of different national contexts.

Table 8. Result 4- Summary of achievements (2011-2016) and future required activities

<table>
<tr><th colspan="2">RESULT 4 - Improved response mechanism to locust outbreaks</th></tr>
<tr><td colspan="2">Baseline: Spraying of chemical pesticides was the predominant locust control method in CCA, mainly in full cover treatment and using emulsifiable concentrates (EC). Ultra-low volume (ULV) spraying was still marginal, with little knowledge available of this technology. Conventional chemicals, i.e. synthetic and organophosphates, were the most used in CCA, however with Insect Growth Regulators also present. No biopesticides were registered but with related research ongoing in two countries. Constraints mentioned by countries included lack or bad state of equipment, size of the infested areas, frequent vicinity to the neighboring countries and the related difficulty to anticipate further invasions by adult (winged) locust populations, fund shortage or delay in getting funding and lack of technical expertise.</td></tr>
<tr><th>2011-2016</th><th>Forthcoming years</th></tr>
<tr><td>Achievement: Response mechanisms to locust infestations improved thanks to the introduction and development of updated control methods and spraying techniques such as ULV technology, the strengthening of human and operational capacities and the promotion of less harmful pesticides and alternatives to conventional pesticides</td><td>Further objective: Response mechanisms to locust infestations further improved through increased use of updated and efficient techniques using less environmentally hazardous pesticides and formulations</td></tr>
<tr><td>Related activities:</td><td>Related activities:</td></tr>
<tr><td>○ Updated control methods and spraying techniques, including the ULV technology, introduced, developed and promoted through: provision of information at various occasions, a demonstration on EC and ULV spraying (Kyrgyzstan in October 2012), production of an advocacy video on ULV technology (2015) - see also hereafter.</td><td>○ Further assist in promoting updated control methods and spraying techniques, including ULV technology, targeting both decision-makers and control staff.</td></tr>
<tr><td>○ Human capacities strengthened on locust control: 123 Locust Experts from six countries trained during one regional session and eight national ones on locust control methods and spraying techniques - especially ULV- and including the use of GPS and sprayers calibration.</td><td>○ Continue strengthening human capacities for locust control, possibly using the already-mentioned ToT and coaching formula;
○ For the increasing number of countries using ULV sprayers, organize on-the-job training (within and outside CCA) of (young) mechanics/technicians for proper maintenance, calibration and functioning of that equipment.</td></tr>
</table>

○ Operational capacities strengthened on locust control: delivery of a limited number of ULV sprayers for demonstration purposes to most countries – resulting in purchase of more ULV sprayers, against national budgets, by a number of countries; substantial assistance being provided to Afghanistan, Kyrgyzstan and Tajikistan (2016/17); conventional pesticides in ULV formulation also delivered to Kyrgyzstan and Tajikistan, including through triangulation process from Morocco to Tajikistan.	○ Strengthen operational capacities for locust control for the in-need countries considering the importance to have the right quantity pf the appropriate equipment to be able to conduct adequate locust control operations.
○ Less harmful pesticides and alternatives to conventional pesticides promoted, including Insect Growth Regulators (IGRs) and biopesticides, through provision and exchange of information, internships on biopesticides for two CCA Experts (Australia) and production of two videos (advocacy and tutorial) on biopesticide use.	○ Support increased use of alternatives to conventional pesticides, in particular: - Insect Growth Regulators (IGRs) against hopper bands using the barrier spraying (video, demonstration, cost-benefit assessments, etc.); - biopesticides (field tests against the three CCA locust pests to facilitate their inclusion in the national list of registered pesticides and operational use).
○ Registration of more pesticides and sharing of information on pesticides encouraged: detailed information on pesticides registered and frequently used against locusts in CCA gathered and minimum list of pesticides for registration recommended (E-Committee, 2012); Participation of CCA Experts in the 10th meeting of the Pesticide Referee Group – PRG (Tunis, 2014) and the Stakeholder Workshop on procurement and supply of pesticides for locust control organized as follow-up of the PRG (FAO, Rome, 2015), and sharing of resulting recommendations with all CCA countries.	○ Update the work of the E-Committee on pesticides (dating 2012) for record (including for the next PRG meeting) and to support the registration of recommended pesticides at the national level.

102. During the discussions, countries reported further on recent progress on the use of the ULV technology and underlined how the Programme had been instrumental to that end. Georgia has been one of the first countries to switch to ULV technology, which is now predominant at the national level. The Delegates from Turkmenistan and Azerbaijan indicated that following the delivery of ULV sprayers by the Programme (in 2013 for demonstration purpose), their countries had purchased more units, which had proved to be very efficient. The Delegates indicated that in the 2016 campaign, the treatments realized with ULV technology had reached 90 percent in Turkmenistan, 70 percent in Kyrgyzstan and 62 percent in Azerbaijan. The Delegates from Kyrgyzstan and Turkmenistan also provided with the cost estimate of different control techniques and platforms (with ULV, EC, hang-glider and Antonov aircraft), showing that the ULV technology was the least expensive. The Delegate from Tajikistan supported a gradual transition, taking into account the advantages and disadvantages of both EC and ULV technologies.

Table 9. Result 5 - Summary of achievements (2011-2016) and future required activities

RESULT 5 - Impact on human health and the environment mitigated and monitored	
Baseline: *Insufficient attention dedicated to human health and environmental issues, although some mitigation measures were in place (training, guidelines, personal protective equipment -PPE, etc.) and local populations were usually well informed prior and during control operations; monitoring of spraying operations rarely done and potential impacts on human health and the environment rarely assessed. Constraints included: lack of know-how, guidelines and specialists; sometimes also insufficient awareness concerning the importance of these issues; and shortage of appropriate equipment.*	
2011-2016	**Forthcoming years**
Achievement: Impact of spraying operations on human health and environment better mitigated and monitored, including by the setting up of Human Health and Environmental Monitoring Teams in two countries, for the first time ever in CCA.	**Further objective**: Contribute to mitigate and monitor impact of locust control operations to through introduction of successful activities in as many CCA countries as possible.
Related activities:	Related activities:
○ Human capacities strengthened on mitigating and monitoring the impact on locust control on human health and the environment: 146 Locust Experts trained from nine CCA countries during two regional sessions, eight national ones and two on-the-job trainings.	○ Continue strengthening human capacities on mitigating and monitoring the impact on locust control on human health and the environment, possibly using the already-mentioned ToT and coaching formula.
○ Related operational capacities strengthened: delivery of PPE to most countries for demonstration purposes; delivery of cholinesterase kits as well as environmental monitoring and sampling material to Kyrgyzstan and Tajikistan for activities carried out in 2014 and 2015 (see below).	○ Strengthen operational capacities by delivering material for demonstration purpose in view of the training sessions.
○ National integral systems for environmental and health monitoring of locust control developed in two countries, Tajikistan (2014) and Kyrgyzstan (2015), as pilot activities; ○ As a result, Human Health and Environmental Monitoring Teams set up, for the first time ever in CCA, in Tajikistan (2015) and Kyrgyzstan (2016), with Programme operational and technical support.	○ Replicate the successful pilot activity to develop a national system for environmental and health monitoring of locust control in other CCA countries; ○ Support the setting-up of Human Health and Environmental Monitoring Teams, independent from Control Teams in other CCA countries; ○ Ensure the use of the CCA Spray Monitoring Form and link with ASDC and CCALM.
○ Monitoring of the health of locust control staff introduced through the use of cholinesterase kits (to measure exposure to organophosphates).	○ Strengthen monitoring of the health of locust control staff through: elaboration of a harmonized human health check-up protocol; development of insecticide use passport; broadening the coverage of cholinesterase monitoring (for countries using organophosphate insecticides); introducing biomonitoring of exposure to other key insecticides (e.g. urine analysis, immuno-assay kits); etc.

○ Methodology of pesticide residue analysis on vegetation developed and tested, with related gap identified, through a Study on the "Fate of insecticides used for locust control on pasture in Kyrgyzstan" (Bishkek Control Toxicological Laboratory).	○ After the review of the vegetation extraction procedure and establishment of a protocol following the international standards (scheduled in early 2017), send the latter to all countries for knowledge and experience sharing; ○ Ensure pesticide residue analysis from vegetation samples collected in Kyrgyzstan and Tajikistan by the Bishkek Control Toxicological Laboratory (as already planned) to establish realistic livestock withholding periods and crop pre-harvest intervals for the insecticides used in locust control.
○ Critical review of pesticides and empty containers management conducted, with formulation of related recommendations (2016), thus offering a basis to identify further steps.	○ Based on the recommendations of the review conducted in 2016, establish a plan of action for sound management of empty containers of pesticides used for locust control and implement it in at least one pilot country; ○ Develop standard operations procedures (SOPs) related to pesticide risk reduction on a number of topics (i.e. transfer of pesticides from drums to the hoppers of hand-held, knapsack, vehicle-mounted or aircraft sprayers and emptying of drums; triple-rinsing of empty metal and plastic drums of various size, etc.); ○ Review and improve pesticide storage warehouses.
○ Minimum list of information on safety measures to be adopted by local populations before, during and after control operations prepared, with a view of developing or improving existing extension material.	○ Support preparation of posters, flyers and other extension material for local populations.

103. During the discussions, countries confirmed that a growing attention had been paid to these issues, which were being addressed very seriously, and that further work to further improve all aspects of locust control with a view to mitigate and monitor impact on human health and the environment was required.

Table 10. Result 6 - Summary of achievements (2011-2016) and future required activities

RESULT 6 - Public information and awareness increased	
***Baseline**: Past emergency assistance for controlling locust outbreaks and reducing crop damage in CCA provided by FAO, donors and other partners during crises, with the recurrent FAO recommendation of developing long-term sustainable management. Contacts with traditional partners and potential donors made by FAO in 2008/09 to provide with an overview of the locust situations and increase awareness on the need to support such regional approach following the requests formulated by countries.*	
2011-2016	**Forthcoming years**
Achievement: Visibility of locust situations and management in CCA increased, allowing to obtain funding to implement all core Programme activities for the ten countries over the 2011-2016 period as well as additional support for some of them.	**Further objective**: Ensure visibility of all achievements over the 2011-2016 period and mobilize the required resources to implement the envisaged future Programme activities, including to support the sustainability of the results achieved so far.
Related activities:	Related activities:
○ Visibility of the locust issues and management in CCA increased, including the update of the FAO website "Locust Watch in CCA" and the preparation of some communication documents.	○ Increase efforts to enhance visibility of the results achieved so far and of additional needs, with preparation of communication products targeting both high-level decision-makers in the concerned CCA countries and international technical and financial partners.
○ This resulted in the approval of four projects contributing to the whole Programme (in addition to the initial USAID project that allowed Programme start), for a total available budget of USD 3.3 million as of the end of Year 4 (September 2015) and USD 8.3 million as of the end of Year 5 (Japan/JICA project).	○ Ensure resource mobilization for the implementation of all future envisaged activities, to the benefit of all ten CCA countries.

104. It was agreed, considering the overall discussions held under Item 17 of the Agenda on the way forward and in view of the end of the USAID project (the only one covering all CCA countries), that countries and FAO should engage jointly in resource mobilization for the coming years, with the objective to make sustainable the regional cooperation for locust management in CCA and to further strengthen capacities, in accordance with high-level best practices. Concerted actions would be needed to that end.

ANY OTHER BUSINESS

105. A presentation on climate change and locust pests was made by the Senior Locust Expert. The Delegate from Uzbekistan indicated that research should be carried out on this topic and funds needed to that end, asking for FAO assistance. This was supported by the Delegates of Tajikistan and Turkmenistan. The Senior Officer, Team Leader, AGPMM, indicated that there was certainly a need for applied research on the subject. As for the funding, the first step would be to prepare a Concept Note to that end. Given the experience and competencies available in the region, she therefore suggested that an E-Committee would be created to prepare it, based on the existing studies and observations. This would serve as a basis to seek funding for such applied research.

ADOPTION OF THE REPORT

106. Due to more time required than initially planned for Items 16 and 17 of the Agenda, it was agreed that the draft report would be prepared and shared with all countries for comments after the session.

107. This version takes into account all comments received and can therefore be considered as approved by all participants.

CLOSING REMARKS

108. During the closure session, the Chairperson gave the floor to the Delegates from each country. All of them expressed their high satisfaction and gratitude for the work accomplished over the past five years. They warmly thanked FAO, stressing once again the crucial role played in bringing countries all together and in having accompanied countries for capacities strengthening. All also reiterated the need to continue working together and implementing the Programme, building upon the extremely positive dynamics that had been created over the recent years.

109. The Delegate from Turkmenistan proposed to host the 2017 annual Technical Workshop on Locusts in CCA and contribute to its organization (should it be held, depending on available funds).

110. The Senior Locust Expert, the GIS Expert and the Locust Programme Officer greeted all participants, underlining how fruitful had been the work carried out jointly during the past years and wishing all the best for the future work. It was indicated that what appeared as a journey, which started all together several years ago, had been extremely interesting and motivating and that hopefully such a journey would continue, as per needs expressed and willingness of all participants.

111. The Senior Officer, Team Leader AGPMM, indicated that next steps would be the preparation and sharing by FAO of communication products, so that countries and FAO could ensure joint resource mobilization for the way forward. Then, she thanked the

hosting country, Kazakhstan, for its hospitality and the assistance provided in the workshop organization and its smooth running. She expressed her gratitude to all Delegates and beyond to all staff at the national level, who had contributed to make possible so many improvements and achievements in those past years. She also thanked the FAO team, staff and consultants, present or not during the workshop, who had worked hard for the success of the Programme. Last, she mentioned her appreciation to the donor representatives for having supported the Programme as well as for having attended the workshop. She concluded by underlining once again that a lot had been done, with a lot of energy and passion of all. She reiterated that all the possible would be done to organize an annual workshop in 2017.

112. The Representative of USAID in turn thanked Kazakhstan for the fantastic meeting as well as the FAO Colleagues for the huge work accomplished. He indicated that the progress made had been incredible from Programme start. This concerned: the regional cooperation between countries, which is far beyond what existed initially; the introduction and use of new technologies (such as ULV, ASDC and GIS); and the national capacities, which had been greatly developed. Overall, the goal had been reached. He also stressed the willingness of all countries to continue to further develop regional cooperation, whatever the form it would take, and to continue strengthening capacities, including by learning from each other. Regarding the next future, the Representative indicated that the USAID project evaluation should be conducted as soon as possible. He also said that the willingness of countries to continue working together was clear and that all knew what to do next. This would serve as a basis to make a case. All combined efforts would make a difference. The strength of the Delegates was their technical knowledge and that their commitment would make the difference at country level. Each of them had to advocate within their own Ministry of Agriculture to further support regional cooperation and the way forward.

113. The Senior Locust Expert, EMPRES Evaluator, shared his first impressions regarding the implementation of the CCA Programme over the 2011-2016 period, as part of the evaluation of the whole EMPRES Programme. He indicated that all what he had heard during the week was positive and that all presentations had showed that a lot of progresses had been made. He congratulated the countries for moving in the right direction and stressed that focus should now be put on sustainability, both of the results reached and of the existing regional cooperation. He concluded by indicating that it was up to the Delegates to convince their national authorities to work towards such sustainability.

114. Last, the Chairperson congratulated and thanked the FAO team and all participants for the work accomplished over the past years as well as for the active participation in the meeting. He reiterated his pleasure to have hosted such a fruitful and positive meeting and wished all a safe and good return home.

ANNEXES

Annex I - List of participants

NAME	TITLE & AFFILIATION	TEL.	E-MAIL ADDRESS	FULL ADDRESS
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EVENT MANAGEMENT COMPANY - Carlson Wagonlit Travel (CWT)				
Ms Paola Pieri	CWT Operator			
Ms Elena Gole	Hostess			

Annex II - Approved Agenda

Technical Workshop on Locusts in Caucasus and Central Asia (CCA)
Astana, Kazakhstan, 14-18 November 2016
Approved agenda

Opening

1. Opening address
2. Election of Chairman, Vice-Chairman & Drafting Committee
3. Adoption of the Agenda

Session 1: National locust campaigns in 2016 and forecasts for 2017

4. National locust campaigns in 2016 (countries' presentations)
5. Locust forecast for 2017 and preparation of the next campaigns (countries' presentations)

Session 2: Implementation of the Programme to improve locust management in Caucasus and Central Asia

6. Overview on Programme implementation in 2016 and funding situation
7. Regional cooperation in 2016
    a) Regular information sharing: monthly bulletins in the coming years
    b) Cross-border or joint surveys (countries' presentations):
        - Armenia – Azerbaijan – Georgia – Russia, May 2016
        - Kyrgyzstan – Uzbekistan, May 2016
        - Kyrgyzstan – Tajikistan, June 2016
        - Afghanistan – Tajikistan, July 2016
        - Tajikistan – Uzbekistan, August 2016
8. National capacities' development in 2016
    a) Internship on locust management (countries' presentations):
        - Afghanistan and Kyrgyzstan, February 2016
    b) Training-of-Trainers on locust management (countries' presentation):
        - Regional sessions:
            - Locust spraying and pesticide risk reduction, Afghanistan, Kyrgyzstan, Tajikistan and Uzbekistan, February 2016
            - Locust monitoring and information management, Afghanistan, Kyrgyzstan, Tajikistan and Uzbekistan, February/March 2016

- National sessions :
  - Locust monitoring and information management, Afghanistan, Kyrgyzstan and Tajikistan, April/May 2016
  - Use of the Automated System for Data Collection (ASDC), Tajikistan, July 2016 (refreshing courses and national sessions)
  - Locust spraying and pesticide risk reduction, Kyrgyzstan and Tajikistan, September/October 2016

c) Assessment of the Asian Migratory Locust situation and on-the-job training, Uzbekistan, August 2016 (country's presentation)
d) Update on fellowships on locust management
e) Update on the monographs of the three locust pests
f) Practical guidelines on the three locust pests in CCA
g) Equipment delivery to strengthen operational capacities in Afghanistan, Kyrgyzstan and Tajikistan (Japanese-funded project)

9. Programme of work during Year 6 (2017)

Session 3: Developing monitoring and analysing systems (Geographical Information System)

10. Developments of the Automated System of Data Collection (ASDC)

11. Developments of the Locust Geographical Information System (GIS) in CCA

Session 4: Risk reduction for human health and the environment

12. Mitigating impact of locust control operations:
    a) Pesticide and Empty Container Management, Tajikistan, July 2016 (country's presentation)
    b) Conclusions of the E-Committee on empty pesticide container management
    c) Practical guidelines on pesticide risk reduction
    d) Minimum list of information to be included in extension material for local populations

13. Monitoring impact of locust control operations:
    a) Activities carried out by the Human Health and Environment Monitoring Team in Kyrgyzstan and Tajikistan, lessons learnt and recommendations (country's presentation)
    b) Impact assessment of control operations and pesticide residue analysis

14. Progress made on safety and environmental precautions (countries' feedback)

15. Progress made on spraying technologies products and biopesticides (countries' feedback)

Session 5: Programme to improve locust management in Caucasus and Central Asia: results achieved and the way forward

16. Programme on locusts in CCA: results achieved (2011-2016)

17. Programme on locusts in CCA: the way forward

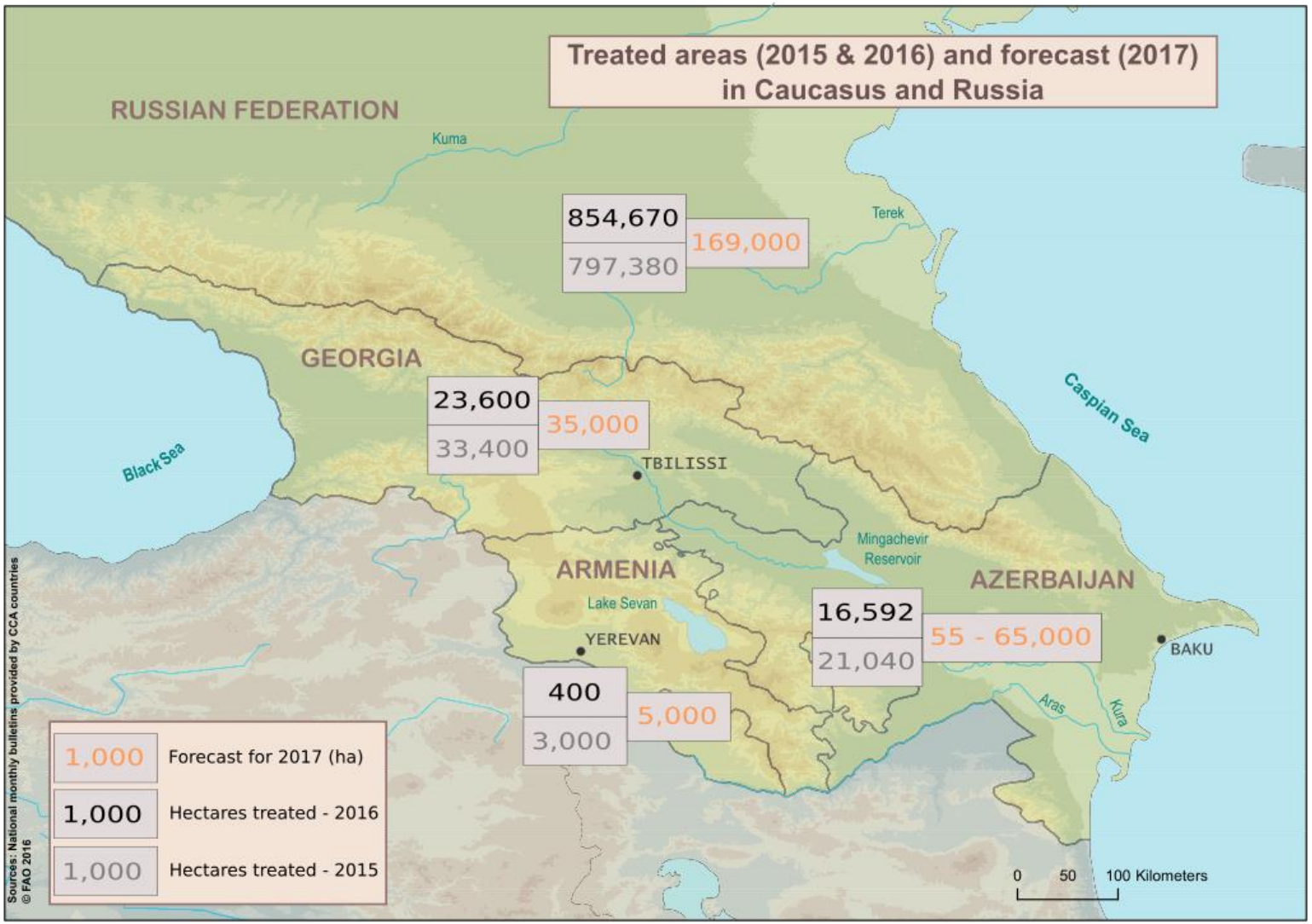
Closing

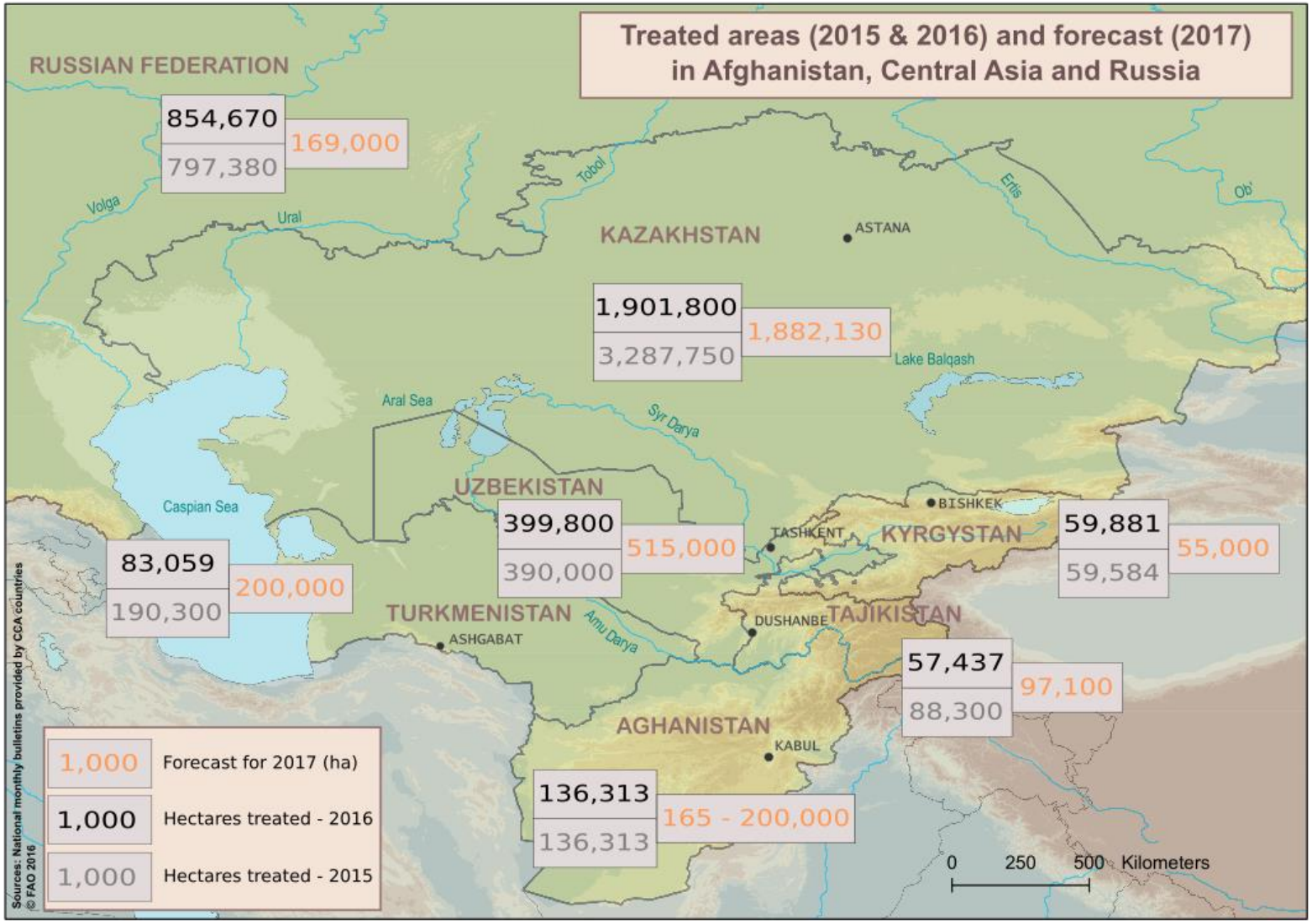
18. Any other business

19. Adoption of the report

20. Closure address

Annex III - Maps of treated areas in 2015 and 2016 and forecast for 2017 in CCA countries




Treated areas (2015 & 2016) and forecast (2017)
in Afghanistan, Central Asia and Russia
RUSSIAN FEDERATION
854,670
797,380
169,000
Volga
Ural
Tobol
Ertis
Ob'
KAZAKHSTAN
ASTANA
1,901,800
3,287,750
1,882,130
Lake Balqash
Aral Sea
Syr Darya
UZBEKISTAN
399,800
390,000
515,000
Caspian Sea
BISHKEK
TASHKENT
KYRGYSTAN
59,881
59,584
55,000
83,059
190,300
200,000
TURKMENISTAN
ASHGABAT
Amu Darya
DUSHANBE
TAJIKISTAN
57,437
88,300
97,100
AGHANISTAN
KABUL
136,313
136,313
165 - 200,000
1,000 Forecast for 2017 (ha)
1,000 Hectares treated - 2016
1,000 Hectares treated - 2015
Sources: National monthly bulletins provided by CCA countries
© FAO 2016
0 250 500 Kilometers

Annex IV - Table of expenditures for Year 5 (1st October 2015 - 30th September 2016)

Res. & Act.	Description	TOTAL USAID/ FTPP/ RP (USD) (1st Oct. 2015- 30 Sept. 2016)		USAID (USD)		Turkey (USD)		FAO RP (USD)		JPN/JICA (USD)	
		Budget Year 5	Exp5 Year 4	Budget Year 5	Exp. Year 5	Budget Year 5	Exp. Year 5	Budget Year 5	Exp. Year 5	Budget Year 5*	Exp. Year 5
R1 - Regional cooperation		**114,139**	**97,455**	**68,000**	**63,455**	**0**	**0**	**15,000**	**32,200**	**31,139**	**1,800**
1.1. Facilitate regional exchanges to manage locust situations		**114,139**	**97,455**	**68,000**	**63,455**			**15,000**	**32,200**	**31,139**	**1,800**
1.1.1. Create/maintain regular regional information sharing of standardized data		21,000	13,829	18,000	10,829			3,000	3,000	6,793	1,800
1.1.2. Allow direct experience exchange (technical workshop)		86,346	81,826	50,000	52,626			12,000	29,200	24,346	*0*
1.2. Develop coordination, including through transboundary policy		**0**	**0**								
1.3. Identify the best long-tem solution for sustainable regional cooperation		**0**	**0**								
R2 - National capacities		**151,658**	**22,743**	**0**	**17,105**	**134,658**	**5,638**	**17,000**	**0**	**399,342**	**199,767**
2.1. Build up capacities through a vast Training-of-Trainers (ToT) programme		**0**	**11,163**	**0**	**11,163**					**356,157**	**177,780**
2.2. Make available and accessible background documentation and literature		**17,000**	**5,942**	**0**	**5,942**			**17,000**	**0**	**19,894**	***0***
a	Bibliography & Material to be made available (E-committee on documentation)	0	0								
b	Monographies	0	0								
c	Practical guidelines	17,000	5,942	0	5,942			17,000	0		
2.3. Allow internships and post-graduate formation		**134,658**	**5,638**	**0**	**0**	**134,658**	**5,638**			**23,291**	**21,987**
a	One-month internships	0	0								
b	Fellowship: 2 or 3-year diploma for students	134,658	5,638			134,658	5,638				
2.4. Promote and support applied research		**0**	**0**								
a	Grants for applied research	0	0								
b	Entomological and chemical equipment for laboratories	0	0								
R3 - Locust issues and disasters better anticipated and mitigated		**143,500**	**140,892**	**115,000**	**107,706**	**20,000**	**24,886**	**8,500**	**8,300**	**743,854**	**105,440**
3.1. Improve survey operations for better field locust monitoring		**30,000**	**21,353**	**10,000**	**-3,533**	**20,000**	**24,886**			**668,159**	**59,937**
3.1.1. Strengthen human capacities (techn. assistance on survey)		30,000	24,886	10,000	0	20,000	24,886				
3.1.2. Strengthen operational capacities (survey equipment)		0	-3,533	0	-3,533					668,159	59,937
3.2. Organize regular cross-border surveys		**25,000**	**23,430**	**25,000**	**23,430**					**15,527**	**18,315**
3.3. Develop monitoring and analyzing systems		**45,000**	**48,722**	**45,000**	**48,722**					**60,168**	**27,188**
3.3.1. Extend use of Geographical Information System and remote sensing		45,000	48,722	45,000	48,722					60,168	27,188
3.3.2. Improve forecasting		0	0								
3.4. Enhance preparedness: harmonized national contingency plans		**43,500**	**47,387**	**35,000**	**39,087**			**8,500**	**8,300**	**0**	
R4- Improved response mechanisms to locust outbreaks		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2,150,045**	**988,971**
4.1. Allow early reaction and appropriate control operations		**0**	**0**							**2,150,045**	**988,971**
4.1.1. Strengthen human capacities (techn. assistance on control)		0	0								
4.1.2. Strengthen operational capacities (control equipment)		0	0							2,150,045	988,971
4.1.3. Enhance public-private partnership		0	0								
4.2. Promote less harmful pesticides and alternatives to conventional pesticides		**0**	**0**	**0**	**0**				**0**		
4.2.1. Develop ULV formulations and related techniques		0	0								
4.2.2. Propose alternatives to conventional pesticides (demonstration)		0	0								
4.2.3. Encourage registration of more pesticides		0	0								
4.3. Promote joint cross-border control operations		**0**	**0**								

Res. & Act.	Description	TOTAL USAID/ FTPP/ RP (USD) (1st Oct. 2015- 30 Sept. 2016)		USAID (USD)		Turkey (USD)		FAO RP (USD)		JPN/JICA (USD)	
		Budget Year 5	Exp5 Year 4	Budget Year 5	Exp. Year 5	Budget Year 5	Exp. Year 5	Budget Year 5	Exp. Year 5	Budget Year 5*	Exp. Year 5
R5 - Impact on human health & environment mitigated/monitored		**0**	**20,690**	**0**	**19,678**	**0**	**1,012**	**0**	**0**	**230,726**	**22,465**
5.1. Mitigate impact of locust control operations on human health & environment		**0**	**9,839**	**0**	**9,839**	**0**	**0**			**195,547**	**12,443**
5.1.1. Strengthen human capacities (techn. assistance)		0	9,839	0	9,839						
5.1.2. Strengthen operational capacities (PPE)		0	0							174,682	
5.1.3. Pesticides and empty containers management		0	0							16,983	12,043
5.1.4. Produce extension material for mitigating impact of locust treatments		0	0							3,882	400
5.2. Monitor impact of locust control operations on human health & environment		**0**	**10,851**	**0**	**9,839**	**0**	**1,012**			**35,179**	**10,022**
5.2.1. Strengthen human capacities (techn. assistance)		0	9,839	0	9,839						
5.2.2. Strengthen operational capacities (Testmate, environmental material, etc.)		0	0							8,734	
5.2.3. Develop integral system for environmental and health monitoring		0	1,012			0	1,012			14,557	10,022
5.2.4. Facilitate impact assessment & analysis of material (residue analysis)		0	0							11,888	
R6 - Public information and awareness increased		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
6.1. Develop awareness and education among local populations		**0**	**0**		**0**						
6.2. Enhance visibility of locust issues and management and of donor support		**0**	**0**		**0**						
6.2.1. Prepare and implement a communication plan		0	0								
6.2.2. Create and update a website on locusts in Caucasus and Central Asia		0	0								
Other		**166,987**	**51,797**	**85,000**	**0**	**81,987**	**41,097**	**0**	**10,700**	**249,345**	**93,151**
Coordination (Locust Programme Officer)		81,987	45,013			81,987	34,313	0	10,700	231,715	93,151
Evaluation		0	0								
FAO SEC		0	6,784				6,784				
TSS		85000	0	85,000	0					17,630	0
Sub-total		**4,349,596**	**1,743,371**	**268,000**	**207,944**	**236,645**	**72,633**	**40,500**	**51,200**	**3,804,451**	**1,411,594**
Support cost		**307,076**	**102,521**	10,000	**4,872**	30,764	**7,431**	0	**0**	**266,312**	**90,218**
Total		**585,909**	**344,080**	**278,000**	**212,816**	**267,409**	**80,064**	**40,500**	**51,200**	**4,070,763**	**1,501,812**

*The budget provided for the Japan/JICA project is for the first year of the project, i.e. from 3 December 2015 to 2 December 2016 while the expenditures are up to 30 September 2016 (end of Programme Year 5).

The darker cells under the Japan/JICA project refers to Activities which do not appear under the same Results in the project and in the Programme (both the CBS and coordination costs being under Result 1 of the proje

Annex V - Locust GIS in CCA

The GIS output products for analyzing Italian (CIT), Moroccan (DMA) and Asian Migratory (LMI) locust data and preparing forecasts, defined by the E-Committee (data analysis and forecast) and agreed by Delegates, are as follows:

- **Product N° 1 – "Monthly map of locust densities"** will be issued throughout each locust campaign for each locust pest (CIT, DMA and LMI) and for the following regions: the three Caucasian countries and Russia; the six Central Asian countries and Russia. The situation will be reflected for administrative territorial units of the first (oblast) or the second (rayon) level.

- **Product N° 2 – "Maps of areas infested above Economic Threshold (ET):** recent trends and average" will reflect the result of analysis of infested areas with density above ET at the level of the whole country and administrative territorial units over a 3-year period. Final maps will be issued every year and inform about any change in current year as compared with the previous two years as follows: danger (increase of more than 15%), caution (increase of less than 15%), and calm (no change or decrease).

- **Product N° 3 – "Maps of treated areas above ET":** recent trend and average" will be issued every year and inform about any change in treated areas in current year as compared with the previous two years: caution (increase of more than 15%) or calm (increase of less than 15% (in comparison with average multiyear level).

- **Product N° 4 – "Map of the level of threat"** will be issued for the current year and reflect the ratio (%) between treated and infested areas with densities above ET (i.e. which are subject to control operations) as follows: danger if there is any deviation (more, less or similar) by 25% and more and normal/multiyear average level in the case of an equal amount or increase/decrease under 25%.

- **Last experimental Product N° 5 – "The forecast of hatching periods"** will be carried out based on forecasted temperatures of soil (with a threshold of 10-12°C) and air.

It should also be noted that the Database Programmer suggested different options to create electronic maps such as: (1) a choice of locust species, countries, reporting period; (2) final maps (for a particular month) to be automatically distributed and to be laid out to the server; (3) colored image of the situation could be reflected in the administrative unit's contour and as a vertical diagram/column at the observation point; (4) different thresholds could be set for different situations.

Last, regarding the switch from the presently rented server to the FAO server, starting from 2017, the Information Technology Division (CIO) recommended to follow the FAO Software Development Process and Technology Guidelines (FAO technical standards) as far as the advanced functions (summary, analysis, forecast) of the locust GIS are concerned. After discussion with the Database Programmer and in liaison with the CIO Experts, the following was reiterated or agreed upon in September 2016: (1) The GIS will include ASDC field data, meteorological data, locust historical/statistical data, different types of maps, remote sensing products, etc.; (2) Database in GIS software is located on the server and users access it though a web-interface on the Internet; (3) Database software: PostGIS SQL; GIS software: QGIS or GeoServer; HTML JavaScript (JQuery) will be used to develop the interface; Cartographic information will be displayed with the help of OpenLayers and OpenStreetMap; WEB server will be Apache Tomcat.

Annex VI - Programme to improve national and regional locust management in CCA: the way forward

Taking into account the Programme Roadmap endorsed in October 2011 as well as the initial brainstorming conducted during the 2015 Technical Workshop, the Workshop allowed defining the way forward, i.e. discuss, refine and agree upon a common vision, objectives, results and activities for the coming years.

Objectives and strategy

The initial overall objective of the "Programme to improve national and regional locust management in CCA" remains valid: reduce occurrence and intensity of locust outbreaks in CCA, thus limiting threat or damage to crops and rangelands and safeguarding rural population food security and livelihood, as well as minimizing impact on human health and the environment.

Overall, all aspects of locust management have been addressed by the Programme, which has been partially implemented due to limited available funds. The following builds on the results achieved during the 2011-2016 period and is in continuity with what has been done so far. This being said, it is considered that the Programme should focus on the three following main directions in the coming years:

- **Towards the sustainability of the existing regional cooperation**
  The five-year period, from 2011 to 2016, has allowed both to agree on the importance of regional cooperation to successfully manage such transboundary plant pests and to create a technical network on locust issues between CCA countries. The existing regional technical network, which is the cornerstone of a successful regional management of locust transboundary plant pests, needs to be maintained and consolidated; a mechanism needs to be put in place to ensure that such regional cooperation will be pursued in the long term and beyond the Programme. In addition to already established working connections between the CCA countries, the regional cooperation would also benefit from the participation of other key players in transboundary locust management, namely, Iran and China.

- **Towards the implementation of an effective locust control preventive strategy**
  Treated areas in the ten CCA countries have varied annually from 1.9 to 6.9 million hectares (ha) between 2006 and 2015, with an average of annual 4.1 million ha treated. This represents a considerable area and everything has to be done/pursued, in the field and at national central level, where analyses are carried out and forecasts prepared, to understand better why such huge areas have to be treated recurrently and on how to reduce them on a sustainable manner. If well designed and implemented, the locust control preventive strategy and related field operations will contribute reducing the number of hectares annually infested and treated – In fact this also means reducing damage on crops and rangelands and contributing more to the preservation of food security and livelihood of highly vulnerable rural communities, reducing negative impact on human health and the environment and reducing financial costs. The locust control preventive strategy also proved to be the only one sustainable over the long-term from economic, social and environmental perspectives.

Preventive control consists in appropriate monitoring of locust populations at key periods of their development in order to allow early detection of changes in numbers, density and behavior. This monitoring and related data analysis result in adequate early warning and early reaction, which aim at

reducing occurrence and intensity of locust outbreaks and preventing their development into major upsurges, thus minimizing negative impact on food security and human health and the environment. To achieve this result, CCA countries may work in depth in several directions: a more precise identification and description of the hotspots (highly suitable habitats or becoming so under specific conditions to be defined) of the three species, thus allowing to target more precisely survey operations/itineraries; more accurate locust monitoring using well-defined forms, modern tools, i.e. the ASDC and GIS, enhanced analysis, forecast and reporting capacity.

- **Towards further harmonization and increase of knowledge and of best practices**
  The Programme has contributed to update and harmonize knowledge and practices and such work should continue. In addition, due to different initial contexts -in terms of human, operational and financial resources-, some countries have benefitted from far more assistance than others. Other countries also need more assistance. This comprises equipment, including transportation means, which are necessary to adequately conduct locust survey and control operations. Additional technical and operational assistance is required with a view of further supporting the implementation of world-wide recognized best practices on a number of topics related to locust management.

Expected results and activities

The Programme design, i.e. subdivisions between the various **Results** (Roadmap endorsed in October 2011), includes all main topics related to locust management. The **activities** to be carried out in the coming years (either pursued or newly introduced) fit in this framework. Such activities are presented hereafter.

Result 1 - Regional cooperation further developed

Activity 1.1. Facilitate regional exchanges to manage locust situations

- Regular regional information sharing of standardized data should be ensured by the preparation of **monthly national and regional bulletins on locust situations and management** during the locust campaigns. With a view to ensure the sustainability of the whole approach, each country should start ensuring the preparation of bulletins against its own budget, i.e. as part of normative work of a designated staff. It is essential that this activity be also linked as soon as possible with the Locust GIS in CCA (see Result 2). In addition, the entity responsible for preparing the regional bulletin in the future, either FAO or not, will also need to be agreed upon in the framework of the identification of a sustainable long-term solution for regional cooperation.

- To ensure direct experience exchange, the **Technical Workshops on Locusts in CCA** are considered as very important and should continue to be held on an annually basis. However, the duration of such Technical Workshop could be slightly reduced, as proposed by some countries in October 2015 (to be determined).

- As indicated by several CCA countries, develop liaison with some other neighboring countries, in particular Iran and China, which could be invited to participate as Observers during the annual workshops.

Activity 1.2. Develop coordination including through transboundary policy

- **Joint activities and intra-regional assistance** should be further promoted, including by transfer of competencies within the region (these topics are developed under Activity 2.1 on transfer of competencies and Activity 3.2 on cross-border or joint surveys). Movements of teams and transfer of equipment from one country to another could also be envisaged in the future (to be linked with Activity 1.3. hereafter).

Activity 1.3. Identify the best long-term solution for sustainable regional cooperation

- **Sustainable regional cooperation**: identify, refine, agree upon and implement the best possible mechanism to ensure long-term regional cooperation - i.e. the mechanism that appears the most appropriate for CCA countries, at technical, institutional, financial and any other relevant levels.

Result 2 - National capacities strengthened

Activity 2.1. Training-of-trainers

- It is recommended to extend the positive experience of the recently-held **Training-of-Trainers on locust management**, covering all main topics, to all CCA countries (as only three of them fully benefitted from this process and one partially). This allows preparing national staff both on substance and on how to deliver training to other experts. Such Master-Trainers become valuable resources, not only to deliver national sessions but also to organize refresher courses the following years, with FAO assistance if needed (according to topics, countries, Master-Trainers…). This is a very powerful tool to train many experts at the national level, thus benefitting to the country and the whole region.

- As indicated since Programme design, it is important to take advantage of the existing situation, i.e. the theoretical, operational and field knowledge already present in some CCA countries, to disseminate, harmonize and update competencies and technologies. To a certain extent, trainings have been delivered so far by Experts from outside CCA: the reasons were, thanks to FAO global technical network, to share best practices at world-wide level in addition to develop links between CCA and outside CCA Locust Experts. In addition to this world-wide transfer of knowledge, a further step forward would be to identify trainers within CCA and also to further develop the **coaching formula between CCA Experts**, which has been recently tested successfully during some of the national sessions of the Training-of-Trainers.

Activity 2.2. Background documentation

- A recommendation would be to ensure the translation of the **monographs** on the CCA locust pests, from Russian into English, since they are of interest for the overall scientific community and plant protection services of countries working on them (to be posted on the FAO website “Locust Watch in CCA”). This should be followed by their print-out and dispatch to the main research centers, universities and relevant plant protection services.

- **Practical guidelines**: after finalization of the two guidelines on the three CCA locust pests and on pesticide risk reduction of control operations (currently under preparation) and their upload on the FAO website “Locust Watch in CCA”, their translation (into Russian or English as needed) and

possibly other languages will be required as well as their print-out and dispatch to the plant protection services of the concerned countries (funding already available at least for one of the two guidelines). To complete the series, additional four practical guidelines would also be useful on: survey; information management and forecast; control; and campaign management.

Activity 2.3. Internships and post-graduate education

- **Internship**: All countries have benefitted from an internship in a performing center outside CCA, including seven countries in the National Center for Locust Control (CNLAA) of Morocco (all but Armenia, Turkmenistan and Uzbekistan). Such internships were considered as extremely useful to provide an overview of an Anti-Locust Center outside CCA, which applies the preventive locust control strategy, both as a single country and as a member of a region including ten countries. Additional internships could therefore be considered in the National Center for Locust Control of Morocco for Turkmenistan and Uzbekistan (the need appears to be less important for Armenia in view of the locust infestations occurring in this country) as well as for other countries, should they countries express interest in doing so.

Activity 2.4. Applied research

- Another recommendation concerns **applied research**. Based on the observation that several institutes in CCA involved in locust research have a long history and very good specialists but face severe lack of funds, support to applied research had been inserted in the Programme Roadmap. In the initial five-year period, and taking into account the available resources, focus was put on other aspects and more urgent needs. At this stage, however, it would be appropriate to address it. This could include applied research on more precise identification of the hotspots of the three locust species, thus allowing to target more precisely survey operations for a better locust monitoring as the basis of the locust preventive strategy. In October 2015, research on biological control had also been indicated as a topic to be further explored, possibly by several institutes in CCA. In addition, a number of topics, which could be addressed to the benefit of all CCA countries, had also been identified by the E-Committee on Fellowships. It should be recalled here that in October 2011, at Programme launch, two grants had been envisaged for applied research. Should funds become available, it was said that an E-Committee should be established to select the topic(s) and institute(s) and that this E-Committee should be composed of independent experts from countries outside CCA to ensure absence of conflict of interest. It was also underlined that the selected topics should be of interest for all CCA countries. Finally, it had been agreed that a call for interest would be issued (in accordance with FAO rules), with clear and transparent selection criteria.

Result 3 - Locust issues and disasters better anticipated and mitigated

Activity 3.1. Improve survey operations for better locust monitoring

- Strengthening **human capacities for locust monitoring**: in view of the progress made on locust monitoring but also of the disparities which still exist between countries and the necessity to extend the knowledge gained by the trainees to all Locust Experts at the national level, it is recommended that more trainings be carried out, possibly using the ToT formula; the already-mentioned coaching formula could also be further developed for national sessions.

- Strengthening **operational capacities for locust monitoring**: apart from Afghanistan, Kyrgyzstan and Tajikistan, which currently benefit from an extensive assistance thanks to the Japan/JICA funded project, some other countries may need assistance considering the importance to have the necessary equipment to be able to conduct adequate survey operations, monitor locust situation and anticipate outbreaks.

Activity 3.2. Organize regular cross-border surveys

- Pursue the **joint and cross-border surveys**, taking into account countries' request for an increased duration to allow better joint monitoring of the locust situation in border areas. Although the Programme would continue to support such extremely useful and key activities, such joint and cross-border surveys should be gradually integrated in the annual national plans, thus included in a specific budget line.

Activity 3.3. Develop monitoring and analyzing systems

- **Automated System for Data Collection**: with the overall objective that all CCA countries operationally use ASDC for locust monitoring, thus collect standardized data, support will be needed in terms of: (a) required equipment (tablets) - specific needs of each country were discussed during the Workshop to that end; and (b) technical assistance for two aspects: adequate filling of the forms by all national survey teams and use of the system itself (to be inserted in the above-mentioned ToT, including with the coaching formula).

- **Locust GIS in CCA**: after development of the GIS advanced functions in late 2016/early 2017, the recommendations concern **GIS testing** (basic and advanced functions together – at least during Year 6 but probably longer), to review it as needed on this basis and to allow its **operational** use in all CCA countries. Strong technical assistance will be required to that end, with a reasonable timeframe of five additional years to do so. This should include a **forecasting workshop** (already included in the Roadmap) to train Forecast Experts and allow them to take best possible advantage of the GIS. While the system will be initially hosted by FAO, discussions should also take place on its use in the long run (to be linked to the mechanism to be adopted for long-term regional cooperation – see Result 1).

Activity 3.4. Enhance preparedness for risk reduction through harmonized national contingency plans

- Following the introduction of the contingency planning approach for locust management (October 2015), it would be recommended that as a pilot activity, one or more country(ies) prepare with FAO assistance a national **contingency plan**, based on the proposed canvas and share lessons learnt with the other CCA countries during the following annual workshop.

Result 4 - Improved response mechanisms to locust outbreaks

Activity 4.1. Allow early reaction and appropriate control operations

- Strengthening **human capacities for locust control**: further required support should be discussed with countries. In any case, the ToT and coaching formula should include this very important topic.

- Strengthening **operational capacities for locust control**: apart from Afghanistan, Kyrgyzstan and Tajikistan, some other countries may need assistance considering the importance to have the appropriate equipment in the right quantity to be able to conduct adequate locust control operations.

- For the countries which have an important quantity of ULV sprayers (to be discussed), **on-the-job training of (young) mechanics/technicians** is also suggested to ensure proper maintenance, calibration and functioning of that equipment; such training could be conducted in countries having a long experience in locust control with ULV equipment, such as Morocco or some other Desert Locust affected countries.

Activity 4.2. Promote less harmful pesticides and alternatives to conventional pesticides

- The **ULV technology** has been widely presented and promoted during the 2011-2016 period. Technical assistance is further required for the countries that are willing to develop its use, at various levels: registration of ULV pesticides[11]; promotion targeting decision-makers (including by developing easily understandable cost-benefit assessments of various control options, including EC and ULV spraying); training: all control agents involved in ULV spraying should receive a specialized training and then regular refresher courses at the national level; and related equipment. Countries should express their views regarding any future required support.

- Further attention should be paid to the development of the use of alternatives to conventional pesticides. This includes more use of the **Insect Growth Regulators** (IGRs), which were registered in at least eight countries (as of 2012)[12]. IGRs allow to control quickly hopper bands infesting huge areas using the barrier treatment technique, which reinforces their lower impact on human health and the environment as compared to conventional pesticides. Promotion of IGRs could occur through the preparation of a video on their use, cost-benefit assessments of barrier treatments vs. blanket treatments, operational demonstrations of their use, attended by CCA Experts, etc.

- In addition, as far as **biopesticides** are concerned, field tests using conidia of *Metarhizium acridum* could be conducted against the three CCA locust pests with the objective would be to facilitate its inclusion in the national list of registered pesticides and operational use.

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[11] Related actions may include: make optimal use of existing efficacy and risk data compiled by the PRG; Make available studies from the PRG database to registration authorities in CCA; Make available (already existing) protocols for local field trials; Establish agreement for mutual acceptance of efficacy trial data within CCA, based on the agreed protocols; Ensure exchange of efficacy trial results among CCA countries; Incite pesticide companies to conduct local efficacy trials, because they know that the results of their investments will be shared among countries and are this more cost-effective; Increase the role of the E-Committee on Pesticides as "technical advisory body" on locust control to national registration authorities, etc.

[12] None in Armenia and no information available for Afghanistan. Source: Report of the E-Committee on pesticides, FAO, 2012 (Technical Workshop on Locusts in Caucasus and Central Asia (CCA), 12-16 November 2012, Bishkek, Kyrgyzstan).

- The work of the E-Committee on pesticides (dating 2012) may be updated, for record (including for the next PRG meeting) and to support the registration of recommended pesticides at the national level.

Result 5 - Impact on human health and the environment mitigated and monitored

Activities 5.1. & 5.2. Mitigate & Monitor impact of locust control operations on human health and the environment

- Strengthening **human** and **operational capacities** (Activities 5.1.2, 5.1.2, 5.2.1 & 5.2.2): as indicated, attention paid to human health and environment is unequal according to the countries. The ToT and coaching formula should definitely include this very important topic. The related training material should also be delivered at these occasions and while implementing other activities as below-mentioned.

Activity 5.1. Mitigate impact of locust control operations on human health and the environment

In addition to a number of activities proposed under the above-mentioned results, which contribute to reduce human health and environmental impact of locust operations, the following could be envisaged:

- Regarding **management of empty containers of pesticides used for locust control (Activity 5.1.3)**, a plan of action could be established based on the recommendations of the review conducted in 2016 and it should then be implemented at least in pilot countries (at least one).

- **Standard operations procedures – SOPs (Activity 5.1.3 and possibly others)**, which still do not exist at the international level on specific topics related to pesticide risk reduction should be prepared by FAO to the benefit of all member countries, including in Russian language. A review should be conducted by FAO to that end. Recently, while implementing activities under the CCA Programme, at least the need for SOPs on: the transfer of pesticides from drums (of various sizes) to hand-held, knapsack, vehicle-mounted or aircraft sprayers and emptying of drums; and the triple-rinsing of empty metal and plastic drums of various sizes had been identified.

- Review of the **pesticide storage warehouses** (**Activity 5.1.3)** should also be conducted by the countries themselves using the FAO pesticide storage guidelines as a reference to identify improvements in storage infrastructure and practices.

- **Extension material for staff and for local populations** (**Activities 5.1.4 & 6.1)**[13]: based on experience gained in other parts of the world, preparation of posters, flyers and other documents for local populations can be supported.

[13] The Roadmap includes both Activity 5.1.4- Produce extension material (posters, leaflets, booklets, etc.) and ensure translation into national languages (initially intended for staff) and Activity 6.1. (a)- Produce, translate (English/Russian/national languages) and dispatch extension documentation to local populations and schools.

Activity 5.2. Monitor impact of locust control operations on human health and the environment

- It is recommended that the successful activities to develop a **national system for environmental and health monitoring of locust control (Activity 5.2.3),** which were conducted in Tajikistan and Kyrgyzstan as a pilot activity, be replicated in as many as possible other CCA countries. This concretely means assistance by high-level experts in order to review the existing situation against international standards and on this basis formulation of targeted recommendations as per each country needs as well as development of a number of tools immediately useable.

- In addition, the setting up of **Human Health and Environmental Monitoring Team (Activity 5.2.3)**, independent from control teams, is recommended; they have been an important step ahead in Kyrgyzstan and Tajikistan, should be considered by other CCA countries. Technical assistance can be provided to that end.

- As it is essential to collect accurate and complete information to properly monitor impact of locust treatments, as a minimum, countries should ensure the **use of the CCA Spray Monitoring Form (Activity 5.2.3)**, which is the basis of the **ASDC** system and will feed the **Locust GIS in CCA**. The final part of the Spray Monitoring Form specifically refers to the minimum information needed for monitoring the locust control operations from the human health and environmental perspective (fields added during the 2015 annual workshop). As far as the GIS is concerned, ecological and land-use maps should be incorporated in the system to allow environmental evaluations and guide environmental monitoring.

- **Strengthened monitoring of the health of locust control staff** may be done through various activities, such as: elaboration of a harmonized human health check-up protocol, relevant for adverse insecticide effects and intended for medical staff; further introduction of the insecticide use passport; broadening the coverage of cholinesterase monitoring (for countries using organophosphate insecticides); introducing biomonitoring of exposure to other key insecticides (e.g. urine analysis, immuno-assay kits); initiating an epidemiological study in the possible long-term operator health effects of insecticides used for locust control (with national health institutes).

- **Pesticide residue analysis and impact assessment (Activity 5.2.4):** after the review of the vegetation extraction procedure and establishment of a protocol following the international standards, send the latter to all countries for knowledge and experience sharing; also ensure pesticide residue analysis from samples collected in Kyrgyzstan and Tajikistan by the Bishkek laboratory of control operations, as already planned in the Japan/JICA project. The establishment of realistic livestock withholding periods and crop pre-harvest intervals for the insecticides used in locust control will result in residue levels that do not pose risks to human and animal health.

Result 6 - Public information and awareness increased

Activity 6.2. Enhance visibility of locust issues and management, and of related donor support

- **Visibility of locust issues and management**: efforts should be made to increase **visibility** of the results reached so far and of the additional needs; communication should target both the high-level decision makers in the concerned CCA countries and the international technical and financial partners; this can be achieved through the design of a **communication plan** and related specific **communication products** on the Programme as well as the availability of an updated, modern version of the **website** "Locust Watch in CCA", acting as a showcase for the Programme and a basis for resource mobilization.

- **Resource mobilization**: countries and FAO should engage jointly in resource mobilization for the coming years, with the objective to make sustainable the regional cooperation on locusts in CCA and to further strengthen capacities, in accordance with high-level best practices.

Annex VII - Bilingual List of National Technical Focal Points

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