



Food and Agriculture Organization
of the United Nations

**WORKSHOP ON LOCUST DATA COLLECTION,
ANALYSIS, FORECAST AND REPORTING IN
CAUCASUS AND CENTRAL ASIA (CCA)**

13 March 2024

REPORT

Food and Agriculture Organization of the United Nations

Rome, 2024

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List of acronyms and abbreviations

ASDC	Automated System of Data Collection
CCA	Caucasus and Central Asia
CCALM	Caucasus and Central Asia Locust Management System
CIT	<i>Calliptamus italicus</i> (Linnaeus 1758), Italian Locust
DMA	<i>Dociostaurus maroccanus</i> (Thunberg 1815), Moroccan Locust
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information System
ha	Hectare
ISTT	Institute of Space Technique and Technologies (Almaty, Kazakhstan)
JICA	Japan International Cooperation Agency
LMI	<i>Locusta migratoria migratoria</i> (Linnaeus 1758), Asian Migratory Locust
NSP	Plant Production and Protection Division (FAO)
NSPMD	“Locusts and Transboundary Plant Pests and Diseases” Team (FAO)
NDSI	Normalized Difference Snow Index
NDVI	Normalized Difference Vegetation Index
NDWI	Normalized Difference Water Index
ToT	Training-of-Trainers
USAID	United States Agency for International Development

OPENING

Introduction, round of presentation and adoption of the Agenda (Items 1 and 2)

1. The Workshop on locust data collection, analysis, forecast and reporting in Caucasus and Central Asia (CCA) took place online on 13 March 2024. It was organized by the Food and Agriculture Organization of the United Nations (FAO) in the framework of the interregional and multi-funded “Programme to improve national and regional locust management in Caucasus and Central Asia (CCA)” (Programme).
2. Representatives from Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan and Uzbekistan, as well as resource persons from Afghanistan, participated in this Geographic Information System (GIS) Workshop. Besides, the participants included Representatives from FAO-Headquarters and decentralized offices as well as the Software developer from the Institute of Space Technique and Technologies (ISTT) Almaty, Kazakhstan. The list of participants (with up to 50 experts online simultaneously) is provided in Annex 1.
3. Mr Alexandre Latchininsky, International consultant, Senior Locust Management Expert, opened the Workshop and welcomed all participants. He said that this is fifth GIS workshop organized. Such highly specialized GIS Workshop have been mostly held remotely during the first quarter of every year, thanks to the projects funded by the Japanese International Cooperation Agency - JICA (GCP/INT/384/JCA), the United States Agency for International Development - USAID (GCP/GLO/917/USA) and the FAO Regular Programme. The objectives are to discuss the practical use and management of the Automated System for Data Collection (ASDC) and of the “Caucasus and Central Asia Locust Management System” (CCALM), with a view to improve data collection, validation, analysis, forecast and reporting for early warning and timely locust control. Such Workshops also aim at improving jointly the GIS in addition to promoting experience exchange, problem solving and network creation between staff responsible for ASDC and CCALM management in CCA countries. It was underlined that the GIS Workshop targets specifically the staff responsible for the use and management of ASDC and CCALM at the national level, in the ten CCA countries covered by the FAO Programme.
4. A round of presentations allowed the Delegates from the participating countries to introduce themselves and afterwards the provisional agenda was presented and endorsed, as provided in Annex 2. An overview of the development, introduction and use of the locust GIS in CCA (2013-2023) was also briefly provided (given in Annex 3).

SESSION 1: LOCUST DATA COLLECTION

Use of the Automated System for Data Collection (ASDC) during the 2023 locust campaign: challenges, solutions, etc. (Item 3)

5. Countries provided insights on ASDC use and related issues during the 2023 locust campaigns, including: availability of tablets/smartphones; training sessions and users; extent of use (number of records and geographic coverage) during locust surveys and control operations; problems/difficulties met by staff; lessons learned and recommendations to improve ASDC functionalities.

6. The Delegate of Azerbaijan noted the importance of ASDC and CCALM for the Agrarian Services Agency (ASA). He underlined that out of the 61 tablets delivered by FAO, 34 are used in the field (15 are not) and 12 tablets do not function anymore. At present time, all regional centers are equipped with tablets or smartphones. In 2023, the national briefing sessions were delivered by three Master-Trainers (MT) in five regions to the benefit of 95 staff from ASA, representing 31 districts. In addition, five briefing sessions on locust control and risk reduction were conducted from 5 May until 7 July for a total of 80 specialists from 19 districts. Training materials, presentations and publications provided by FAO, were translated in Azeri, and distributed. All briefing sessions included practice on estimating locust density and developmental stage as well as ASDC use. The intention is to improve the work in 2024 and increase the number of ASDC records to cover all locust surveys, especially in the places of high locust density. The recommendations to FAO included the organization of a new training course on QGIS, CCALM use for MT. The Delegate of Azerbaijan noted the importance of the practical parts in such training, to be taken into account in the agenda. He also underlined that in 2023, the treated area decreased by three times compared to 2022. Totally 889 reports were made covering 48 591 hectares (ha) of surveyed and 8392 ha of treated areas. ASDC coverage represents 83 percent of the total infested areas and 78 percent of the treated areas.
7. The Delegate of Armenia indicated that in 2023, following national sessions conducted on 18 April for ten agronomists of the State Non-Commercial Organization (SNCO) "Agricultural Services Centre", Ministry of Economy (MoE) and on 25-29 April for local farmers and responsible staff at local administrations in ten regions, a training was further delivered on 9-13 May to 20 SNCO experts and agronomists by the FAO Senior Locust Management Expert and the GIS Expert. All these sessions allowed to use ASDC during locust survey with paying special attention to bordering districts. In terms of recommendation, the need to carry out more trainings was stressed, especially for new staff. She noted that in 2023, 221 reports were made by 20 Locust Experts.
8. The Delegate of Georgia underlined that in 2023, ASDC program was used both during locust survey and control operations on tablets/smartphones. No paper form is used anymore. Several national briefing sessions were delivered by the MT 2023. This helped receiving 919 ASDC records during surveys on 232 114 ha and 814 during treatments on 73 909 ha. ASDC coverage represents 78 percent of the total infested areas and 88 percent of the treated areas. The Delegate of Georgia noted that staff instruction on locust monitoring and control includes mandatory ASDC use. He also highlighted that the use of ASDC and CCALM helps to make quick decision, especially during locust treatment time, and that it also allows enhancing the quality of locust data. The Delegate of Georgia mentioned the difficulties met during 2023 summer related to the rainy weather, resulting in late locust treatment and less ASDC use.
9. The Delegate of Kazakhstan informed that out of the 20 tablets delivered by FAO, 12 ones had been transferred to local specialists for use during the 2023 locust campaign. In February, MT trained the agronomists on how to use ASDC. The Delegate underlined that presently there are ASDC users in nine oblasts. But she mentioned, as constraints, the weak internet, non-receipt of geographical coordinates and non-sending of records from the field.
10. The Delegate of Kyrgyzstan informed that out of 47 tablets delivered by FAO, 20 tablets had been used during 2023 locust campaign. He noted that a large amount of the tablets delivered by FAO are

no longer functional due to their physical obsolescence and breakage. The three MT having a large experience of ASDC use continue to work in plant protection service and they follow-up on ASDC use. They conducted trainings before the locust season with assistance of two new specialists. A total of 167 ASDC records were made during 2023, including 100 records during survey on 33 283 ha and 67 records during treatments on 21 762 ha. The data from 2020 paper forms were being entered into CCALM database through WEB-interface.

11. The Delegate of the Russian Federation reminded that the Russian Agricultural Center (Rosselhozcenter) had developed its own digital phytosanitary monitoring system and uses 1413 smartphones for field data collection. He noted that with the help of CCALM, the locust situation is closely monitored in the districts close to the national boundaries. He indicated that in parallel more than 20 specialists made 397 ASDC records in 2023 during survey operations on 76 037 ha and anti-locust treatments on 7781 ha in Saratov, Orenburg and Volgograd oblasts and Stavropol territory. The Delegate noted that ASDC data are about 1% of full volume of locust observations in the Russian Federation. He remarked also that the training of specialists is important because the reliability of information depends on experience and knowledge.
12. The Delegate of Tajikistan, after having thanked FAO for the organization of a training in Bokhtar in February 2024, remarked that ASDC data in 2023 were limited because a significant part of tablets was not functioning- however, 20 new tablets have been delivered by FAO at the time of the workshop. He underlined that the Minister of Agriculture supports the use of digital technologies and had ordered that ASDC be used and that the data be entered into the database. The MT will control this process during the forthcoming campaign.
13. The Delegate of Turkmenistan indicated that ASDC and CCALM are important and informative for plant protection specialists and students. At present time, 24 tablets have been delivered by FAO and will be used for locust monitoring. She thanked the FAO International Experts for the training delivered in 2023 and 2024 to the benefit of staff from the different *vilayats*. So far, ASDC has been used in test mode only. The Delegate expressed the hope that in 2024 the Turkmen locust experts will be skilled enough to collect ASDC field data during the locust survey. She emphasized that CCALM is useful for the science and for monitoring of other pests as well and recommended FAO to organize a course on QGIS for Turkmen specialists.
14. The Delegate of Uzbekistan mentioned that 64 staff and specialists were trained in 2023 with the help of MT from the Agency for Quarantine and Plant Protection (AQPP) and its Scientific Research Institute of quarantine and plant protection, Ministry of Agriculture (MoA) and with the support of the JICA-funded project. In 2023, a total of 5204 records were made by 104 AQPP locust experts during survey and control operations on 604 496 ha.
15. Ms Nadiya Muratova, FAO International Consultant, GIS Expert, provided an overview of ASDC use in CCA during Programme Year 12 (1st October 2022 to 30 September 2023). She indicated that as of 30 September 2023, a total of 11 556 records, made by 318 ASDC users, were recorded from the ten CCA countries (including test forms as far as Turkmenistan is concerned). The number of records thus doubled with respect to the previous year (5681 records in 2022). The GIS Expert underlined that ASDC coverage in Azerbaijan and Georgia reached 80 percent and 90 percent of the total infested/treated areas respectively and mentioned the significant increase in the number of ASDC

records in Afghanistan and Uzbekistan. She expressed the hope that the trainings of locust specialists planned in six countries, mainly in Central Asia, in early 2024 will facilitate the progress during the forthcoming campaign and that ASDC will be used as widely as possible during locust surveys and control operations.

16. During the discussions, the Senior Locust Management Expert underlined the good result of Uzbekistan on ASDC use as well as in several other countries. The Delegate of Georgia thanked FAO for the huge work done because ASDC and CCALM help in operational activities. He noted that both systems are developed professionally and represent a good instrument for locust monitoring.

Use of the special test mode of ASDC during national trainings (Item 4)

17. The FAO International Consultant, GIS Expert, reminded that in 2023 a new test mode was introduced in ASDC. This possibility allows to facilitate the distinction between real and test forms, which are filled out during trainings. The users can now mark the test form at the end of both “Locust Survey Form” and “Spray Monitoring Form” in ASDC. She asked to mandatorily use this option when appropriate and to inform/train specialists on this during national briefing sessions.

SESSION 2: LOCUST DATA ANALYSIS & FORECAST

Synchronization of locust survey data between the Caucasus and Central Asia Management System (CCALM) and the Russian and Kazakh locust Geographic Information Systems (GIS) (Item 5)

18. The Delegate from the Russian Federation thanked for FAO proposal to improve the data exchange module between the Russian “Agroexpert” and FAO CCALM GIS, so that the data provided be fully in line with the ASDC locust survey form. For this, he suggested to send (by e-mail) the description of two parameters - «Type of biotope» and «Infested area», which are absent presently in the list of data transferred from the system “Agroexpert” into CCALM.
19. The Delegate of Kazakhstan explained that at present time the Joint Stock National Company “Kazakhstan Garysh Sapary” (Kazakh GIS developers) works on the Kazakh database «FitoKZ» to change its software. She suggested that a meeting be held at the beginning of April 2024, between representatives from the “Republican Methodological Center for Phytosanitary Diagnostics and Forecasts” of the State Inspection Committee in the Agro-Industrial Complex, MoA, and the FAO GIS expert together with CCALM developer, to discuss all problems connected with data automatic exchange between CCALM and FitoKZ.

Use of the satellite products in CCALM to analyze locust situation (Item 6)

20. The Delegate of Azerbaijan noted that CCALM gives a good opportunity to get satellite products during locust season. He underlined however that Azeri specialists could not fully use this source because of poorly trained personnel. He noted that initial QGIS course will be organized and asked FAO to deliver in-deep CCALM/QGIS introduction. The FAO GIS Expert asked to give feedback on the initial QGIS course once held, with the list of the participants, the program and the skills get.
21. The Delegate of Georgia noted that the national briefing sessions delivered by Georgian MT include CCALM use. All MT are responsible to increase capacities of staff for ASDC and CCALM use. In practice, CCALM is used to get the data of areas treated in each municipality and also weather data including

soil and air temperature and amount of precipitation. This weather information is derived from CCALM satellite data.

22. During the discussions, a participant from the Russian Federation highlighted the good experience and increasing knowledge of Georgia in ASDC and CCALM use, particularly satellite products. He suggested that Georgian MT could train other neighbor countries on these subjects. On his question on data quality control, the Delegate of Georgia explained that the activities of employees are mainly monitored using CCALM. Concerning data quality, during two-day trainings, new staff do not have time to fully learn how to use the systems. He underlined however that presently there are many experienced specialists who provide valuable information and point out errors of others ASDC users.
23. The Senior Locust Management Expert underlined that satellite products are important. Their interpretation depends on user's experience. He also noted that CCALM training is necessary for CCA countries for more widely use of the system.

CCALM use to improve locust data analysis and forecast: (a) Selection of mark points (most frequently visited areas to monitor the locust situation) and warning message of temperature passing above a threshold value; (b) Analysis of locust density during last five years in the mark points (Item 7)

24. The GIS Expert noted that presently CCALM keeps locust data for ten years, which allows (a) calculating the average egg-pod/locust density on the site/rayon area and comparison of the density of current year with the previous year; (b) documenting the transition from solitarious to gregarious phase; and (c) getting coordinates of locust egg-pods and thus determine of locust habitats. The Delegate of Georgia suggested to FAO to prepare and issue a manual on CCALM/QGIS use specifically for analysis locust situation and forecast on the basis of ASDC data.
25. The ISTT Software Developer reminded that during the E-Committee on ASDC and CCALM held in July 2023, the possibility to set "Warning" messages in CCALM was discussed. In this respect, mark points should be determined by authorized or privileged operators. To set up such warning message, the operator should prepare a special record in CCALM, which should include: latitude, longitude, the person's name, the creation date and the values of soil temperature (as an example). The warning will be issued when the temperature exceeds or goes lower than the set one. A with a single; afterwards, no more message is generated.
26. During the related discussions, the Delegate of the Russian Federation asked for instructions on how to use this feature and mark some points. The ISTT Software Developer promised to issue such manual when the test stage will start in the end of 2024. In reply to a question from the Delegate of Azerbaijan on the number of the control/mark points, the ISTT Software Developer answered that there is no limitation.
27. The second development in CCALM concerns the analysis of locust multiyear densities. The ISTT Software Developer explained that, for the determination of the areas in which the average density during the last five years will be calculated, the same mark points will be used as well as the radius around ASDC survey points. This will also be determined by authorized or privileged operators.
28. The Delegate of the Russian Federation remarked that for calculating the density over several years, it is necessary to have multiyear data and that it is difficult to keep such big volumes of data. The ISTT

Software Developer explained that all ASDC data have been kept since its launch in 2014. Concerning satellite products, they are kept two years for the Normalized Difference Vegetation Index (NDVI), Normalized Difference Snow Index (NDSI), Normalized Difference Water Index (NDWI) and for three years as far as temperature and precipitation information is concerned.

29. The Senior Locust Management Expert noted that weather condition influences locust situation only during the two previous years. He provided the example that the situation in 2024 is mainly affected by conditions in 2023 and to a lesser extent in 2022. His recommendation was therefore to keep the CCALM satellite products during three years.

CCALM use to improve locust data analysis and forecast: any other aspects (item 8)

30. The Delegate of Georgia asked about the possibility to transfer the national part of CCALM data to Georgia. The ISTT Software Developer explained that currently there is only one way to save the data from Georgia, using QGIS project. Other ways may be possible in the future and must be discussed with CCA countries.

CLOSING SESSION

Recommendations for ASDC and CCALM improvement and use in 2024 (Item 9)

31. After having reviewed the implementation of the recommendations on ASDC and CCALM use and management, formulated by CCA countries and FAO during the previous GIS Workshop in 2023, the below listed recommendations were formulated and endorsed by the participants, addressed to countries and to FAO.

32. To monitor their implementation and identify new recommendations, the following is done:

- *Progress made, as of February 2023, are indicated in blue.*
- *Recommendations, either still valid or new ones (especially those formulated during the 2023 Technical Workshop on Locusts in CCA) are indicated in brown.*

ASDC/CCALM use and management:

1) Advocate for introduction and wide use of ASDC and CCALM at the national levels (action: countries and FAO)

- To Turkmenistan and FAO: ensure CCALM in-depth introduction to Turkmenistan in 2023 – *Done (May 2023).*
- To all countries: further increase the number of ASDC reports in order to be able to carry out a meaningful analysis and move to effective forecast thanks to CCALM
 - *There was significant increase of ASDC records in 2023 although the situation varies from country to country.*
 - *To be continued in 2024. To that end, as recommended during the 2023 Technical Workshop on Locusts in CCA, include the filling of Locust Survey and Spray Monitoring Forms as an integral part of the Locust Experts' duties; plant protection/locust control managers should encourage this process.*

2) Designate/confirm at least two information officers with appropriate education and skills who will be responsible for managing CCALM at the national level (action: countries)

- Provide confirmation of ASDC and CCALM responsible staff at the national level
– *Information was received from all countries*

3) Continue to provide remote support for ASDC and CCALM maintenance and use, including QGIS, and to deliver related refresher courses/training

- To countries: with projects support, ensure delivery of Training-of-Trainers (ToT) national and briefing sessions including ASDC and CCALM use
– *National/briefing sessions delivered in Armenia, Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan in 2023.*
– *To be continued in 2024 in all CCA countries, during trainings delivered by FAO Experts or national Master-Trainers.*
- To FAO: organize one-day online training sessions for Master-Trainers from all CCA countries to familiarize with the new functionalities of ASDC and CCALM
– *Postponed to the second half of 2024*

4) Create a WhatsApp group including staff responsible for CCALM management and use from the various countries to facilitate direct communication (action: FAO)

- Telegram group was created in 2022, which currently has 26 members.
- To FAO and countries: continue to support and use the Telegram group as needed for easy communication and problem solving
– *Done. To be continued in 2024.*

Manuals and guidelines

5) Review, update and finalize English and Russian versions of ASDC and CCALM manuals (action: FAO) and translate them into national languages (action: FAO and countries)

- To FAO: both manuals to be updated according to new changes introduced in ASDC and CCALM in 2023 – *Postponed to the second half of 2024.*

6) Ensure the release of video manuals on the use of ASDC, CCALM and QGIS in Russian and English (action: FAO), subsequently with subtitles in national languages (action: FAO and countries)

- To FAO and countries: ensure the translation into national languages of the subtitles of the video “Get started with ASDC” (FAO: to be sent to national experts; Countries: to provide translation)
– *Postponed to the second half of 2024. Afghanistan, Armenia, Azerbaijan, Georgia, Tajikistan, Turkmenistan, Uzbekistan have indicated their interest in the translation of such manuals.*
- To FAO: issue a video tutorial on CCALM use in English and Russian – *Postponed to the second half of 2024.*

7) Based on available funding sources, print and dispatch a limited number of Monograph on the Italian Locust (CIT) to CCA countries and publish the Monograph of Moroccan Locust (action: FAO)

- To FAO: in addition to remaining delivery of the CIT Monograph (Kazakhstan), finalize and publish the DMA Monograph, identify funding for limited print-out and dispatch it to all or most CCA countries in 2023. – *DMA Monograph published and printed and under dispatch.*

ASDC functionalities

8) Make available a new ASDC beta version for testing during locust campaign and facilitate its use (action: FAO)

- To FAO and countries: test the paper ASDC third form of Human Health and Environment monitoring and discuss it during the E-Committee meeting planned in July 2023 for future introduction into ASDC as beta version for testing in 2024.
 - *Paper form discussed during the 2023 E-Committee;*
 - *Testing of ASDC beta version postponed to the second half of 2024/the beginning of 2025, after an online related meeting/training is organized on this new form (May/June).*

CCALM functionalities expansion

9) In order to expand the possibility of creating CCALM products, prepare and enter into CCALM database relevant historical data, starting from 2000 (if available), on: areas infested by locusts; areas infested by locusts exceeding the economic threshold (ET); and treated area; including for the second administrative level (district)

- To countries: it is expected that CCA countries share as soon as possible missing data for 2022.
 - *Done by all countries for 2022.*
 - *For 2023, data received from most countries and yet to be received Uzbekistan.*

10) Translate CCALM interface into national languages

- To FAO: provide the necessary changes in the translation of CCALM interface into national language – *Planned in the second half of 2024.*

11) Continue testing of CCALM in national languages (action: users and FAO)

To countries: feedback to continue to be provided to FAO on CCALM use, whenever relevant.

12) Improve CCALM functionalities (action: FAO), in particular:

- To countries and FAO: it is suggested to introduce a soil moisture satellite product for CCA countries in CCALM in 2023. – *Done.*
- To FAO: make available display of ASDC and CCALM outputs on “Locust Watch in CCA”, with realtime data (or on a monthly basis). – *Done.*
- To FAO: provide remote support for ASDC and CCALM maintenance and use, with nominated Information Officers from the ten countries. – *Done.*

Other recommendations for 2024, formulated during the 2023 Technical Workshop on Locusts in CCA:

- Develop a module in CCALM for the creation and sending of “Warning” messages to users, FAO and other corresponding Locust Control/Plant Protection services.
- Develop a system of mark points (most frequently visited areas for monitoring the locust situation) for the ten CCA countries. This opens a new opportunity to monitor the increasing a locust density from one year to another and make forecast of outbreak.
- Develop a module for synchronization between the new ASDC Human Health and Environmental Monitoring (HH&Env) Form and the Spray Monitoring Form.

13) Pursue cooperation on importing/exporting data from the Russian Federation system into CCALM; Further explore possibilities to ensure automated import data from Kazakhstan into CCALM

- To FAO and the Russian Federation: continue the ongoing cooperation on a regular basis
– *Done in 2023.*
– *To be continued in 2024. As agreed during the 2023 Technical Workshop on Locusts in CCA, ASDC still to be used by national Experts in the Saratov, Orenburg, Volgograd oblasts and Stavropol Territory while cooperation on importing/exporting ASDC data, as well as importing the locust survey data from the Russian Federation system into CCALM, is pursued.*
- To FAO and Kazakhstan: concretize automated data exchange between the Kazakh GIS and CCALM
– *Official agreement obtained in 2023; API was sent to CCALM developer.*
– *To be pursued.*

Development prospects

14) Convene the E-Committee on CCALM, including representatives from interested CCA countries and FAO experts (Information Officers), to jointly discuss CCALM GIS products (including interpretation of satellite ones) and expand them (action: FAO and countries)

- To FAO and countries: E-Committee to be convened based on needs – Next proposed meeting in July 2023 – *Done. To be continued as needed in 2024.*

15) Generally, link the management and use of ASDC/CCALM systems to the discussion on long-term regional cooperation (action: countries and FAO)

- To countries and FAO: continue an advocacy and steps for the creation of an FAO Locust Commission on CCA which is in progress. ASDC and CCALM management would be part of the attribution of such Commission. *To be continued in 2024.*

Closing remarks (Item 10)

33. The Delegates of Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan agreed with all recommendations. The Delegate of Georgia asked again about opportunity to transfer the national part of CCALM data base in Georgia. He explain this request in connection with the need to maintain the functionality of CCALM not only during the execution of work on USAID or JICA projects. ISTT Software Developer and FAO experts promised to return to this question during E-committee meeting.

34. Senior Locust Management Expert reminded that next time we will meet during E-committee meeting in July. He noted the big progress in ASDC data collection and underlined that good analysis and forecast depend very much on reliable field information and from professional interest and qualifications of locust experts.

ANNEXES

Annex 1. List of participants

NAME	TITLE & AFFILIATION	TEL.	E-MAIL ADDRESS	FULL ADDRESS
COUNTRIES				
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Annex 2. Agenda

ITEMS	DOCUMENTS	PRESENTERS
Opening		
1. Introduction & Round of presentation		Alexandre Latchininsky, Senior Locust Management Expert, Transboundary Plant Pests and Diseases (NSPMD) & Workshop Moderator
2. Adoption of the Agenda	Provisional agenda	Alexandre Latchininsky, Senior Locust Management Expert
Session 1: Locust data collection		
3. Use of the Automated System for Data Collection (ASDC) during the 2023 locust campaign: challenges, solutions, etc.	Working Paper WP (template)	Countries' presentation: Afghanistan, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan, Uzbekistan
4. Use of the special test mode of ASDC during national trainings	WP	Nadiya Muratova, GIS Expert (NSPMD)
Session 2: Locust data analysis and forecast		
5. Synchronization of locust survey data between the Caucasus and Central Asia Management System (CCALM) and the Russian and Kazakh locust Geographic Information Systems (GIS)	WP	Nadiya Muratova, GIS Expert
6. Use of the satellite products in CCALM to analyze locust situation	WP (template)	Azerbaijan, Georgia and Uzbekistan presentations (to be confirmed)

ITEMS	DOCUMENTS	PRESENTERS
<p>7. CCALM use to improve locust data analysis and forecast:</p> <p>(a) Selection of mark points (most frequently visited areas to monitor the locust situation) and warning message of temperature passing above a threshold value</p> <p>(b) Analysis of locust density during last five years in the mark points</p>	WP	Igor Ivanov, Institute of Space Techniques and Technologies (ISTT)
<p>8. CCALM use to improve locust data analysis and forecast: any other aspects</p>	-	Round-table discussions
Closing		
<p>9. Recommendations for ASDC and CCALM improvement and use in 2024</p>	-	Alexandre Latchininsky, Senior Locust Management Expert, & Nadiya Muratova, GIS Expert
<p>10. Closing remarks</p>	-	Alexandre Latchininsky, Senior Locust Management Expert

Annex 3. Overview on the development, introduction and use of the locust GIS in CCA (2013-2023)

The Geographic Information System (GIS) on locusts in Caucasus and Central Asia (CCA) was developed to the benefit of the ten countries participating in the FAO “Programme to improve national and regional locust management in CCA”, under Result 3 of its Roadmap “Locust issues and disasters better anticipated and mitigated” and Activity 3.3 “Develop monitoring and analyzing systems”, for use both at the national and regional levels. This was possible thanks to several funding sources over the past years, including projects funded by USAID, the FAO-Turkey Partnership Programme (FTPP), JICA as well as the FAO Regular Programme.

- Automated System of Data Collection (ASDC)

The Automated System of Data Collection (ASDC) was created in 2013 with the objective to facilitate collection and sharing of standardized locust data by Plant Protection/Locust Experts during survey and control operations, using tablets, smartphones and computers. It simulates the FAO standard “Locust Survey Form” and “Spray Monitoring Form” endorsed by CCA countries and serves as a basic data for the locust GIS in CCA, entitled Caucasus and Central Asia Locust Management System (CCALM). After ASDC first testing by Georgia, Uzbekistan and the Russian Federation in 2014-2015, the system was endorsed by CCA countries in October 2015, finalized and made available in eleven languages (Armenian, Azeri, Dari, English, Georgian, Kazakh, Kyrgyz, Russian, Tajik, Turkmen and Uzbek) in 2016/2017.

To support the widespread use of ASDC, as of 30 September 2023 (i.e. up to Programme Year 12 inclusive), FAO delivered or supported the organization of training sessions on ASDC use for a total of 2186 experts from the ten countries, to various extents (from 2017 to 2023); during the trainings, recommendations were formulated to improve the functionalities of the system as well as translations into the national languages of individual ASDC fields. FAO also delivered 354 tablets to CCA countries (from 2014 to 2022).

2

As a result, a gradual increased use of the system in the crop protection services of CCA countries was observed overall. The number of ASDC standardized locust survey and spray monitoring forms increased from 165 records from five countries in 2016 to 5681 reports from nine countries (all except Turkmenistan) in 2022 and 11 556 reports from ten countries in 2023 – more specifically:

YEAR	RECORDS	USERS	COUNTRIES
2016	165	18	5
2017	904	58	7
2018	911	68	7
2019	1481	89	7

1 This includes: 148 experts from eight countries (Afghanistan, Azerbaijan, Armenia, Georgia, Kyrgyzstan, Russian Federation, Tajikistan and Uzbekistan) in 2017; 225 experts from four countries (Afghanistan, Azerbaijan, Kyrgyzstan and Tajikistan) in 2018; 225 experts from nine countries (Afghanistan, Armenia, Azerbaijan, Georgia, Kazakhstan, Russian Federation, Tajikistan, Turkmenistan and Uzbekistan) in 2019; 95 experts from three countries (Azerbaijan, Kazakhstan and Kyrgyzstan) in 2020; 584 experts from the ten CCA countries in 2021; 271 experts in 2022 and 633 persons in 2023 from all ten CCA countries.

2 Number of delivered tablets by county is as follows: 43 tablets to Afghanistan, 27 to Armenia, 61 to Azerbaijan, 54 to Georgia, 20 to Kazakhstan, 47 to Kyrgyzstan, one to Russian Federation, 58 to Tajikistan, 15 to Turkmenistan, and 28 to Uzbekistan.

2020	4285	100	8
2021	5178 (+ 73 tests)	133	8 (+2 for test)
2022	6330	217	9
2023	11 556	318	10

During the fourth previous Workshops on Locust Data Analysis, Forecast and Reporting in CCA and the annual Technical Workshops (TW) on Locusts in CCA, held in November 2023, delegates reiterated the need for continued technical and/or operational support (training sessions) for the full coverage of the national territory with ASDC. In Caucasus specifically, it is worth mentioning that the ASDC coverage of the number of hectares treated reached almost 80% of the total treated areas in Azerbaijan and almost 90% in Georgia, representing a great achievement; in Central Asia, the percentage of the treated areas with ASDC coverage with respect to the whole treated area is still lower. Nevertheless, a substantial increase in the number of records occur in Afghanistan and Uzbekistan in 2023 – in the latter country, ASDC coverage reached 36% of the treated areas, which is very good considering the relatively recent introduction of ASDC and CCALM.

- **Caucasus and Central Asia Locust Management system” (CCALM)**

The “Caucasus and Central Asia Locust Management system” (CCALM) was created in 2016/2017 with the objective to improve data analysis, forecasting and reporting at the national and regional levels. It is filled using ASDC and other sources, i.e. satellite products.

More specifically, CCALM basic functions (data import, query, display, output), i.e. the database and its management system, was developed by the Institute of Space Technique and Technologies (ISTT), Almaty, Kazakhstan, and launched in early 2016. Based on the technical specifications worked out and agreed upon by CCA Forecasting and FAO Experts, the advanced functions (summary, analysis and forecast algorithms) were developed by ISTT in line with the technical standards of FAO. They include a set of output products for analyzing Italian (CIT), Moroccan (DMA) and Asian Migratory (LMI) locusts data and elaborating forecasts. Among them, there are maps of: (a) locust densities, (b) treated areas, (c) areas infested (or treated) with densities above the Economic Threshold (ET). CCALM is fully available since March 2017 in two languages, English and Russian, at ccalm.org.

During the 2017-2019 locust campaign, CCALM (basic and advanced functions) was gradually introduced to several CCA countries. In-depth training were delivered to staff from Afghanistan, Armenia, Azerbaijan, Georgia, Kyrgyzstan, Russia and Tajikistan as well as, more recently, from Uzbekistan (2022) and Turkmenistan (2023). Two/three experts per country were designated to be responsible for CCALM management and use at the national level. During this testing phase, they made a number of recommendations for improving the system, which were discussed and endorsed by CCA Delegates during the annual Technical Workshop on Locusts in CCA. As already mentioned, four specific Workshops on Locust Data Analysis, Forecast and Reporting in CCA were also held in November 2019 (Tashkent, Uzbekistan), March 2021, February 2022 and 2023 (online). The recommendations formulated at this occasion resulted in a number of improvements of the GIS, including new functionalities.