



Mission report of the Post-Harvest & Quality Control Consultant

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Mission Report- 25/07/2015-26/08/2015



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List of acronyms and abbreviations

AIDO	Afghanistan Almond Industry Development Organization
ADF	Afghanistan Development Funds
ANHDO	Afghanistan National Horticulture Development Organization
ANNGO	Afghanistan National Nursery Growers' Organization
ANSA	Afghanistan National Standards Authority
ARFVPA	Afghanistan Raisin Fruits and Vegetables Promotion Administration
CHAMP	Commercial Horticulture and Agricultural Marketing Programme
DAIL	Directorate of Agriculture, Irrigation & Livestock (Provincial and District level)
DIPSA--	
UNIFI	Dept. of Plant, Soil and Environmental Science of the University of Florence
ELISA	Enzyme--linked Immunosorbent Assays
EU	European Union
GAP	Good agronomic Practices
GHP	Good Hygienic Procedures
HACCP	Hazard Analysis and Critical Control Point
HmP	Harvesting Mid Point
HPS	Support to the Development of Perennial Horticulture Private Sector (HPS)
ISO 22000	ISO 22000 is a standard developed by the International Organization for Standardization dealing with food safety. It is a general derivative of ISO 9000)
ISO 9000	The ISO 9000 family of standards is related to quality management systems and designed to help organizations ensure that they meet the needs of customers and other stakeholders while meeting statutory and regulatory requirements related to the product.
MAIL	Ministry of Agriculture, Irrigation & Livestock
MOPH	Ministry of Public Health
MoU	Memorandum of understanding
NGO	Non--Governmental Organization
OHDW	Determination of Optimum Harvest Date Window
PH	Post-Harvest
PHDP	Perennial Horticulture Development Project
RASFF	Rapid Alert System for Food and Feed
SME	Small and Medium Enterprises
SOP	Standard Operating Procedures
TL	Team Leader
ToR	Terms of Reference
ToT	Training-of-Trainers
USAID	United States Agency for International Development



General Agenda

#	W/d	Non W/d	Date		City	Activities
1	X		25/07/15	Saturday	Florence	Departure from Florence
2	X		26/07/15	Sunday	Kabul	Arrival to Kabul-Meeting Equipment Supplier for local procurement. Meeting with SO3 Staff.
3	X		27/07/15	Monday	Kabul	Badam Bagh- Meeting with Pomology Lab. Responsible
4	X		28/07/15	Tuesday	Kabul	Field visit in Paghman- Apricots Producers
5	X		29/07/15	Wednesday	Kabul	Local Procurement
6	X		30/07/15	Thursday	Kabul	Report Activity
7		X	31/07/15	Friday	Kabul	Day off Friday
8	X		01/08/15	Saturday	Kabul	Local Procurement Revision-IT coop. Project revision
9	X		02/08/15	Sunday	Kabul	Meeting with NC-Curator, SO2-SO3-SO4 Pms and ARIA-MAIL Responsible activity coordination
10	X		03/08/15	Monday	Kabul	Coordination Meeting
11	X		04/08/15	Tuesday	Kabul	Custom officer Meeting
12	X		05/08/15	Wednesday	Kabul	Quarantine Dept. + Research Dept.
13	X		06/08/15	Thursday	Kabul	Report Activity
14		X	07/08/15	Friday	Kabul	Day of Friday
15	X		08/08/15	Saturday	Kabul	Desk Analysis- all the meeting cancelled due to security concerns
16	X		09/08/15	Sunday	Kabul	Meeting with Mr. Mirzaman Popal-ACCI Export 11.00- Meeting with Mase 2.00 pm
17	X		10/08/15	Monday	Kabul	Meetings cancelled due to security concerns - AAIDO- Factory -ANSA-1pm
18	X		11/08/15	Tuesday	Kabul	ELISA equipment test and check
19	X		12/08/15	Wednesday	Kabul	WAT- Security Concerns-Cherry data analysis
20	X		13/08/15	Thursday	Kabul	Report Activity and Cherry data analysis
21		X	14/08/15	Friday	Kabul	Day of Friday
22	X		15/08/15	Saturday	Kabul	Document for ACCI- Preparation of informational material
23	X		16/08/15	Sunday	Kabul	Data analysis and ELISA test kit training Preparation
24	X		17/08/15	Monday	Kabul	Training on data analysis and ELISA test kits
25	X		18/08/15	Tuesday	Kabul	WHA (security concerns) - Report Activity
26	X		19/08/15	Wednesday	Kabul	WHA (security concerns) - Report Activity
27	X		20/08/15	Thursday	Kabul	Report Activity and Cherry data analysis
28		X	21/08/15	Friday	Kabul	Day of Friday
29	X		22/08/15	Saturday	Kabul	Visit to local suppliers and close of the local procurement
30	X		23/08/15	Sunday	Kabul	Report Activity and Cherry data analysis
31	X		24/08/15	Monday	Kabul	Debriefing with HPS-TL – Departure from Kabul



Executive Summary

Goals of the mission

The goals of the mission were specified in the Working Order prepared by the HPS Team Leader and the SO3 Project Manager. The list of mandatory Deliverables is below reported:

- Briefly review of the developments of the Afghan QC system;
- Receive the Mycotoxin (Aflatoxin and Ochratoxin) QC ELISA kits;
- Set up the ELISA kits and perform a series of Capacity Building training sessions (appr. 10 days) to Laboratory technicians and other relative QC staff.
- Start drafting Technical Manual on Lab procedures for fruit QC;
- Monitor the Shelf life and Post-Harvest (incl. maturity index & harvesting time) tests in Pomology Laboratories (PHDCs);
- Start drafting the PH Manuals for specific fruits in Afghanistan;

Briefly review of the developments of the Afghan QC system

The first survey on the Quality System in Afghanistan was held in May 2014. During this year the political situation has changed: a new parliament has been elected and mostly all the Ministers are changed. During the mission a certain numbers of meeting were focused on the evaluation of the changes occurred in the QC system. As a result is possible to state that only minor modification occurred and practically the situation is stuck at the 2014. The only relevant news is the initial collaboration between ACCI and ANHDO-HPS. In this collaboration ANHDO-HPS should provide technical assistance to ACCI and their members.

Receive the Mycotoxin (Aflatoxin and Ochratoxin) QC ELISA kits

The bid launched for the ELISA procurement was won by Tecna Lab from Trieste (Italy). In the RFQ was included, as mandatory, the verification of the equipment before its shipment. Such activity was done in July 2015, before the mission. During the inspection all the available equipment and the ELISA kits were tested and checked. A small report was sent to the SO3-PM and HPS TL. All the equipment was properly working and in line with the RFQ.

Set up the ELISA kits and perform a series of Capacity Building training sessions (appr. 10 days) to Laboratory technicians and other relative QC staff.

As above mentioned, the training was not accomplished. However, according with PHDP TL such training will be hold in October 2015 during the next mission in close collaboration with PHDP.

Start drafting Technical Manual on Lab procedures for fruit QC

As reported in the previous report (May 2015), the Pomology Laboratory Manual was finalized by PHDP. Such manual will be integrated with the ELISA equipment description. The ELISA protocol was prepared by Tecna (the winner of the RFQ) and the initial protocol are included in the ELISA kit box. However, during the training the official protocol will be, likely, changed accordingly with the specific condition of the pomology laboratory. Any variation will be eventually decided with Tecna staff, and the final version of the protocol will be included in the manual as an annex.

Monitor the Shelf life and Post-Harvest (incl. maturity index & harvesting time) tests in Pomology Laboratories (PHDCs)

In the period between May and July 2015, new post-harvest and maturity index protocols for grape, apricot, citrus, pomegranates and cherry varieties have been prepared. Plum, apricots and pears (to be confirmed) are foreseen for the 2016 season.



the activities planned in July 2015 is fully on going. Cherry HmP and OWHD have been done and is, to date, under revision. Apples characterization was finished but the data were not checked and elaborated. Same situation for Grape in Herat and Kandahar. However, the post-harvest protocol for grape was slightly different compare to cherry or apples, in fact the maturity path is completely different and the hypothetical optimum maturity value is known and should be verified. Pomegranates and Citrus characterization are still in progress. In Table 3 is reported a tentative of the final data issue:

Start drafting the PH Manuals for specific fruits in Afghanistan.

Since July 2015, the PH Manual is in progress . As reported in the Annex 2 -SO3-Int'l Consultant Plan the deadline for the delivery of such manual is foreseen before the start of the 2016 harvesting season for the follow species:

- Fresh fruit: Grape, Plum, Apples, Apricots.
- Dried Fruit: Raisin, Apricots, Almonds.

Final Recommendations

Grape and Raisin Promotion Group

- Promote an internal by-law.
- Creation of an agreed a policy of production (disciplinary) with included all the mandatory techniques: quantity of fertilizer, herbicides, harvest methodology, maturity index, allowed varieties, internal traceability and quality control,. In close collaboration with ANSA.
- Cost-Analysis of grape and raisin
- Geo-referencing the data from the different survey.

QC Laboratory

- Before starting the ELISA training, is mandatory to prepare a MoU between MAIL and HPS-ANHDO, in which is clearly explained that such equipment is only temporarily placed in the pomology laboratory. As soon as a suitable private laboratory will be ready (or identified) the ELISA equipment will be immediately transfers.
- Dried and fresh fruit test
- In the whole set of experiment shelf life is the most complicated and so far the planning activities are all behind the schedule. Probably a differentiation including dried fruit shelf life should be evaluated.
- The situation in Kunduz and Jalalabad is becoming critical. Such situation should be duly considered in all the SO3 activities related to the dried fruit, pear, citrus and pomegranates.

ACCI

- As reported in par., the collaboration with ACCI is started and even of at preliminary stage, ACCI represent a golden occasion to promote, as explained in the previous report (May 2015) ANHDO, trough HPS, and implement an internal services.

Other recommendations

- Reshape of the Result 2 according to the AAIDO situation.
- Perform a survey and the baseline definition on Samangan and Kunduz Provinces for almonds, Pistachio.
- Implement a booklet for ANHDO-HPS with the available services (starting from the ACCI draft) and define a services catalog. The main services for ANHDO could be summarized as follow:
- Finding women association
- No further actions will be taken with ARPAV until the requested activities and documents will be not fully prepared.





Goals of the mission

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- A. Briefly review of the developments of the Afghan QC system;
- B. Receive the Mycotoxin (Aflatoxin and Ochratoxin) QC ELISA kits;
- C. Set up the ELISA kits and perform a series of Capacity Building training sessions (appr. 10 days) to Laboratory technicians and other relative QC staff.
- D. Start drafting Technical Manual on Lab procedures for fruit QC;
- E. Monitor the Shelf life and Post-Harvest (incl. maturity index & harvesting time) tests in Pomology Laboratories (PHDCs);
- F. Start drafting the PH Manuals for specific fruits in Afghanistan.



1. Deliverables

1.1 Briefly review of the developments of the Afghan QC system

The first survey on the Quality System in Afghanistan was held in May 2014. During this year the political situation has changed: a new parliament has been elected and mostly all the Ministers are changed. During the mission a certain numbers of meeting were focused on the evaluation of the changes occurred in the QC system. As a result is possible to state that *only minor modification occurred and practically the situation is stuck at the 2014*. As reminder, the description of the situation in the 2014, and the relevant variations are reported below:

The National Quality System (NQS) in Afghanistan is composed by the following main actors:

1. Ministry of Public Health-Food Drug Quality Control Laboratories (MOPH)- Pursuant to the MoU between MAIL and MOPH, MAIL is responsible for testing the quality of raw/unprocessed agricultural product. MOPH is responsible for testing processed food (e.g. fruit juice). MOPH has an internal laboratory with many and very advanced equipment. Part of these instruments (e.g. at least 3 HPLC) are not used. Capacity building and specific training is needed.
2. Ministry of Commerce. MoC, through ARPAV, it releases the Quality Certificate for export and has many connections with SMEs. SO3 team was invited to the first Agribusiness Sector Action plan for 2013-2016 meeting. Unfortunately, this was the first and the last meeting.
3. Afghanistan Chamber of Commerce, ACCI. During the mission a new collaboration with ACCI was started between HPS-ANHDO and the ACCI-Export Department. They are extremely interested in ANHDO and HPS competences and activities. ACCI is not a technical branch and many issues related to the food safety and agriculture control are beyond their competencies. As an example, the knowledge on mycotoxin and certification are not part of the ACCI services. HPS-ANHDO should act as ACCI technical partners. This partnership is a win-win situation: ACCI will improve the numbers of services provided to its members and ANHDO will easily become a national reference for the horticulture sector. After the initial meeting a draft document was prepared and shared with SO3-PM and ANHDO General Manager. The document represents a list of the potential collaboration with ACCI and ANHDO(HPS). The main services for ANHDO could be summarized as follow:

- a. Horticulture technical consultancy
- b. Dried and fresh fruit test
- c. Mycotoxin ELISA tests
- d. Soil and Water tests
- e. ISO consultancy
- f. HACCP consultancy



4. Ministry of Agriculture Irrigation and Livestock. MAIL has different laboratories in different Department. However, the Food Quality Control Department (FQCD) was folded and, to the best of my knowledge, its competencies are now reduced.

Another visit to MAIL (Departments of Research and Quarantine Department) was done. The outcomes of such visits was a substantially unaltered situation:

a. According to the MAIL, the role of ARFVPA will be reduced. This laboratory is now used because represent it the unique alternative for having some data on raisin and almonds. Even if general and not fully trusted.

b. The situation about the connection of Afghanistan to the WTO is still pending. The requirements from WTO are complex and subtle. The tool to grant the access to WTO is to create laws and ad hoc regulations. To date (August 2015) the draft of the law has been discussed between all the different Ministries involved, but it is presently blocked in the Parliament waiting for the final approval, possibly because some internal conflicts between different Ministries are still pending.

c. Quarantine Department-MAIL: The situation in the Quarantine Department-MAIL was totally confirmed. The situation of Quarantine Department is similar to the one of ARFVPA. At the custom border (import and export) the tests performed by the Customs laboratories are under the competencies of ARFVPA (MAIL) and MoPH. In the next future, with a possibly exportation of fresh fruits or other products (e.g. certified plants), the reliability of the Quarantine Department might be under the same criticisms. This particular issue is out of HPS scope but pest management and pesticides/herbicides are part of QC system. In the next future the lack of equipped labs for this kind of analysis will be a problem as well as the toxin test today for raisin and almonds.

5. Afghanistan National Standards Authority (ANSA). Is responsible for the release of the national and international standard procedures. Last year was not possible to visit the laboratory and understand the potentiality of such Institution. Also this year due to security concerns was not possible to visit the laboratory. However, during a telephonic communication on regard to the ANSA involvement in a Test Ring, one of the ANSA representative explained that ANSA is not equipped for food analysis. In any case, ANSA, even if not directly involved in the food analysis, should cover a relevant position in the whole QC system. Standards and reference materials must be provided and controlled by an official Institution. ANSA should become such institution and fully become the Afghan representative in regard of the other international certification body. So far, ANSA is concentrated others standards than food. The number of standards related to food is still neglect compared with the other industrial sectors.

6. Afghanistan Custom: In order to have a complete overview of the QC system, the missing piece was the Kabul Custom. During the 2014-2015 two times, as HPS, we tried to retrieve information from Custom without any success: on 1th of July we had a meeting with the Director of the Kabul Custom, regrettably, we did not feel welcomed, and no information was gained. We face the same situation before when we tried to retrieved information on the export procedures in previous meeting (14/05/2014). This time we succeeded to have a meeting with a Kabul Custom employee. The nature of the discussion wss delicate and the identity of such employee is keep nameless. His role, experience (more than 10 years) and knowledge made our source fully trustworthy. The first information to confirm was the role of ARPAV. From the last report (August 2015) MAIL asserts that the released Quality Control Certificate is considered from MAIL and Custom as invalid. There is still confusion on the document provided by the Custom at the moment of the delivery. Most probably the Custom just recorded the provided documents (by the trader) and



verify only the presence of such documents with a check list without any consideration on their validity. Another important point to be fully clarified was the sealing of the containers. This aspects has an incredible relevance for the QC of commodities. Once the goods (e.g. raisin) has been tested by ARPAV, the trader received the Certificate of Quality that will be part of the official documentation of the delivery. The container is not sealed at this point and the trader might change the content (in terms of quality product) in the container itself. During the meeting with the Custom employee such issue has been deeply analyzed and discussed.

6. US-AID survey on mycotoxin. In May 2015 HPS-SO3 staff, was invited to the presentation of an US-AID project on mycotoxin (Rapid assessment of Mycotoxins in Afghanistan's food value chains) The project was focused on the presence of mycotoxin on many different commodities (wheat, raisin, flour,...). HPS-SO3 have been an active role in the definition of such project. During the visit to the Quarantine Department, I met Mr. Iqbal Karimi, local responsible of USAID. In such occasion, I had the chance to visit the US-AID ELISA laboratory and discuss deeply with Mme. Debra Frey about sampling methodology and problems encountered by project.
7. Tabasom. From 2015, the interest of Tabasom Manager on HPS was progressively reduced and practically stopped in the summer 2015. The main HPS's goals were not in line with their expectations in terms of type of possible activities and level of HPS contribution. However, in the last part of the mission thing were changed now, Tabasom seems to be interested in participate to the next HPS ELISA training. This suddenly change is due to Due to its internal personnel changes. The QC Responsible Mr. Alas Osmany has left and now they are willing to work with HPS to train the new laboratory technician on ELISA test kit.

1.2 Receive the Mycotoxin (Aflatoxin and Ochratoxin) QC ELISA kits

The bid launched for the EISA procurement was won by Tecna Lab from Trieste (Italy). In the RFQ was included , as mandatory, the verification of the equipment before its shipment. Such activity was done in July 2015, before the mission. During the inspection all the available equipment and the ELISA kits were tested and checked. A small report was sent to the SO3-PM and HPS TL. All the equipment was properly working and in line with the RFQ.

During the mission the equipment was received in duly time and properly stored (when necessary) in the appropriate way. The period between the shipment and the delivery of the ELISA test kits was lower than 10 days. Such period was granted as the maximum time to expose the kits to the ambient temperature. We are confident that the kits are perfectly functioning.

The local procurement was divided by the international procurement, because many of the requested items were available in Afghanistan. Such decision, if initially highly appreciated, has implied many problems. The numbers of suppliers available in Kabul is extremely low (3) and get reliable quotation was an incredible time consuming exercise. Such a delay was the main cause to the impossibility to lead the ELISA training during August 2015.

At the moment the ELISA equipment is in the HPS office. However, despite, HPS aims to helping private sector, such equipment will be initially placed in the Pomology laboratory in Badam Bagh. The reason of such recommendation is strictly technical: Pomology laboratory, and its personnel, are ready to host such kind of instruments and the premises and required accessories are already present in the laboratory. In other word, it is ideally possible, starting immediately after the installation of the equipment, to perform tests and training (e.g. for ARFVPA staff). As said, to date the equipment is in HPS premises and everything will remain as it is, until an MoU with MAIL will be signed. The MoU will clearly state that the ELISA equipment will be temporally placed in the pomology lab. until a suitable private beneficiary will be identified.



1.3 Set up the ELISA kits and perform a series of Capacity Building training sessions (appr. 10 days) to Laboratory technicians and other relative QC staff.

As above mentioned, the training was not accomplished. However, according with PHDP TL such training will be hold in October 2015 during the next mission in close collaboration with PHDP.

1.4 Start drafting Technical Manual on Lab procedures for fruit QC

As reported in the previous report (May 2015), the Pomology Laboratory Manual was finalized by PHDP. Such manual will be integrated with the ELISA equipment description The ELISA protocol was prepared by Tecna (the winner of the RFQ) and the initial protocol are included in the ELISA kit box. However, during the training the official protocol will be, likely, changed accordingly with the specific condition of the pomology laboratory. Any variation will be eventually decided with Tecna staff, and the final version of the protocol will be included in the manual as an annex.

1.5 Monitor the Shelf life and Post-Harvest (incl. maturity index & harvesting time) tests in Pomology Laboratories (PHDCs)

1.5.1 Review the existing repeatable protocols and procedures

In the period between May and July 2015, new post-harvest and maturity index protocols for grape, apricot, citrus, pomegranates and cherry varieties have been prepared. Plum, apricots and pears (to be confirmed) are foreseen for the 2016 season. The approach applied in the new post-harvest and shelf life trials is a compromise. HPS is an agriculture project that needs a good scientific basis, but not an academic level. The compromise, is the reduction of the evaluation period (observations) from 20 to 5 observations. The fully characterization was set only for one year, however, the results get from each trails will be checked every year. With such system, the maturity evolution curve will be less accurate, but hopefully sufficiently accurate to get relevant commercial information. From the previous report the following activities are still pending:

- Collaboration with traders and farmers is mandatory (the theoretical result must meet their requirements and shaped on their requests). The retrieved information will be confirmed for 2 or 3 years, trough out a random check of the results.
- Use of harvesting date mathematical model that will give additional information on the results. Climate historical series are available on the web (<http://afghanag.ucdavis.edu/natural-resource-management/weather/weather-climate-data-online-daily-data-afghanistan-stations>) and flowering data are available for all the varieties in the NCs. These data have been already requested, but so far are not available.
- Dried fruit quality parameters will be set in a dedicated section. However the laboratory protocols are not yet developed.

In regard of the proposed work plan (Table 1), the activities are in line with the schedule (except for the shelf-life tests). During the winter 2015 dried fruit will be tested (as a cross activity between PHDP-ANHDO and Italian Cooperation).

For the next year the approach will be similar: about 20 fruit varieties to be tested in the different PHDPs centers. In the same time the gaps and missing data from 2015 activities will be fulfilled with additional tests. In any case the result from 2015 must be validated by precise and highly specific tests on the tested varieties as reported in the protocols.



As reported in and Table 1, the activities planned in July 2015 is fully on going. Cherry HmP and OWHD have been done and is, to date, under revision. Apples characterization was finished but the data were not checked and elaborated. Same situation for Grape in Herat and Kandahar. However, the post-harvest protocol for grape was slightly different compare to cherry or apples, in fact the maturity path is completely different and the hypothetical optimum maturity value is known and should be verified. Pomegranates and Citrus characterization are still in progress. In Table 3 is reported a tentative of the final data issue:

Table Error! No sequence specified. 2015 Pomology Labs. Activity Plan: All the activities for SO3-SO2+LDM+PHDPHII

ACTIVITIES 2015	Kabul	Herat	Kandhar	Jalalabad	Kunduz	Mazar-i-Sharif
SO2-SO3-LDM-PHDPHII	SO3-SO2 NEW PROTOCOL:Cherry: 5 varieties-Apple: 5 varieties Pear: 3 varieties fully characterized (to be confirmed)+OLD PROTOCOL:HmP- HmP Apricots	SO3-SO2 NEW PROTOCOL:Grapes-HmP for 15 varieties+5 varieties fully characterized+OLD PROTOCOL:HmP-Plum	SO3-SO2 NEW PROTOCOL:Grapes-HmP for 15 varieties+5 varieties fully characterized+OLD PROTOCOL:HmP-Plum	SO3-SO2 NEW PROTOCOL:Pomogranates: 5 varieties fully characterized+ Citrus:5 varieties fully characterized	OLD PROTOCOL:HmP-Apple+HmP pear	OLD PROTOCOLHmP-Apple+HmP Apricots

Table Error! No sequence specified. 2015 Pomology Labs. Activity Plan: All the activities for ONLY SO3-SO2

WHAT	WHERE	HOW MANY	WHEN	Done ?
Cherry	Kabul	5 varieties	2015	Yes, Under Verification
Grape	Herat+Kandahar	5 varieties	2015	Yes, to be verified
Apples	Kabul	5 varieties	2015	Yes, to be verified
Pomegranates	Jalalabad	5 varieties	2015	On going
Citrus	Jalalabad	5 varieties	2015	On going

1.5.2 Follow up of the first results

Maturity index and Optimum harvesting date

During May 2015, cherry varieties were fully characterized. The initial results were promising as reported in the previous report (May 2015). However, during the elaboration many problems were raised :

- Many typo mistake were found
- Data were not homogeneous
- In some cases data were in contradiction with the natural maturity path- E.g. brix and weight cannot decrease drastically in one day.

The reason of such difficulties were almost three:

- Technical staff do not check daily the data and compare daily the pathway of the maturity evolution.
- Data were not sent daily to the Consultant



The above mentioned points have as a consequence the delay in the data elaboration and their publication.

3. Technical staff, however, claim a lack of collaboration from MAIL staff and the clash between different interests has a consequence the lack of maturity fruit.

This latter point was already raised and is reported in par. 1.5.4 as reminder.

Shelf-Life Tests

In all the proposed protocols, there is a specific section dedicated to the Shelf-Life tests. Different tests are calibrated to the specific characteristics of the fruits. All the shelf life tests, however, foreseen a comparison between controlled condition in fridge and at room temperature. Everywhere (included Kabul), the situation in the PHDCs is critical. Due to electricity problems all the FHs said that shelf life tests are not possible in their centers.. In Kabul, where the electricity is not a problem, we experienced another kind of difficulties. The incubator was full of fruits for the exhibition and the temperature was always too high for the incubator. Such situation has led to lost relevant information about cherry and apples shelf life tests. This is a simple example of the routine problems that normally occurred in the PHDCs.

In the whole set of experiment shelf life is the most complicated and so far the planning activities are all behind the schedule. Probably a differentiation including dried fruit shelf life should be evaluated.

1.5.3 2014 Pomology results

The fruit characterization using the OHDW (for more details please consult the May 2015 Report_Annex Determination of Optimum Harvest Date) was assigned to the Consultant in May 2015. The activities held in 2014 were not supervised by the Consultant. However, such data are relevant and important to the fruit maturity index definitions. The following data were requested several times:

- All the available data on HmP and/or data related to fruit maturity in all the 6 centers for the 2014.
- All the available flowering data at least for 2014 and 2015 for all the varieties and in all the PHDCs centers. (2014-15 data from Kabul and Herat for cherries were received).

However the situation seems to be as follow:

- Data on Harvesting Mid point have been done ONLY in Kabul.
- Shelf Life tests have been done only in Kabul
- UPOV and fruit characterization are available in all the centers, however the data are not inserted in excel files.

In order to solve this stuck situation, during the next mission with PHDP (October 2015) a visit to the PHDCs centers is foreseen. During these visits, the main goal will be to collect as much data on the 2014 activity as possible and create a database to be transfer in Kabul.

1.5.4 Possibly Constraint to the Pomology Activities

During the protocol writing, I had the chance to discuss with all the people involved in the NC and Pomology Laboratories. Remain nameless, things are not going well and between the different teams there are some disagreements. All the plan for the next years in the pomology laboratories for the characterization of 60 varieties is totally based on the cooperation between MAIL, LDM and HPS. If one or more PHDCs is not fully



collaborative, the set target will not reach. So far, there was not relevant episodes in which the 2015 plan was challenged, however this situation must be duly considered.

During the meeting, duly requested by the Consultant to clarify the problems with data each issues were raised, faced and a solution were proposed. The analysis of other data will provide information about the accuracy of the results.

As above mentioned some technical problems are affecting the expected results in the pomology activities.

1.6 Start drafting the PH Manuals for specific fruits in Afghanistan

Since July 2015, the PH Manual is in progress . The deadline for the delivery of such manual is foreseen before the start of the 2016 harvesting season (May 2016) for the follow species:

Fresh fruit: Grape, Plum, Apples, Apricots.

Dried Fruit: Raisin, Apricots, Almonds.



Follow up from the previous report (May 2015)

In the previous report, many issues were still unclear. During this mission part of them have been explained in this section. The issues still not totally clear are reported as recommendation (par. Error: Reference source not found).

2.1.1 ARPAV

In August 2014, to accomplish the point 1 of my ToR, in agreement with the SO3-PM and Mr. Hasheemi-ARFVPA President- we decided to help ARFVPA to get the ISO 9001 certification. Such task was included in the MoU signed between ANHDO and ARFVPA (2013). The initial possibly deadline was set in May 2015. After a good start, the collaboration from ARPAV staff is progressively reduced and since May 2015 they did not provide any of the requested documents mandatory to proceed in the certification process. The situation of ARFVPA, is stuck since 2 years and so far, was not possible to understand which kind of interventions are possible with this institution. The recommendation is to clear as soon as possible the future policy of MAIL on the Quality Certificate and QC system, in order to decide which kind of approach should be correct with ARFVPA.

In the meantime, no further actions will be taken until the requested activities and documents will be not fully prepared.

2.1.2 AAIDO

To date (August 2015), AAIDO situation is still confused. However, the recent Internal Auditing Mission, will provide some suggestions on the future role of AAIDO. From EU, the situation is still freeze.

2.1.3 PUBBLICATION- STATE OF ART AND DEAD LINE

The publication state of art and deadline are reported in Annex 1,

2.1.4 JALALABAD AND KUNDUZ

The political situation in Jalalabad and Kunduz under the security point of view, is rapidly changed. The access to such cities is not anymore easy and every time the situation should be evaluated day-by-day. This situation must be duly considered in the expected results. Particularly, attention should be given to the total number of fully characterized varieties: pears, citrus and pomegranates.



Potential intervention for selected partners

3.1 *PHDP cross cutting activities*

In October 2015 the Consultant will be in Afghanistan to finalized his last mission with PHDP/II project. In agreement with PHDP staff and TL, he'll conduct some cross-cutting activities between PHDP and HPS:

1. *to visit as many Pomology Laboratories as possible.*

- Retrieve 2014 pomology data
- Create a database to be transfer to Kabul
- Verify the technicians gaps and propose capacity building needs

2. *Perform the ELISA test kit training (about 10 days)-HPS activity*

3. *Test analysis of Raisin and Pistachio (ANHDO-HPS Activity)*

As part of the project, samples of raisin and pistachio from producers, will be tested on mycotoxin. Such activity is closely related to the successful of the ELISA set-up and training.

4. *Integration to the Pomology Laboratory Manual with ELISA protocol and equipment (PHDP-HPS activity)*

3.2 *Additional Analytical Development for the Afghan QC*

From the previous report (May 2015)

❖ Mycotoxin tests represent the priority for dried fruit sector. However, to fully get a National Quality Control (domestic and export), microbiological and chemical determinations are needed. E.g. EU Regulation reports that fruits have to be tested also for lead and cadmium. Microbiological limits are reported in the Regulation 2073/05 and L.283/1962, where for fruits the following pathogens are tested: Salmonella, Listeria, Escherichia coli O157, Campylobacter, etc. The possible approaches to introduce microbiological tests are mainly two:

- a. Traditional microbiological methods, using specific and generic medium for food microbiological pathogens (e.g. mannitol salt agar, rose bengal chloramphenicol agar, slant and bartley medium).
- b. Using rapid tests kits (e.g. Sartorius nutrient pads).

Tests kits are, of course less reliable with higher detection limits, expensive and very difficult to find in Afghanistan. On the other hand, are easy to use. In the next future the microbiological tests (traditional or rapid assays) are highly recommended in quality laboratory. The situation of the existing laboratories in Afghanistan, regarding microbiological tests, is not fully clear and should be included as a task for the next mission.

❖ Chemical tests are performed with specific techniques and the difference is the technology behind the instruments and not the methodology that are almost very similar.

❖ Recently, EU countries adopted a new and more strictly regulation on food labelling (nutrition facts and allergens) for all the goods addressed to be exported to EU (EU Regulation n.1169 released in 2011, and mandatory since 13 December 2014 in all EU countries). An internal training to SO3 staff is highly recommended. SO3 team will transfer the acquired knowledge, through ToT, to its beneficiaries especially all the trainers that aims to export directly in EU.





Final Recommendations

Grape and Raisin Promotion Group

Using the existing Grape and Raisin Promotion Group and the forthcoming tests on raisin (October-November 2015), SO3 should proposed to the Group member the raisin test service. Using the pomology laboratory in Kabul (in collaboration with MAIL). This option has been promoted several times in different occasions.

QC Laboratory

Before starting the ELISA training, is mandatory to prepare a MoU between MAIL and HPS-ANHDO, in which is clearly explained that such equipment is only temporarily placed in the pomology laboratory. As soon as a suitable private laboratory will be ready (or identified) the ELISA equipment will be immediately transfers. Is important to start to push the idea that QC is not only mycotoxin and certification but also chemical and microbiological analysis.

No further actions will be taken with ARPAV until the requested activities and documents will be not fully prepared.

Shelf Life Tests are behind the schedule and required attention. A solution might be include dried fruit shelf life tests.

The situation in Kunduz and Jalalabad is becoming critical. Such situation should be duly considered in all the SO3 activities related to the dried fruit, pear, citrus and pomegranates.

ACCI

As reported in par., the collaboration with ACCI is started and even of at preliminary stage, ACCI represent a golden occasion to promote, as explained in the previous report (May 2015) ANHDO, trough HPS, and implement an internal services as ISO consultancy to help its members to applied the ISO procedures. The actions to take to accomplish this task are: i) A cycle of internal training from the consultant and ii) a practical stage with a professionals working in ISO certification in Afghanistan.

Other recommendations (part of such recommendations are from the May report)

- ❖ In the grape and Raisin Promotion Group:
 - Promote an internal by-law



➤ Creation of an agreed a policy of production (disciplinary) with included all the mandatory techniques: quantity of fertilizer, herbicides, harvest methodology, maturity index, allowed varieties, internal traceability and quality control,. In close collaboration with ANSA.

❖ Packaging improvements:

➤ Find a suitable packaging house (on the model of BANO Food Industry) (SO3 implemented this if further specific recommendation please) for improvement

❖ Cost-Analysis of grape and raisin

❖ Finding women association

❖ SO3 has performed many survey and baseline on different species. However, such important milestone of the project is not crystallized in a publication with a narrative description of the situation. These kind of documents are incredibly important for further actions in the horticulture sector, as well as for the visibility of the project.

❖ Geo-referencing the data from the different surveyes.

❖ Reshape of the Result 2 according to the AAIDO situation.

❖ Perform a survey and the baseline definition on Samangan and Kunduz Provinces for almonds, Pistachio.

❖ Implement a booklet for ANHDO-HPS with the available services (starting from the ACCI draft) and define a services catalog. The main services for ANHDO could be summarized as follow:

❖

- a. Horticulture technical consultancy
- b. Dried and fresh fruit test
- c. Mycotoxin ELISA tests
- d. Soil and Water tests
- e. ISO consultancy
- f. HACCP consultancy
- g. Horticulture technical consultancy