

# Visit to Afghanistan under the Financial Assistance of USAID and the IALC

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## SUMMARY

### Situational Analysis:

We visited Educational Institutions and Agricultural Research Stations in two Provinces of Afghanistan (Kabul and Nangarhar) from 15-22 December 2003. Afghanistan has an estimated population of 26 million. Due to prolonged war and infighting, poverty is rampant. Employment is on the rise due to a return of refugees to their homeland. Peace is being restored.

It was noted that the educational system in agriculture had gone down to rock bottom. The research system is in disarray with minimum direction and the experts are lacking in skills and in expertise. Therefore, the following interventions are suggested in order to up-grade their skill level in agricultural research and education in the target areas of Afghanistan.

#### 1. Human Resource Development (HRD):

This component is suffering badly from the low level of education, skills and outdated knowledge in the field of agriculture and livestock. Efforts are needed to support the following, both financially and technically, because skilled manpower is the backbone for development.

##### i. Short Term Training:

The staff engaged in education and research need some short term training courses at the university level and at the research stations in the following areas so that their rusty technical know how is updated with the latest skills and innovations:

##### a. Farm Profit Maximization:

The present yield levels and production in the various areas of Afghanistan are very low and dismal. The cost of production in some cases is higher than the output due to poor production technology which is adopted by the farmers. The quality of production technology which should be developed by the research system in order to cope with changing needs is lacking. Emphasis should be given on the following major items:

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- Efficient use of water through economical delivery to the plants.
- Growing drought tolerant crops – cereals, pulses, oilseeds and medicinal plants.
- Growing of value-added crops like vegetables, fruits and olives.
- Reducing cost of production using the technologies of minimal tillage, improved varieties and better agricultural practices.
- Intercropping, multiple cropping, relay cropping, companion cropping and mix cropping. In addition, old management should be modified for developing new cropping techniques. Double story cropping to be introduced, upgraded to ensure high return i.e., fruit orchards to be modified to optimize profit from fruits as well as understory crops.

**b. Training in secondary enterprises:**

- Apiculture
- Floriculture and landscaping
- Fish Farming
- Mushroom growing
- Backyard poultry farming
- Fruit canning and preservation
- Human nutrition.

**ii. Long Term Training:**

Most of the scientists who are teaching at the university level and those who are working in the research stations have education up to the B.Sc level. Therefore, the quality of education which is given to the students is not in consonance with the present needs. The outdated knowledge of the B.Sc level teachers and researchers is further hampering progress and development.

The delivery system in crop and animal husbandry is poor and inefficient. Efforts should be made to train these experts up to the M.Sc and Ph.D. levels. The Agricultural University Peshawar is staffed with highly qualified professors and researchers, well equipped laboratories and research stations for practical training. They are equipped with innovative skills in economically-viable production technology.

The following subjects should be included:

**Degree courses**

- a. Agronomy and Crop Production
- b. Plant Breeding and Genetics
- c. Tissue Culture Techniques
- d. Soil Sciences
- e. Plant Protection
- f. Food Technology

- g. Horticulture
- h. Animal Science and Nutrition
- i. Human Nutrition
- j. On-Farm Water Management
- k. Crop Management
- l. Agriculture Economics and Extension
- m. Computer Science

**iii. Capacity Building:**

Due to 25 years of infighting, war and other disturbances, the infrastructure of the research stations is dilapidated and the machinery and equipment are non-existent or minimal. The irrigation system has been damaged. In places where water is available, it is not sufficient. Therefore, it is necessary to upgrade and improve the capacity of the irrigation system. The infrastructure improvements and other requirements for agricultural research and education should be made available according to changing needs and market demand. The following interventions are needed:

- a. Provision of field machinery like tractors, planters, reapers, harvesters, threshers and equipment for food preservation, processing, laboratory equipment for soil and food analysis etc.
- b. Establishment of an efficient irrigation system consisting of concrete water channels, equipment for water use, rehabilitation of the tube wells at the various research stations and renovation of the old tube wells in farmer's fields.

**iv. Delivery system:**

The technology which is developed by agricultural research is not reaching the farmers. As a result, the adoption rate of the improved production technology has been extremely low. A good delivery system comprised of outreach and extension services should be established in order to ensure agriculture and livestock development:

- a. Adaptive research trials on farmers fields of crops, fruits and livestock.
- b. Establishment of Technology Transfer Units in various provinces.
- c. Regular courses in short-term training for extension staff and farmers.
- d. Seed multiplication and certification of improved varieties of crops and fruits for distribution to the near by areas.
- e. Seminars and workshops.
- f. Video, TV, I.T. system and radio.

### **16 December, 2003:**

We went to Kabul by road via Jalalabad due to postponement of air flights to Kabul as a result of bad weather.

On 16 December, we had a meeting with the President of Kabul University. He stressed coordination and help in a major project (4 sub-projects of the German Government) on social sector and policy development, especially fiscal policy development. He arranged a meeting with an Area Study Centre for Research to strengthen ties with Pakistan and to identify impediments hampering our good relations, especially in transit and trade. We discussed things related to training in the field of small and large enterprises, trade and econometrics.

### **17 December, 2003**

We returned to Kabul University and met the Dean of the Faculty of Agriculture. Discussions were held on creating linkages between the Agricultural University in Peshawar and Kabul University for imparting training in five major areas: Horticulture, Agronomy, Plant Protection, Plant Breeding and Forest Resources and Environment. The teaching staff is capable and very receptive, but due to the war resources are scarce. Many of the most qualified staff members have joined NGOs and other organizations.

The research work which is the backbone of the agricultural economy is suffering due to a lack of experts and equipment. The University professors have a very outdated knowledge and need upgrade their skills. Our next meeting was with the Director General of Research for the Ministry of Agriculture and Livestock, who briefed us about activities being undertaken in the Research Programmes under his supervision.

### **Visit to Research Station Karghar:**

Their new research is still in the embryonic stage, but some of the old germ-plasm of grapes was seen being multiplied. This horticulture farm is called Karghar, spread over an area of about 3-5 hectares. It is primarily a grape farm, with one tube-well supplying flood irrigation with a pipe diameter of 3 inches. This farm is near Kabul located at a 1,900-2,000 meter elevation. On the eastern side there is a low mountain with a height of 500 feet. This can very easily be converted into a gravity-flow trickle irrigation system and can become a model for future systems. Even water can be pumped above for covering the barren and naked mountain with fruit orchard with drip irrigation.

In this farm mainly the following crops are grown:

1. Onion
2. Tomato
3. Potato
4. Pistachio
5. Egg plant

## 6. Chillies

The soil of this farm is sandy loam with moderate organic matter. Grape germplasm from Italy had been planted for observation and experimentation to select superior quality table type grape varieties.

### **Visit to Research Station. DARUL AMAN**

This station is south of Kabul about 3-4 kilometers. The station was formerly known as Monocrop Research Station for Cereal Crops. Now has been converted into a Multicrop Research Station consisting mainly of wheat, triticale, maize and horticulture crops and run under assistance of the NGO "EGRE". They are in the process of establishing a germplasm bank of deciduous fruits and pome fruits like plum, apricot, apple, peach and nectarine. They have introduced some U.S. germplasm which will be grown, tested, screened and evaluated for quality, yield, disease and insect resistance. Emphasis will be on acid value, TSS, taste, size, storability, resistance to cold, nematode, fungal and bacterial diseases, insects like fruit fly, hairy caterpillar, woolly aphids, codlingmoth, dieback and some viral diseases and root rot like Fusarium, Phytophthora and Pythium disease of roots.

It is of utmost importance to search and investigate for different rootstocks which have resistance to the prevailing root rot diseases and problems. They will be available in some of the land races of fruits like wild peach, pear and some dwarfing rootstocks of apricot. Already a number of different rootstocks have been tried in NWFP stations, such as Tarnab, Peshawar and Mingora Swat. Rootstocks both from local and exotic sources can be tried here instead of wasting 5-10 years on experiments and testing.

Similarly, some exotic varieties of pear, prune, nectarine, seedless guava and one seeded-loquat are under cultivation in Pakistan and can be easily made available and tried in Kabul with similar agro-ecological conditions.

In similar fashion, some improved versions of free stone plum, peach and apple varieties have been identified from exotic sources in the United States, Switzerland, and Great Britain and are available commercially. Good varieties of olive that are early bearing, dwarf in stature and have high oil content can be introduced for the two zones of Afghanistan in semi arid/sub-tropical zones of Ningarhar and Lughman and dry temperate zone of Afghanistan like Kabul.

Other material for the cold areas about 4,500 feet in altitude (greater than 1,400 meters) can be tried.

### **Cereals:**

In cereals they mainly grow wheat (such as spring wheat, durum wheat and bread wheat of *Triticum aestivum*, especially spring wheat).

They have also been trying facultative wheat with winter blood to combat hard winter, spring frost and snow.

An area of 1.5 million hectares is planted with mainly rain-fed wheat and 2.6 million hectares under irrigated conditions. Material used came from CIMMYT, Mexico, but for the last 15-20 years due to infighting their research activities were almost non-existent. The major problem they are faced with in wheat is mostly yellow rust, while in the eastern part they also have a leaf rust problem i.e. Puccinia graminis tritici. In some areas due to humidity and rains, they also face problems from wheat smut i.e. loose smut (Ustilago tritici), covered smut, (Tilletia foetida), armyworms, and locusts. In some areas there is also problem of blacktip of wheat in years of rains during maturity.

Another problem which they reported is nematode of wheat, stem sawfly, whitefly, aphids and jassids. In wheat they presently need germplasm for barani areas for commercial cultivation, like Tatara, Bakhtawar-92, Saleem 2000 and Hyder-2000 from NWFP while Inqilab, Nowshera-96, MH98 and Chakwal-2000 have become vulnerable to leaf and yellow rusts and should be avoided in future plantations.

### **Training and Skill Development:**

The training sector in Afghanistan has significantly degenerated into a state of intellectual disarray and has been relegated into a condition of least-preferred assignments and choices by the trainers due to poor conditions.

Since their research is in rudimentary stage, the government of Afghanistan needs two time frames for their research.

#### **A. Short Term (1-3 years).**

They may introduce promising material from Pakistan of deciduous fruits, olive and cereals and after one season of testing in the research stations of various ecological zones they should decide on an urgent basis for their commercial and large scale adoptions to cope with their dwindling food shortage and income.

#### **B. Long term planning (10-15 years)**

In this type of planning, which is a must for their sustainability, the government of Afghanistan should introduce diversified germplasm of fruits, oilseeds, cereals and cotton etc. through some donor agencies from areas which are nearly similar to the climate of Afghanistan in the various zones.

In the shortest possible time the nearest places like Pakistan, Iran and India, where they can concentrate the rehabilitation of their research and development activities in Afghanistan.

The crop material from far away countries can take decades, whereas they can get some promising gene material for commercial cultivation from their neighbors quickly..

In rice, they should bring material from Swat and Hazara for cold-tolerant rice varieties which are immediately available like Begumi (JP5) of NWFP and Semi-fine basmati types.

In cotton some of the varieties from Multan can be introduced which have resistance to virus, pink bollworm and jassids.

### **18 December, 2003: (Ministry of Agriculture and Livestock).**

#### **Activities**

Today we met the Director General, Agricultural Research and held detailed discussions with his Deputy Director Mr. Sayed N. Hariq and Director Mr. Kochi about the assistance they need for carrying out basic research at the various research stations. From these discussions it became clear that many of their most qualified staff members have now joined various NGO's including the FAO. It was also pointed out that a large number of NGO's are busy in agriculture, but actually they only provide lip service and the objective research, which is badly needed, is not touched by these agencies. They also explained that the condition of the offices was not good, laboratories were out of equipment, and no chemicals were available for research purposes. Whatever germplasm was available has been lost during wars.

Therefore, it is strongly felt that the following fundamental issues may be addressed on priority basis:

#### **I. Human Resource Development:**

The present staff who are now working in the research stations seem to be hard working and were good enough in their areas of expertise, but they need a significant injection of technological innovation if they are to be able to meet the new emerging needs in the field of agricultural research and livestock improvement.

#### **II. Crop and Livestock Improvement:**

There is an area of 1.5 million hectares under wheat in the rain fed areas, together with 2.6 million hectares in the irrigated, for a total of almost 4.1 million hectares. Their yield level is drastically low with an average of 1.2 tons/ha. This year they had surplus production, but the market rate of about five Afghani or six Pakistani rupees per kilogram does not even meet the cost of production. With this area they can minimally produce 10 million tons of wheat if some of the inputs are properly applied and seed of improved varieties and NPK fertilizer with minimum dose of 100-50-30 (N-P-K) kg/ha used on the land. The same is also true for other commodities. Assistance is needed by the livestock sector in production of cattle, small ruminants and poultry consisting of layers and broilers.

### C. Agriculture Extension/Outreach:

The major reason for the low yield is the poor carrying capacity of the farmers as well as the seriously-lacking dissemination of improved production technology to the farmers. It is therefore urgent that experts working in the research stations be closely engaged in practical training. In the short term, experts should be trained in the following commodities:

- a. **Wheat:** They can be trained in wheat breeding and production in the months of December-May and attached with good local researchers.
- b. **Maize:** Training in the field of maize breeding and production can be provided in CCRI, Pirsabak, Nowshera and attached with Dr. Kiramat, who is a good and practical maize breeder.
- c. **Rice:** The best training place in NWFP to impart training to Afghan trainees would be Agricultural Research Station, Mingora, Swat.
- d. **Fruits:** Training in the field of fruits can be most beneficial at Taranab and at Swat Research Station because these two places can be compared with the corresponding stations in Ningarhar, Laghman and Kabul.
- e. **Fruit Canning and Preservation:** ARI, Tarnab is one of the best places for commercial fruit canning and preservation like fruit drying and preservation, jams, jellies and marmalades, fruit juices and squashes.
- f. **Pulses:** It will be more appropriate if the good research station in Iran is available and these people get training. If not, then ICARDA is the best choice followed by ICRISAT. In Pakistan NARC may not be a bad choice. In NWFP Karak and Kohat are also up to standard.
- g. **Oilseeds:** Oilseed like canola, sunflower, safflower, olive and groundnut. In oilseeds, in the NWFP Swat may be a good choice. They should emphasize sunflower, soybean, flax and peanuts. Olive is one of the best choices where it can be commercialized in snow-free areas with elevation not more than 1,400 meters. Best areas will be Jalalabad, Laghman and other low altitude areas. New material can be obtained from PO DB Tarnab and other information from Dr. Zar Quresh or from countries like Spain and Italy where they have made good progress.
- h. **Sugarbeet:** It is a new emerging potential crop which can be tried in Ningarhar, Laghman and other areas. The best places for training in

sugarbeet production and processing is Sugar Crops Research Institute, Mardan.

#### **D. GermPlasm Introduction and Evaluation:**

The research in Afghanistan is badly in need of germplasm from places where they have near identical agro-climatic conditions. The germplasm of the following must be ensured for sustainable research and development.

1. Wheat
2. Maize
3. Oilseeds
4. Rice
5. Chickpea
6. Fruits, both pome fruits, Vinefera and deciduous
7. Evergreen fruits or non-deciduous like the citrus family.
8. Sugarbeet
9. Vegetables like tomato, onion, cauliflower, cabbage, okra, beans, asparagus, peas and the like.
10. Cotton varieties adapted to semi-arid sub-tropical conditions.
11. Livestock and poultry breeds from NWFP.

#### **E. Processing Industry:**

Production has no meaning unless it is cost effective to the farmer and competitive in the market for the consumer. Therefore, it is of paramount importance that the produce must be value-added like flour mills for cereals, cleaning, grading and splitting for chickpeas, processing and preservation of fruits and vegetables. In case of production of perishable commodities like fruits and vegetables, there should a full-fledged processing industry for long domestic consumption and export purposes.

#### **F. Marketing:**

The production which is obtained from the farmer must be disposed of at a price which is profitable to the growers and the disposal should not be delayed, because by that time the growers not only need money for their own sustenance but they also need inputs for the following crops which are to be planted on the land vacated. They need money for the purchase of seed and plant material, fertilizers, land preparation and sowing cost. It is, therefore, important that production be regulated according to market demand and quality be according to consumers' preference and cost quality efficient.

#### **19 December, 2003**

Today was a holiday. However, we had a trip of the outskirts i.e. North and Lakeside of Kabul City. We also had an overview of the Badam Bagh which is very well planned and large in size but has a ruined infrastructure. The pipe of the

main irrigation water supply had been destroyed during the past year's disturbance and, therefore, the area had a deserted outlook. We noticed that it might have been one of the best research stations in the past, and felt it could be rehabilitated with very little effort. We wondered why a station under the control of the Federal Agriculture Ministry situated in the capital was still out of the sight of the various organizations including the FAO for the last three years. A number of NGO's and International Organizations are working in Afghanistan (especially Kabul) for the development of agriculture sector. However, it is sad that the pace of development is dismal due to lack of vision, poor planning and improper implementation. The on-ground bottlenecks are not targeted due to disarray and disjunction in situational analysis.

The station desperately needs rehabilitation, with special emphasis on restoring irrigation. Also important are innovative skills and new interventions like hybrid irrigation through a trickle system, introduction of new germplasm of fruits and crops and introduction of secondary enterprises for women's development like fruit and vegetable processing, mushroom growing, floriculture, backyard poultry farming, and apiculture.

In grapes two types of grapes have been tried, one for table purposes and another for wine processing.

We also noticed that thousands of acres of land in the vicinity of Kabul to the northern side have been unproductive where grapes orchards were once in abundance and were the main source of income.

These areas have water sources from dug wells, underground and some surface water.

Therefore, under rehabilitation programs for poverty reduction of the recently returned Afghans which have been settled in these areas, accelerated development in agriculture is advised.

The available underground water sources can be exploited and efficiently harnessed through trickle irrigation for the intended fruit orchards and creeping type vegetables like cucumber, squashes and fruit like watermelon. If rehabilitation work is carried out with sincerity, dedication by targeting the capital starved farming community; this country can become a food basket for most of the food-deficient countries. However, it is in the interest of the regional countries to make an investment in agricultural industry in Afghanistan for the creation of new job opportunities and to add value to the raw produce for export and local consumption.

#### **Sheesham Bagh Research Station, Ningarhar:**

After visiting the Dean, Faculty of Agriculture, we went to the above station where we discussed the ongoing research work with the Director and staff of the station. There is no doubt that the staff was busy in doing their research in the following areas:

1. Crops improvement
2. Soil
3. Vegetables
4. Agronomy
5. Seed multiplication
6. Plant protection.

In crop improvement the major thrust area is cereal improvement, which mainly includes wheat, rice and maize. The material is obtained from ICARDA and CIMMYT for wheat while there is neither their own breeding programme nor any body else is assisting them.

The big area in which they are trying to make headway is vegetables. In vegetables, they had tomato in plastic tunnels where there was sporadic attack of virus, abundant cauliflower and carrot and broccoli in the field.

I noticed that the staff was young, new graduates, energetic and motivated. However, all 23 researchers were graduates up to the B.Sc. level which cannot give a quantum jump to crop production with innovative approaches.

Another area of much concern was lack of field machinery and experimental row harvesters, plot threshers and the like. Their language was mostly Pushto with little understanding of English.

In order to really bring the people of Afghanistan into the mainstream and direct the development of their knowledge, there is a need for capacity building by training the professors and researchers to at least the M.Sc level. Specialists are also needed in agriculture economics, marketing and information technology.

We also got information about the rehabilitation of the olive oil extraction unit installed by the Italian government in Farm Ada some 40 years ago. It has been rehabilitated and started functioning on Dec. 21, 2003.

On way back to Pakistan, we visited Farm No.4 of Olive, which has been rejuvenated and had started some production due mainly to better plant management and care.