

Re-typed December 2012 (with some typo corrections)

## VII. CONCLUSIONS AND SUGGESTIONS

### Conclusions

The extensive ruins of ancient civilization along the central and southern Helmand River give evidence that it was once a major, prosperous and agricultural society based upon extensive irrigation. Most historians have agreed that successive hordes of invaders from the north and west destroyed the large cities and major irrigation canals. What was once the "bread basket" of Central Asia was by the 20<sup>th</sup> century a vast, barren or scantily vegetated and populated land affected to varying degrees by salts, alkaline and erosion.

The detailed history of the project is presented in chapter one. We, here, conclude and summarize the major events.

#### Pre-Project agricultural development (1900-1946)

- Between 1910 and 1914, the Afghans began to develop parts of an old canal system to be known as the Seraj Canal.
- In 1930 German engineers were called in to assist the repair, improvement and extension of the Seraj Canal.
- Later in the 1930's Japanese engineers were called in to improve and extend the old Deh Adam Khan Canal which was later to be called the Boghra Canal.
- World War II interrupted this project after only 15 kilometers of canal was dug using hand labor.
- The Afghans continued the work through the war and completed 25 kilometers of the canal by 1945.

#### First period of heavy equipment construction (1946-1949)

Between 1946 and 1949 the Afghan government, using monies accumulated through trade in World War II, contracted with Morrison-Knutsen Afghanistan (MKA) to contract:

- 1) Road improvements between Chaman to Kandahar and Kandahar to Girishk to facilitate movement of equipment, supplies and personnel into the country and to their construction camp, north of Girishk.
- 2) The Boghra Canal with diversion dam to provide water for the Nad-i-Ali and Marja desert tracts.
- 3) Major diversion structures on the Boghra Canal and the construction of Shamalan Canal spur.

#### MKA's second contract (1949-1953)

This contract was financed under an USA Export-Import Bank loan focused on:

- 1) Remedial construction problems resulting from previously unanticipated factors, e.g., (clay) lining the leaky Boghra Canal, examining drainage problems and farmer misuse of water.
- 2) Land development and preparation for settlement.
- 3) The construction of the Arghandab reservoir with a storage capacity of 481 million cubic meters or 390,000 acre feet.
- 4) The construction of the Kajaki reservoir with a storage capacity of 1.8 billion cubic meters or 1,495,000 acre feet.

The concept of an integrated Helmand Valley development activity was developed and the autonomous Helmand Valley Authority (HVA) was established. Major land settlement at this time was implemented by HVA.

#### MKA's third and last contract (1953-1960)

This contract was also financed under an Export-Import Bank Loan. During this period:

- a) The US Point IV assistance Program was established to give technical assistance on agricultural matters.
- b) Major drainage construction was accomplished in the Marja, Nad-i-Ali and Shamalan areas.
- c) A diversion dam, a canal and a drainage system were constructed in the Darwishan area.
- d) Diversion and canals were constructed in the South Arghandab and Tarnak areas.
- e) A small hydro-electric plant (out puts 3000 KW) was constructed on the Boghra canal, with distribution lines to serve Girishk, Chah-i-Anjir and Lashkar Gah.
- f) The Afghan Construction Unit (ACU) was established and given the responsibility for the operation and maintenance of the canals and project roads. This unit eventually replaced MKA.
- g) Land development and preparation continued in Marja and Shamalan areas.
- h) The Tudor Report (1956) was published. The evaluation undertaken for US International Cooperation Agency (ICA), examined the engineering accomplishments and the numerous project problems recognized at the time.

#### Period of study, planning and continued land settlements (1960-70)

The major highlights of this period were:

- 1) The arrival of the US Bureau of Reclamation (BuRec) to give technical assistance on drainage systems, design, and maintenance.
- 2) The continuance of land development and settlement in the Marja and Shamalan areas.
- 3) The completion of two Farm Economic studies.
  - a) I.M. Stevens and K. Tarzi, Economics of Agricultural Production in Helmand Valley, Afghanistan, 1965.
  - b) I.M. Stevens and K. Tarzi, Economic Analysis of Marja Farms, 1964. The expansion of HVA in 1965 to cover the Kandahar area (HVA henceforth known as Helmand-Arghandab Valley Authority "HAVA". By the mid-1960's HAVA was coordinating utilities, education, agriculture research, extension, housing, health and industrial development for the region.

- 4) Production figures for Marja and Nad-i-Ali began dropping, and some land was being abandoned by settlers in these areas mainly nomads, because of rising water table, salting and poor agricultural practice.
- 5) Shamalan was selected for an intensive land development project which would farm on areas with the greatest agricultural potential in the shortest time frame.
- 6) A similar feasibility study was completed for the central Arghandab by 1970.
- 7) In 1967 US Geological Survey studied the rates of silting in the Kajaki reservoir.
- 8) High yielding varieties of wheat first introduced in 1967.

#### Period of Building, Planning and Change (1970-1976)

The highlights of this period were:

- 1) 1970 Farm Economic Survey completed by G. P. Owens (I. G. Farouq, was field supervisor.)
- 2) 1970 cotton survey completed by K. Shea and G. Farouq (myself).
- 3) US Geological survey team made limited study of water resources in Upper Helmand Valley 1971.
- 4) Flood control diversions in Lower Helmand studied by JECO (International Engineering Company) in conjunction with Asian Development Bank 1972.
- 5) Major drains constructed in Babaji area, 1970-72.
- 6) With-drawal of USAID/BuRec from HAVA after land development aspects of Shamalan project deemed unfeasible, 1973-74.
- 7) Kajaki Hydro-electric generators installed and transmission line constructed to furnish power to Kandahar, Lashkar Gah and Girishk.
- 8) More than 4000 families settled between 1973-76, the total reached 10,083 families.
- 9) Feasibility of new highway to Iran through Lashkar Gah, Deshu and Lower Helmand studied by Asian Development Bank and right of way surveyed by Italian contractor.
- 10) Land development and reclamation studied by JECO under the Asian Development Bank for Seraj area and Lower Helmand.
- 11) Feasibility of flood control dam in Khowaja Ali area, studied by Indians.
- 12) USAID/Soil Conservation Service returned to Helmand in support of the Central Helmand Drainage Project 1974.

The social characteristics of the people in the Helmand Valley is such that there are four types of people living there, namely, nomads, urban dwellers, settlers and sedentary population. The ethnic linguistic composition of Helmand is complex as the result of migration and settlement over the years. One can find all ethnic/linguistic groups from all over Afghanistan in this valley. So this socio-cultural heterogeneity of the Helmand Valley's population should be kept in mind whenever the question of planning for the project comes up.

The average farm size in the valley is 6.92 hectares ranging from 3.22 hectares in Sanguine to 38.25 hectares in Khanashin area. There is a substantial inequality in land holdings. Large holdings are "inefficient", this is why one fourth of the land in farms was not cultivated in 1975 (over 68% of the land in Khanashin, where the largest holdings are

exist, was idle). Most of the people in the valley cultivate their own land. Small holding is also a problem, it cannot support a family. In Nowzad area, 42% of the farms are less than one hectare. Fragmentation of land was another problem in some areas.

About 66% of farmers in 1970 reported their land was leveled, while in 1975 this percentage moved up to 96.4. This reflects the increase of agricultural machinery in the province.

Wheat is still the dominant crop (66% of the total cropland) and cotton is the most important crop (29%). Cotton farming in Helmand has expanded very rapidly in recent years from 5% in 1970 to 29% in 1975, due mainly to the introduction of high-yielding varieties of wheat and reasonable prices for cotton. Double cropping in Helmand Valley is getting common. In 1970 about 9% of the cropland was double cropped while this figure was about 23% in 1975. So, farming in Helmand has started to break away from its traditional subsistence form and farmers are now able to grow more high value cash crops. The shift is due mainly to improved wheat farming and the use of chemical fertilizers. Helmand has the potential to grow more high valued crops such as vegetables and fruits when the marketing requirements for these crops are met, e.g., construction of better farm to market roads in the area. Though farming in Helmand as a whole shows considerable improvement, the water short regions in the north (Nowzad and Zamin Dawar) and Khanashin in the south are still subsistence farming areas.

The Helmand Valley is noted for its early use of tractors and their concentration reflects the level of wealth and the land tenure pattern. The 1970's have been a very rapid increase in tractors, from less than 100 in 1969 to more than 1000 in 1975. Important to note is that those areas which have small holdings are using more tractors than those areas which have large holdings. Marja and Nad-i-Ali two settlement areas are using more tractors than others.

The main agricultural problems perceived by Helmand farmers were in descending order of frequency, (a) poor drainage/salting, (b) inadequate irrigation water, (c) lack of equipment, (d) lack of finance and credit (e) the high price of chemical fertilizer. Agricultural education and training was also a problem there. Since household size is large and the labor force appears adequate for agricultural production, about 50 percent of the household contain individuals with off-farm occupations and about 30% more are willing to have off-farm occupations.

While the adoption of high yielding varieties of wheat was very rapid in Helmand, the adoption of improved breeds of livestock and poultry has produced at a much slower pace. The reasons are their non-availability, high cost, and the disease problem.

The major inputs in Helmand agricultural production are plowing, labor, seed, fertilizer and to a lesser extent insecticides. Fertilizer was the most expensive input for farmers in Helmand (43% of the total cost/hectare) while the second most expensive cost is plowing. Seed cost was third (11%) and labor was the fourth (10%) major cost. Average cost per

hectare was 5,573 Afs. While the average sales revenue for crop production was 12,562 Afs. per hectare.

Farmer income in the Helmand Valley has been increasing at a fairly rapid speed. Main net owner income in 1975 was 46,682 Afs. while 27,118 Afs. was in 1970 which shows 8.9% increase in five years.

The Helmand Valley has good water, large irrigable lands and suitable climate. These three important production factors can very seldom be found together in other parts of Afghanistan. In some parts, if there is land, then irrigation water is scarce while in some areas where water is plenty, then irrigable land is quite limited. Given that water, and land are both available in an area, possibly the climate is such that the other two factors cannot be used efficiently throughout the year. The Helmand Valley is one of the few rich and suitable areas in the country having all these privileges together. About 48,000 hectares of irrigable land existed in the Valley for new development. About 40% of the total water runoff of the country belongs to Helmand and the growing period of plants in the Valley is about 800 (300?) days a year.

In addition, the Helmand valley project has well established a modern infra-structure, technical know-how among the farming population and administrative efficiency in the project's staff. These additional factors give the project a strong position. This is a take-off period for the project, any investment will give more returns. The project authorities as well as the government of Afghanistan must pay more attention to it. Helmand will not only make Afghanistan self-sufficient in grain but will be a source of fruit and vegetable export to the nearby Gulf States.

#### Suggestions and recommendations

The following are some suggestions and recommendations to the Helmand Valley Project authorities for the betterment and further success of the project.

##### The construction of new reservoirs and diversions:

There is one reservoir in the Helmand Valley, Kajaki Dam, and two diversion dams, namely Boghra and Darwishan. The Kajaki reservoir and the two diversions will be filled with mud and sands soon because of the presence of mud and sands pouring into them. If there were small dams and diversions above the present ones they would be very useful. First, these new constructions will hold back the mud and sands flow from the present systems which are coming down through floods from the mountains and the adjacent plains. By this, the life of the present reservoir and diversions will become longer. Second, each new dam will provide the possibility of the construction of new canals and irrigation system which will develop the agriculture of the surrounding areas. Third, the new constructions will increase the possibilities for generation of electricity. Fourth, the new dams will help the development of fisheries.

Some diversion dams can be built below the present dams, especially below the Kajaki reservoir in Garmab area. This will regulate the flow of the Helmand River throughout

the year. This new dam (Garmab Dam) will keep winter water to the summer season. In winter, there is more demand for electricity and little demand for irrigation water. While in summer there is more demand for irrigation water and little for electricity. The new dam will keep the winter water used by power generators for summer irrigation use. In addition, about 30,000 hectares of new lands, will come under irrigation in Sanguine, Kishki Nakhud and Saraj areas.

#### More power generation:

Kajaki reservoir produces now 66,000 KW/h electricity while having capacity of about 120,000 kw/h. By the construction of the Kajaki reservoir's spillway gates, which is about 80% completed, the water storage capacity of the Kajaki reservoir will be raised from 1.7 billion cubic meters to three billion cubic meters. This will increase its power generation capacity to about 200,000 kw/h. Electricity will be available for Kandahar, Helmand, Herat and even to Kabul provinces or possibly be exported to Iran. It can be also used for the production of chemical fertilizer.

Boghra Canal produces new 3000 KW/h electricity. Darweshan canal will also generate about 2000 kw/h power if a hydro-electric power plant is installed there. In the same time every diversion dam as well as major canal drops in different parts of the valley will give electricity to the surrounding areas. By this the transmission line costs will be reduced considerably. If fully exploited the potentials, every village will have electricity. Thus the Kajaki electric plant will work only for export.

Electricity will bring big changes to the area. Different firms dealing with agricultural commodities will come into being and small industries based on agriculture will be introduced to villages and farm families. Small industries will provide work for all members of a farm family and will bring a considerable extra income to them.

#### Land Development:

By the construction of the Kajaki spillway gates, the capacity of the reservoir will be raised from 1.7 billion cubic meters to three billion cubic meters. In additions if the Garmab regulator dam is constructed as was proposed to the Afghan Government in 1977, then, the new water flow will bring about 48,000 hectares of new land under irrigation namely in Zamin Dawar, Kishki-Nakhud, Seraj, Shamalan, Darwishan and Khanshin areas.

#### Zamin Dawar area:

This area has the best soils in the valley, less drainage problems but water short. A preliminary design and survey of the project area is already done and it was ready to start construction work soon. The Government of the Federal Republic of Germany was supposed to finance the project. But the present war in Afghanistan stopped this work.

#### Seraj and Kishki-Nakhud area:

This is also a vast area, having large potential of irrigable land. A contract was signed with an American consulting engineering firm to make a detailed survey and prepare the appropriate design of the project. This contract didn't include Kishki Nakhud area due to its financial limitations of HVA. Other wise, it would be much better to cover Kishki Nakhud area as I suggested in 1977, in which the intake of the canal will go up from Haiderabad to Garmab. Garmab diversion will regulate the water flow of the Helmand river and will irrigate Kishki Nakhud as well as Seraj area. The work is disrupted due to the present circumstances in Afghanistan.

#### Darweshan area:

The present irrigation system of Darweshan serves a part of this area which starts from Hazar Juft (where the intake of the Darweshan canal is situated) to Saffar, fifty kilometers down from the intake. From Saffar to Landi, a large irrigable area with suitable soils is located. A preliminary land development survey of the area has been done but no practical action has been taken so far.

#### Khanashin-Deshu area:

This area starts from the end of Darweshan area and is extended on both sides of the Helmand River. The area has good river flood plains. Total irrigable area is estimated about 34,883 hectares while only 7241 hectares were under cultivation in 1975. Two irrigation canals one on the right bank and another on the left bank of the river needed in order to irrigate the remainder 27,642 hectares of land. A pre-feasibility study of the area has been done. This study strongly suggests the development of this area.

#### Water and Soil management.

Lack of water and soil management is one of the crucial problems in the Helmand valley. Field reports show that a large amount of water in irrigation canals is going waste. In some cases it reaches 25 percent in major canals and to 15 percent in secondary and tertiary canals. Such water wastage brings up the level of the underground water in the respective area to the surface which affects crop production very badly. Average precipitation rate in Helmand is about 3.56 inches (90 mm.) a year while the evaporation rate is 116.57 inches (2961 mm.) a year. Whenever the water table in a certain area is high and reaches the surface, due to un-proper use of water, then the high heat evaporates the water from the surface and its salts remain in the soils which poses a great problem to plant's growth. Five ways are recommended here to reduce water wastage:-

1. Lining of canals, construction and proper maintenance of water control gates.
2. Well planned drainage systems.
3. Proper maintenance of canals and drains.
4. Giving water management education to irrigation workers, extension agents as well as farmers.
5. Charging farmers for their water use.

A comprehensive survey of the soils and water resources in Helmand is needed to show precisely the situation of under ground water, total irrigable land, total irrigated land and soils classification.

### Land settlement:

The Helmand Valley has great potential for development. The existence of large irrigable areas in addition to availability of adequate water and warm weather give the Helmand Valley authorities to work for further land development. The development of new land will bring new people to the area for settlement.

Land settlement, introduction of new people to the new land, is an important program since the 1950's in the Helmand Valley and will continue to be important till the land water potentials of the valley are fully exploited; Especially when the proposed land development projects (about 48,000 hectares) are undertaken. About 51,578 hectares of irrigated land is already distributed to 10,083 settler families in different areas of the Helmand Valley Project. In view of this magnitude and scope, the process of land settlement can be used as a mean of socio-economic justice in the valley. Large estates are in the hands of a few landlords most of them in lower Helmand, who are considered to perform no adequate economic function in land use, these lands must be reclaimed. This reclamation is not easy, however. It will bring disaster, create reaction and political problems if not handled. The objectives of the settlement in the Helmand Valley are to:-

- Maximize the utilization of land and water resources of the area;
- Settle nomads, whose settlement is always in government plans;
- Settle landless farmers who have no land but have agricultural experience. The government of Afghanistan has responsibility to solve their problem;
- Help relieve the pressure in over-populated rural areas;
- Slow down rural urban migration;
- Help social justice; and
- Help stabilize economic and political situation in the area.

Since the Helmand Valley Project has settled a large number of settlers, therefore, it requires constant comprehensive planning. By this the farmers should not be totally dependent upon government help. Both farmers and the government should work together for the success of the project. Agriculture deals with both nature and human beings, so, it is necessary to keep them both in mind when under taking any action in the project. Ignoring any thing concerning them or considering it of lesser importance would bring disaster to the whole project. The project authorities should clearly understand what to do with both sedentary and settler population of the project. With this in mind, a package deal for the Helmand Valley Project is suggested here, seeming to be a suitable framework.

### Type of land settlement:

A suitable type of land settlement for the Helmand Valley Project is "planned land settlement". In this type of land settlement, settlers are not totally dependent on government help; both settlers and government work together. Major constructions, public services and those provisions which settlers alone are not able to supply themselves, are provided by the project authorities, while the rest of the project's development work is left to settlers. Careful and considerable efforts are needed to formulate a guideline to clarify the share of each part, government and settlers.

### Preliminary surveys:



In the case of an entire population being moved for resettlement in Helmand, a comprehensive socio-economic survey of the departure area is needed which would make a reliable basis for future planning and settlement. After such a survey, before the actual settlement, a comprehensive land and economic survey of the arrival area is a must. It should be discernable, from this survey, whether the new place can provide satisfactory living conditions for settlers in the present and future. In the case of individual and spontaneous settlement, where settlers are coming from different parts of the country, a preliminary survey of the arrival area is sufficient.

#### Provisions:

When the land and environment survey is completed and found suitable for settlement, the preliminary preparation of the project is necessary. Special consideration should be given, at this stage, to soil and land problems, health, public utilities, communication facilities and other socio economic factors needed by the settlers.

#### Planning for the project:

The next important stage for a successful land settlement project is the "planning stage". The decision made in this stage will influence the life of settlers for generations. The following steps should be here considered:-

- (a) Farm size: The size of the lot assigned to each settler must be sufficient to support a family at a satisfactory level of living, taking into consideration the technical result of the soil and present and future abilities of the settler.
- (b) Type of farming practice: Project authorities must kindly advise settlers about suitable crops that grow well in their settlement area. Otherwise, they will cultivate those plants to which they were accustomed in the past, possibly not suitable to the new area.
- (c) Physical planning: If the topographical conditions are suitable, the circle type of housing is preferable, having the advantages of both linear and the concentric types of housing.
- (d) Settlement regulations: The terms of settlement must be clearly stated by the project authorities and each settler must know them well in advance. The regulations should be simple, to avoid long waiting periods and extra expense. Strong measures should be taken to prevent land fragmentation due to inheritance and land speculation due to economic reasons. Other wise, either land would fragment in such a way that there would be no more economic units, or speculated upon in such a manner that large estates would fall into the hands of a few people. In both cases another redistribution of land would be necessary, and that is not feasible. The regulations must be strictly implemented and no favoritism should be permitted.

#### Selection of the settlers:

Another important stage in the execution of a land settlement project is the stage of selection of the prospective settlers. Those settlers should be selected who are capable of answering positively to the project's objectives. Such selection would guarantee to a large extent the success of the project. The criteria for the selection of settlers vary from project to project and time to time. However, having agricultural experience must be a

prerequisite for any settler selection. If nomads are going to be settled, a special arrangement is necessary; whether it be giving them agricultural training before they receive their prospective lots or giving them intensive on the job training in farming.

#### Installation:

When settlers arrive in the new area, they are not able to manage their lives properly for a certain period of time; some sort of arrangements for their reception, nutrition, housing, technical and financial assistance and other immediate need is vital. They must receive this help till they are fully installed and adopted in the area and to able them to continue their living in the valley as its sedentary population.

#### Successful continuation and development:

The Helmand Valley Project authorities should take the following necessary steps in order to direct the project so as to develop successfully:

- Law and regulations: Agriculturalists, Jurists, economists and sociologists should undertake different research and investigations in order to decide upon the best regulations taking into account the present socio-economic conditions, power relationships, religious situation and needs for the country's agro-economic development. Such laws and regulations would guide the project towards a successful outcome.
- Agricultural education and training: An agricultural project can only be successful if it activates all segments of the farm population e.g., children, youth and adults, including women. This education must have rural characteristics, facilitate the community development and home economics programs and change the old leadership. Training of personnel in cooperative and farm management is an important part of such a programme.

Farmers in the Helmand Valley contrary to the farmers in many less-developed countries, are progressive and accept new techniques of farming easily once they are convinced. For example, there were less than 100 tractors in the valley just five years ago 1970, while their number increased to 1000 in 1975. About 6% of the farmers in the valley were using newly introduced high yielding varieties (HYV) of wheat in 1970 while this percentage reached to 44% in 1975(66% of the total cropland). The same practice is applicable to the use of chemical fertilizer. Those areas which have enough irrigation water like Marja and Nad-i-Ali have reported that 95% of them had cultivated HYV of wheat and about 96% of them used chemical fertilizer which shows a significant and rapid change. In order to accelerate the progress of the project and speed up its production, a well-trained agricultural extension staff is needed in the area. These agents must give the farmers the necessary advice and training in all aspects of their farming. The most proper channel for the project authorities to introduce new farming techniques and equipment to the farmers of the valley is the agricultural extension service. Though the present extension service in the project is the best in the country even in the region, it still needs more attention and importance.

HVA has an animal husbandry department for many years, its result is not satisfactory. Thus, special attention should be paid here to livestock keeping and to already introduced, but not efficient, improved breeds of cattle and chickens.

Farmers' participation in decision making: The project authorities must give the farmers a chance to take part in decision-making concerning their own affairs. They would thus be interested in the implementation of the plan and would feel that the project organization belongs to them. Moreover, they would receive some training in handling and organizing their own affairs.

Provision of specific basic services: Provision of technical assistance to the farmers, marketing facilities, organizing cooperatives and providing necessary public services are vital factors for the success of any agricultural project. Neglecting any part of this program or considering it less important will adversely affect the farmer's life, in both present and future. But this help must be so that the farmers are gradually emancipated and not turned into beggars.

Stimulating self-help and group action: The concept of self-help and group action must be strengthened among the farmers. Construction of unpaved roads, wells, houses, and pest control are examples of group action.

Community development program: a well-integrated community development program is a major input in improving the farmer's lives. The project must activate both male and female members of the farmer's family. It must provide essential elements of technical knowledge and industry to school children, adolescents and adults through the educational and industrial programs of the community development.

Integration of the project into national objectives: To avoid the isolation of the Helmand Valley Project from the rest of society, to preserve harmony among different sectors of the project and finally to avoid failure, it is necessary for the project to be a part of the national plan.

Organization: Since the Helmand Valley Project is a large irrigation project with many potentials, it is advised that the Helmand Valley Authority must preserve its present autonomous entity within the government's overall machinery. It is further advised that HVA must have a qualified staff especially in its planning and statistics department to conduct various surveys in different fields and prepare appropriate plans, based on acquired surveys for every part of the project. This will help the project a great deal, will clear the way for its progress and speed up its development.