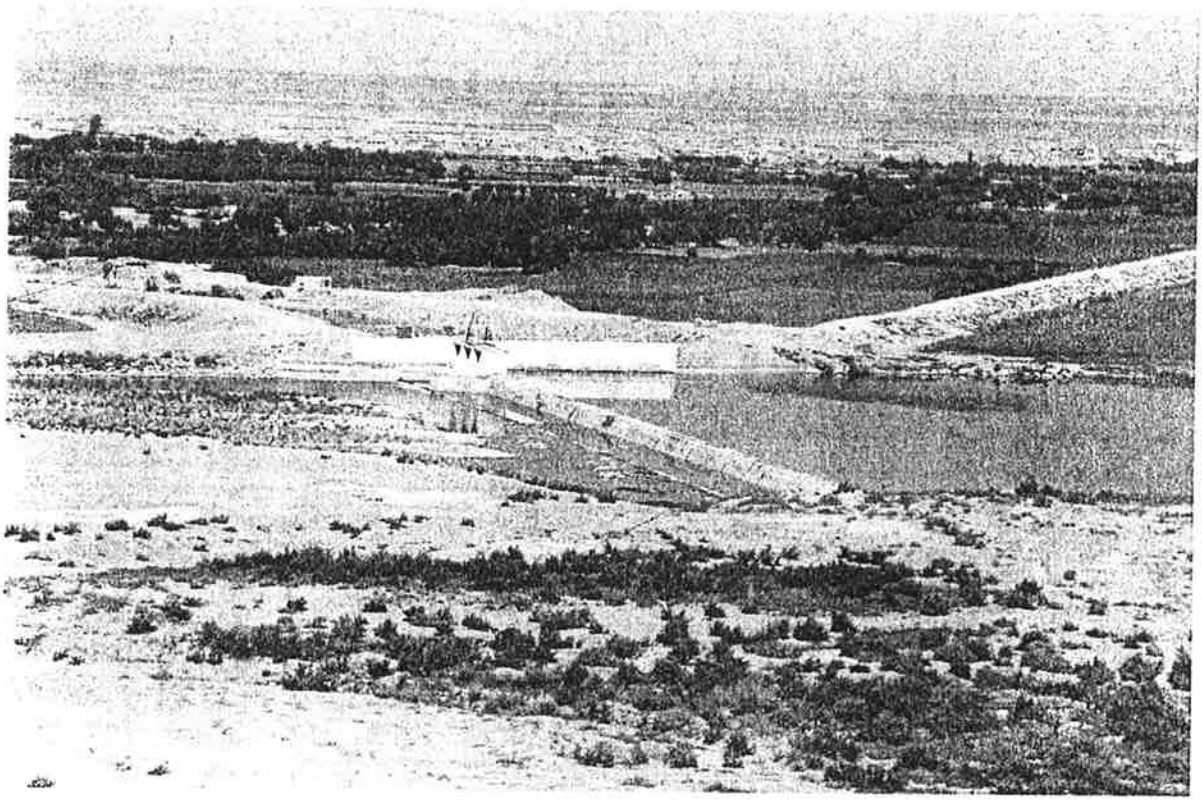
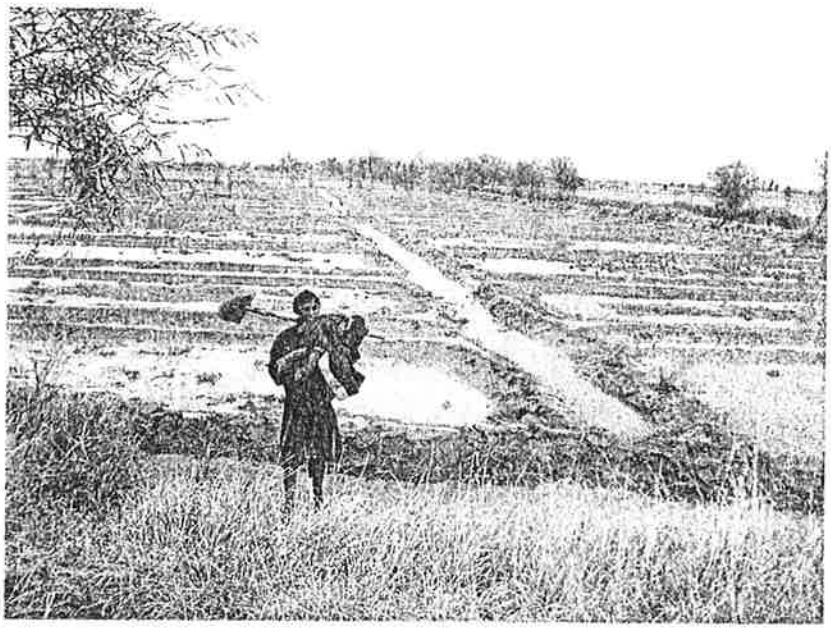
Initial survey of the

Middle Helmand Irrigated Agricultural Production Systems



Report of a Mission to Lashkargah – Helmand

2003 Nov 29 – Dec 08



USAID - RAMP Project

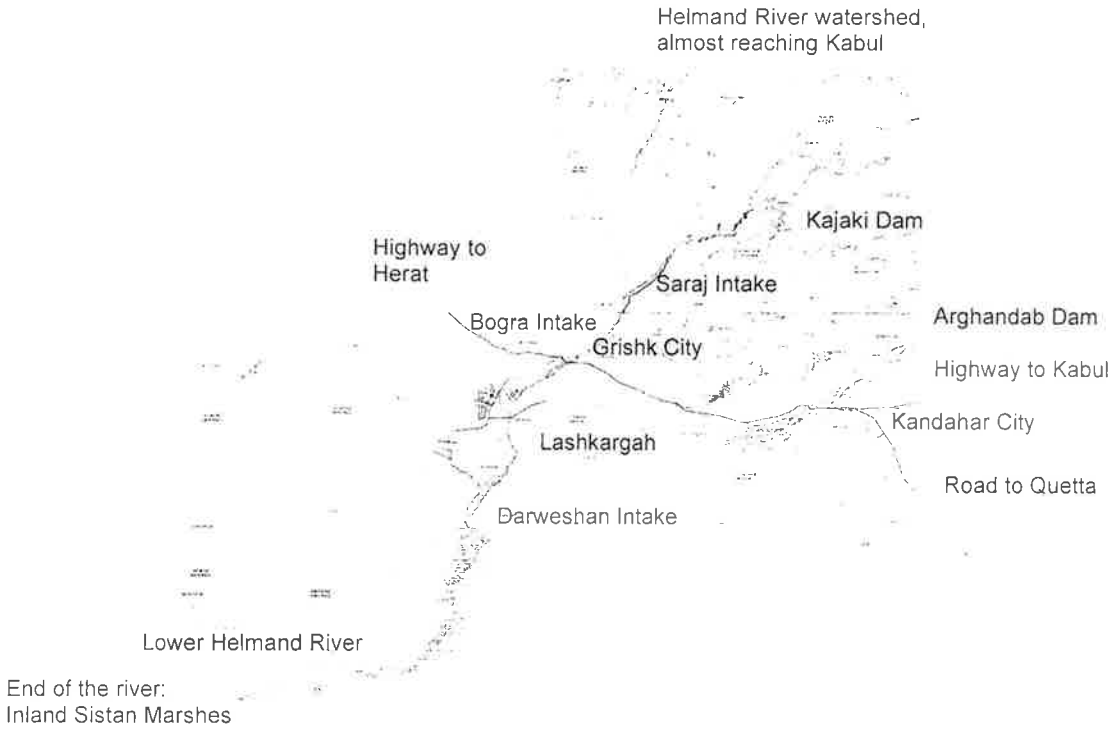
Chemonics International

By Johannes Oosterkamp

Senior Programming Engineer

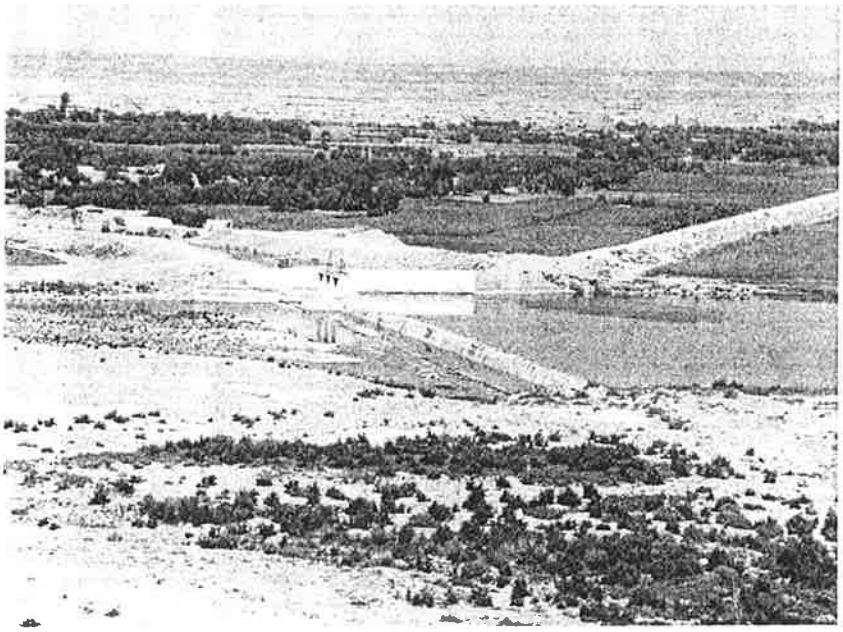
Kabul, 2003 December

Helmand canal flow depends on the river, Kajaki dam and intakes



(Helmand River; Outline)

Helmand River flows from right to left,
the Bogra Canal in the background, left



(Bogra Intake)

Contents

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Acronyms:

ACI American Concrete Institute

ASTM American Society for Testing and Materials

IECO International Engineering Company, main consultant for the Helmand Civil Engineering works, absorbed by M&K.

HAVA Helmand and Arghandab Valley Authority (in its heyday very similar to the TVA, also in its own heyday)

HCC Helmand Construction Company, a para-statal company, follow-up of the Helmand Construction Unit, follow-up of M&K

M&K Morrison and Knudson, main contractor for the Government of Afghanistan (now absorbed by the Washington Group).

MAAH Ministry of Agriculture and Animal Husbandry

MHIAS Middle Helmand Irrigated Agricultural Production Systems

MIWRE Ministry of Irrigation, Water Resources and Environment

MWP Ministry of Water and Power

USDA-NRCS US Department of Agriculture National Resources Conservation Service (formerly Soil Conservation Service

USDI-BR US Department of Interior Bureau of (land) Reclamation (the agency that developed all the large water-projects in the US)

From the departure note (1979 August) of the USDA-SCS Chief of Party:

"Everyone sincerely hopes that it will not be a permanent withdrawal. There is yet the fond hope that someday, somehow a similar program and team can be put together to continue ..."

and

"If USAID ever has the opportunity to revitalize their programs in Afghanistan, they will be well advised to put top priority on continued development assistance in the Helmand Valley".

1. Objective of the Assessment

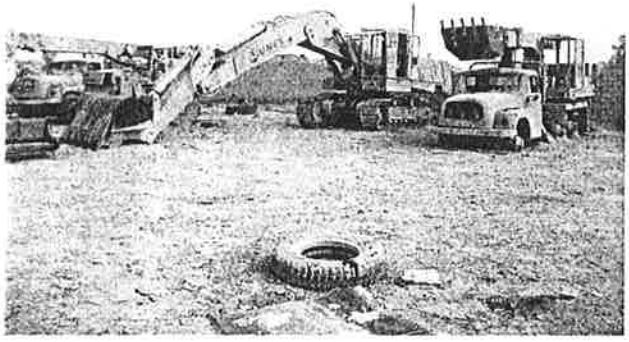
To evaluate the operational status of the Middle Helmand Irrigation System (MHIS) and estimate requirements for its (i) immediate repairs and improvement and (ii) outline a scope of work for mid-range re-development.

(The present survey is focused only on drainage and irrigation. It will be followed up by a similar study of the agricultural production system and its processing and marketing aspects.)

The basic irrigation system of the MHIS is depending on four main canals:

- Bogra Canal (right bank, built in the fifties and sixties)
- Darweshan Canal (left bank, also of the fifties and sixties)
- Lashkargah-Shamalan Canal (right bank, of the eighties) as an extra intake from the Helmand River in order to reinforce the Shamalan Canal which originally was and still is a lateral of the Bogra Canal
- Nahr-e-Saraj Canal (left bank, eighties) which was built upstream of Bogra, starting from Sangin District.

The MHIS area nominally irrigated is just over 100,000 ha, now down to some 70,000 ha.
(A map of the system's global location and features is shown above. Each intake has its corresponding canal system and irrigated lands.)



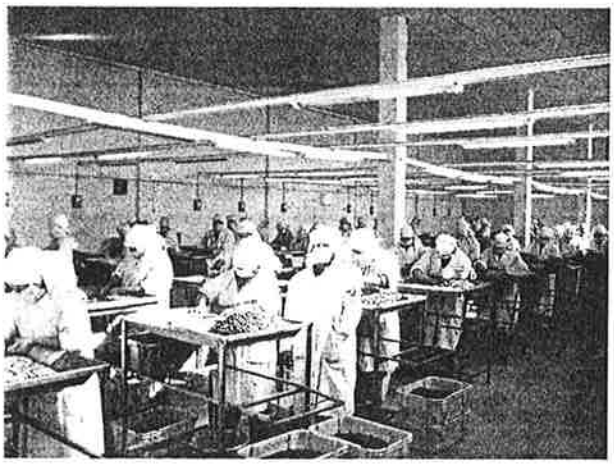
The actual status of the different systems is remarkably good, despite ten years of open warfare during the eighties, with many attacks on the irrigation infrastructure and additionally some fifteen years of only a very low presence of government authorities with operational capabilities. However, HAVA's construction equipment for maintenance has been badly damaged.

It must be recognized that the effective canal capacity now is at some 70% of design and that salinity and drainage are in worse condition, lowering on-farm production.

However, it must also be recognized that farmers have been contributing (and also maybe have been providing leadership) for the upkeep of the systems.

(At the end of the day)

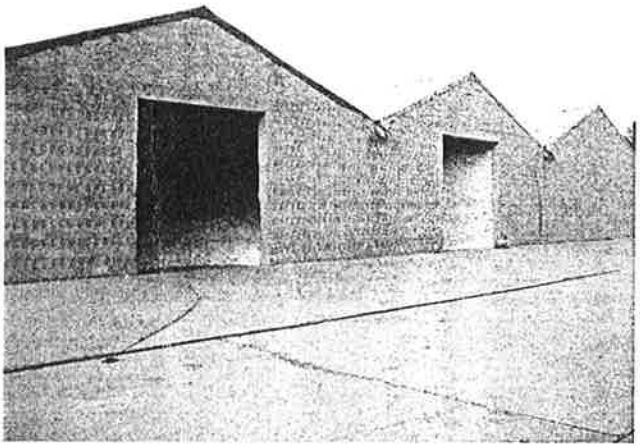
The agricultural production systems (where more public services activities have to be operational) may have suffered to a larger degree: especially research and credit facilities seem to have suffered and markets have been lost. NGOs and suppliers have satisfied only some of the requirements. This matter has to be looked into during a follow-up visit. Farmers nevertheless are producing, even on salinized fields and processors are active.



(This year's cotton crop waiting for ginning.)

(Ploughing for the wheat season.)

(Sorting raisins in Kandahar. CADG, someway managed to continue, even under Taliban rules of work .)



2. Summary Recommendations

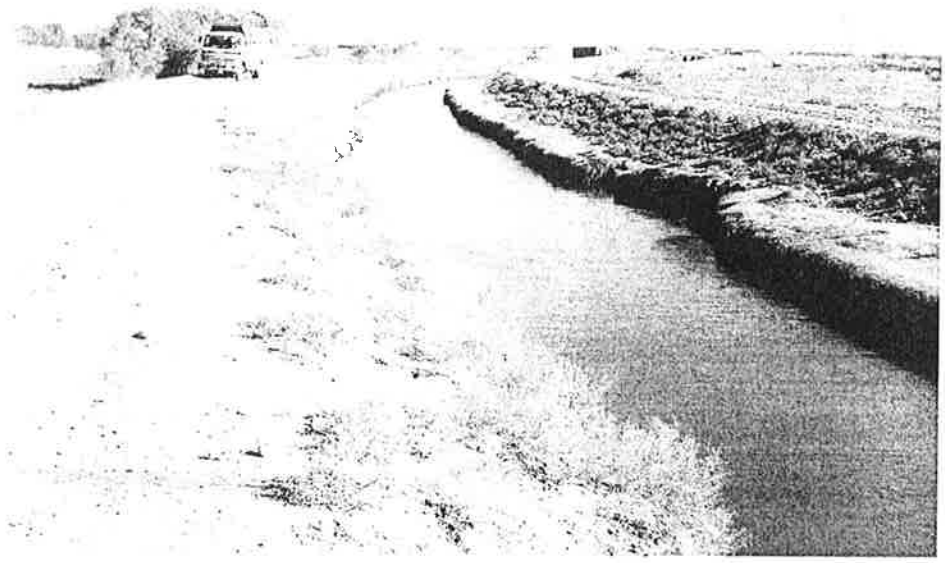
Note: The present document has been formulated in rather generalized terms. It will be followed up by a series of proposals regarding rehabilitation (yes) of infrastructure which hopefully will be implemented soonest.

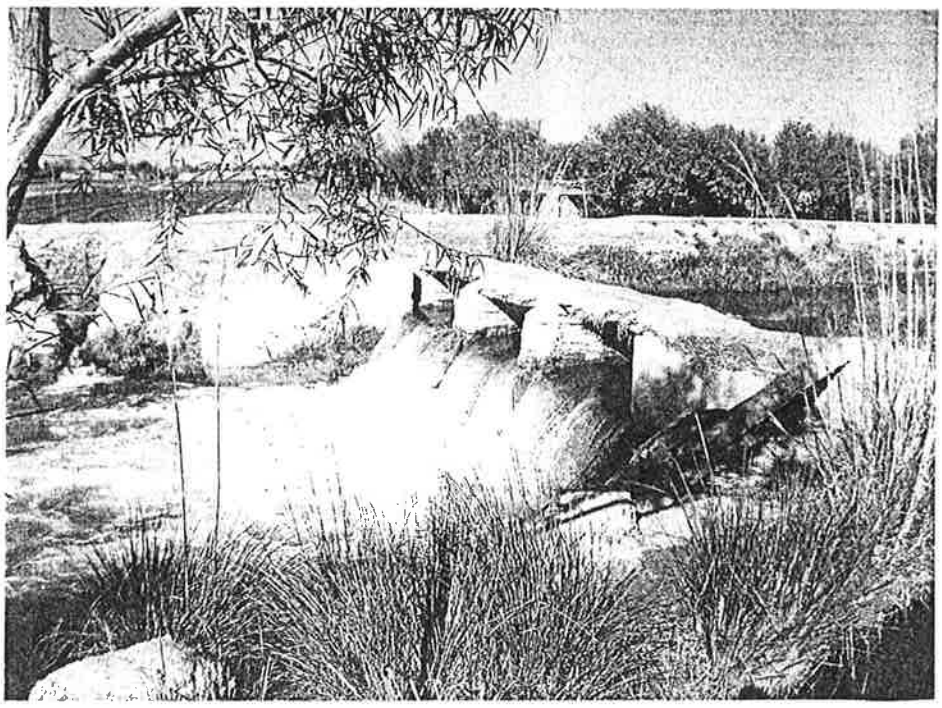
1. To deploy technical specialists immediately to define emergency systems repairs (to be completed by mid-January 2004).
2. To provide priority technical assistance and operational support to HAVA staff.
3. To immediately engage two or three construction services contractors to repair damaged canals and structures before the irrigation main season begins (2004, April 01).
4. To design a general re-development plan with time horizons of one year, five years and ten years. (In the present and follow up documents the term Rehabilitation will be used sparingly because it refers to a return to the old days.)

5. Agricultural production specialists need to visit the area to evaluate agricultural re-development, (planned) presence of development participants and future funding, credit possibilities for farmers, etc. In that context vocational education, farmers' training, extension and validation of new techniques and inputs have to be considered, possibly in a single, multi-faceted, package; may-be along the lines of a several years land grant university and private sector production partnership. However, some brainstorming has to be completed beforehand in view of potential of temporary NGO's, more permanent (¿?) local consultants, (semi-) public entities and private commercial businesses.

It may require some three years to repair the damages of the irrigation and drainage hardware. It may require far more time to re-design the knowledge and management base and count again with a body of capable and well trained technicians, whether in public or private service. Even so, time will be consumed to train farmers, to modernize agriculture. The general farming population is conservative and will require very convincing and long lasting examples in order to change their current ways of farm and irrigation management.

(A downstream section of the Shamalan Canal filled with sediment and the bank road that requires a good treat.)





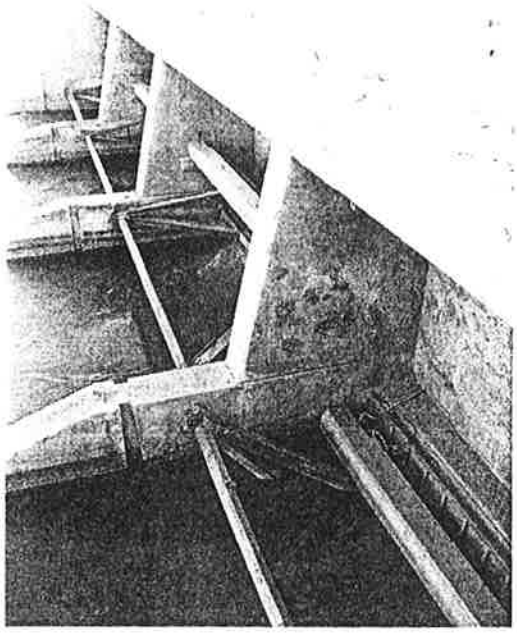
(Self help rehababi-litation. 10 to 20 KWatt Banki turbines for local electricity and battery charging may be installed on canal drops like this one and also largfr oneswith larger turbines, enough to cover a village.)

3. Immediate action

Below is a brief list of immediate system repair actions and required activities. It is provisional and certainly not exhaustive.

In order to speed up the process of the larger sized activities RAMP might formulate a couple of small activities related to field investigations. Such activities may be financed within the authority of the CoP and after having the nod from AID.

- Arrange that HAVA direct an umbrella/framework request to USAID in which it formulate the needs of financial and technical assistance for re-development of the Middle Helmand System. The request is to be ratified by the Governor of Helmand and the MIWRE and MAAH. (This request would be the legal basis for USAID's / RAMP-Chemonics interventions.)
- Propose and prepare an agreement with HAVA regarding the financing of to be leased of vehicles (3 Hilux Pick-up for HAVA use);
  (Rental of a pick-up truck: $700/month including driver ($8,000/yr). Second hand good quality pick-up to buy: $8,000 and a driver take-home pay would be like $1,500/yr. So a lease/transfer of ownership agreement ought to be sorted out which complies with AID's rules.)
- Arrange for a list of equipment required for the HAVA administration, communications, design office and operations department (for example for discharge measurements in the systems' canals (in order to be able to calibrate settings of gates): some $20,000 for acquisition of small field material; installation of an internet connection; hiring of a secretary which is computer literate ($1,500/yr). (In order to allow HAVA to do field work and communicate with Kabul.) (Peter Siu was working on a first budget.)
- Request HAVA to do an inspection of all structural works resulting in proposals for repair and budgets.
- Request HAVA to identify quarries of hard conglomerate to be used in structural fill-work in canals and bank reconstruction along river beds.
- Launch a contract with HAVA/DAI for a technical analysis and proposal for repair of the river crossing weir at Bogra and redesign/reconstruction/reinforcement of a section of the Bogra canal bank where apparently it is founded on unstable material and has broken/collapsed already on previous occasions, demanding immediate repair (while in the irrigation season). (This study requires presence of an expatriate, specialist in soil mechanics and river engineering; maybe it requires some simple core drilling equipment, to a depth of 10 m or so for foundation studies.)



Repair of the Bogra #1 gate is a simple thing requiring some welding and high quality concrete technology. (CADG could e-contact a specialist in concrete and/or contact a L.Berger specialist and have them suggest how to put a broken off concrete support stool in place again. Then a proposal for repair could be incorporated in one of the general repair jobs.

(The hoist cable between gate and concrete counter-weight beam snapped, the weight fell down on its concrete stool, cracked it and fell further on the gate's beam. The beam has to be raised again, the stool replaced, the gates beam be straightened or replaced and the gate will be back in business again.)

- Get a first order of sealing rubbers for gates in the canals. HAVA/DAI could work out a requirement. DAI supposedly has access to suppliers, about models in stock, preparation according to specification and so.
- Recruit, for a week or ten days, a construction machinery expert with specific knowledge of Czech equipment that is owned by HAVA and was used in the eighties to construct the Nahr-e-Saraj irrigation system. The consequence may be that a plane load of spare parts may be ordered for repair of machines that still are not beyond repair. The same expert should have a look at the Changir workshop where HCC controls mainly US made machinery from the seventies. (CADG mentioned that it has contacts in Prague.)
- Prepare first three initial rehabilitation contracts (or task orders under the umbrella of a IQC) to get construction (basically cleaning of canals and in initial rehab of roads) on the move. The term of execution of these three contracts would have to be completed within less than a year. (Some of the urgent activities would have to be executed during the irrigation canal closure in the months of 2004 January and February.)
- Define a further three contracts (task orders) for rehabilitation of canals and drainage works .
- Arrange for a specification of equipment required for a basic Soils and Water Laboratory to be reestablished in the HAVA compound in Lashkargah: Main determinations are related to electric conductivity, pH, salinity, alkalinity and some elemental soil fertility values. (Chemonics could contact a USDA-NRCS specialist for the purpose.)
- Develop a staffing and equipment (including communications) list for a RAMP sub-office to be established in the HAVA compound in Lashkargah.
- Arrange for a list of staff and equipment for a Chemonics staff house in order to maintain independency from employed contractors. (Staff: a good cook cum house cleaner and some watchmen, etc.)
- A very basic and elemental requirement: Request HAVA to arrange a mirab and shuras workshop in which contributions and cooperation will be established for maintenance and operation of the system for the duration of one year. This workshop will have to be repeated during 2004 for two or three times for determination of the same at a better structured level, including considerations of the irrigation law and suggestions for changing the same to make it more operational and according the more modern systems of management. Such a "popular" consultation/motivation process may become more structured in the course of the year and the next year may also.

A couple of things that above have been mentioned are requested to be done by HAVA and may result in mishaps: If so, they will be part of the learning curve and contingencies have to be planned. For example then they ought to be handled with detailed back-up help or through for example DAI or CADG at a second instance. I am quite sure that if/when HAVA requests either one of these for voluntary help for formulating proposals they may get it. If some costs are involved with such help we ought to see how to reimburse. As well a RAMP field office is to be established where action has to be restrained: "Not already have everything done beforehand". Important is that the public authority gets moving again, as an authority, in its own right.

4. Basic substantive intervention scheme

For this report first a requirement of funding for future re-development/re-habilitation activities has been made. (For details see the attached *.XLS sheet.)

(It will take hopefully till the end of the year to get some considerable job-orders at their implementation levels: "authorizations to incur costs".) As soon as the reasoning above and below has been approved then that will be the up-coming non-stop job.

At the moment of writing the present some documents from the USDA Natural Resources Conservation Service have arrived from Washington DC. They relate to the seventies when the Soil Conservation Service (its predecessor) was present in the Helmand Valley. They have not been seen yet. For sure the information contained therein will be considered, as well as information from other sources (current and almost historical) that will become available.

Any serious re-development of the agricultural production in Middle Helmand will require at least seven fields of attention:

- Drainage and Irrigation
- Agricultural production
- Animal husbandry
- Institutional development (mainly HAVA related)
- Farmers' (and families) Training and Vocational Education
- Processing and marketing
- Communication facilities (Broadcast Radio and TV)

These points will be elaborated below, to some extend and some are more urgent than others. However, the main theme of the present trip report is irrigation and drainage, or rather drainage and irrigation to indicate the relative priority between the two. In follow-up visits and reports the other themes will have to be tackled.

A couple of points regarding financial and economic evaluation.

When one deals with:

- a base of 100,000 ha of irrigated/irrigable land;
- an initial rehab/repair of $200/ha on average;
- a life span of that rehab/repair of 10 years;
- an interest rate of 7% (current cost of capital for creditworthy creditors). In practice of USAID/Af rehabilitation funds are being donated to the producers and a financial analysis would show even stronger results than the economical):

then one ought to be able to produce net at least $30/ha more per year to break even economically.

$30/ha would be an equivalent of 150 kg wheat/ha or 15,000 mt of wheat ($3,000,000) at system level, against an investment of $20,000,000.[1] This reasoning can be refined but it won't change the picture in a dramatic form. In practice the increase of yield will be far larger.

Discounting the same values against 12%/yr of interest would result in a payment of $35//ha/yr; discounting against 12% but during a period of 20 years would result in a payment of $27/ha/yr.

Being able to jack up an average wheat harvest from may be 1,500 kg/ha/yr actual to 2,000 kg/ha/yr would not be an excessive requirement in a year or two of solid work, not being hampered by security or bureaucratic issues. (2,000 kg/ha/yr is the average of Pakistan; France is going for over 8,000 kg/ha/yr on mainly rainfed land.) One must not forget that some 30,000 ha out of 100,000 ha are currently without serious production, because of shortage of irrigation water and/or because there is a presence of strong salinity. Recovering a part of that "lost" land is equivalent to a strong increment of net benefits.

One must also not forget that change-over of crops to high value crops (vegetables, fruits, animal husbandry, etc.) possibly will result in better financial results than the dedicating of investment to wheat.

After the first round of investment in rehabilitation and redevelopment, a second round of inversion (in the order of $20,000,000 with a three year investment period) can be planned, complementary to the first, with concentration of activities in the agricultural, animal husbandry, processing and marketing fields.[2]

A review of agricultural production ought to be had, immediately after getting the presently proposed continuation of on-going drainage and irrigation rehab moving forward. At first sight very worrisome is the low level of

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1 As in most development projects, agronomists and engineers look at gross produce and confound gross and net income; also in the present case. However, after canal and drainage rehabilitation and upgrading one can expect considerable increase of production without a major cost of production. Gross will be practically equal to net!

2 In an annexed table some ideas have been expressed regarding land use. This theme has to be elaborated in consultation with stake holders in order to be able to give direction to agricultural extension and promotion services.

presence of animal husbandry. Farm manure and deep-rooting legumes are urgently required to give the soils a better production potential in the burning desert climate. Application of more fertilizer is definitely not a panacea. Education and training at all levels (from basic primary to vocational) of farmers and farmers' sons and daughters is required. The main governing institution, HAVA, needs to revitalized and modernized. The agricultural extension and promotion systems even so. (As mentioned above, some solid brainstorming has to be completed on this subject.)

It must be realized that using $20,000,000 in agricultural development, on actually non-saline, properly irrigated and drained land, probably gives a better return on the investment. Luckily, one sector of activities does not exclude the other; rather, they reinforce each other and are causing synergic effects.

Balanced rehabilitation of the drainage and irrigation systems and re-development of irrigated agriculture will increase production and help attract needed agro-processing and marketing investors.

5. Public and private involvement

There is a tendency to privatize everything. However, in the Helmand system a number of goods and services are of public nature and have to be dealt with as such. It can be argued that the "public" is composed of different communities that are dependent for their irrigation water on the different main canals: Nahr-e-Saraj, Bogra, Lashkargah-Shamalan and Darweshan and that are dependent on a decent agricultural extension and promotion service for their agricultural production. There are a number of other main canals, minor and traditional. They can be dealt with in a similar fashion. Irrigation and drainage cost can be determined at communal level and ought to be paid by the members of each community. Some contribution of public, treasury, funding can be expected as well; some taxes have to be paid also. One way or another the use of external, donation, funds has to be embedded in this reasoning.

In Islam a notion is present indicating that water is God-given and can be taken for free. However, farmers are perfectly willing to pay cash or part of their up-coming crop to the neighbour for using water of his pump but are not willing to pay a contribution for gravity water from the canals. It seems that the reasoning is that the Government has put the infrastructure and should pay for it. Nowadays, if it not is the Government that maintains the system one easily finds a foreign donor who is willing to foot the bill.

A movement has to be put in place to develop irrigation communities, shuras, at elementary watercourse or communal level, and have them federate and confederate at the level of the different systems with the purpose of starting a self-government system to insure independent funding.

Farmers are contributing in kind for irrigation water, now already, in order to have infrastructure maintained/ rehabilitated. Different examples can be mentioned. For drainage the case is more difficult. It is possible to exclude farmers from irrigation water if they have not participated in a repair; it is almost not possible to exclude uncooperative farmers from the advantages that a functioning drainage system presents. The remedy may be to exclude such persons from the irrigation water.

The problem with the lack of willingness to contribute cash may be the generalized presence of corruption and institutional inefficiency. There is little guarantee that the contribution that each farmer may pay will end up funding the purpose of the payment even if it is his through own, communal institution. Much depends on trust in leaders of each organization.

The strong presence of "gunculture" complicates arguing and reasoning. Sometimes its presence seems to be too pervasive to allow for any decent development.

6. Water management and the environment

The package of activities being designed for this program does not consider amplification of the irrigated area to be rehabilitated beyond the original project area. Non-project areas that have been invaded (by, in some cases, "gun-squatters") may have to be regularized and be provided with proper infra-structure. In other cases irrigation "rights" may have to be cancelled. It appears that most of the drainage water currently flowing in the drains is relatively fresh and fit for irrigation. Many of the drains receive drainage water but also spills and tails of irrigation water. Better irrigation management may reduce such spills and increase salinity of drainage water to some extend. For the present it is understood that once the already present salinity in the soils has been leached away

to acceptable levels it will be relatively easy to keep salinity at acceptable levels, technically spoken. Culturally and socially spoken it may be required to design a good amount of effective training.

More damage to the environment may be indiscriminate use of pesticides, especially in the case of production of cotton and potatoes. From agricultural research and training side all efforts have to be undertaken to diminish levels of use; to calibrate nozzles of spraying guns; to spot spray instead of general spray "just for in case"; to use specific pesticides which more over are non-persistent and degradable.

In general there should be no reason for environmental concern because of the activities related to the present program.

7. Drainage and salinity

As long as water can circulate from the irrigation field ditch; to the land; through the soil; to the drainage ditch and on to the major drains, then salinity generally need not be a problem. Else, salinity will become a problem for sure and maybe also alkalinity.[3] The density of the field drain network is for the moment a secondary problem. In previous times a layout has been designed (by USDI-BR and USDA-NRCS) and basically has been constructed. The matter now is to rehabilitate what still is there and then to consider what is to be added, when and where necessary and at an acceptable economic and financial cost.

A peculiar feature of the subsoil is its geological condition. Soils are generally loamy to heavy, underlain by subsoil of the same material, underlain at a number of meters by a conglomerate layer which is almost impermeable. It means that an apparent water table rapidly can be built up and has to be dealt with.

It appears that the salt problem is mainly caused by salt already present in the soil, not so much by irrigation with water from Helmand River. That would imply that once leached salt would not be a major problem as long as reasonable drainage is maintained. This view maybe optimistic, some of the older documents still have to be consulted, and it may have to be adjusted. In any case, Helmand River water is of excellent quality.

Irrigation management is not as tight as it is supposed to be. Now, early December in the off season, one can observe spill of irrigation canal water into the drainage canals and the mix being used again for irrigation. Many operational and operating pumps have been observed during the visit; maybe to irrigate poppy for a couple of years, salinizing the land, which may have been gotten at gunpoint anyway, and abandoning it after it has lost most of its productive value.

8. Irrigation

Irrigation has been carried on, despite all problems. Management is in place despite the damages to the systems' structures.

Farmers and irrigation communities have been contributing to keep the systems running. Effectively payments are being made, however in kind only. The Nahr-e-Saraj Canal has been cleaned last winter, to a considerable extend. The intake of the Lashkargah-Shamalan has been provided with a weir made of bags provided by farmers, allowing them to irrigate their fields more than 60 km downstream.

Reestablishment of the physical and technical system to a degree of 90% of its design capacity may not be all that difficult. Reestablishment of the human management system and modernizing it may be more complicated.

Many steel gates have been repaired. However many gate structures and drop structures need revision and almost all have suffered serious amounts of scouring at their downstream edges. Such scour pools have to be backfilled, preferably with scour resistant material. (It seems quite normal to replace steel gates after 40 years of use, even if they have been made of quality galvanized corrugated steel of "ARMCO".)

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[3] Alkalinity: Excess presence of Sodium on the clay-kation-exchange-complex: "The creeping menace". This "contamination" is very damaging regarding total loss of soil structure and almost irreversible. Any attempt with adding gypsum (CaSO4) to replace the Sodium with Calcium is very costly and results are not guaranteed.

One of the main problems with irrigation will be to institute a style of management that respects fairness and equitability and that responds to technical criteria. In practice it will mean that it is important to shift water down the main canals; that not most of it is used at the upstream ends, in the process drowning and salinizing the fields and leaving the downstream ends suffering from drought.

9. Institutional Development

HAVA used to be Lashkargah and vice versa. It covered from Chakhansur and beyond in the Southwest to Arghandab on the North-eastern side of Kandahar, something like a distance of 200 km, as the crow flies.

Recently, with the coming into force of the Karzai government a Provincial Irrigation Department has been established in Helmand, being part of MIWRE, like HAVA is as well. It relates to the Water Resources Department of MIWRE. HAVA may be relating to the Vice-Minister. (¡To be clarified!)

There is a Farsi proverb: "There is no need to have two tables with food in the same room". It seems to be applicable in the present case. The PID has been promoted by FAO, possibly with funds from the Netherlands which are about to dry up. (¡To be verified!) How about continuity of this PID and how about the need for continuity? There is a chance that MRRD has a proper delegation in Lashkargah as well, also occupying itself with minor irrigation canals, like the PID. (¡To be verified!)

In view of the Arghandab River being fully exploited in Kandahar Province it seems to be proper to create a Water Authority for the Arghandab irrigation perimeters, downstream of the dam, till the limit of Helmand/Kandahar or till the confluence of the Arghandab River with the Helmand River. Evenso, because of peculiar problems related to irrigation in the lower Helmand, downstream of the Darweshan project, it seems proper to create a separate Authority for that part as well, probably relating to Nimruz Province. Moreover it seems proper that HAVA divest all its interests in Lashkargah City and that it concentrate on irrigation and drainage of agricultural land.

Within HAVA opposition may be voiced to such reduction of influence. In practice it would not matter much as long as it is possible to concentrate funds on the rural parts of Helmand and its irrigated agriculture/horticulture/ fruticulture/forestry, etc and as long as HAVA management considers agricultural development and promotional work as its first, second and third priority.

In the early nineties the Agricultural Department was separated from HAVA and brought into the MAAH, till now. It ought to be discussed whether this decision should be reverted, in the sense that farmers will have to do basically with one public window regarding their day to day agriculture and its inputs, including irrigation water and drainage service.[4] For many private services there may be a (bewildering) choice for farmers and advertisement of going rates and prices for services, inputs and outputs would be helpful in order to put limits to the sharks.

A potential solution of this problem would be to split up the MIWRE in its basic components: Irrigation and Water Resources to the Ministry of Agriculture; Environment to an independent Presidential Council. The Power component could remain in the MWP and in the particular case of Helmand the entire Kajaki dam could be transferred to MWP. Water releases for power, for irrigation, for flood control, for minimum river discharge and for environmental purposes could be agreed upon in an Operation Manual with weekly adjustments based on requests by the two ministries involved, the MAAH and MWP. The Environmental Council would have to approve such adjustments, especially to safeguard interests of the Sistan Marshlands and those specified in the agreement with Iran.

So, HAVA could become HVA and concentrate on agricultural production on an area of about 100,000 ha.

The other theme to be dealt with regarding HVA is the governing structure and the transition of the present form to a more modern and more generally accepted system where the public authority, or pseudo-public corporation and the representation of the farmers cooperate for the common interest.

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[4] Drainage water is a public "bad" as opposed to public "goods".

10. Some statistics (as received in Lashkargah)

Table 1: Main, primary, canals (with intakes on the river)

Name	Capacity nominal m3/sec	Capacity actual m3/sec
Nahr-e-Saraj	22	15
Bogra	72	50
Lashkargah-Shamalan	22	15
Darweshan	28	20
Total	144	100

Table 2: Irrigation areas

Name	Area nominal ha	Area actual (because of lack of canal capacity) (estimated) ha	Area actual (because of salinity) (requires detailed survey) ha
Nahr-e-Saraj	18,000	10,000	
Upper Bogra	11,000	11,000	
Lateral S10+7	9,500	6,600	
Lashkargah-Shamalan	16,000	10,000	
Nad-e-ali	10,000	10,000	
Marja	14,000	10,000	
Darweshan	25,500	17,500	
Total	104,000	75,100	

Table 3: Cleaned drainage canals

Name	Cleaned main drains	Cleaned farm drains	To be cleaned large drains km
Saraj	-	80%	Over 50
Upper Bogra	-	-	Over 50
Grishk Bazar	-	-	Over 50
Central	-	-	Over 50
Lateral S10+7	-	-	Over 50
Lashkargah-Shamalan	-	100%	Over 100
Nad-e-ali	50%	80%	10
Marja	20%	30%	90
Darweshan	-	10%	Over 100
Total			Over 550

Table 4: Roads

Name	Distance km
Radiating out of Lashkargah to the Highway	40
Bogra Canal Bank Road Shamalan – Grishk	10
Bogra Canal Bank Road Grishk – Bogra intake	10
Darweshan – Marja	40
Darweshan Canal Bank Road	40
Marja – Nad-e-ali	20
Shamalan Canal Bank Road Downstream of Lashkargah	40
Shamalan Canal Bank Road Upstream of Lashkargah	20
Highway – Sangin	50
Sangin – Kajaki	30
Total	300

11. Rehabilitation of irrigation

For starters: Rehab of irrigation is mainly equivalent to gates being repaired and erosion and scour holes being backfilled. The dry canal season of January and February has to be exploited for the purpose. (Not all gates and works have been designed with grooves for (back-up) stop-logs and all wooden stop-logs have disappeared, presumably ended up in the kitchen fires.

A large amount of canal cleaning has to be undertaken, may be in the order of 2'000,000 m3 or so. A two to three year cleaning period has to be provided for. Some cleaning can be done manually during canal closure; most of it has to be done mechanically in running canals. Probably some draglines and back excavators with extra long booms have to be brought (second hand in good condition). Rushing the job too much will demand a too large number of such machines which later-on remain without work. That means that with some calm we can get better unit-prices. After the initial cleaning period some can be put into regular maintenance cleaning. (Each meter of Bogra Canal ought to be cleaned every five years or so. A machine or a couple of them will travel down the canal, working, and then start all over again.)

Eventually all gates have to be considered for replacement or very thorough refurbishing. There is no emergency need for it. Steel workshops are available in Pakistan and again may become available in Kabul. The copying of existing gates will be no problem, except for the quality of material (steel and galvanization). ASTM and ACI standards and their application really have to be taken seriously. It would be shame a pAir shoddy concrete and steel to the very good workmanship of 40 years ago. (M&K may have been pushed out of the country because of the Government's discontent; it must be recognized that they have left an excellent job behind.)

The Shamalan Canal has suffered two consider able breaches because of development of meanders of the Helmand River. Canal dykes and river banks have to be rebuilt again. The river banks have to become scour proof and Helmand River is treacherous, not as bad as Kunar River, but nevertheless.

The system's irrigation management has been based on settings of gates that were calibrated by cable-way operated discharge measuring devices. In the meantime the theory of measuring flumes has been improved and it may have become time to install a number of them, in order to give farmers firsthand observation possibilities of discharges. Cheating by canal operating staff at the level of favouring particular friends with more water can only be controlled effectively by those who are being cut short.

There may be more irrigation development items that have to be looked into.

12. Rehabilitation drainage

Cleaning of drainage canals has to be externally organized and funded only at the level of medium and large canals. Farm drains are the domain of the farmers. Some help might be given, to be decided on a case by case basis. Basically farmers have to be convinced about the need of their own input. The external funding agency has to be quite firm on the subject.

At this moment of writing no clear picture of the total amount of drainage canals and required cleaning is available. The amount of 550 km of large drains still to be cleaned could represent something like 2,000,000 m3 of material to be removed.

With a cleaning capacity of 50 m3/hr per excavator/dragline it would take like 40,000 hours (equivalent to something like $2,000,000 direct costs), which, @ 8 effective hours per day, is the equivalent of 5,000 days. Some 8 units could be employed during 2 years.

Manual working would be possible but with difficulties and problems. Especially during the 60 days period that irrigation canals are dry manual cleaning of irrigation canals would be preferred over cleaning of drains.

Manual cleaning of drains could be seen more from the social point of view; to give people a temporary employment. Mid-sized drains could be handled with assistance of pumps.

If cleaning is organized on a pay per m3 basis some persons could make a sum of money, of for them very large proportion. Large scale employment of labour would require massive food kitchens and medical services. It could consider also different educational and training services for during the off hours.

Structures in drainage canals are relatively few and often can be taken as part of the irrigation and road systems. Canal drops in main drains have to be taken as part of the drainage system.

In the sixties and seventies the drainage system has been reinforced, by means of field ditches and in some cases by means of underground tile drains. In the meantime theory, practices and materials have been developed. Especially, the technology of using corrugated plastic pipes has become available at reasonable prices.

Once initial rehab of the drainage and irrigation systems has been finalized and once HAVA is in a reasonably functioning shape again and once USAID and GoA have managed to work par-i-passu, that is working in-step, and once agricultural output is at least at the level of the late seventies again, then a thorough review of drainage conditions has to be undertaken and economy, financial conditions and technical possibilities have to reviewed for investment in improvement.

13. HAVA rehabilitation

HAVA still has 360 staff of which only 7 engineers and the Agriculture Department has 350 staff of which only 10 agronomists. Payment for salary comes from Kabul with sometimes four months in arrears. Operational funds are absent except for some specific payments by the Governor. Engineers' salaries are in the order of $40/month with a limit of $50/month.

One cannot expect much motivation under such labour conditions to excel; one need not be surprised about the presence of apparent irregularities that are being condoned. The families have to be fed.

There is a strong desire amongst HAVA personnel to engage in executive tasks regarding repair and construction and dispose of owned machinery. It is understandable because of a long tradition of State owned industries and services and because of the overhead being used for the funding of the regular operations which are being starved totally.

Besides HAVA functions the Helmand Construction Company, kind of a reincarnation of the construction system left behind by Morrison & Knudsen when it left the country in the late fifties.

A pool of Tjech equipment has remained in HAVA's custody from the time that the Saraj Canal was constructed in the eighties. Many of the machines have been stripped from parts, beyond repair. Others may be recoverable.

In view of current conditions HAVA requires an operations department from where the larger canals are being managed which implies being operated and maintained. Currently this department has about 20% of the entire HAVA staff.

Currently HAVA has an engineering department which can be strongly reduced in view of potential and future design capability in the private sector and reduced demand for such services until consideration is being given to amplification of the systems. However, the permanency of certain sections within HAVA is required, like design for maintenance and for modernization.

Survey; technical/financial audit and supervision of contractor work; soil and water laboratory; hydraulic and hydrological measurements (canal discharges, weather measurements) have to be taken care off again.

In case HAVA takes charge again of the agricultural promotion and development it should be looked at the items which HAVA would administer; which ones it would contract with private companies/consultants/NGOs and which traditional tasks it should not be bothered with anymore.

As well it should be looked into the farmers funding certain activities which are in the private domain: which are of "exclusive" and "rival" character.

The agricultural financing is a chapter in itself and soonest has to be looked into.

14. Re-development of agriculture

Agriculture has been reasonably well productive during the seventies when development of the MHIS was in full swing. An analysis was completed in 1984 and an extract has been appended to the present.

In the mean time poppy has come up as a crop with a large potential. In view of its illegal character it is difficult to be dealt with at the strictly productive level, complementary to other crops. Helmand Province is known for its poppy production, especially the upper areas of the province. In the Middle Helmand its presence is less usual. It may be argued that production of poppy is fully market driven. Irrigated land dedicated to poppy covers only 2.5% of the entire irrigated area in the country. The presence of irrigated land certainly is not a restrictive factor in the production, nor are other inputs like fertilizer, pesticides and seed. Production is controlled by price at the farm-gate and provision of credit by buyers and contract production.

At the micro economic level choices for crops are being according to cultural factors like satisfying the needs of consumption, distribution of risk, net income derived from different crops, provision of credit, access to markets, contract production, pressure/encouragement by the extension system and some longer term aspects like lead-time for planting orchards and woody trees before harvest can take place.[5]

The important part of the RAMP concept is its integration of agricultural production inputs and services and then down to market where the consumers are present. Added value along the market chain as far as possible and profitable may be directed back to the farmers through their participation and reinvestment within the country.

Production and processing of fruits is promoted by RAMP staff and this concept may be applied in Helmand as well. Promotion of animal husbandry is required in order to have presence of deep-rooting leguminous plants to improve soil conditions. Of course animal husbandry has to be profitable as such. Woody trees have to be promoted for supply of fuel and other products and to help controlling wind erosion and deposition of wind-blown sand and loam on unwanted places, for example in canals. Again, forestry has to be profitable as such. Farmer will give importance to results of financial analysis. They have too little reserves to be considerate for the national economy.

A program of research has to be undertaken in order to fill in the above remarks with concrete fact in order to serve for the development of tools for decision making by farmers.

In this regard it is important to have close channels and short chains of communication between farmers; extension workers and agents; researchers that validate suggested practices and training institutions. That way information coming from the field can be retro-fed effectively.

In Table 10 a suggestion has been given about possible future land use. Some suggestions about yields have been given. What is required is evaluation of net income by each and distribution of this income between the different production factors: land, water, labour, inputs and services.

A number of investigations have to be undertaken. Especially investigations regarding production economy and farmers' finances may have to be carried out and continually updated during the entire life time of the project. Such type of work is to be an integral part of the public services system.

In countries with advanced agriculture the research and extension may cost around 7% of the production value; if training is added it may cost 10%, partly funded by public funds and partly by private funds.

In case the horizon of potential production is set at $3000/ha/yr of gross produce over 100,000 ha, then 10% of that is equivalent to $30,000,000/yr.

In traditional middle-eastern share cropping agriculture the gross produce is divided between owners of the production factors in (simplified) form:

20% for land; 20% for water; 20% for seed and manure; 20% for labour and 20% for traction.

In modern Helmand irrigated agriculture gross produce may be divided as follows, see Table 5.

Chances to be able to cash for water are slim; even so for extension services. It should be part of a cultural change to promote such payments; for the time being the public treasury (HAVA incorporated?) would have to take care of them.

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[5] Net income is according to the farmers' perception which may be different to that of an economic analyst.

Table 5: Possible distribution of gross produce between production factors

Item	
Tax	10%
Water	5%
Land	10%
Seed, fertilizer and manure, biocides	25%
Labour, including management	20%
Traction and post harvest	15%
Credit	10
Paid for extension services	5
Total	100%

Above considerations are made for produce at farm-gate. Between farm-gate and consumer markets values are added. In short, the more added value that can be arranged in a profitable way up-stream of the farm-gate the better it is for the farmer. For added work on the farm the opportunity cost for labour can be taken low, until family labour is fully occupied and external labour has to be brought in. As well, the share of added value generated downstream of the farm-gate that can be transferred back to the farmer should be increased as much as possible, without hurting excessively the motivation of the other participants in the production chain.

Differences between financial and economic analysis will show up; the farmer being interested in financial impact (only).

For the $30,000,000/yr extension/investigation/training services a tentative plan of budget could be made. Planning for funding such a budget would be a task for the coming months, between GOA, USAID and other interested parties.

15. Roads rehabilitation

Some 300 km of roads require to be rehabilitated urgently, to facilitate transport of agricultural produce, inputs and general goods and also to facilitate services related to rehabilitation. For the program of the coming year 200 km may be taken, the year after the other 100 km. In the meantime some more minor roads may be determined to require a repair.

To rehabilitate the road Lashkargah – Shamalan Canal upstream – Grishk may be questionable because traffic for the Highway westward, direction Herat and vice versa may start using it. It may lead to a large number of accidents: cars being pushed into the canal by on-coming traffic.

The construction of roads will require its own availability of construction equipment: earthmoving; transport of gravel (may be crushing of gravel), shaping and compaction.

Roads can be rehabilitated now as a first step in a more ample programme; for the time being below standards as set by the MPW: A road crown of 4 m and shoulders of 1 m would be sufficient for the time being. Dewatering side ditches; level crossings with washes and culverts should be designed in some cases for 6 m width so they need not be reconstructed.

For a number of tracks, not mentioned above, it has to be determined whether they are being crossed level by irrigation ditches, whether formal (pucca) or informal (kutcha) ditches, whether for irrigation or for drainage. The minimum work required is to put in culverts (Concrete, steel pipe, Armco pipe, whatever) so that the flows of water and traffic need not be interrupted (cars and trucks getting stuck in deep pools and banks of irrigation ditches getting broken, leading to losses of water and actually to a mess.

16. Budgets and contracts

Planned and executed work shall be inspected and approved by staff in the service of RAMP and accountable only to RAMP. Staff will be specialized at the engineering level and at the level of accounts.

Individual parts of projects will be planned in detail by the implementing agency with bills of quantities, (original) design drawings and actual state drawings, plans, zero-time photographs, GPS readings and budgets. Where necessary, relevant specifications of ASTM and ACI will be have to be adhered to. Where necessary/required, calculation sheets for structural work will have to be presented.

Planning proposals have to be approved before execution can start. After finishing work the implementing agency has to resurvey in order to determine amounts of work completed.

In order to speed up the start of construction, taking into account a reasonable level of soundness of construction, the following is being proposed:

The two major players presently active in on the ground construction are DAI and CADG. At a later stage we may suggest to other ones to step in and bring their construction equipment, both plain commercial contractors and members of the so-called NGO community. If necessary other holders may be invited to form part of the IQC.

We could proceed with different initial contracts. However, such contracts can be lumped together in an IQ Contract with multiple holders. Sub-sequent task orders can be formulated and approved and be charged to the main project. The holders may sub-contract with RAMP-approved contractors up to 30% of each individual task-order.

At the construction level the following categories have been determined. Soon activities in the agricultural development (including processing and marketing) may have to be identified and funded as well. The proposed field office anticipates on this field of work.

Works.

- Road repair
- Road structures like fords and culverts
- Cleaning of drainage canals
- Cleaning of irrigation canals
- Steel gate repair and concrete repair in irrigation canals
- Concrete repair in drainage canals
- Scour resistant backfill downstream of canal structures (irrigation gates and waste gates, cross-regulators and bottom drops in the case of irrigation canals and bottom drops in the case of drainage canals)
- Different smaller investigations
- The possibility of the need of construction of defensive works in the river (which currently is being "claimed" by UNOPS and presently doubt is expressed if they can timely deliver) and associated reconstruction of Shamalan canal embankments.

Cleaning of drainage canals

With "NN" a task-order has to be negotiated regarding the cleaning of canals. The maximum value of the order will be NTE $1,500,000. A second and third task-order in this sector of work may be awarded through a follow-up ICQ in case of satisfactory completion of this first task-order. Basic element for determining cost is the price per m3 excavated, dumped on the canal bank and removed to the off-side of the bank. In case of presence of distribution ditches located on the off-side of the bank the dirt has to be removed across such ditches, onto the fields. Trees present on canal banks have to be respected as much as practically possible. Two or three tariffs may be handled according to size of canal (in order to respect extra cost of specialized equipment and/or manual excavation). In case of presence of a bank road with gravel in or just below the surface, its existence has to be respected.

The second element of cost is related to preparation, determining job locations, surveys of sections for determination of quantities. Over-excavation will not be recognized for payment. Under-excavation has to be corrected.

Farm level drains have to be considered for 100% farmer contribution (probably in kind; cash cannot be expected for the time being). Agreements with all farmers draining onto a major collecting drain have to be obtained before cleaning of that major drain can be started. The agreement will contain the obligation of the farmers to clean the on-farm drains. Primary and secondary drains can be cleaned irrespective of farmer cooperation, except for rights of way that have to be authorized free of charge. In case of opposition it has to be seen how enforcement procedures can be applied. (After-all the Government maintains a right of way along canals and roads and farmers occupying such rights of way can be considered as encroachers, squatters. The social condition of such squatters may have to be respected, whether originally and still landless farmers or legitimate farmers having expanded their areas of operation.

Delaying work on problematic drains and investing in discussion with farmers groups may be helpful.

"NN" has experience working with draglines rented from HCC and as well with the organization of hand-labour gangs. "NN" should be put a limit on the amount of allowed sub-contracting. In case of sub-contracting the full responsibility, technical and financial, will remain with "NN", the prime contractor.

Each specific job under the contract must be proposed in detail (with 0-time pictures of the field situation, GPS readings, type of execution).

Repair of works (concrete, steel gates, scour resistant fills) will be arranged in different task orders; at administrative level fully independent.

Cleaning of irrigation canals

With 'NN" task orders have to be negotiated regarding the cleaning of irrigation canals. Most of the items mentioned for drainage canals are valid.

Road repair

With "NN" a task-order has to be negotiated regarding the repair of roads.

Budgets for roads shall consist of different components like shaping, refilling, and compaction of sub-base; cleaning of lateral drainage ditches; providing, spreading and compacting gravel. Construction of works (using concrete, gabion, and other materials) shall be considered in separate task orders). A major cost element may be the preparation and transportation of gravel. Good road quality gravel is not present in the entire area so either rounded river gravel has to used after grading or the same quite hard gravel has to be crushed, leading to preferred angular gravel but also to a higher cost.

Works

With "NN" separate task orders have to be prepared for the repair of works. Works may contain steel, (reinforced) concrete, gabion, scour resistant rock and other material. Design and workmanship will be part of their cost. Task orders will have to be formulated on batches of different works, each with its design, bill of quantities, prices. The cost of each work will be fixed price.

Three particular works have to be distinguished.

One is the reconstruction of the Helmand River bank where developing river meanders have breached the Shamalan Canal at two places. The corresponding task orders may be contained in a separate IQ contract depending on the amount of activity effectively undertaken by UN-OPS. Upon reestablishing the river bank the canal banks have to be reconstructed.

The other is a thorough revision of the Bogra Canal left side bank, in the vicinity of Grishk. The bank has broken one or two times leading to heavy and undesirable inundations and to stoppage of the canal to allow the repair. The weakness of that section of canal bank may be related to the foundation material and has to be investigated in order to find a more permanent solution for the problem.

The third one is the repair of the "riprap" weir across the Helmand River opposite Bogra Intake. Repair of the weir is necessary but not urgent. Problem with the repair is the supply of proper material (large size and erosion resistant riprap).

17. Logical framework

A considerable number of the activities mentioned below are (sub-)projects as such and can be planned and funded as such. Even further sub-division into different contracts or tasks in many cases will be recommendable and possible.

In the present document only Infrastructure will be elaborated. Below, see Table 6, a very provisional Logframe has been presented for the overall project. In Table 7 a similar Logframe for rehabilitation of road, irrigation and drainage infrastructure has been presented and in Table 8 a Logframe for Institutional re-development of HAVA.

It is understood that such logframes are prepared in company, by stakeholders or their representatives; in an Objective Oriented Planning Seminar. As soon as more concrete obligations between MAAH, HAVA, USAID, and other possible participants have been formulated such a seminar should be organized in Lashkargah.

A first step towards improvement would be a sharper definition of several of the terms in use.

Table 6: Logical Framework MHIAS, overall level

Narrative summary	Verifiable indicators	Means of verification	Important assumptions
Objective: Increase sense of economic well being of the population living within the boundaries of the MHIAS	Levels of awareness among different groups within the communities (men, women, children) about specific financial, environmental and other living condition issues	Baseline and evaluation surveys	Existence of suitable political climate and economic stability
Target 1: After project year ...: To increase marketed produce with $50,000,000/yr	Value of yearly market produce	Surveys of Lashkargah toll registers and other sources of info to evaluate trucked amount of produce and its degree of processing	Credit, inputs, information and infrastructure are sufficiently available (It is assumed that local produce sold on nearby village or district markets is negligible.)
Target 2: To increase project farmers' and urban incomes with ....$/family/yr (to be defined: # of project farmers)	Incomes of rural families and urban families involved in agricultural processing	Surveys and monitoring of target farmers' group members and control farmers; similarly with urban workers' families	Credit, inputs, information and infrastructure are sufficiently available
Target 3: To develop a sustainable production system with acceptable environmental impact on the land and marshes downstream	Qualities and quantities of river water at different points along the Helmand River	Reports of analysis by chemical laboratory (biocide and salinity data) and hydrologic data by Hydrology Department of the MIWRE (or a temporary caretaker institution)	Presence of a legal framework that allows to sanction presence and/or use of old fashioned biocides and excessive use of more acceptable biocides
Activity 1: Re-development of HAVA as a viable and sustainable project authority	Presence of an active institution	Surveys of HAVA TOR, employment statistics, activity and progress reports; (Xchecking with farmers' surveys)	Favourable and flexible attitude in GOA and USAID are present regarding developing acceptable TOR for HAVA
Activity 2: Re-habilitation of the MHIAS public infrastructure (roads, irrigation, drainage)	Presence of functioning roads, canals and drains at different hierarchical levels (primary, secondary and tertiary)	Bi-annual of mapping of status of infrastructure (part of HAVA's plans of work and completion reports)	Timely availability of investment funds

Narrative summary	Verifiable indicators	Means of verification	Important assumptions
Activity 3: Rehabilitation of training, research and extension systems, private and public **(Public systems may be placed within HAVA or within the Provincial Department of Agriculture. This is an important item to be sorted out.)**	Presence of different active institutions	Survey of bi-annual plans of activities and progress reports (Xchecking with site visits and interviews: degrees of adoption of proposed practices and inputs; numbers of students; etc) (There is a tie between this activity and the seed production activity.)	Favourable and flexible attitude in GOA and USAID are present regarding developing acceptable TOR for HAVA
Activity 4: Development of private sector off–farm processing infrastructure	Presence of different active companies	Lashkargah Chamber of Commerce reports and other sources of info (Xchecking with visits to plants and facilities	Favourable and flexible attitude in GOA and USAID are present regarding positive climate for developing private business in combination with some sound continuation of public corporations
Activity 5: Development of public and private nurseries for (grafted) fruit trees and woody trees	Presence of active nurseries	Bi-annual surveys of nurseries and their accounts regarding materials delivered (Xchecking with seedlings planted and survived)	Presence of guarantees for sales in order to promote rapid take off and reduced lead-times.
Activity 6: Development of public and private seed production facilities for common crops	Presence of active seed producers at different levels of basic and commercial seed production	Bi-annual surveys of seed farms and their accounts regarding materials delivered (Xchecking with common farmers regarding seed planted and harvested) (There is a connection between this activity and the research activity.)	Presence of guarantees for sales in order to promote rapid take off and reduced lead-times.

Table 7: Logframe MHIAS, Rehabilitation of infrastructure

Narrative summary	Verifiable indicators	Means of verification	Important assumptions
Objective: (=Activity 2 of overall logframe): Re-habilitation of the MHIAS public infrastructure (roads, irrigation, drainage)	Presence of functioning roads, canals and drains at different hierarchical levels (primary, secondary and tertiary)	Bi-annual of mapping of status of infrastructure (part of HAVA's plans of work and completion reports)	Cooperation between parties (GOA, USAID, other donors, farmers' representations) with HAVA providing leadership
Target: To have re-established within project areas the road, canal and drain systems, after Project year ...	Establishment of regular and efficient flows of traffic, irrigation and drainage water	Observations in the field, interviews with users, HAVA reports	Timely availability of investment funds; timely availability of priority schedules
Activity 1: Design a tender procedure for an initial IQContract with a value NTE $2,000,000			
Activity 2: Immediately Design, prepare and negotiate contracts for repairs on canal infrastructure that require execution during 2004 canal closure period. Value per contract NTE $100,000			
Activity 3: Design, prepare and negotiate task order and execute a road shaping/ gravelling project			
Activity 4: Design, prepare and negotiate task order and execute a drain cleaning project			
Activity 5: Design, prepare and negotiate task order and execute a canal cleaning project			
Activity 6: Design, prepare and negotiate task orders and execute repair of infrastructure projects			

Table 8: Logframe HAVA, Institutional re-development

Narrative summary	Verifiable indicators	Means of verification	Important assumptions
Objective (=Activity 1 of overall logframe): Re-development of HAVA as a viable and sustainable project authority	Presence of an active institution	Surveys of HAVA TOR, employment statistics, activity and progress reports; (Xchecking with farmers' surveys)	Favourable and flexible attitude in GOA and USAID are present regarding developing acceptable TOR for HAVA
Target: Describe targets for 2004 and 2005			
Activity 1: Describe activities for 2004			

Completing Table 7 is a relatively straightforward job.

Completing Table 8 will be far more complicated because issues like cooperation between MAAH and MIWRE are involved. In case Kajaki Dam operations are to be governed by a council under the presidency of MWP then HAVA will be either full member of the Council or provide important management information through MIWRE.

Moreover the issue of yes or no re-establishment of a public agricultural extension service within HAVA is crucial for the organization of an entire range of other agricultural production and processing activities. From the technical point of view there is a strong need for short distance communication, integration, between irrigation and drainage extension and agricultural production extension. Such a service may be placed within the Provincial Department of Agriculture with HAVA having direct responsibility only for main canals.[6] Vice versa, the whole of HAVA might be placed in the MAAH, with the same purpose of keeping lines short.

Other issues to be dealt with are public or semi-public processing corporations like in the cases of ginning, spinning and weaving of cotton or the entire dairy industry.

Establishing or helping to establish private industries making use of public capital (as for example to be supplied by USAID) is to be sorted out at the planning level as well and therefore the issues should be reflected in logframes. Market farming can be promoted but farmers have to know about their business partners.

[6] Drainage being public service (non-rival and non-exclusive) and irrigation being very public are difficult to be handled by private extension agencies. Public in the case of drainage can be defined at the level of the major independent drainage systems (each main drain leading back to the Helmand River) and irrigation similarly regarding each main canal taking off from the Helmand River. Moreover there are "private" sources of irrigation water like wells.

Discussion with thegatekeeper of Bogra Intake:

Can he find solutions for the problems?

Table 9: Budget for operations

Budget for operations	Units	Unit cost monthly	First year Cost	Second year Cost
Institutional development (HVA)				
Equipment:				
Communication			20,000	10,000
Office			30,000	10,000
Laboratory			20,000	10,000
Transportation (rent/lease of 3 double cabin pick-ups)			50,000	20,000
Construction (repair of mainly excavation equipment)			150,000	50,000
Construction (rent/lease of different pieces)			250,000	100,000
Heavy anchor chain from Karachi ship wrecking for canal chain-cleaning			20,000	
Buildings			50,000	
Computer staff for one year (3 persons)	3	300	10,800	10,800
Inspection mission for Czech equipment			10,000	
Operational expenses for construction equipment	1	4,000	48,000	48,000
Operational expenses for office and laboratory equipment	1	1,000	12,000	12,000
Miscellaneous			150,000	100,000
Sub-total			820,800	370,800
RAMP field office				
Equipment office			20,000	10,000
Transportation (rent/lease of 3 double cabin pick-ups)			50,000	20,000
Operational cost vehicles	3	500	18,000	18,000
Operational cost office	1	500	6,000	6,000
Equipment guesthouse			15,000	5,000
Staff guest house for one year	1	300	3,600	3,600
Sub-total			112,600	62,600
Technical and administrative staff for RAMP's field office				
Nat. MAAH officer	3	500	18,000	18,000
Nat. Civil engineer	1	500	6,000	6,000
Nat. Accountant	1	500	6,000	6,000
Nat. Admin/fin officer	1	400	4,800	4,800
Int. Senior Civil engineer, part time	0.5	7,500	45,000	45,000
Int. Senior Agronomist, full time	1	12,000	144,000	144,000
Int. Senior Marketing/processing specialist, initially part time	0.75	12,000	108,000	108,000
Int. Junior Agro research specialist, full time	1	9,000	108,000	108,000
Int. Junior Agro extension specialist, full time	1	9,000	108,000	108,000
Int. transportation of personnel	10	2,000	20,000	20,000
Overhead and company	12	20,000	240,000	240,000
Subtotal			807,800	807,800
Works				
Drainage				
Cleaning of canals @1.50/m3			1,500,000	500,000
Repair of structures			500,000	250,000
Sub-total			2,000,000	750,000
Irrigation				
Cleaning of canals			1,500,000	1,500,000
Repair of structures			1,500,000	1,500,000
Sub-total			3,000,000	3,000,000
Roads				
200 km and 100 km (first stage repair) and follow-up revision			1,000,000	1,000,000
Structures (crossings with water courses)			200,000	200,000
Sub-total			1,200,000	1,200,000
Repair of Shamalan Canal in case UNOPS can't deliver in time			500,000	
Repair of Bogra Intake river weir				500,000
Agricultural/processing/marketing, tbd			2,400,000	2,467,600
Total			10,841,200	9,158,800
Total				**20,000,000**

Table 10: Expected land use in the Middle Helmand Valley

Land use in the Middle Helmand Valley. Valley wide and farm wide: current, medium-term, long-term													
Item		Valley		typical 1 ha family farm									
	expected short-term landuse under "acceptable"drainage and irrigation conditions and current agricultural traditions	expected medium-term landuse under improved production conditions	expected long-term landuse under improved production conditions	current yield ton/ha	medium-term yield ton/ha	long-term yield ton/ha	current area	medium-term area	long-term area	farmgate unit value ($/ton)	current farmgate total value $	medium-term farmgate total value $	long-term farmgate total value $
Winter crops													
Small grains (wheat)		16,000	30,000	1.5	2.5	4.5	0.550	0.400	0.250	150	124	150	169
Oil crops (canola)		7,000	20,000	0.5	1.0	2.0	0.150	0.200	0.200	200	15	40	80
Fodder crops		6,000	15,000	20.0	25.0	30.0	0.100	0.150	0.150	20	40	75	90
Winter vegetables		4,000	10,000	3.0	5.0	15.0	0.050	0.100	0.150	50	8	25	113
Winter fallow		?	?				0.100						
Sub-total/ha		33,000	75,000				0.950	0.850	0.750		186	290	451
Summer crops													
Cotton (seed cotton)		10,000	20,000	0.5	0.8	1.2	0.250	0.250	0.200	350	44	70	84
Fodder (green)		7,000	15,000	10.0	15.0	25.0	0.200	0.200	0.150	20	40	60	75
Grain (maize, sorghum)		6,000	15,000	1.5	2.0	4.0	0.250	0.150	0.150	150	56	45	90
Oil crops (sunflower, sesame, safflower, soybean) weight of grain		4,000	10,000	0.5	1.0	2.0	0.100	0.100	0.100	200	10	20	40
Vegetables and annual fruits		6,000	15,000		6.0	15.0	0.050	0.150	0.200	50	-	45	150
Summer fallow							0.100						
Sub-total/ha		33,000	75,000	13	25	47	0.950	0.850	0.800	770	150	240	439
Perrenial crops													
Fruits and nuts		4,000	15,000		5.0	15.0	0.015	0.100	0.150	200	-	100	450
Sugarcane							-						
Firewood and lumber		2,000	5,000		4.0	6.0	0.015	0.050	0.050	40	-	8	12
Fodder (alfalfa)		1,000	5,000	20,000	25,000	30,000	0.020						
Sub-total/ha		7,000	25,000				0.050	0.150	0.200	240	-	108	462
Total ha	50,000	40,000	100,000				1.00						
Total/ha/yr											336	638	1,352
				A considerable variation amongst family farms is being observed, due to a number of reasons:									
				Distance to consumer's markets and distance from suppliers (of inputs, credit and knowledge									
				Social and cultural background of farming families									
				Local deliveries of the irrigation and drainage systems									
				Soil qualities and especially levels of salinity and alkalinity									
				Variations in family systems may become even larger due to limited supplies of services									
				in relation to developing demands									

Budget for operations	Units	Unit cost monthly	First year Cost	Second year Cost	$5M/half year
Institutional development (HVA)					
Equipment					
Communication			20,000	10,000	20,000
Office			30,000	10,000	30,000
Laboratory			20,000	10,000	30,000
Transportation (rent/lease of 3 double cabin pick-ups)			50,000	20,000	50,000
Construction (repair of mainly excavation equipment)			150,000	50,000	50,000
Construction (rent/lease of different pieces)			250,000	100,000	50,000
Heavy anchor chain from Karachi ship wrecking for canal chain-cleaning			20,000		
Buildings			50,000		10,000
Computer staff for one year (3 persons)	3	300	10,800	10,800	10,000
Inspection mission for Czech equipment			10,000		
Operational expenses for construction equipment	1	4,000	48,000	48,000	10,000
Operational expenses for office and laboratory equipment	1	1,000	12,000	12,000	10,000
Miscellaneous			150,000	100,000	10,000
Sub-total			820,800	370,800	280,000
RAMP field office					
Equipment office			20,000	10,000	
Transportation (rent/lease of 3 double cabin pick-ups)			50,000	20,000	
Operational cost vehicles	3	500	18,000	18,000	
Operational cost office	1	500	6,000	6,000	
Equipment guesthouse			15,000	5,000	
Staff guest house for one year	1	300	3,600	3,600	
Sub-total			112,600	62,600	30,000
Technical and administrative staff for RAMP's field office					
Nat. MAAH officer	3	500	18,000	18,000	
Nat. Civil engineer	1	500	6,000	6,000	
Nat. Accountant	1	500	6,000	6,000	
Nat. Admin/fin officer	1	400	4,800	4,800	
Int. Senior Civil engineer, part time	0.5	7,500	45,000	45,000	
Int. Senior Agronomist, full time	1	12,000	144,000	144,000	
Int. Senior Marketing/processing specialist, initially part time	0.75	12,000	108,000	108,000	
Int. Senior Credit specialist, initially part time	0.75	12,000	108,000	108,000	
Int. Junior Agro research specialist, full time	1	9,000	108,000	108,000	
Int. Junior Agro extension specialist, full time	1	9,000	108,000	108,000	
Int. transportation of personnel	10	2,000	20,000	20,000	
Overhead and company	12	20,000	240,000	240,000	
Subtotal			915,800	915,800	100,000
Works					
Drainage					
Cleaning of canals @1.50/m3			1,500,000	500,000	
Repair of structures			500,000	250,000	
Sub-total			2,000,000	750,000	
Irrigation					
Cleaning of canals			1,500,000	1,500,000	
Repair of structures			1,500,000	1,500,000	
Sub-total			3,000,000	3,000,000	
Roads					
200 km and 100 km (first stage repair) and follow-up revision			1,000,000	1,000,000	
Structures (crossings with water courses)			200,000	200,000	
Sub-total			1,200,000	1,200,000	
Repair of Shamalan Canal in case UNOPS can't deliver in time			500,000		
Repair of Bogra Intake river weir				500,000	
Subtotal					
Subtotal			6,700,000	5,450,000	1,000,000
Agricultural/processing/marketing, tbd more precisely			2,400,000	2,251,600	
Season's credit for production and long-term credit for investment			tbd	tbd	
Sub-total			2,400,000	2,251,600	500,000
Total			10,949,200	9,050,800	**1,910,000**
Total				**20,000,000**	
Credit for producer, farmers and processors, investment					
Investment. Wild guesses, not even ball park guesses					
One may take the numbers below partly equity, mostly credit					
On farm for 20,000 ha first year and 20,000 ha second year	20,000	300	6,000,000	6,000,000	
Processors, 1,000 jobs @ $8,000 good for 5,000 ha/yr			8,000,000	8,000,000	
Production credit, annually rotating, so the capital is blocked like investment					
On farm for 20,000 ha first year	20,000	300	6,000,000	6,000,000	3,000,000
Processors 1,000 jobs @ $10,000 good for 5,000 ha/yr			10,000,000	10,000,000	90,000
Sub-total			30,000,000	30,000,000	3,090,000
Total				**60,000,000**	
				80,000,000	**5,000,000**

So we are discussing about 40,000 farmers and 2,000 positions in processing. This picture has to be elaborated with more detail and with economic and financial analysis. Probably the demand for capital will only rise as a result.

The $5M for the first half year as from today. The $3M on-farm expenses would consider $2.5M for summer crops inputs @ $300/ha result 8,000 ha. $0.5M would have to be dedicated for anticipation of later impact: nurseries for fruit and reforestation, bring in new varieties for all kind of species in order to locally validate. It is not clear what CADG wants to accomplish on such a short term with its $4M. It is not clear which other entity is covering which activities.

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Repair of structures			1,500,000	1,500,000	
Sub-total			3,000,000	3,000,000	
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