Democratic People's Republic of Korea

Republic of Korea

Evaluation

of

Livestock Development and Vegetable Production - SPFS

GCP/DRK/002/ROK

Report of the Evaluation Mission

September 2000

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Preface

The following report represents the views of the independent evaluation mission on the performance and achievements of the project Livestock Development and Vegetable Production – SPFS (GCP/DRK/002/ROK), which started in late 1999. The evaluation was initiated with a view to providing the donor, the recipient government and FAO with an independent and objective assessment of the status of project achievements, including an estimation of the project's likely impact and its replicability. The mission took place from 22 July to 4 August 2000; discussions were held with project backstoppers in Bangkok (FAO's Regional Office), project management and relevant agencies in Pyongyang, and target beneficiaries (management and farm workers) in the two participating cooperative farms. The report has also benefited from a debriefing session held with FAO, DPRK and ROK participation in Rome in September 2000.

The project began its operations some ten months ago – achievements visible on the ground are thus necessarily limited. The present mission was to concentrate on the project's performance and achievements as well as its prospects for replicability and the eventual need for follow-up; however, some observations of the mission also relate to the design of the project. As operations are still at an early stage, the Mission considered it opportune to review the project's workplans in more detail, and to make some remarks on actions deemed necessary. As the project is expected to lead to a further expansion, its prospects for sustainability and replicability are considered in depth in the conclusions regarding sustainability. Findings from this section have led to some proposals for future development efforts that could build on, and extend, the project's experience. At the same time, the underlying constraints facing agricultural development in DPRK are seen as a serious, and hard to solve, problem.

The evaluation was a challenging task given the late start of the project and the consequent difficulty to measure impact at the field level. However, preparations made, and support given, by project management enabled the mission to gain a good overview of the project's performance.

Visits to the cooperative farms were made using semi-structured interviews with the farm management teams. Several individual farm households were also visited.

The Evaluation Mission was most appreciative of the efforts made by the project management, the Government officials contacted, as well as a range of other individuals who provided information and discussed issues in a frank and constructive manner. Cooperative farm management team members and farm workers were a crucial source of information; their insights and judgments have profoundly influenced the report.

The Mission recognizes the project's contribution to enhancing food security of cooperative farmers. The project's unique experience is undoubtedly relevant to other development efforts aiming at increasing food security in DPRK. The project's performance is appreciated by its collaborators, and its experience can contribute to other development efforts in the country.

However, while the project shows the potential to achieve a positive impact, there is also the danger that the economy of DPRK will in the foreseeable future not be able to generate even the moderate inputs required by the project. Thus, the momentum created by the project will not reach its full potential if DPRK has to rely entirely on its own resources – ongoing donor support as well as positive changes in economic and trade performance will both be needed to ensure the project's long-term sustainability and success.

The Evaluation Mission

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List of Acronyms

AC	Agricultural Commission (became MOA)
DPRK	Democratic People's Republic of Korea
FAO	Food and Agriculture Organization of the United Nations
M&E	Monitoring and Evaluation
MOA	Ministry of Agriculture
NPK	Nitrogen, Phosphate, Kalium (fertilizer)
NTC	National Technical Committee (SPFS)
PBEE	Evaluation Service, Office of Programme, Budget and Evaluation (FAO)
PMU	Project Management Unit
RAP	Regional Office for Asia and the Pacific (FAO)
ROK	Republic of Korea
SPFS	Special Programme for Food Security
TCDC	Technical Cooperation among Developing Countries (FAO)
TCDM	Unit for Cooperation with Multilateral and Bilateral Agencies, Technical Cooperation Department (FAO)
TCP	Technical Cooperation Programme (FAO)
TOR	Terms of Reference
UNDP	United Nations Development Program
USSR	Union of the Soviet Socialist Republics
WFP	World Food Programme

Executive Summary

In September 1997, the DPRK Government expressed interest in participating in the SPFS, which could assist in implementing its food security policies and strategies. By March 1998 it had identified the main elements of Phase I in an SPFS National Programme Document and developed a Plan of Operations. The present project (funded by the Government of the Republic of Korea with a budget of US$ 500,000 and a planned duration of two years) assists the SPFS in two of the four cooperative farms identified, viz. Waeso and Samhun. The main activities concern diversification into livestock and intensification of production through irrigation and protected vegetable production. The project document was signed on 18 May 1999, but due to delayed start-up procedures operations began only in October 1999.

The development objective of project GCP/DRK/002/ROK is to contribute to improved food security in the country through the introduction of improved technologies. The immediate objectives are to increase the production of vegetables and livestock products, to improve sustainability of farming, to reduce production risks and to increase farmers' incomes on two cooperative farms, benefiting 1,500 households. Specifically, the project was expected to assist to: rehabilitate and expand ruminant herds based on improved natural and artificial pasture and forage; initiate a feedgrain production in DPRK; broaden the variety range and lengthen the season for vegetable production; and improve nutrition and incomes of private rural households. The project was also expected to prepare for a wider Programme under an expansion phase, by making detailed proposals for investment, technical cooperation and policy improvements.

Towards the attainment of these objectives, initial results achieved include:

- The establishment of improved pastures, hay and silage production and storage facilities on the farms as well as the provision, by the Government, of 132 improved goats of the local breed to Samhun Cooperative Farm. The goats will form the nucleus of a breeding herd for the production and sale of improved animals to cooperative farm members.
- The supply by the Government of a new biopesticide recently developed by the Academy of Agricultural Science to be used on vegetables, including potatoes, in the context of an IPM Programme.
- The initiation of protected agricultural activities in vegetable production, in both low tunnels and in greenhouses, aimed at increasing crop yields and at extending the growing season. In the process, this activity has not only assisted in crop intensification but has also expanded the scope for double or multiple cropping.

Furthermore, other activities that have been initiated will yield important results in the not-too-distant future. These include:

- Increased distribution of small livestock to cooperative farmers, which would lead to a better food supply and/or improved household income via sales at farmers' markets.
- The opening up of natural pasture, which will ensure particularly the sustainability of higher numbers of goats kept by households.

Generally, the project has assisted the participating farms to overcome crucial input constraints and thus to maintain or raise productivity, and also to embark on selected innovative activities.

At the same time, the Mission noted shortcomings in the project design and implementation, which, if not corrected, could jeopardise the future success of the project and the National SPFS Programme in general. These shortcomings include an inconsistent project document, which was inadequate for workplanning purposes; loose project supervision, which led to the slippage of several important backstopping and supervision missions; and generally a preference for input-driven, conventional agricultural activities at the expense of innovative field experiments, which also have their rightful place in a project's pilot phase.

The above notwithstanding, Government and participating cooperative farmers praised the Project for the support it has provided to date as well as for its general concept. Furthermore, the project is moving systematically towards identifying and implementing strategies which would increase productivity, enhance household food security and increase participating farmers'

income through sales of excess production. The Mission views the current phase as a pilot period, where approaches can be tested, institutional links developed and the concept refined. The second phase should see the implementation of the proposed concepts, as well as a move towards integration of the remaining components outlined in the SPFS National Programme Document.

Major remaining tasks during the present phase are:

- An assessment of production potential on cooperative farms as well as household plots as foreseen for the beginning of the project, to be undertaken by the Academy of Agriculture Sciences in cooperation with a TCDC expert. This has not been done and should be started as soon as possible. (The continuing need for the services of a TCDC expert – or alternative arrangements – should be discussed during the forthcoming visit of the Senior Regional Plant Production and Protection Officer.)
- The continuation of some activities, with improved design, in the next growing season (such as pasture development), as well as the initiation of planned activities not yet started (high-protein maize and sorghum, new varieties and cultivars of vegetables).
- The preparation for the second phase, including an outline for other, complementary projects to operate under the umbrella of the National SPFS Programme.

Other issues have to be tackled as well during the present phase; these are addressed in the Conclusions and Recommendations sections at the end of the report. The main body of the report presents a review of project performance to date, and additional supporting information.

The Mission recognizes that the project has the potential to increase agricultural productivity. However, years of economic decline in DPRK have resulted in severely reduced land and labour productivity, and agriculture is characterized by a low input - low output system. Agricultural rehabilitation will to a large extent be dependent on the country's commercial import capacity; in other words, on a revival of the economy. Given the limited land area, increases in agricultural production can only come from intensive cultivation and increased yields. This inevitably calls for increased use of purchased inputs, including fertilizers, farm equipment and spare parts, fuel, pesticides, improved varieties, seeds, etc., which may not be available in the short term due to the unavailability of foreign exchange. (Most of these inputs are based on imports). This aspect will undoubtedly influence the replicability and sustainability of project results.

To overcome the limiting factors noted above, good husbandry practices, including suitable rotations, the further utilization of organic matter, and the broadening of the crop range, need to be further encouraged. The Project, with technical inputs from the Academy of Agricultural Science and Ministry of Agriculture is well placed to contribute towards these objectives.

It is the view of the Mission that the opportunity exists for the project to become an important factor in reconstructing the country's agriculture. Key success factors in the Mission's opinion include, in addition to commitment and leadership both from FAO and the Government of DPRK, steady support and involvement from all project collaborators, clear and consistent planning as well as steady backstopping and monitoring, and a willingness to invest in promising novel activities through field-level experiments and demonstrations.

1. Background

1.1 Agriculture and food security in DPR Korea

The economy of DPR Korea (DPRK) developed vigorously from around the mid-1950s until the mid-1970s. However, the economy seriously declined in the early 1990s, and was further weakened by consecutive major natural disasters in the form of floods in 1995 and 1996 and tidal waves and drought in 1997. The natural disasters during 1995 to 1997 also accentuated the underlying problems besetting the economy: machinery and equipment in industry, agriculture and other sectors are mostly outdated and in poor condition. The running of the economy was largely dependent on favourable relations with the former USSR and former centrally planned economies in eastern Europe as well as China. With the demise of these economies, and the changes in China's trade regime, the DPRK economy is faced with a large trade deficit, and low foreign exchange reserves and credit worthiness.

Over 80% of the country's area of about 12 million hectares is mountainous land, unsuitable for agricultural production. (However, in recent years steep and unsuitable hilly land has been brought under cultivation. The DPRK is taking steps to let this land revert to its natural vegetation or to re-afforest it.)

About 1.85 million ha, or approximately 15% of the total land area, is currently used for agriculture. Out of this area about 600,000 ha are used for rice, 650,000 ha for maize (this area is reported to have declined in 1998 and 1999), 200,000 ha for vegetables and 300,000 ha for permanent crops including orchards and mulberry trees. Another 100,000 ha are approximately equally divided annually between potatoes and barley/wheat/buckwheat. Soils are generally poor with organic matter content around 0.5% and a pH between 5 and 7. The land is subject to erosion particularly in the hilly areas. Agriculture is carried out on cooperative and state farms. The average size of cooperative farms is about 500 ha, whereas that of state farms is much larger. Small plots of land, usually about 100 square meters in one or more locations, are allocated to individual farm households. On this land the farmers can grow whatever they wish. A wide range of crops are grown on these relatively small plots and a large part of the households' nutritional needs, other than carbohydrates, are probably provided from these plots which are intensively cultivated and well cared. Small livestock, including goats, pigs, poultry, rabbits and geese are also kept. Surplus produce is sold at private farmers' markets, which are held throughout the country at 10-day intervals.

Agricultural policy has historically focused on paddy and maize with the aim to attain food self-sufficiency. To this end, agricultural modernization was pursued through irrigation, provision of agricultural inputs (fertilizer, pesticides, herbicides, etc.) and mechanization, and largely achieved in the 1970s. (National average yields of rice and maize have been reported by the Ministry of Agriculture to be as high as 6 and 4 tons/ha, respectively, by the early 1990s. The total grain production was estimated then by the DPRK Government to have reached 6 million tons/annum.)

However, the natural calamities in the mid-1990s and the collapse of the country's trade relations brought down yield levels substantially. Floods, droughts and tidal waves reduced the agricultural potential. The breakdown of DPRK's trade with its traditional partners effectively limited the country's ability to earn foreign exchange, or to continue the barter trade that was in operation for the much needed acquisition of agricultural inputs, including fertilizers (or the raw materials for their domestic manufacture), pesticides, agricultural machinery (including spare parts), fuel, etc.

An FAO/WFP crop assessment mission in November 1999 estimated that year's production at 3.5 million tons (up from 3.4 million tons in 1998 and 2.4 million tons in 1997), while minimum food requirements are 4.8 million tons – a shortfall of 1.3 million tons. Fertilizer (NPK) availability in that year amounted to 200,000 tons, as opposed to a past annual consumption of 600,000 tons. The mission noted that food supply prospects in DPR Korea would remain precarious despite some improvement in rice production, and observed that heavy nutrient mining and the growing importance of double cropping meant that overall fertilizers requirements were likely to rise.

For the present, total yields are still well below the country's minimum requirements and the country will need to rely substantially on food aid to feed its population. Such reliance will continue, at least for the immediate future, or until such time as economic development in the country improves to the extent that it can meet its input supply requirements either in finished products (e.g. fertilizers) or as raw material for local manufacture. Such developments will be slow. The need for emergency or humanitarian assistance in the form of food aid, or inputs to increase the production of local foodstuffs, will continue.

1.2 FAO and SPFS assistance in DPRK

The main feature of the DPRK food security policy is to attain self-sufficiency in basic cereals, notably rice and maize. While the country's Public Distribution System (which supplies basic necessities, including food) aims to provide each individual with 2450 Kcal per day of cereal-based food energy, it has not been able to reach that figure in recent years. Against this backdrop, Government is now placing more emphasis on input efficiency and cost effectiveness in agriculture, and looks for cropping patterns that optimize utilization of land resources on state and cooperative farms as well as crop production and animal husbandry on household plots around rural dwellings.

In view of the existing constraints (shortage of land, shortage of agricultural inputs), FAO in co-operation with the Government initiated a double cropping programme in 1997, essentially to increase the potential for producing a second crop sown either before or after the harvest of the main crop (rice/maize). FAO's contribution concentrated on assisting the Government with the necessary expertise and inputs needed for both the secondary and main crop with funds provided from both FAO's Regular Programme (TCP) or from donors following appeals. The double cropping Programme commenced in 1997 with about 34,000 ha and by the winter of 1998 about 63,000 ha of winter wheat was sown producing about 189,000 metric tons of wheat or about 3 metric tons/ha. An area of 53,000 ha sown with spring barley in 1999 produced about 106,000 metric tons with an average production of about 2 metric tons/ha.

In September 1997, the DPRK Government expressed interest in participating in the SPFS, which could assist in implementing its food security policies and strategies. To this end, in October/November 1997, an FAO Exploratory Mission visited DPRK to determine the nature and scope of the SPFS. At the end of that mission, Government signed an Aide Memoire that stated its commitment to the SPFS. By March 1998, the Government had identified the main elements of Phase I in an SPFS National Programme Document and a Plan of Operations was prepared, including a tentative budget of US$ 2.8 million for a two-year programme with the following components:

- Intensification activities involving demonstration of multiple cropping systems and crop rotations; labour and energy saving farming techniques; seeds improvement; pest control; and fertility management.
- Water control including drainage improvement, and water harvesting in both lowland and upland areas.
- Diversification including production of livestock (encompassing also improvement of animal feed), aquaculture, and expanding the range of irrigated vegetable production.
- Constraints analysis including the identification of major results, opportunities and constraints to food security, with a view to engaging Government in a critical dialogue on the general environment for food security.

Four cooperative farms were selected where pilot demonstrations would be carried out. The farms are located in the provinces of South Pyongan, North Hwanghae and Pyongyang City. The farms are typical of the central-western part of the country which has high agricultural potential and access to Pyongyang (the country's capital).

The water control component was initiated by FAO in September 1998 under project SPFP/DRK/8801, with a budget of US$ 88,241 (to be completed December 2000).

1.3 Project design and approach

Further support to the SPFS programme is being provided by the present project (funded by the Government of the Republic of Korea with a budget of US$ 500,000 and a planned duration of two years), through which the SPFS is assisted in two of the four farms identified, viz. Waeso and Samhun. The main activities concern diversification into livestock and intensification through irrigated vegetable production. The project document was signed on 18 May 1999, but due to the formal requirements of the recipient Government operations started only in October 1999.

The development objective of project GCP/DRK/002/ROK is to contribute to improved food security in the country through the introduction of improved technologies, while the immediate objectives of the project are:

a) during the implementation of the pilot phase to increase the production of vegetables and livestock products, to improve sustainability of farming, to reduce production risks and to increase farmers' incomes on two cooperative farms benefiting 1,500 households. More specifically, the project will assist to:

- rehabilitate and expand ruminant herds based on improved natural and artificial pasture and forage;
- initiate a feedgrain production in DPRK;
- broaden the variety range and lengthen the season for vegetable production; and
- improve nutrition and incomes of private rural households.

b) to prepare for a wider programme under an expansion phase, by making detailed proposals for investment, technical cooperation and policy improvements.

The objectives were to be pursued through a combination of support measures in various areas, such as fodder and pasture (among others, establishment of cultivated pasture, natural pasture improvement, expansion of winter fodder production and storage), livestock (among others, establishment of two modern chicken hatcheries on the farms to improve the capacity of cooperatives to supply broiler and layer chicks to households for rearing), vegetables (among others, introduction of a range of new vegetables, construction of plastic houses and tunnels, extension of vegetable growing season) .

An assessment of livestock and vegetable production potential on private household plots as well as an analysis concerning the productivity of private household plots and cooperative farmland was planned, with the likely intention to optimize the provision of technical advice and inputs to cooperative farms as well as to household plots.

Training of farmers, managers and scientists was to take place through the organization of workshops, farmers' field schools and provision of an overseas fellowship in animal nutrition. (The budget sheet attached to the project document contained also an allocation for a study tour on winter fodder preparation, not mentioned in the body of the text. The study tour – with a revised focus on livestock and pasture establishment – has taken place in the meantime. The overseas fellowship has been converted into a one-month external training tour for four persons to New Zealand on pasture establishment, planned for late 2000.)

Monitoring of the project activities was to be done through the Academy of Agricultural Sciences, which was to be in charge of designing the details of the demonstration activities and of the monitoring of the programme. (A TCDC specialist, in cooperation with the Academy, was expected to prepare detailed designs of the demonstration activities.) On-farm activity monitoring activities were to be undertaken by two specially assigned staff on each farm.

1.4 Institutional arrangements

Overall responsibility for the project rested with the Agricultural Commission (now Ministry of Agriculture). Project implementation was to be supervised by a Steering Committee composed of representatives of the Academy of Agricultural Sciences, the Ministries of Finance and Foreign Affairs, as well as of the MOA. A National Technical Committee was also to be formed by the

MOA consisting of Directors, Vice-Directors or Senior Officers to give guidance to farm managers in conducting the demonstrations. Furthermore, the MOA was to establish a small Project Management Unit (composition not further specified) under the SPFS National Coordinator[1].

1.5 Assessment of project design

Apart from inconsistencies regarding procurement arrangements (see footnote below), the project document displayed a number of other inconsistencies: the attached workplan did not list all the activities specified in the actual project document (e.g. the TCDC specialist to arrive at the beginning of the project), the budget deviated from the inputs specified earlier (e.g. only one incubator rather than two), and the sections marked outputs and activities did not contain all outputs and activities detailed elsewhere in the project document. Furthermore, the outputs and activities were listed in no particular logical order.

The institutional relationships, as well as the managerial and institutional framework for implementation were adequately outlined, while the attached work plan suffered from the above-mentioned inconsistencies and omissions. Targets and identification of beneficiaries were not provided, nor were prospects for sustainability discussed. Prior obligations and prerequisites, as well as assumptions and risks were not mentioned. The question of cost effectiveness of the project was not raised in the project document.

2. Project Implementation

2.1 Budget and its utilization[2]

The bulk of the project's budget is devoted to physical inputs (approximately 70%). To date, most expenditure has been on one international consultancy, an international study tour on animal nutrition and small livestock rearing for 5 people, and the provision of equipment and supplies (1 minibus, 2 6-ton trucks, computers and other office equipment, fertilizer, plastic sheeting, pasture seeds, tractor tyres, knapsack sprayers).

Components	**1999 Expenditure**	**2000 Budget**	**2001 Budget**	**Revision "B" Total Budget**	**Original Total Budget**	**Changes**
Consultants		12000	10000	22000	32000	-10000
Travel		20000	10000	30000	10000	20000
Training		50000	9943	59943	70982	-11039
Expendable Equipment	31500	149250		180750	180750	0
Non-expendable Equipment	41438	86962		128400	128400	0
Technical Support Services		12612	5000	17612	13000	4612
General Operating Expenses	84	1000	5000	6084	7400	-1316
Sub-total	73022	331824	39943	444789	442532	2257
Support Cost	9493	43137	5193	57823	57522	301
Total	**82515**	**374961**	**45136**	**502612**	**500054**	**2558**

[1] The project document was inconsistent in its provisions regarding procurement: while it stated under the heading Institutional Arrangements – Management that the AC/MOA may procure project inputs through its procurement office, the preceding Project Arrangement declared that FAO will provide the equipment and supplies.

[2] Due to the conversion in FAO to the Oracle accounting software, the budget components differ in some instances from the original budget set-up.

2.2 Status of planned activities and outputs[3]

2.2.1 Fodder/pasture

Samhun Cooperative Farm has established 10 ha of sown pasture, and converted 2 ha of former cropland to grass seed production. (An additional 53 ha of natural pasture on Samhun have been identified and utilized, but the feed value evaluation is needed.) Natural pasture resources accessible to both farms have been identified, evaluated for feed value, opened up, improved and put under better management.

A capacity for winter fodder production and storage was established by constructing a 150 m^2 hay storage structure on Samhun Cooperative Farm; additional storage structures will be constructed. In addition a 60 MT capacity silage tank is under construction on the same farm.

Plans were developed to plant 15 ha of high-protein maize and 15 ha of high-protein sorghum on each of the two farms. However, due to the delay in procuring the appropriate seed varieties, caused by difficulties encountered in identifying sources of supply in China, the planting went ahead with conventional varieties. The sowing of this area with these specific high-protein varieties is now scheduled for spring 2001.

2.2.2 Livestock

Originally two modern chicken hatcheries were planned, but the budget attached to the project document only contained an allocation for one. This hatchery is currently (August 2000) under construction on Waeso Cooperative Farm. The delivery of the incubator (with a stand-by generator and a capacity of 20,000 chicks/annum) is expected to be made soon. So far, the cooperatives have to rely on traditional methods for production and distribution of chicks to their members.

The Government has provided 132 goats to Samhun Cooperative Farm for breeding; some additional 28 goats are expected. A marked increase has already been observed in the number of some small livestock kept on farms and by households since project start.

2.2.3 Vegetables

The introduction of a range of new vegetables was planned; however, to date no new kinds of vegetables or improved varieties of existing vegetables have been introduced in either of the two cooperatives.

Both farms have practiced protected vegetable cultivation in plastic tunnels as well as green houses (Samhun Cooperative Farm 12 greenhouses of 100 m^2 each, Waeso Cooperative Farm 10 greenhouses of 100 m^2 each) for the early production of vegetables and to facilitate double cropping.

2.2.4 Private household plots

Private household plots were to receive special attention from the project. To date, officially only a minor role has been foreseen for household plots in overall vegetable production, but household plots are very significant in the case of livestock as the cooperative farms will produce, from superior stock, offspring of goats, rabbits, and poultry for sale to its members. This improved stock will not only provide improved nutrition for the farmers but will also provide them with a cash income from the sale of their excess production in the Farmers Markets.

An analysis concerning the productivity of private household plots and cooperative farmland was foreseen in the project document, but this exercise has not been carried out yet. Plans are in progress to carry it out later in 2000.

[3] This sections sums up the main implementation achievements to date; a more detailed account can be found in Annex Four.

Provision of technical advice and inputs to family plots has taken place in the form of routine technical demonstrations. However, under existing conditions the supply of fertilizers is a limiting factor. Hence emphasis is given to using more organic manure.

2.2.5 Training

Farmers and managers have been trained in early spring vegetable production in greenhouses and tunnels. Training in pasture establishment for improved livestock fodder production has also taken place. Waeso cooperative farmers and managers have been trained in the use of a bio-pesticide newly developed by the Academy of Agricultural Sciences.

Organization of workshops, farmers' field schools have taken place, with some modifications from the original project document. The originally planned study tour on winter fodder preparation, has been converted into a study tour on livestock and pasture establishment in June 2000 to China, Thailand and Pakistan. Five members from the pilot farms and the PMU have participated. The provision of one overseas fellowship in animal nutrition has been substituted by an external training sessions of one month duration for four persons, scheduled to take place later on this year in New Zealand.

2.2.6 Monitoring

The Academy of Agricultural Sciences was charged with designing the details of the demonstration activities and monitoring of the project. To date, however, there has been no actual monitoring by the Academy, and also marginal involvement in ongoing demonstration activities. According to the authorities, this will be carried out at the appropriate time in the future when a TCDC specialist, in cooperation with the Academy of Agricultural Sciences, will prepare detailed designs of the demonstration activities. (The project document stipulated that the TCDC specialist should have come at the beginning of the project.) However, the budget provision for TCDC seems to have been revised downward from the original project document, and may now be needed to fund a TCDC vegetable specialist. (The issue should be discussed during the forthcoming supervision mission by the Senior Regional Plant Production and Protection Officer.)

Technical committee members did, however, draft detailed demonstration activities and monitoring programmes, and Planning Officers on each farm were appointed as monitoring officers and are doing M&E activities.

2.3 Project management, Government support, and technical and operational backstopping

Project management has been able to set in motion the project, and establish functioning working arrangements in the country. There have been problems with timely ordering of inputs, but this seems to be more related to slow procedures followed by FAO than delays on the part of project management. With the exception of the monitoring arrangements and the prolonged start-up phase, all locally controlled project activities are largely on track. The PMU prepared an Inception Report in October 1999, and produced the first two of the Quarterly Progress Reports in January and April 2000.

Government support is evident from the counterpart contributions provided by the cooperative farms, and from the delivery of goats to Samhun Cooperative Farm. It has also provided – with the exception of the so far marginal involvement of the Academy of Agricultural Sciences – all counterpart staff listed in the project document. The climate seems favourable for the increased distribution of small livestock by cooperatives to farm members as a means to improve their household food security and income. Integration into the national programme and with other related projects has not as yet been promoted. This would, however, have been premature in view of the short duration of the project to date.

Technical and operational backstopping to date has been less than optimal. Even considering the delayed start of effective project operations, the project has passed the middle of its first year and should by now have received one supervision mission (month 5), one technical backstopping mission (month 4), one TCDC mission on design and monitoring of demonstration plots (beginning of project), and one international pasture establishment consultancy. Only the

last mission has taken place, while the other missions have slipped without apparent explanation. Likewise, there appears to be a greater than necessary delay in procuring inputs, perhaps owing to the project document's inconsistency regarding operational responsibilities. Budget monitoring seems to have been adequate; budget revisions have been prepared, e.g. soon after detailed workplans were available from the farms and the PMU which necessitated such changes.

3. Conclusions

3.1 Likely achievement of project immediate objectives[4]

Generally, positive developments are evident – these are discussed with specific reference to the project's immediate objectives (viz. to rehabilitate and expand ruminant herds based on improved natural and artificial pasture and forage; initiate a feedgrain production in DPRK; broaden the variety range and lengthen the season for vegetable production; and improve nutrition and incomes of private rural households) in more detail in the paragraphs below.

Regarding the more general aspects (viz. to increase the production of vegetables and livestock products, to improve sustainability of farming, to reduce production risks and to increase farmers' incomes on two cooperative farms benefiting 1,500 households), the project appears to be making progress on all counts, with the possible exception of sustainability, due to the external input requirements.

The second part of the immediate objectives (i.e. to prepare for a wider programme under an expansion phase, by making detailed proposals for investment, technical cooperation and policy improvements), has not yet been addressed by the project. (Its place would logically be towards the end of the current phase.) It appears, however, that considerable interest already exists by donors to complement the project activities with additional projects, under the umbrella of the SPFS National Programme Document. A proposal in this regard is made in the Recommendations section and further outlined in Annex Nine.

3.1.1 Rehabilitation and expansion of the ruminant herd

The rehabilitation of the ruminant herd was to come mainly from improved natural and artificial pasture and forage. Improved pasture and forage has been established on both farms; in addition, Government has provided 132 goats to Samhun Cooperative Farm. On both farms, the number of goats kept has increased since project start. These activities will undoubtedly act as catalyst for the further development, on a sustainable basis, of the livestock sector at both the cooperative farm and on the household plots

3.1.2 Feedgrain production

Initiation of a feedgrain production in DPRK was given as one of the project's immediate objectives. In practice, this task consisted of the introduction of high-protein maize and sorghum seeds as a supplementary source of feed. These seeds could not be ordered due to supply difficulties by Chinese sources, and the activity had to be postponed until early 2001. For the current year, the hybrid seeds have been substituted by conventional seeds for purposes of feedgrain production. (It also remains to be determined whether hybrid varieties are an appropriate approach regarding the country's input supply constraints and trade deficit.) On the other hand, both farms have established new pastures, opened up and improved natural pastures, and in the case of Samhun Cooperative Farm a pasture seed multiplication plot has been established. In addition, on the cooperative farms provision is being made for increasing hay and silage production and the space needed for its storage during the winter months is currently under construction.

As far as household plots are concerned, many are currently used for growing maize (in addition to some vegetables and fruit trees), to be used as feed for their small livestock.

[4] Merely 10 months after the effective start of project operations, it would be too soon to attempt an assessment of the project's effectiveness and impact. However, apparent results and some potential impact of the project are discussed below.

3.1.3 Broadening the variety range of vegetable production

The introduction of a range of new vegetables as well as improved varieties of existing vegetables was planned; however, to date the project has concentrated on early and/or double cropping of traditional Korean vegetable varieties. This may well be a missed opportunity as the vegetables grown currently do not display much diversity and thus may not fully utilize existing production potential. (The Academy of Agricultural Sciences has indicated that adaptive trials and demonstrations of non-traditional vegetable varieties will begin soon.)

The Government has also supplied to Waeso Cooperative Farm farm 150 litres of a new biopesticide recently developed by the Academy of Agricultural Sciences for use on vegetable crops. This is a positive development in the context of implementing an IPM programme.

3.1.4 Improved nutrition and incomes of private rural households

As the project is still in its early stages, no major changes in the nutritional and income status of the households could be ascribed to the project. However, the stage is set for an increased distribution of small livestock to cooperative farmers, which would lead to a better food supply and/or improved household income via sales at farmers' markets. The opening up of natural pasture will ensure particularly the sustainability of higher numbers of goats kept by households. Initially, in view of the relatively small size of the area developed/identified these pastures will only be used by the cooperative-owned breeding stock of goats. Assurances were received from the farm management that at a later stage, as more pasture has been developed, this will also become available for the households. In the meantime, households will use natural grazing, as in the past.

In the case of vegetables, any developments taking place on cooperative farmland will undoubtedly have a demonstration effect for the household plots. However, the role of household plots is still limited due to the shortage especially of fertilizer, which is essential for more efficient production. (On the other hand, the housholds can overcome this constraint to some extent by using manure from the livestock kept.) The availability of plastic sheeting would also be expected to assist in double cropping and hence increase productivity.

3.1.5 Validity of the methods and technologies used

The methods and technologies to be promoted by the project aim in two directions: diversification and intensification. The former as laid down in the project document e.g. in the objective to widen the range of varieties and cultivars grown of vegetables; this has not happened yet. (Not foreseen in the project document, but frequently mentioned as a request by cooperative farm members, is the introduction of superior breeds of animals, in particular goats.)

Most activities initiated by the project have aimed at intensification. This has led e.g. to extending the growing season, and has expanded and diversified the scope for double cropping. The methods have not in themselves been innovative, but were designed to overcome production constraints on cooperative farms and improve the productivity of farm households, particularly regarding small livestock. Thus, the methods and technologies used by the project are valid and appropriate. However, some methods would not be replicable on a wider scale, at this stage, due to the persistent shortage of agricultural inputs in DPRK.

3.2 Monitoring & Evaluation

Monitoring data provided so far have been adequate to give operational guidance to management, but for more far-reaching strategy and policy decisions, additional in-depth monitoring and evaluation arrangements are called for. An outline is included in the constraints analysis part of the SPFS National Programme Document. This aspect is also covered in the project document, where it calls for a comparative analysis of productivity of cooperative farms vis-à-vis household plots. This has not been done to date, but the Academy of Agricultural

Sciences as well as project management have given an undertaking that this will be initiated in the near future.

3.3 Project management and backstopping

Project management has been able to set in motion the project, and establish functioning working arrangements in the country. Acknowledging the prolonged start-up phase, and with the exception of the monitoring arrangements and some demonstration activities, all locally controlled project activities are largely on track. Government support is evident from the counterpart contributions provided by the cooperative farms, and from the delivery of goats to Samhun Cooperative Farm. Technical and operational backstopping to date has been less than optimal; in particular too many planned missions to the project have slipped without apparent explanation.

3.4 Project's potential for sustainability and replication

The project has the potential to increase agricultural productivity. However, the greatest inherent weakness of the project is that of sustainability, at least as it refers to the availability of certain project components including fertilizers, plastic sheeting for use in protected cultivation, tractor tyres, other farm equipment and hybrid grain seeds. These supplies are not assured since they cannot be procured locally and their availability is subject to a Government allocation of foreign exchange for their purchase from abroad. The Government may well not be in a position to make such allocations at least until such time as its economy substantially improves. On the other hand, the provision of small livestock, mainly for distribution to farm households, and the improvement of pastures appear to be more sustainable.

4. Recommendations

4.1 Project duration

In view of the delayed start of the project, and also considering the delayed delivery of certain key inputs, an extension of the project within the existing budget until late 2001 should be considered in order to give it the experience of two full growing seasons.

4.2 Activities to be initiated/intensified by the current project

4.2.1 Assessment of production potential

The project document stipulated that an assessment of production potential on cooperative farms as well as household plots would be undertaken by the Academy of Agriculture Sciences in cooperation with a TCDC expert, at the beginning of the project. This has not been done. It should be started as soon as possible. (The continuing need for the services of a TCDC expert – or alternative arrangements – should be discussed during the forthcoming visit of the Senior Regional Plant Production and Protection Officer.)

The aim of the assessment should be to identify ways to optimize resource utilization, which would fit the larger scale operations of cooperative farms as well as those of farm workers on their household plots.

4.2.2 Small livestock production

Small livestock, particularly of browsing animals such as goats, but also chicken and rabbits, currently offer the best potential to increase the availability of meat. Apparently only one breed of goats is kept, and reportedly there is also not much variation in the breeds of rabbits and chicken. Trials with improved breeds would offer an opportunity to explore further the production potential in this field.

4.2.3 Vegetable production

Farm workers have shown to be very adept at cultivating their household plots with a variety of vegetables for home consumption and sale. With some assistance, they certainly have the skills to look after "on farm" demonstrations on their own household plots to test the suitability of vegetables not commonly grown on farms and household plots.

4.2.4 Pasture establishment on cooperative farmland

Work on improvement of natural pasture and establishment of sown pasture has begun in a satisfactory manner; however, FAO's pasture establishment consultant observed some areas for improvement (such as the testing of additional species and cultivars, seed inoculation), which need to be taken into careful consideration in future workplans.

4.2.5 Project support

In view of the potential and expectations from the current SPFS project in the general area of food security and improved nutrition, it would be advisable to have the project under close supervision and support by FAO, especially with a view to streamlining backstopping visits and procurement.

4.2.6 Active involvement of Academy of Agricultural Sciences

The Academy of Agricultural Sciences needs to be more actively involved in designing the details of the farm demonstration activities as well as in monitoring them, as foreseen in the project document.

4.2.7 Capturing the demonstration effect

New activities introduced on the cooperative farms and houshold plots should be developed to serve as demonstrations to a wider audience (as already begun on a small scale). To this end, exchange visits among farms and field days could be considered.

4.3 Possible further follow-up of the project

4.3.1 Activities identified in SPFS National Programme Document

When reviewing the project achievements, it must be kept in mind that the SPFS National Programme Document reckoned with a donor budget of approximately US$ 2.8 million in order to implement the identified components. To date, only two projects (the current project GCP/DRK/002/ROK, and project SPFP/DRK/8801) with a combined budget of less than US$ 0.6 million have been funded. Thus, there still exists a considerable resource gap, and consequently several planned SPFS components have not been fully, or not at all, implemented.

The Mission sees a continuing need for most of the activities envisaged under the SPFS National Programme Document. They would complement, or follow up on, the activities initiated by the current project. Thus, the Mission generally endorses the project proposals developed by the Ministry of Agriculture (see Annex Nine), and recommends to develop these proposals further in discussions with potential donors and by fielding formulation missions, once donor agreement in principle has been secured.

Annexes

Annex One - TOR

1. BACKGROUND

During 1998, FAO implemented a project (US$ 88,000) on the Special Programme for Food Security in the Democratic People's Republic of Korea (DPRK) focusing on water management. During implementation of this project, additional needs were foreseen for technical and material assistance in the areas of vegetable and livestock production and improvement. A project document was formulated at the request of DPRK. The project document was signed during the latter part of May 1999 and is being funded by the Republic of Korea. The total duration of the project is two years and the budget is US$ 500,000. The project's present termination date is May 2001.

The development objective of project GCP/DRK/002/ROK is to contribute to improved food security in the country through the introduction of improved technologies.

The immediate objectives of the project are to:

- Rehabilitate and expand ruminant herds based on improved natural and artificial pasture and forage;
- Initiate a feedgrain production in DPRK;
- Broaden the variety, range and lengthen the season for vegetable production; and
- Improve nutrition and incomes of private rural households.

Given that the present project is a pilot phase which aims at applying its technology and management to two cooperative farms benefiting 1,500 households, the project is structured so as to provide possibilities for a wider programme in an expanded phase.

2. PURPOSE AND OBJECTIVES OF THE EVALUATION

2.1 Purpose

The purpose of the mid-term evaluation of the project (pilot phase) is to:

a) Review the overall project design and experience gained after one year of project implementation;

b) Analyse in depth, the achievement and the potential sustainability of project key-outcomes; and

c) Assess the overall validity of the methods and technologies used to improve livestock and vegetable production in the two pilot sites selected.

2.2 Objectives

The specific objectives of the evaluation exercise will be to:

1) Review the design of the SPFS project.

2) Review project implementation process, as well as its interaction with other projects and Government activities in the region.

3) Review the main outputs produced by the project to date.

4) Assess the project's effectiveness (i.e. the degree of achievement of project immediate objectives) and its potential for sustainability and replication.

5) Formulate recommendations for possible further follow-up of the project in general and identify lessons learned to be applied to the design, extension and/or implementation of similar projects in the future.

3. SCOPE OF THE EVALUATION

3.1 Review of project design

The review of the project design will focus on the following:

a) Relevance of the project to development priorities and needs.

b) Clarity and realism of project development and immediate objectives, including specification of targets and identification of beneficiaries and prospects for sustainability.

c) Quality, clarity and likely efficiency of project design, including:

- Clarity and logical consistency between objectives, outputs, activities and inputs and progress towards achievement of objectives (quality, quantity and time-frame);
- Realism and clarity of specification of prior obligations and prerequisites (assumptions and risks);
- Realism and clarity of institutional relationships, the managerial and institutional framework for implementation and the work plan;
- Cost-effectiveness of project design.

3.2 Review of project implementation process

The evaluation of the project implementation process will cover the experience gained to date following one year of implementation and will cover efficiency, problems and successes of project implementation, including:

a) Availability of funds as compared with budget for both the donor and national component;

b) The quality and timeliness of input delivery by both FAO and the Government;

c) Managerial and work efficiency;

d) Implementation difficulties;

e) Adequacy of monitoring and reporting;

f) The extent of national support and commitment; and

g) The quality, quantity and timeliness of administrative and technical support by FAO's operational and technical units.

3.3 Review of main outputs

The review of the expected project outputs will cover the following:

a) Cultivated pasture established on a proportion of the pilot farms.

b) Natural pasture resources accessible to pilot farms selected and feed value.

c) Capacity for winter fodder production and storage.

d) Capacity of cooperatives to supply broiler and layer chicks to private households for rearing.

e) Productivity of family plot and cooperatives in the production of livestock and vegetables.

f) Range of vegetable varieties grown and the extension of the vegetable growing season.

g) Training of farmers, managers and scientists and the subjects.

h) Assess reports prepared, including budget monitoring.

The mission will examine the extent to which the project is supported by the Government, and how it has been integrated into the national programme and with other related projects.

3.4 Assessment of project effectiveness and potential for sustainability

The core component of the evaluation exercise will focus on the following:

a) To what extent has the project improved livelihoods and how has the project, or how will it be institutionalized.

b) To what extent has the Central Monitoring Section of the Project Management Unit functioned in providing adequate monitoring of data to be used by management.

c) To what extent has the project improved nutrition and incomes of private rural households.

d) To what extent has rehabilitation and expansion of the ruminant herd occurred on improved and natural artificial pasture and forage.

e) To what extent has the broadening of the variety and range of vegetables progressed.

f) To what extent has the feedgrain production progressed.

3.5 Conclusions and recommendations

Based on the above elements, the mission will draw specific conclusions and make proposals for any necessary further action by the Government, FAO and the donor, in order to ensure sustainability of project achievements, including any need for additional assistance and activities of the project prior to its completion. If appropriate, this may include specific recommendations for the design and implementation of a follow-up of the same project.

4. COMPOSITION OF THE MISSION

The mission will be composed as follows:

- Representative of FAO who will be the Team Leader of the Mission;
- A staff member of PBEE who will represent the Republic of Korea; and
- A representative of the Government of DPRK, a national expert in natural resource management and local development.

5. TIMETABLE AND ITINERARY OF THE MISSION

The mission will take place during the third week of July 2000. The programme is as follows:

- 18 July, Arrival of the mission members at RAP for briefing
- 19 July, Briefing at RAP
- 20 July, Travel to Beijing for Visa procurement
- 21 July, Visa procurement in Beijing and briefing with FAO Representative
- 22 July, Travel to Pyongyang by flight JS 152
- 23 July, Meeting with Project Management Unit and others
- 24 July, Meetings with FAO Office, UNDP, meeting with National Committee for FAO
- 25 July, Meeting with Project Technical Committee or begin field visits

- 26 to 30 July, Visits to Samhun and Waeso cooperative farms and Mt. Myohyang Area and other areas as may be deemed useful
- 31 July to 4 August, Report Writing, final wrap-up meeting in Pyongyang
- 5 August, Departure for Bangkok (RAP) via Beijing
- 6 August, Bangkok
- 7 August, Debriefing at RAP
- 8 August, Departure for Rome
- 9 August, Mid-Term Review Session with Mission Members, TCDM, Republic of Korea.

6. CONSULTATIONS

The mission will maintain close liaison with the Representatives of the donor and FAO and concerned national agencies, as well as national project staff. Although the mission should feel free to discuss with the authorities concerned anything relevant to its assignment, it is not authorized to make any commitments on behalf of the Government, the donor, or FAO

7. REPORTING

The mission is fully responsible for its independent report, which may not necessarily reflect the views of the Governments, the donor or FAO.

A draft report will be produced and the findings and recommendations discussed with concerned national counterparts and, wherever possible, consensus achieved.

The mission will also complete the FAO Project Evaluation Questionnaire.

The mission leader bears responsibility for the finalization of the report, which will be submitted to FAO within two weeks after field mission completion. FAO will submit the report to the Government and to the Donor.

Annex Two - Itinerary/people met

18/7/2000

Arrival Papasolomontos Bangkok

19/7/2000

Arrival Bultemeier Bangkok
Visit DPRK embassy (visa Papasolomontos)

Met: Mr M Papademetriou, Senior Plant Production and Protection Officer

20/7/2000

Met: Mr E Hotte, Senior Operations Officer
Mr D Hoffmann, Senior Animal Production and Health Officer

21/7/2000

Dep Bangkok, arrival Beijing

Met: Mr O S Ahmed, FAO Representative China & DPRK

22/7/2000

Dep Beijing, arrival Pyongyang

Met: Mr So Il, Vice Director, External Cooperation Department, Ministry of Agriculture (MOA), evaluation mission member
Mr Yun Ryong Chan, Senior Officer, Pasture and Livestock Department, MOA

23/7/2000

Met: as before

24/7/2000

Met: Mr Yun Ryong Chol
Mr Ri Song Chol, FAO NPO DPRK
Mr G-M Agostini, FAO Adviser
Mr Roberto Christen, Technical Adviser UNDP
Ms K Jorgensen, Deputy Resident UNDP
Mr Yun Su Chong, Secretary-General DPRK National Committee for FAO

25/7/2000

Met: Mr Sin On Ryol, Deputy Director, Vegetable Production Dept, MOA
Mr Yun Ryong Chan, Senior Officer, Pasture and Livestock Department, MOA

26/7/2000

Visit to Samhun Cooperative Farm

Met: Mr An Jong Dae, Chairman
Mr Kang Hyon Chae, Chief Engineer

Mr Kim Chol Su, Production Officer
Mr An Byong Jun, Planning Officer (also assigned monitoring officer for project)

27/7/2000

Visit to Waeso Cooperative Farm (overnight in Kaechon county)

Met: Ms Kunk Ok Hui, Chairperson
Mr Jon Sa Hong, Chief Engineer
Mr Ri Myong Hua, Planning Officer (also assigned monitoring officer for project)

28/7/2000

Visit to International Friendship Exhibition; return to Pyongyang

Report writing

29/7/2000

Report writing

30/7/2000

Report writing

31/7/2000

Visit to Samhun Cooperative Farm (accompanied by Mr Yun Ryong Chan)

Met: Mr An Jong Dae, Chairman
Mr Kang Hyon Chae, Chief Engineer
Mr Kim Chol Su, Production Officer
Mr An Byong Jun, Planning Officer (also assigned monitoring officer for project)

1/8/2000

Visit to FAO/UN offices

Attended children's performance

Report writing

2/8/2000

Met: Mr D Broderick, WFP Country Director
Mr Yun Su Chong, Secretary-General DPRK National Committee for FAO
Mr Kim Yung Hui, Deputy Director, Vegetable Research Institute, Academy of Agricultural Sciences
Mr Kim Yong, Chief, Breeding Dept, Vegetable Research Institute, Academy of Agricultural Sciences

3/8/2000

Visit Kumsusan Memorial Palace

Met: Mr D Morton, UNDP Resident Representative
Mr. Cha Rin Sok, Director, Agricultural Production Dept, MOA (Project Coordinator and Chairman, NTC and National Steering Committee)

4/8/2000

Finalization of draft report

5/8/2000

Departure Papasolomontos/Bultemeier for Bangkok (via Beijing)
Arrival Bangkok

6/8/2000

Holiday

7/8/2000

Preliminary debriefing in RAP
Departure for Rome

8/8/2000

Arrival Rome

9/8/2000

Preliminary debriefing Rome

7-8/9/2000-09-22

Official debriefing of complete mission

Annex Three - Summary Profile of Waeso and Samhun Cooperative Farms

	Waeso	**Samhun**
location	Kaechon county, South Pyongan province (150 km from Pyongyang)	Hwanju county, North Hwanghae province (60 km from Pyongyang)
total arable land area	782	672
paddy	372	71 (seed)
maize	185	300 (seed)
vegetables	34	200 (seed)
orchard	101	73
mulberry	30	19
other cropland (incl tobacco)	20	11
pasture	40	120
forest	100	1555
fishponds	3	12 (reservoirs)
livestock		
cattle		55 (calves)
draught oxen	180	160
pigs	1680 (of which 1200 owned by HH)	969 (of which 769 owned by HH)
goats	520 (320 owned by HH)	820 (680 owned by HH)
chicken	3200 (2000 owned by HH)	3500 (3157 owned by HH)
ducks	1500 (1000 owned by HH)	1111 (861 owned by HH)
geese	400 (none owned by HH)	350 (307 owned by HH)
rabbits	3200 (2000 owned by HH)	4000 (3835 owned by HH)
mechanization		
tractors	26	25
transplanters	28	5
trucks	5	3
population	3120	3350
families	680	810
workers	1680	1190
workteams	12	18
sub-workteams	40	54
ag university graduates	40	12

Inputs received/activities started in connection with project:

Samhun: received 12 tons of urea, 12 tons of compound fertilizer, 12 sets of tractor tyres, 12 knapsack sprayers, 62000 m^2 0.08 mm plastic sheeting, 3000 m^2 0.1 mm plastic sheeting, 0.6 tons of pasture seeds, one 6-ton truck.

Double cropping activities on 3.8 ha (with plastic sheeting received from project); 12 temporary greenhouses (100 m^2 each) constructed; pit dug for silage; construction started of goat house (120 m^2); new pasture (10 ha) established; converted arable land into pasture seed multiplication plot (2 ha).

Waeso: received 13 tons of urea, 13 tons of compound fertilizer, 12 sets of tractor tyres, 13 knapsack sprayers, 63000 m^2 of plastic sheeting for tunnels on fields, 4000 m^2 plastic sheeting for green houses, one 6-ton truck; also received 150 litres of biopesticide from Academy of Agricultural Sciences for IPM activities

Built sheds for chicken hatchery (awaiting incubator; changed order after study tour); 10 temporary green houses (100 m^2 each) constructed; for double cropping, tunnelled 1 ha of spinach in early spring, also 1 ha of seed beds; conducted trials on potatoes vs. maize productivity; built 3 fish ponds.

Both farms have also received limited assistance from project SPFP/DRK/8801 (water control), and have also earlier been involved in double cropping activities. Samhun Cooperative Farm has also participated in a Swiss-funded maize breeding project.

A noteworthy aspect is that since project start, particularly on Samhun Cooperative Farm the numbers of some small livestock have increased (e.g. geese from 100 to 350, rabbits from 3500 to 4000, goats from 680 to 820; in Waeso the main increase has been in goats from 420 to 520). Partly this is due to Government supplies under the project – Samhun received 132 goats, and is still awaiting another 28 goats, in particular 10 of superior breeding stock.

Some activities planned under the project have been delayed as the necessary inputs have not yet arrived, such as building materials for animal sheds and high-protein maize and sorghum seeds. However, such delays have been minimal in that alternative actions have been taken by the farm management and the PMU. Thus, substitute cement and building materials have been used pending the arrival of the project-ordered inputs. In the case of hybrid high-protein maize and sorghum seeds, local seeds were used for feedgrain production, and the hybrid seeds will be used in early 2001.

Annex Four - Detailed breakdown of implementation status

Fodder/pasture:

10 ha of artificial pasture have been established on slightly hilly sites on Samhun. Two ha of cultivated land have been allocated to grass seed production and sown with Dactylis glomerata, alfalfa and white clover for seed production.

Natural pasture resources accessible to pilot farms have been identified, evaluated for feed value, opened up, improved and put under better management

An additional 53 ha of natural pasture on Samhun Cooperative Farm have been identified and utilized, but the feed value evaluation is needed.

A capacity for winter fodder production and storage has been established by constructing a 150 m^2 hay storage structure on Samhun Cooperative Farm; additional storage structures will be constructed. In addition a 60 MT capacity silage tank is under construction on the same farm. Plans are advanced for the construction on each farm, of an additional 100 m^2 of dry feed storage, intended mainly for hay, dried maize straw, etc.

Plans were developed to plant 15 ha of high-protein maize and 15 ha of high-protein sorghum on each of the two farms. However, due to the delay in procuring the appropriate seed varieties, caused by difficulties encountered in identifying sources of supply in China, the planting went ahead with conventional varieties. The sowing of this area with these specific high-protein varieties is now scheduled for spring 2001.

Livestock:

Originally two modern chicken hatcheries were planned, but the budget attached to the project document only contained an allocation for one. This hatchery is currently (August 2000) under construction on Waeso Cooperative Farm. The delivery of the incubator (with a stand-by generator and a capacity of 20,000 chicks/annum) is expected to be made soon.

Currently the cooperatives have to rely on traditional methods for production and distribution of chicks to their members.

The Government has provided 132 goats to Samhun Cooperative Farm for breeding; some additional 28 goats are expected.

Vegetables:

The introduction of a range of new vegetables was planned; however, to date no new kind of vegetables or improved varieties of existing vegetables have been introduced in either of the two cooperatives.

Protected vegetable cultivation in plastic tunnels has included mainly early production of cabbage, and spring Korean Cabbage; in greenhouses, costmary (Chrysanthemum), lettuce and early Korean Cabbage have been planted.

Samhun Cooperative Farm has constructed 12 greenhouses (100 m^2 each), and Waeso Cooperative Farm 10 greenhouses (100 m^2 each).

The project was planned to expand the range of vegetables grown and extend the vegetable growing season. Regarding the latter, the project has assisted the farms to start with early cultivation. Without covered cultivation, vegetable production commenced around 5 April, while with protected cultivation vegetable production commenced at 20 February, and made possible e.g. a main crop of maize to follow on 20 May.

The life expectancy of the plastic is estimated at two years or four cropping periods. The plastic is taken down and stored at the end of each growing season, i.e. late spring and early winter.

Private household plots:

Private household plots were to receive special attention from the project. An assessment of livestock and vegetable production potential on private family plots was planned to identify the comparative advantages. To date, only a minor role has been foreseen for household plots in overall vegetable production. In the case of livestock, however, their role is very significant as the cooperative farms will produce, from superior stock, offspring of goats, pigs, rabbits, and poultry for sale to its members. This improved stock will not only provide improved nutrition for the farmers but will also provide them with a cash income from the sale of their excess production in the Farmers Markets. A marked increase has already been observed in the number of some small livestock kept on farms since project start.

An analysis concerning the productivity of private household plots and cooperative farmland was foreseen in the project document, but this exercise has not been carried out yet. Plans are in progress to carry it out later in 2000.

Provision of technical advice and inputs to family plots has taken place in the form of routine technical demonstrations. However, under existing conditions the supply of fertilizers is a limiting factor. Hence emphasis is given to using more organic manure.

Training:

Farmers and managers have been trained in early spring vegetable production in greenhouses and tunnels. Training in pasture establishment for improved livestock fodder production has also taken place.

Waeso cooperative farmers and managers have been trained in the use of a bio-pesticide newly developed by the Academy of Agricultural Sciences.

Workshops, farmers' field schools and provision of one overseas fellowship in animal nutrition have taken place, with some modifications from the original project document. Workshops and farmers' field schools have been organized. The originally planned study tour on winter fodder preparation, has been converted into a study tour on livestock and pasture establishment in June 2000 to China, Thailand and Pakistan. Five members from the pilot farms and the PMU have participated.

The overseas fellowship on animal nutrition has been converted into a one-month external training tour for four persons to New Zealand on pasture establishment, planned for late 2000. No arrangements have been made for it as yet; the selection and training is however scheduled for September/October 2000.

Monitoring:

The Academy of Agricultural Sciences, according to the project document, is in charge of designing the details of the demonstration activities and of the monitoring of the project. To date, however, there has been no actual monitoring by the Academy. According to the authorities, this will be done at the appropriate time in the future when a TCDC specialist, in cooperation with the Academy of Agricultural Sciences, will prepare detailed designs of the demonstration activities. (Following the project document, the TCDC specialist should have come at the beginning of the project.) However, the budget provision for TCDC seems to have been revised downward from the original project document, and may now be needed to fund a TCDC vegetable specialist. (The issue should be discussed during the forthcoming supervision mission by the Senior Regional Plant Productionand Protection Officer.)

Technical committee members drafted detailed demonstration activities and monitoring programmes, and Planning Officers on each farm were appointed as monitoring officers and are doing M&E activities.

Other activities not included in the Project Document.

- Construction of a 120 m^2 goat shed on Samhun Cooperative Farm.
- Three fish ponds of 1/3 ha each on Waeso Cooperative Farm.
- Provision by the Government of 160 breeding goats of high productivity, of which 132 have already been provided, to Samhun Cooperative Farm to act as a nucleus of improved animals for upgrading the local stock currently kept by the farmers on their own household plots.

Annex Five - Inputs received/ordered

Received:

The first shipment of inputs was received in late 1999, consisting of:

- 25 MT of Urea
- 25 Mt of compound fertilizer
- 24 sets of tractor tyres
- 125000 m^2 of 0.08 mm polyethylene sheeting
- 7000 m^2 of 0.1 mm polyethylene sheeting
- 25 knapsack sprayers
- 2 Chinese trucks of 6 MT capacity

Delivered in 2000:

- 1 minibus for project management
- 2 computers
- 1 photocopier
- 1 scanner.
- 0.6 MT of fodder seed (consisting of Dactylis glomerata, Trifolium repens gigantium and Medicago sativa H.)

Ordered (not received to date):

- 4 moisture meters
- 2 seed screeners with relevant electricity generators
- 1.9 MT of spinach seeds
- 100 MT of lime nitrogen fertilizers
- 150 Mt of cement
- 22.5 m^3 of timber
- 1.5 MT of breeder chick feed
- 3 MT of gasoline
- 100 Kg of insecticide
- 10 sets of small moveable sprinklers
- 1 irrigation pump and pipes
- 1 transformer
- 3 feed grinders
- 3 feed cutters
- 3 feed choppers (for silage)
- 1 poultry incubator
- 1 MT of high protein maize seed
- 1 MT of high protein sorghum seed

Annex Six - Visitors to the Project

National Officers

- In February 2000, two members of the National Technical Committee (Messrs Kim Song Uk and Sin On Ryal, pasture establishment and vegetable specialist, respectively) visited the project farms and completed the design of pasture establishment and construction of livestock buildings. They also advised on the ongoing greenhouse construction and on other agricultural activities.

- In mid and end-February 2000, members of the PMU and the Technical Committee and research officers from the provincial branch of the Academy of Agricultural Sciences attended demonstrations on double cropping, on protected vegetable cultivation, and on pasture establishment.

- In mid- and end-March 2000, PMU organized meetings of the departments of Pasture Establishment and Vegetable Production in each of the two cooperatives to discuss the local input contribution to the project.

- Twice in April 2000, two members of the Project Steering Committee, Mr. Cha Rin Sok (National Coordinator) and Mr. Kim Yong (former secretary of FAO National Coordination Committee) visited the project farms to check material inputs and their use and overall project progress.

- In mid-April 2000, PMU invited two scientists from the Academy of Agricultural Sciences, namely Professors An Byong Sik and Go Myong Chol, to give technical advice on the introduction of a newly developed biopesticide in Waeso Cooperative Farm for use on potato and vegetables.

- In May 2000, the Directors of the Pasture Establishment Dept. and External Cooperation Dept. visited both farms to check project progress.

- From March 2000 onwards both vegetable and pasture specialists in the Technical Committee visited both farms twice every month to give relevant technical services.

FAO staff

- No visits up to now except for the current Mid Term Evaluation Mission (July-August 2000).

FAO Consultants

- From 15-30 May 2000, the first assignment of the International Pasture Development Consultant, Mr. Suttie, was made and he visited both cooperative farms several times. A final report, including findings and recommendations, was submitted.

TCDC experts

- A one-month TCDC consultancy planned on vegetable production has not yet been fielded. A TCDC specialist scheduled at the beginning of the project to prepare, in co-operation with the Academy of Agricultural Sciences, detailed designs of the demonstration activities and prepare monitorable indicators, has not been fielded yet. (The budget provision for TCDC seems to have been revised downward from the original project document, and may now be only enough to fund the TCDC vegetable specialist – the issue should be discussed during the forthcoming supervision mission by the Senior Regional Plant Productionand Protection Officer.)

Annex Seven - Reports/documents produced

Consultancy reports

- The Consultancy report of the International Pasture Establishment Consultant (Mr. Suttie) was submitted to FAO HQ in July 2000.

Other reports

- The PMU prepared an Inception Report in October 2000, and has produced the first two of the Quarterly Progress Reports in January and April 2000.

- By the end of February, technical committee members (pasture and vegetable specialists) drafted training material for use in both demonstrations and lectures.

- In April, two scientists of the Academy of Agricultural Sciences prepared training material for the newly developed bio-pesticide for use on vegetables, including potatoes.

Project work plans, etc

- In November 1999, the technical committee designed detailed demonstration activity plans.

- In December 1999, after consultation with PMU and the Technical Committee, both project farms prepared detailed annual work plans, reflecting their cropping programmes for the year.

- The project budget for the year 1 was revised in December 1999, based on the detailed workplans of the farms. Also, detailed specifications for the purchase of machinery and other inputs were prepared. For some items, i.e. moisture meters, seed driers, seed screeners, irrigation equipment and poultry incubators, technical specifications were not locally available. As a result there were some unavoidable delays in placing firm orders. For the incubator itself a firm order was placed only after a visit to the factory in June 2000 during the study tour of the cooperative farm members to China, Thailand and Pakistan.

Annex Eight - Composition of committees formed relevant to the Project

1. Project Coordinator

Mr. Cha Rin Sok	Director, Agricultural Production Department, Ministry of Agriculture

2. Project Management Unit

Director

Mr. So Il	Deputy Director, Agricultural Cooperation Department, Ministry of Agriculture

Members

Mr. Kim Chol Hun	Senior Officer, Agricultural Cooperation Department, Ministry of Agriculture
Mr. An Jong Dae	Chairman, Samhun Cooperative Farm
Mr. Kang Hyon Chae	Chief Engineer, Samhun Cooperative Farm
Mrs. Kung Ok Hui	Chairperson, Waeso Cooperative Farm
Mr. Jon Sa Hong	Chief Engineer, Waeso Cooperative Farm

3. National Technical Committee

Chairman

Mr. Cha Rin Sok	Director, Agricultural Production Department, Ministry of Agriculture

Members

Mr. Kim Hyok Jin	Deputy Director, Agricultural Production Department Ministry of Agriculture
Mr. Kim Kon Il	Chief Engineer, Seed Multiplication Department, Ministry of Agriculture
Mr. Kang Chun Bom	Senior Officer, Irrigation Department, Ministry of Agriculture
Mr. Kim Song Uk	Deputy Director, Pasture and Livestock Department, Ministry of Agriculture
Mr. Sin On Ryol	Deputy Director, Vegetable Production Department, Ministry of Agriculture
Mr. So Il	Deputy Director, Agricultural Cooperation Department , Ministry of Agriculture

4. National Steering Committee

Chairman

Mr. Cha Rin Sok	Director, Agricultural Production Dept, MOA

Members

Mr. Yun Su Chang	Section Leader, Ministry of Foreign Affairs, Secretary, FAO National Coordination Committee.
Mr. Kim Man Sun	Director, Science and Technological Service Dep. Ministry of Agriculture

5. Monitoring and Evaluation Unit

PMU Level:

Mr. Kim Chol Hun	Senior Officer, External Cooperation Dept, MOA

Cooperative Level:

Mr. An Byong Jun	Planning Officer, Samhun Cooperative Farm
Mr. Ri Myong Hwa	Planning Officer, Waeso Cooperative Farm

Annex Nine – Outline of project follow-up proposals prepared by MOA[5]

Project Proposal No. 1

Project Name: SPFS Intensification Component

Introduction

The combination of climatic and land constraints with low industrial export earning capacity requires an intensive agriculture in DPRK so as to achieve and maintain national food security. However, scope exists for making crop farming more sustainable at high yield levels, less vulnerable to natural calamities and less labour and energy consuming, thus improving productivity.

Intensification would focus on the following sub-components: double and multiple cropping; introduction of appropriate machinery to decrease the labour burden and free up labour resources for double cropping; demonstrations of labour and energy saving farming techniques; and pest control and soil fertility management.

Brief outline of the activities

Double/multiple cropping. Various multiple cropping options will be demonstrated and crop rotations introduced on pilot sites. They will eventually include, in addition to double-cropping of spring cereals with paddy or maize (as already experimented with since 1997), intercropping and multiple sequential cropping involving winter cereals, vegetables, soyabeans, root and forage crops. In a first stage, a barley/maize and a barley/paddy system as well as wheat/maize and a wheat/paddy system with barley in spring and wheat in winter, will be demonstrated under normal water supply and fertilization conditions. Thjis will be followed by maize/vegetable intercropping and green manuring of areas otherwise left fallow. Control areas will be mono-cropped as before, but will receive the same input as the multiple-cropped areas. Project inputs will be seeds, fertilizer, fuel and tractor tyres as well as fellowships and technical assistance.

Decreasing double cropping labour burden by simple machinery. One of the major constraints working against an increase of double/multi cropping is the heavy labour burden during the harvesting and planting season. Labour constraints at peak times even cause late transplanting of the main crops and harvest losses of preceding crops because of premature harvesting. In most farms, less than 5% of the grain crop land is utilized for double cropping because of heavy labour requirements at peak season. Many attempts were already made to identify suitable means for simple and low-cost harvesting machines. The project will introduce simple portable harvesters using 5 HP gasoline or diesel engines, which can harvest up to 1 ha of wheat a day. Post harvest loss of the preceding crops can be reduced or even eliminated with the use of small mobile threshers. Various training sessions and technical assistance regarding these machines will be provided by the project.

Labour and energy saving farming techniques. The SPFS project will support limited adaptive research in humus pot rice seeding and in minimum tillage techniques. The first technique has the potential to reduce transplanting stress of seedlings, tolerate more delays in transplanting, reduce seed requirements and seedbed space and increase yields. It is however more costly in terms of inputs and careful monitoring of costs and benefits is needed. Project inputs will be seedling trays, herbicide, polyethylene sheetings and tractor fuel. Study tours and training courses for farmers of the pilot farms will be arranged.

[5] All proposed new projects would operate – like the project GCP/DRK/002/ROK – under the umbrella of the SPFS National Document, in close coordination with other related components. All projects will include a provision for project management (rough overall budget estimate US$ 100,000). A separate proposal for the constraints analysis has not been developed yet; however, a rough budget estimate to cover the activities foreseen under the SPFS National Document amounts to US$ 100,000.

Pest control. The past brief exposure of DPRK with Integrated Pest Management under an FAO/TCP Project will be built upon and expanded. IPM will mainly involve intensive training of farmers of the four cooperative farms. The required pesticides and sprayers will be provided by the project. Bio-pesticides will be included in the programme, as sufficient quantities become available. A new type of biopesticide already developed by the Academy of Agricultural Sciences will be integrated into this component.

Soil fertility management. The severe soil deficiencies caused by long-term mono-cropping and high intensity use of agro-chemicals will be corrected at pilot sites. Demonstrations will include balanced fertilizer and micro-nutrient application based on soil testing, and selected introduction of lime and organic matter to reduce soil acidity and improve soil structure. Project inputs will be: soil testing materials, a mix of different chemical fertilizers and additives, and transport services for lime and organic matter ingredients. The project will also provide technical assistance in crop rotation.

Approximate List of Project Inputs

International consultancies:
- Double cropping, IPM, minimum tillage
- Technical backstopping

TCDC Expertise
- Minimum tillage, IPM, crop rotation

G.O.E.
- Fuel, tyres, etc.

Expendable equipment (supplies)
- Fertilizers
- Insecticides
- Polyethylene sheets
- Soil testing materials

Non-expendable equipment
- Portable wheat harvesters
- Small threshers
- Seeding trays
- Knapsack sprayers
- Trucks
- Moisture meters

Study tours
- Double cropping, humus pot seeding, tillage

Short training
- IPM
- In-country training

Total estimated donor contribution: US$ 1,000,000

Project Proposal No. 2

Project Name: SPFS Water Control Component

Introduction

In the DPR of Korea, existing irrigation facilities are heavily dependent on electricity, the supply of which has become irregular and unreliable. Government is considering an expansion of gravity irrigation schemes in the long term. More immediately, however, there are possibilities for introducing water-saving devices that would entail much less capital costs than a large-scale transformation of the system from water-lifting to gravity irrigation.

Better on-farm water management could save up to 30-40% of water. The use of sprinkler irrigation to replace furrow irrigation in appropriate sites could lead to further water and energy savings, limit erosion on sloping land and save cost of levelling. Improved drainage would make farms less vulnerable to flooding with its disastrous consequences as experienced in 1995 and 1996.

A small-scale project has already been implemented by FAO (SPFP/DRK/8801), but it could not cover all components and demonstration works regarding water control identified in the SPFS National Document.

Brief outline of the activities

Drainage improvement. Drainage tends to be neglected relative to irrigation, and its lack is a major contributor to flooding problems and the development of rice root rot. Furthermore, there are some areas, which need drainage for successful cultivation of vegetables. The project would demonstrate the effects of adequate drainage on pilot farms by constructing, rehabilitating and maintaining selected critical drainage works. Some equipment will also be supplied for proper drainage management.

Water saving in paddies. The temperature regulatory effect of deep standing water in paddy fields is important in cold-climate rice culture. This limits the water-saving potential in DPRK. The practice of intermittent irrigation is, however, spreading from Southern to Northern China and experience with this technique in climates similar to DPRK is growing. Adaptive research of this technique appears justified in DPRK because of the large saving potential where irrigation water is typically pumped over an average lift of 20 m or more. Project activities would be integrated with already completed and ongoing upland water-saving irrigation demonstrations.

Project inputs will include tractor tyres, herbicides and diesel fuel for technology testing and demonstration on a limited scale. The project will also provide technical assistance and training.

Water saving in uplands. Sprinkler irrigation in non-paddy areas to replace furrow irrigation will reduce water requirements and land levelling needs, and also decrease erosion. It will also enable farm managers to apply irrigation more flexibly. Small portable sprinkler irrigation equipment will be provided in the project farms on both vegetable plots and upland maize plots. Lessons learned from project SPFP/DRK/8801 will provide a sound base for this further demonstrations.

Approximate List of Project Inputs

TCDC Expertise
- Intermittent irrigation
- Sprinkler irrigation

G.O.E.
- Fuel, tyres, etc.

Expendable equipment (supplies)
- Herbicides, fertilizers

Non-expendable equipment
- Mobile sprinklers and pipes,
- Drainage pumps
- Transformers
- Pipes for irrigation and drainage

Construction and improvements
- Drainage canals, irrigation canals

Study tours
- Intermittent irrigation
- In-country training

Total estimated donor contribution US$ 466,000

Project Proposal No. 3

Project Name: SPFS Diversification

Introduction

The Government of DPRK has in the past focused on maximizing cereal production. Scope for diversification of agriculture exists particularly in the areas of livestock development, vegetable production, small scale farm food processing and aquaculture.

Livestock. The livestock component is composed of several demonstration activities. First of all, sown pastures will be established and natural pastures will be evaluated, improved and utilized for grazing and fodder production. Goats and other small ruminants rearing will be an important activity in the project. On the other hand, conventional chicken rearing, especially layers, will also be encouraged in the farms with favourable conditions. Silage and other kinds of winter fodder production and its storage will demonstrated.

As a new activity, and taking into account the expected increase in the ruminant herd, small scale milk processing and storing will also be supported.

Vegetables. Vegetables are in high demand in DPRK, where they constitute an essential staple during the winter months. Consumer demand is high throughout the year and often cannot be satisfied. Considerable scope exists for diversification and expansion of vegetables by the introduction of new varieties and growing in plastic tunnels and energy-efficient plastic houses. In addition to ongoing activities under project GCP/DRK/002/ROK, the introduction of various vegetable species and new varieties, and heavy rainy season vegetable production will be demonstrated.

Aquaculture. With the decline of capture fisheries due to overfishing and inoperability of the fishing fleet, animal protein supply must increasingly be derived from livestock and aquaculture. Aquaculture is, however, constrained by the short season of 120-180 days during which water temperatures are high enough for spawning and fish growth. As a result, the production cycle is exceedingly long.

Warm water hatchery technology could help to make available fingerlings of common, grass and silver carp as early as April each year (currently July to September). This would shorten the production cycle between hatching of fry and harvest of edible size fish from two and a half years at present to one and a half year. Therefore, small scale warm water hatchery will be supported and aquaculture activities in project farms will be demonstrated.

Small-scale farm food processing. Especially maize, the second-most important food grain crop, is generally consumed in processed form. However, post-harvest losses and storage damage as well as ineffective food processing cause considerable losses in the overall food production. Small-scale on-farm food processing and proper storage will be encouraged and demonstrated by the project.

Approximate Project Budget (Estimated donor contribution)

Livestock	US$ 300,000
Vegetable	US$ 300,000
Small-scale on-farm food processing	US$ 100,000
Total	**US$ 700,000**