

PART II BILATERAL AID PROGRAMME  
EVALUATION

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## 4 Policy and programme characteristics

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### 4.1 Development aid to Egypt

Egypt is one of the biggest recipients of foreign aid in the world. Net disbursements of Official Development Assistance (ODA) have averaged more than US\$ 2200 million per annum during the past 20 years. Large-scale development assistance started in the mid-1970s, when Egypt embarked upon its Open-door policy and improved its relations with the western world. Total ODA increased sharply in the 1990s to an average of more than US\$ 3 billion per annum as a result of debt cancellations in relation to Egypt's turn to market-oriented economic policies and its stand in the Gulf War. During these years, development aid to Egypt has exceeded that to all other developing countries. In addition, aid conditions have become more favourable. The proportion of grants increased from slightly less than 40 per cent in the 1970s to over 80 per cent in the 1990s.

In per capita terms, total ODA amounted to about US\$ 100 in the 1990s, which is higher than that for most low-income countries and substantially higher than aid to other countries with similar population levels (World Development Report 1994). In spite of these large amounts of aid, however, total ODA represented only some 15 per cent of Egypt's GNP in the 1990s, which is the median figure for Africa.

**Table 4.1 Total ODA to Egypt 1970-96 (in US\$ million)**

Period	Total aid	Average/year	% Grants
1975-79	10,669	2,134	38
1980-84	7,328	1,466	47
1985-89	8,324	1,665	73
1990-96	23,396	3,342	84
Total	49,717	2,260	67

Source: OECD Geographical Distribution of Financial Flows to Developing Countries, 1995.

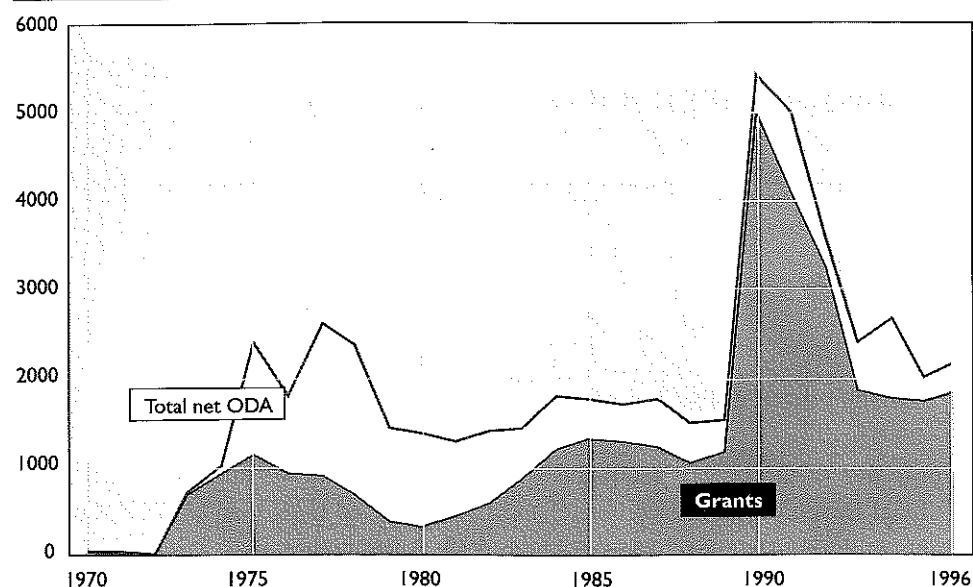


Figure 4.1 Total net ODA to Egypt 1970-96 (US\$ mln)

Bilateral aid is the most important aid category, accounting for two-thirds of the total aid flow over the period 1970-94. It increased steeply from the middle of the 1970s onwards after Egypt severed its ties with the Soviet Union, started its Open-door policy, strengthened its relations with the United States and other western countries, and initiated peace negotiations with Israel.

Aid from Arab countries, the Gulf States in particular, was highest in the 1970s, when it represented half of all aid received. It became negligible in the 1980s due to strained relations following Egypt's peace negotiations with Israel. Subsequently, it increased again in the 1990s as a result of Egypt's support to Kuwait during the Gulf War. Multilateral aid fluctuated strongly but was substantially lower than bilateral aid over the whole period under consideration (12 per cent).

The United States is by far the most important bilateral donor. Over the period 1970-94 the US provided almost 45 per cent of all net ODA and some 60 per cent of all bilateral aid. This proportion increased to some 70 per cent during the 1990s. A second category of bilateral donors includes Germany, Japan and France, with shares of 6 to 10 per cent of bilateral aid. Other bilateral donors, including the Netherlands, contribute only relatively small percentages of total aid, i.e. 1 per cent or less. During the period 1975-96 annual average disbursements for the Netherlands were about Dfl. 44 million.

Table 4.2 Official Development Aid to Egypt: main donors 1970-94 (US\$ million)

Donor category	1970/79	1980-89	1990-94	Total	%
Bilateral	3,341	14,086	14,460	31,887	67.3
Multilateral	2,929	1,626	1,123	5,677	12.0
Arab countries	6,278	61	3,578	9,796	20.7
<b>Total</b>	<b>12,548</b>	<b>15,652</b>	<b>19,161</b>	<b>47,360</b>	<b>100.0</b>
Bilateral aid:					
United States	2,023	10,090	8,595	20,708	64.9
Germany	530	1,219	1,650	3,399	10.7
Japan	410	931	1,293	2,634	8.3
France	138	579	1,241	1,958	6.1
Other bilateral	240	1,267	1,681	3,188	10.0
<b>Total</b>	<b>3,341</b>	<b>14,086</b>	<b>14,460</b>	<b>31,887</b>	<b>100.0</b>

Source: OECD Geographical Distribution of Financial Flows to Developing Countries, 1995.

#### 4.2 Netherlands aid policy

Initially, i.e. during the 1960s, the Netherlands aid policy emphasised the transfer of know-how and bilateral aid was almost exclusively provided as technical assistance. At the end of the 1960s, capital or financial assistance became the dominant form, based on the modernisation theory which accentuated economic growth through industrialisation. Moreover, financial assistance offered good opportunities for Netherlands export promotion. It gradually became clear that economic growth and the presumed trickle-down effect did not improve the living conditions of the poor, however and development co-operation policies became more directly focused on poverty alleviation. In the mid-1970s the present general orientation of Netherlands aid policy was set. Aid was to help the poorest countries and the poorest groups in those countries, and should preferably go to countries whose governments accepted redistribution as central to their development policies.

After 1979 the promotion of economic self-reliance became a second major objective of Netherlands aid policy in addition to poverty alleviation, resulting in the two-track policy. In 1984 the two tracks were integrated into a single objective: the structural reduction of poverty. This implied that sustainable improvement to the living conditions of the poor would not be possible without strengthening a country's productive capabilities. Simultaneously, as a result of the economic recession and the debt crisis, structural adjustment of the economies of developing countries became a crucial new element in the international development discussion. This entailed increased attention for macro-economic

policy issues, including a greater role for market forces and a reduction of state intervention in the economy. In line with this trend, Netherlands bilateral assistance gradually changed its accent from project aid to commodity import support and other forms of macro-economic assistance.

In the late 1970s two new priority themes were introduced, i.e. women in development, and the environment. Together with poverty alleviation, these new policy themes became the principal criteria in the appraisal of project proposals from the mid-1980s onwards. It increasingly became accepted that the quality of government administration and adherence to democratic principles strongly influenced the development, and in the early 1990s two more themes were added, i.e. good governance and the promotion of civil society (DGIS, 1991; DGIS, 1995).

Finally, in 1995, the Netherlands reviewed its foreign policy in response to radical changes that had occurred in the international environment since the early 1990s, taking account of the growing interdependency in the world. For development aid this meant a confirmation of continuity with regard to the main objectives, a closer conceptual and organisational integration in the Ministry of Foreign Affairs, and greater emphasis on the role of development co-operation as a component of the Netherlands presence in various parts of the world (Ministry of Foreign Affairs, 1995).

### 4.3 Country policy

#### 4.3.1 *The initial period: 1975–85*

In the wake of the 1973 oil boycott, the Netherlands Government set out to improve bilateral relations with the Arab countries in general and with Egypt in particular. Plans to intensify political and economic co-operation took shape in 1974 when Egypt was put on the list of countries eligible for development aid and the assistance offer was gratefully acknowledged by Egyptian authorities. Egypt was seen as a leading country in the Middle East which had recently re-oriented its foreign policy towards the western world and had introduced changes in its domestic policy which placed more emphasis on self-reliance and improvement of the position of low income groups. The latter was an important factor as Egypt was officially a middle-income country that already received substantial amounts of aid from other donors, i.e. two other criteria applied by the Netherlands in the selection of priority countries. Apart from political considerations, the move was also inspired by economic motives insofar as the Dutch business community considered the Middle East a promising market for exports and investments and argued for aid as a vehicle through which to expand its activities in the region.

In setting-out its development aid policy, the Netherlands Government announced its intention to focus on a limited number of priority sectors (agriculture and agricultural processing, industry, infrastructure, social services and health) and on geographically well defined rural areas. In view of the high level of expertise available in Egypt, preference was given to quickly disbursable financial aid.

In the implementation of policy several obstacles were encountered for realising these intentions. First, the annual bilateral consultations, which concerned only project proposals, reflected Egypt's interest in and priority for the supply of technologically-advanced capital goods produced in the Netherlands. Several Egyptian ministries expressed their interest in these technologies. As sectoral concentration was formulated in broad terms, it allowed for support to a wide range of projects. In addition, subsequent identification missions proposed that other sectors should be focused upon (e.g. integrated rural development), which further widened the fields covered under the aid programme. Moreover the Netherlands gradually realised the need for technical assistance in addition to financial aid for commodity supplies. Furthermore the Egyptian development model and bureaucratic system did not facilitate quick disbursements and short-term results.

#### 4.3.2 *The policy plans period: 1986–present*

Since the middle of the 1980s country policy plans have been written as a frame of reference for the identification and selection of concrete activities. These have covered the periods 1986/89, 1989/92 and 1992/95, and were supplemented with annual plans that specified aid activities at the level of individual projects. Policy plans reflect changes in objectives, priority themes and sectors, and issues for special attention. Egypt has not been involved in their formulation.

In the 1986–89 plan rural and industrial development were the principal sectors and ongoing activities were (re)grouped accordingly. Project aid was seen as the dominant form since other donors met Egypt's commodity import requirements. Projects were to be contracted out to consultants from the Netherlands. Environment and women in development were mentioned as priority themes.

In the 1989–92 plan a contribution to restructuring the Egyptian economy was explicitly mentioned as a main aim of Netherlands development co-operation. Special attention was given to the expansion of agricultural production and water management, rehabilitation of infrastructure in the social sectors, and the social dimension of structural adjustment. In addition, several new themes and priorities were mentioned: support for medium- and

small-scale businesses, urban development, institutional strengthening, energy, population policy and cultural co-operation.

The 1992–95 policy plan announced an increase of programme aid/balance of payments support to about one-third of total disbursements. In addition, activities were to be supported according to the themes listed in the previous plan. This implied a regrouping of activities under the following headings: rural development, environment, women and development, urban poverty alleviation, health care and population, water supply and sanitation, education, infrastructure and industrialisation, institutional development and cultural aspects.

These three policy plans indicate a gradual broadening of the aid programme over an increasing number of priority themes. As a result, the aid programme has increased in complexity.

Policy plans were general frameworks that did not hamper flexibility in implementation. Actual activities financed did not always correspond with the priorities announced in the plans, and sometimes for good reasons. Although the 1986–89 policy plan stressed that project aid was to remain the principal aid form, substantial amounts of commodity import support were provided in the period 1986–91, chiefly in relation to activities already supported in priority sectors. The chief arguments for this rather sudden change were Egypt's deteriorating balance of payments, the long period of preparation needed for projects, and the under-expenditure experienced in implementation of the aid programme. Commodity import support which presumably allowed for quick disbursements, decreased sharply in 1992 and, despite the announced increase in the 1992/95 policy plan, was discontinued in 1994 mainly due to Egypt's improved balance of payments position.

The various policy plans regularly emphasised the need for improved aid management. The principal issues mentioned were: internal cohesion of the programme, reduction of the number of activities, increase in the size of activities in financial terms, and more intensive use of the technical aid procedure.

In 1997 the Netherlands introduced integrated policy plans specifying foreign policy, foreign trade policy and development assistance policy. The document for the Middle East outlines the political, economic and human rights situation in the Middle East, the principal characteristics of Netherlands policy and the policy instruments with which to achieve the main policy objectives. On the basis of these integrated policy plans, the Netherlands Embassies in the region formulate annual plans for individual countries, which put development assistance into the wider framework of foreign policy.

#### 4.4 Main programme characteristics

##### 4.4.1 Aid volume

The Netherlands is one of the smaller bilateral donors for Egypt, contributing between 1975 and 1996 about Dfl. 960 million, somewhat less than 1 per cent of all aid to Egypt. This contribution has been in the same order of magnitude as those of the United Kingdom, Denmark and Canada. The actual amount is higher if account is taken of the Netherlands contribution to the EU programme for the South and East Mediterranean Region, of which Egypt is the largest recipient.

The core of the Netherlands aid programme consisted of regular bilateral allocations which increased from Dfl. 15 to 20 million per annum during the period 1975–80 to a level of about Dfl. 30 million during the 1980s and further to Dfl. 35 to 40 million per annum in the 1990s. At first, the allocation was provided primarily in the form of loans. Starting in 1985 loan funding became gradually phased out, and from 1989 onwards aid was provided on a grant basis only. The shift came at a time when Egypt was experiencing serious economic difficulties and was unable to meet its financial obligations.

The regular country allocations add up to roughly Dfl. 600 million, or two-thirds of the total aid volume. The remaining one-third was funded on an ad-hoc basis out of special aid budget categories. The most important of these were the balance of payments assistance programme and the sector programme for industrial development. Relatively small amounts were made available through other special programmes, such as the food and emergency aid programme, the co-financing programme for NGOs, the research programme, the sector programme for rural development, and thematic programmes for environment, women in development, and urban poverty alleviation.

Total disbursements per annum increased from Dfl. 20 million in the 1970s to almost Dfl. 70 million in the late 1980s, after which they decreased to slightly over Dfl. 40 million. The peak in the late 1980s was the result of additional programme aid in support of Egypt's deteriorated balance of payments, its economic reform programme, and its stand in the armed conflict in the Gulf.

Netherlands assistance to Egypt has been provided mainly in the form of project aid, totalling Dfl. 626 million or 65 per cent of total disbursements, and spread over a series of some 300 projects. The remaining 35 per cent was provided in the form of programme aid. Part of programme aid consisted of commodity import support to the main sectors of project aid and was sometimes linked to specific project activities. This represented 13 per cent of total disbursements. Programme aid not directly linked to sectors totalled about Dfl. 208 million, or almost 22 per cent of disbursements. Programme aid was

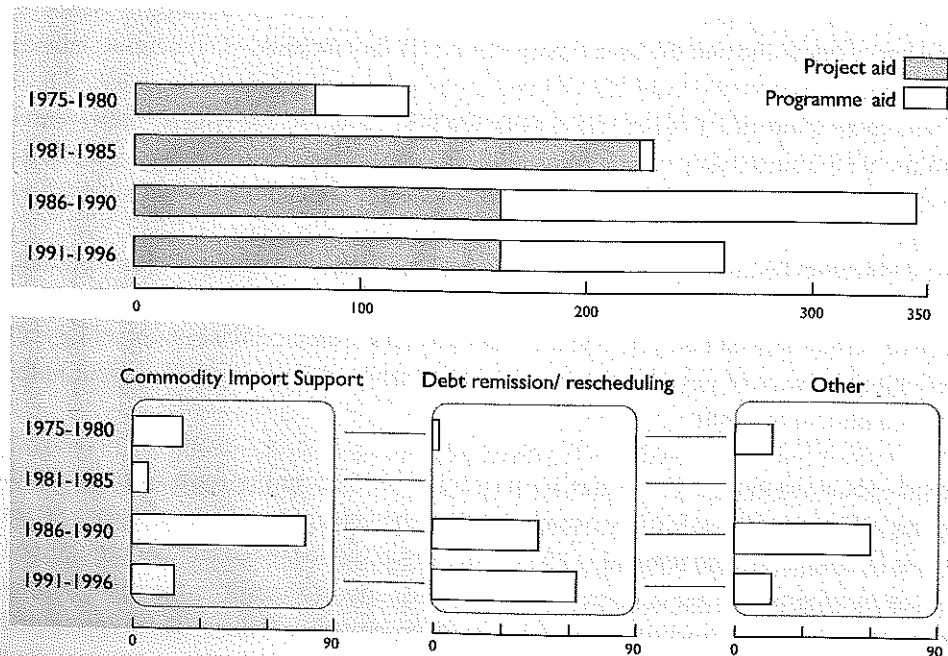


chiefly provided during the period 1986–96. The increase in programme aid coincided with lower disbursements for project aid. Details are given in Table 4.3.

**Table 4.3** Volume of programme and project aid, 1975–96 (Dfl. mln and %)

	1975/80	1981/85	1986/90	1991/96	Total
Programme aid (Dfl. mln)	42.0	7.0	184.2	99.8	333.0
Project aid (Dfl. mln)	79.9	222.3	162.5	161.6	626.3
Total aid (Dfl. mln)	121.9	229.3	346.7	261.4	959.3
Programme aid (%)	34.5	3.0	53.1	38.2	34.7
of which:					
Commodity Import Support	18.0	3.0	22.3	7.0	13.0
Debt relief	3.0	–	13.6	24.8	12.1
Other	13.5	–	17.2	6.4	9.6
Project aid (%)	65.5	97.0	46.9	61.8	65.3
Total	100.0	100.0	100.0	100.0	100.0
Average disbursements/year (Dfl. mln):					
Programme aid	7.0	1.3	36.8	16.7	15.1
Project aid	13.3	44.5	32.5	26.9	28.5
All aid	20.3	45.8	69.3	43.6	43.6

Source: DGIS.



**Figure 4.2** Total Netherlands project and programme aid to Egypt and types of programme aid, 1975–96

Programme aid in the form of commodity import support was chiefly directed to two sectors, namely drinking water/sanitation and agriculture/animal husbandry. Together these sectors accounted for almost 60 per cent of the commodity import support. The remaining 40 per cent went to infrastructure/transport, water management and drainage, and health. The share of the various sectors in import support fluctuated during the aid programme. In the 1970s and early 1980s import support focused on infrastructure/transport and health. In the second half of the 1980s drinking water/sanitation and agriculture/animal husbandry became by far the most important sectors. Details are given in Table 4.4.

**Table 4.4** Programme aid: distribution of commodity import support over sectors, 1975–96 (%)

	1975/80	1981/85	1986/90	1991/96	Total
Water management and drainage	–	26.5	13.0	30.2	14.0
Agriculture and animal husbandry	–	–	26.3	57.4	24.8
Drinking water and sanitation	11.4	–	45.9	12.4	32.3
Health and population	–	35.6	14.0	–	10.7
Infrastructure and transport	80.9	37.9	–	–	16.4
Miscellaneous	7.7	0.7	–	–	1.8
Total (%)	100.0	100.0	100.0	100.0	100.0
Total (Dfl. mln)	22.0	7.0	77.3	18.3	124.6
Average/year (Dfl. mln)	3.6	1.4	15.5	3.1	5.7

Source: DGIS.

The distribution of project aid over sectors shows a different pattern than for commodity import support. Water management and drainage is the most important sector in financial terms followed by agriculture/animal husbandry and infrastructure/transport. Project aid to drinking water and sanitation appears to be much lower than import support for this sector. There is also a strikingly high proportion of disbursements for projects outside the main sectors, indicating the fragmentation of the aid programme. This miscellaneous category, in fact the second in importance in the 1990s, includes projects in support of industries, environment, credit, women and development, cultural activities and a range of project support funds.

In financial terms the fellowship programme is the most important component under miscellaneous. The fellowship programme aimed at enhancing manpower development through education and training in the Netherlands. It is primarily directed towards middle- and higher-level personnel in Government service and in private enterprise. During the period 1975–96 almost 700 fellowships were made available to Egyptians through this

programme, averaging a fairly stable 32 per annum. The courses attended by the Egyptian fellows were principally land and water-related surveys, courses in agricultural production, animal husbandry and rural extension, and courses in hydraulic and sanitary engineering. These are also the main sectors in the development co-operation programme. Female participants in the courses totalled about 100 or some 15 per cent. Additional fellowships, study tours and other forms of training have been financed under projects. This applies to the water management and drainage support in particular. Details of the distribution of project aid over main sectors are given in Table 4.5.

Table 4.5 Project aid: distribution over sectors, 1975-96 (%)

	1975/80	1981/85	1986/90	1991/96	Total
Water management and drainage	24.7	10.5	22.5	38.2	22.5
Agriculture and animal husbandry	37.7	23.9	17.2	10.1	20.4
Drinking water and sanitation	2.5	14.6	0.1	7.5	7.5
Health and population	7.0	2.7	25.1	18.0	13.0
Infrastructure and transport	12.8	37.7	13.3	2.8	19.2
Miscellaneous	15.2	10.6	21.8	23.4	17.4
Total (%)	100.0	100.0	100.0	100.0	100.0
Total (Dfl. mln)	79.9	222.3	162.5	161.6	626.3
Average/year (Dfl. mln)	13.3	44.5	32.5	26.9	28.5

Source: DGIS.

Combining project aid to sectors with commodity import support indicates total disbursements to the main sectors and the changes therein over the twenty years period of Netherlands development assistance to Egypt. The data point at two main sectors, i.e. water management and drainage, and agriculture/animal husbandry which together received over 40 per cent of total disbursements to sectors. For water management and drainage aid increased sharply since the early 1980s to some 37 per cent in the 1990s. For agriculture there is a steady decline since the beginning of the aid programme from almost 30 per cent in the 1970s to 15 per cent in the 1990s. This is mainly due to a strong fall in assistance to animal husbandry. Disbursements for infrastructure/transport decreased even stronger, i.e. from 37 per cent in the early 1980s to 2.5 per cent in the 1990s. The support to infrastructure during the first decade of the programme was an answer to a clear need after the infrastructural damage caused by the wars against Israel. Activities involved projects focusing on the supply of capital goods for the rehabilitation of the Suez canal (tugs and dredging equipment), the electrification of the Suez canal zone, materials for inland water transport, and steel railway bridges. The share of the health sector increased during the 1980s, chiefly due to the supply of modern hospital

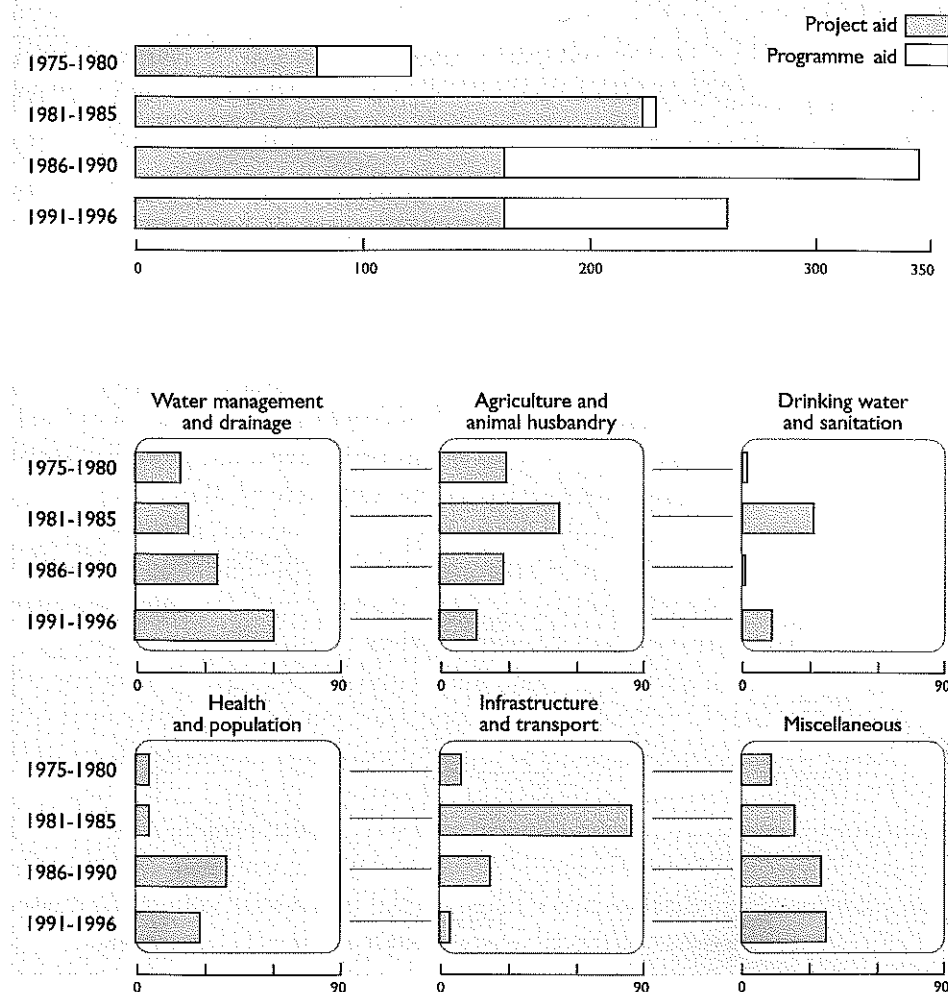


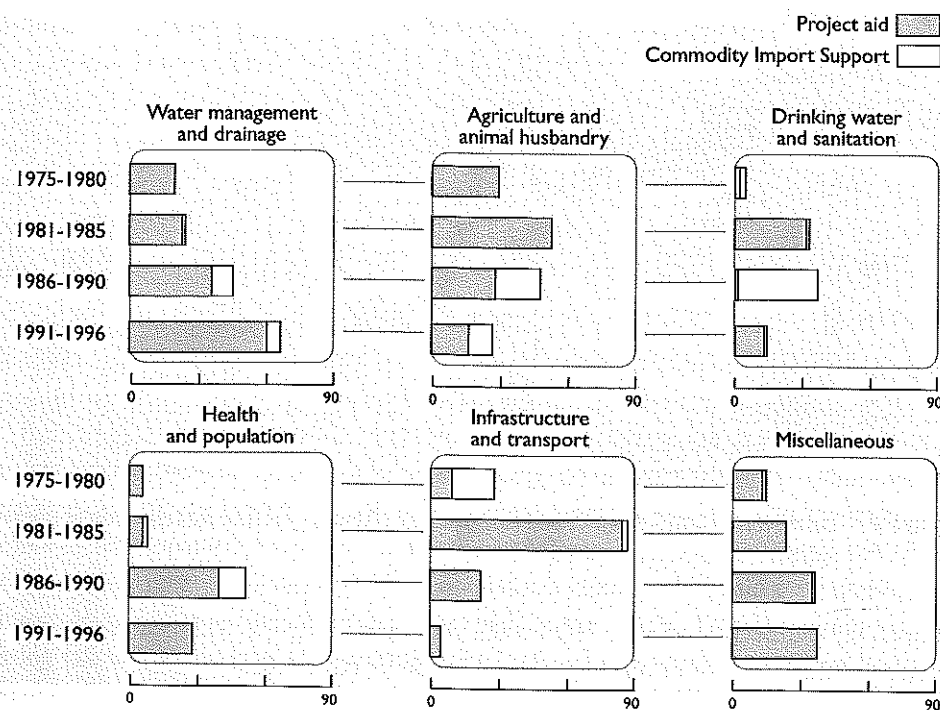
Figure 4.3 Total Netherlands project and programme aid to Egypt and distribution of project aid over main sectors, 1975-96

equipment, and decreased after 1990 when the focus shifted to technical assistance to primary health care. For details, reference is made to Table 4.6.

**Table 4.6** Distribution of project aid and commodity import support over sectors, 1975-96 (%)

	1975/80	1981/85	1986/90	1991/96	Total
Water management and drainage	19.4	11.0	19.4	37.4	21.1
Agriculture and animal husbandry	29.6	23.1	20.1	15.0	21.1
Drinking water and sanitation	4.4	14.2	14.9	8.0	11.6
Health and population	5.5	3.7	21.5	16.2	12.6
Infrastructure and transport	27.5	37.7	9.0	2.5	18.7
Miscellaneous	13.6	10.3	15.0	21.0	14.8
Total (%)	100.0	100.0	100.0	100.0	100.0
Total (Dfl. mln.)	101.9	229.3	239.8	179.9	750.9

Source: DGIS.

**Figure 4.4** Total aid to main sectors 1975-96 (Dfl. mln.)**4.4.3 Priority themes**

The two priority themes that were introduced in Netherlands development co-operation in the late 1970s, i.e. women in development and environment, gradually became reflected in activities supported in Egypt.

The issue of *women in development* was first mentioned in Netherlands development co-operation in 1976, i.e. briefly after the first UN Women Conference in Mexico. It has since been elaborated in close relation to the subsequent UN Women Conferences in Copenhagen (1980), Nairobi (1985) and Beijing (1995). Since the beginning, the issue was closely linked to the unequal power relation between men and women. During the 1990s the objective of women's autonomy became prominent, defined as having four dimensions: physical autonomy (control over sexuality and fertility), economic autonomy (equal access to and control over means of production), political autonomy (decision-making power, self-determination and the formation of power in a self-chosen direction) and socio-cultural autonomy (the right to an identity and sense of self-esteem). In terms of strategy the focus was on integration of the issue in the overall aid programme, i.e. mainstreaming.

In development assistance to Egypt, three periods may be discerned with regard to attention given to women and development. During the first decade (1975/85) the theme was not mentioned in policy notes and only incidental activities were financed, the principal of which was a research project to provide background information on women's position in Egypt and to advise on an effective aid approach. The research resulted in three micro projects involving the establishment of a women's centre and support to women in bakery and poultry activities. It did not result in the identification of a country-specific approach nor in the integration of the issue in relevant sectors (e.g. dairy).

During the period 1985-92 women in development was given separate mention in policy plans and appraisals of all projects were to take into account their importance for women. In practice, women in development was not considered an important issue for the bilateral co-operation programme due to the limited interest on the part of Egypt. Actual activities were limited to a few special projects focused on women.

The period 1992-present is characterised by a sector specialist for women in development being attached to the Netherlands Embassy in Cairo, introduction of the concept of autonomy in country policy plans, the creation of a Local Fund for Women to allow the sector specialist to operate swiftly and effectively, and attempts to integrate the issue into on-going projects and programmes.



In Egypt the Local Fund for Women came into operation in 1993. The number of activities it has financed increased from 8 in 1993 to 24 in 1995 and expenditure roughly tripled from Dfl. 91,00 to Dfl. 277,000 during that period. Activities and expenditure focused on the participation of representatives of women's organisations in conferences and seminars (60 per cent) and, to a lesser extent, on training and the production of information material (12 per cent). Mainstreaming of women in development has occurred chiefly in projects in the health sector.

Up to the mid-1980s, improvement of the *environment* was seen as a separate set of activities in Netherlands development aid. The activities supported were mostly concerned with reforestation, erosion control, energy conservation and alternative energy generation. Growing population pressure, the scarcity of land and water resources and a heightened appreciation of the unique value of ecological systems and the services they provide, incited the international donor community, including the Netherlands, to integrate environmental impact into the regular project formulation and appraisal process. Guidelines or checklists were prepared with which to set more explicit and rigorous standards for project funding in order to mitigate adverse environmental effects and/or to enhance beneficial effects. At the country level, the overall environmental impact assessment became an integral part of the formulation process.

Towards the late 1980s, the call for a more global and comprehensive approach towards the environment became stronger and stronger. Following the publication of the 1987 Brundtland Report, a series of international conferences (UNCED, Earth Summit in Rio de Janeiro) pleaded in favour of an integrated poverty, economic growth and environmental management strategy. As from 1990, the new concept of structural poverty alleviation was introduced in the Netherlands development aid policy. Apart from screening all project proposals on their environmental aspects, the strategy encompasses technical assistance towards strengthening environmental institutions and positive interventions towards the alleviation of urgent environmental problems.

The tackling of environmental concerns has implicitly been part of the Netherlands aid programme for Egypt since its beginning, although not explicitly mentioned under this heading. Throughout, the Netherlands has supported planning, management and research capabilities in drainage and irrigation, activities with a direct impact on population health and labour productivity. In addition, assistance in the sanitation sector has focused directly on improvement of the rapidly deteriorating urban living environment.

More explicit co-operation in environmental matters was initiated in 1989 when the Netherlands fielded a specialist mission to review environmental aspects of the on-going development co-operation programme and to work out the contours of a co-operation

programme in the environment sector. The mission concluded that, in the short term, the implemented projects 'did not cause major negative impacts on the environment but in the longer term, effects of several projects were unknown or potentially negative.'

Although massive environmental problems faced Egypt, the Netherlands did not embark on a special programme for the environment given the substantial support already offered by other donors. Netherlands assistance was focused on funding environmental profile studies for the Fayoum and Lake Burullus regions. The studies were finalised in 1992-94 but were not followed-up by complementary policy and institutional action.

During this period, the Netherlands also participated in the formulation of the National Environmental Action Plan (1992). The contribution covered the input of expertise in the water resources management group, one of the main working groups of the multi-donor funded effort to strengthen the management of environmental affairs in Egypt.

A working paper was followed-up by another consultant mission which drafted the Terms of Reference for a technical assistance project to expand and strengthen the water quality monitoring capabilities at the level of three research institutes under the Ministry of Public Works and Water Resources (Nile Research Institute, Drainage Research Institute and Research Institute for Groundwater), and to strengthen the planning and management capabilities at the level of the Ministry's Planning Sector. With the exception of the Nile Research Institute component, which was covered under Canadian aid, the others were integrated into the on-going Netherlands assistance programme.

Eventually, Denmark became the lead donor in the environmental sector through its long-term support programme to the Egyptian Environmental Affairs Agency.

#### 4.5 Conclusion

Netherlands development assistance started after Egypt embarked on its open-door policy and improved its relations with the western world in the mid-1970s. Netherlands aid represents a small proportion of the massive development assistance the country received and in which the US has had a dominant share.

Netherlands aid was provided in a wider foreign policy context aiming at improving relations with the Arab world. In terms of development assistance policy, the high incidence of poverty was the main argument for the selection of Egypt as a priority country.

The substantial fluctuations in total aid disbursements during the period 1975-96 were mainly the result of programme aid, which supplemented regular bilateral allocations,

and was made available during the late 1980s and early 1990s. Disbursements decreased in the 1990s, i.e. in the period that Egypt seriously attempted to implement economic reform policies in accordance with donor policies.

Over time the sectoral distribution of aid changed significantly. Changes were partly inspired by experiences with the implementation of the aid programme (e.g. the decrease for agriculture, animal husbandry in particular), partly by more attention for Netherlands policy priorities, including the shift from commodity supplies to technical assistance.

Netherlands assistance to Egypt has mainly been provided in the form of project aid: almost two-thirds of total disbursements went to some 300 highly diverse projects. The dispersed nature of the aid programme was influenced by the broad range of project proposals presented by Egypt, and the increase in the number of priorities mentioned in the Netherlands policy plans. It is reflected in the heterogeneity of activities in the main sectors and the increased share of disbursements outside the main sectors, which went up to almost one-quarter of total aid during the 1990s.

## 5 Programme aid

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### 5.1 Background

#### 5.1.1 *External finance and debt*

Since Egypt started to modernise its economy in the 19th century, it has been confronted with the phenomenon of foreign debts. During that century, the country's infrastructure build-up was largely funded with foreign loans and external debt grew to unmanageable magnitudes. Eventually, Egypt defaulted on its foreign obligations in 1876 and in the 1930s debt had again increased to a level where creditors could not be serviced in full. In absence of sophisticated debt rescheduling instruments, creditors generally agreed to convert claims into domestic assets.

During most of the 1950s Egypt's balance of payments was kept closely to equilibrium and small deficits were mostly financed by existing reserves. In the early 1960s, however, an ambitious centrally-planned investment programme led to extensive external borrowing with the Soviet Union and Eastern bloc countries. Over the years, the former Soviet Union provided some US\$ 4.2 billion in loans part of which was used to build the Aswan High Dam, the iron and steel complex at Helwan and the aluminium smelter at Nag Hamadi. To help Egypt restore its physical infrastructure demolished during the 1967 war with Israel, additional aid also came from Western countries. Furthermore, Kuwait, Saudi Arabia and Libya agreed to provide Egypt with an annual grant of some US\$ 300 million. By the mid-1970s the annual grants from the oil producing states went up over US\$ 1 billion.

After the introduction of the 'Open-Door' policy in 1974, Egypt managed to shift a major portion of its external funding from borrowing on market terms to non-debt creating flows, such as workers' remittances and official grants. Egypt's exports, primarily oil, increased significantly and international financing was readily available. The ambitious investment programme did not generate sufficient foreign revenues, however, to lift the balance of payment current account out of almost chronic deficits. From 1982 onwards, foreign exchange revenues actually began to decline and the external financing gap to widen. By

1986, the external debt had gone up to nearly US\$ 47 billion. Foreign exchange shortages forced the Central Bank to establish local currency-denominated blocked accounts to control foreign debt service payments and contributed to a thriving parallel market. With debt to GNP ratios in the 100 to 150 per cent range Egypt was, according to this measure, the most indebted nation in Africa and the Middle East.

By the end of 1986, Egypt was almost a year behind in payments and there was no choice but to seek debt rescheduling. In 1987, it concluded an 18-month Stand-By arrangement with the International Monetary Fund (IMF) in terms more generous than had been granted to virtually any other member country but were nevertheless linked to an economic reform programme. Later that year, the 17 OECD creditors belonging to the Paris Club agreed on re-scheduling payment arrears over a 4–5 year period starting in December 1991. Club members agreed in principle to meet again to consider debt service payments falling due after June 1988, provided Egypt was in compliance with a number of conditions. By 1988, however, the IMF programme had expired and no new arrangement had been agreed upon. Egypt again missed several external debt payments and arrears re-emerged. By the end of 1988, the public and public-guaranteed debt reached a peak of US\$ 44 billion and blocked accounts contained as much as LE 11.7 billion (equivalent to US\$ 5.6 billion), preventing local business to pay its debt service obligations.

In 1990–91, the Egyptian Government took a series of measures to address the incumbent debt overhang but they had little impact on the overall debt burden problem. The extent of Egypt's external debt and the pressure on its prime sources of hard currency became a major concern for foreign creditors witnessing significant delays in external payments. Letter of Credit business suffered because of the premium importers had to pay for scarce dollars on the parallel market and international lending and credit agencies reviewed their risk assessment, putting Egypt in the lowest category (D).

Delays in USA commercial military debt repayments also threatened all USA aid being cut off (in accordance with the Brook amendment). A crisis was avoided at the last moment, late in 1990, when the US Congress approved the cancellation of US\$ 7.1 billion USA military debts in recognition of Cairo's pivotal role in the formation of the anti-Iraq coalition. In addition, the Gulf states and Saudi Arabia cancelled some US\$ 3.8 billion and several bilateral creditors cancelled official development assistance debts.

This gave the Egyptian Government the confidence with which to introduce the fiscal and economic reforms demanded by the IMF and a Special Drawing Rights (SDR) 400 million stand-by accord was signed in May 1991. On the basis of this agreement, the Paris Club of creditors reorganised and reduced Egypt's debts by up to 50 per cent in net present value terms. The agreement provided for a staged implementation of the

reduction on condition that certain structural reform requirements were met. In total, the agreement covered an estimated US\$ 27–28 billion in official and government guaranteed civilian and military debt. In addition, the (commercial) debt conversion programme was resumed with the discount set at 40 per cent and 45 per cent for investment and export projects respectively. Contacts with non-Paris Club external creditors proceeded slowly, however, owing to the difficulties in identifying and contacting the numerous creditors and the reluctance of some creditors to accept similar terms.

As a result of the debt reductions, public debt declined to a much more sustainable US\$ 30 billion in 1995 with annual debt service payments going down from 25–26 per cent to 11–12 per cent of external current account receipts (excluding official transfers). By 1995, Egypt was current on all payments to Paris Club creditors while external payments arrears to non-Paris Club creditors and non-guaranteed private creditors were reduced to US\$ 51 million only (World Bank, 1996).

**Table 5.1 Egypt—Medium- and long term public and public-guaranteed external debt (excluding military debt, private non-guaranteed debt and arrears, US\$ mln)**

	1970	1980	1988	1990	1992	1994	1996
TOTAL DEBT	1,644	13,069	44,404	30,544	31,301	29,515	29,687
multilateral	22	2,973	5,173	3,541	2,798	3,537	3,826
bilateral	1,251	7,954	32,390	25,464	27,854	25,864	25,845
supplier/buyer credit	371	2,142	6,841	1,539	649	114	16
Debt service/ current account receipts (%)	5.1	23.0	25.2	26.7	15.3	11.4	12.6

Source: World Bank Debt tables.

Lower debt service charges almost instantly contributed to restore the country's external balance of payments. Following decades of deficits, the current account turned positive in 1992 setting the currency market at rest and rebuilding confidence in business circles.

### 5.1.2 Social dimension of economic reform—Social Fund for Development

The measures to reform the economy introduced by the Egyptian Government in the mid-1980s had serious consequences for the poorer segments of the population. To soften these effects, the Government initiated several social programmes which, over the years, proved a very costly burden on the budget. Moreover, they hardly constituted an adequate safety net for the most vulnerable members of Egyptian society. Concern regarding the negative impacts of the reform programme, particularly on the lower income groups, intensified in the early 1990s as the effects of the Gulf crisis placed additional strains

on Egypt's economy. The Government faced the prospect of having to provide for the economic and social integration of some 400,000 Egyptian workers and family members estimated to have returned from countries affected by the Gulf crisis. The steep decline in remittances from these workers also had a devastating effect on the poorer segments of Egypt's population.

The creation of an effective social safety net associated with the Government's agreement to undertake a reform programme was critical not only to the well-being of the Egyptian people, but also to the success of the reform effort. During the identification of the Structural Adjustment Loan programme, the World Bank was invited to assist the Government in preparing a set of programmes that would benefit the low-income population groups most directly affected by the proposed reforms. The Social Fund for Development (SFD) was set up in March 1991 to: '(i) help mitigate the possible immediate negative impact of ERSAP; (ii) provide help to the Gulf returnees; and (iii) protect selected vulnerable target population groups from the longer term impact of adjustment' (WB Implementation Completion Report).

In line with this objective, SFD would support a set of five core programmes i.e. (i) the Public Works Programme to support labour intensive public works projects using local labour and local materials; (ii) the Enterprise Development Programme to help establish new and on-going small enterprises; (iii) the Community Development Programme to support micro-enterprises and improve the quality of services at the community level; (iv) the Labour Mobility Programme to help labour adjust to economic reform; and (v) the Institutional Development Programme to support the Fund's secretariat as well as poverty monitoring through surveys and studies.

After support had been canvassed from the major multilateral donors (World Bank, the European Union, the Arab and Kuwait Funds), the set-up of the autonomous SFD was delayed by arguments over organisational and administrative matters which continued for more than two years. Eventually, the SFD secretariat, with a total staff of 130, became fully operational in August 1993. Meanwhile, many bilateral donors, including the Netherlands, joined the multilateral aid consortium and a permanent support staff was stationed in Cairo. As illustrated in Table 5.2, total resources committed to the SFD amounted to roughly US\$ 750 million for the period 1991-96.

Following its difficult start, the SFD quickly reached a remarkable level of management. The picture emerging from the Annual Reports and regular Progress Reports of the World Bank supervising office, is one of a group of highly motivated staff and managers implementing the various programmes with a reasonable degree of success. Over a period of three years (up to the end of 1996), the previously mentioned financial allocation was

**Table 5.2 Egypt: Social Fund for Development—Financial commitments (1991-96)**

Loan	(US\$ million)	Grant	(US\$ million)
IDA	154.7	EU	229.4
Arab Fund	46.4	Egypt	59.8
Abu Dhabi Fund	50.0	Switzerland	30.0
Kuwait Fund	46.4	France	11.9
Germany	69.8	Netherlands	9.8
China	10.0	Others	28.2
Subtotal	377.3	Subtotal	369.1
<b>Grand total</b>	<b>746.4</b>		

Source: Social Fund for Development and World Bank.

disbursed through some 300 sub-projects. The bulk was spent under the Public Works Programme (US\$ 173 million) and especially the Enterprise Development Programme (US\$ 346 million).

The *Public Works Programme* was designed to provide and maintain essential municipal services at the local level and included numerous small, labour-intensive public works sub-projects executed by local private contractors. By the end of 1996, the programme was estimated to have created about 2,800 permanent and 24,000 temporary jobs. Some 1,000 kms of local roads were constructed, 3,400 kms of irrigation/drainage channels maintained, 2,800 kms of potable water pipelines rehabilitated and some 1,200 buildings refurbished.

The objective of the *Enterprise Development Programme* was to support new and existing small-scale enterprises with technical advice, training and credit. A dual delivery mechanism was used whereby credit was delivered mainly through banks and technical services through NGOs. By the end of 1996, the programme disbursed nearly LE 1.3 billion to intermediaries for on-lending (nine public and private sector banks) and technical assistance packages. In total, 150,000 permanent and 57,000 temporary jobs are reported to have been created.

The *Community Development Programme* and *Labour Mobility Programme* were of lesser significance in monetary terms. The first was designed to distribute resources to communities previously under-served by Government agencies through funding of literacy classes, provision of supplies, equipment and personnel for primary health and child care centres, rehabilitation of classrooms and the establishment of small revolving funds for self-help productive activities (Productive Families project). In total, roughly 70,000 permanent jobs and 18,000 temporary jobs were created under that programme.

The original objective of the *Labour Mobility Programme* was to provide some 50,000 workers in restructured or privatised public sector enterprises with financial assistance, training and placement services. As the Government's privatisation programme moved more slowly than was expected, the target was by far not achieved. Initially, the programme was allowed to work with three public sector enterprises employing some 3,000 workers. By January 1996, it was authorised to work on labour mobility programmes of an additional seven public sector enterprises bringing the total number of workers receiving assistance (by the end of 1996) to roughly 10,000.

The *Institutional Development Programme* objectives included support for (i) management; and (ii) poverty monitoring in collaboration with researchers and the Central Agency for Public Mobilisation and Statistics (CAPMAS).

Towards the end of 1995, one year before its mandate was scheduled to terminate, a World Bank evaluation mission found that, despite the slippages in implementation of some components, the Social Fund had largely met its overriding (quantitative) objective of employment creation but that it had difficulties: (i) in targeting the poorer sections of the population and; (ii) in ensuring the sustainability of completed activities.

With respect to targeting, it appeared difficult to measure the actual social, economic and environmental impact of the activities in absence of base line data to determine the conditions without the project and deficiencies in project completion reports. Part of the micro-enterprise and training assistance (mainly, the Community Development Programme) supported business activities that had little market potential or value.

Another main issue was operations and maintenance of the financed infrastructure. Even before the present austerity budget was in place, Governorates and other recipient agencies did not provide adequate budgets for maintenance. Although project agreements provided for Governorates and other sponsoring agencies to allocate sufficient budgetary resources, these agreements were all but impossible to enforce in times of budgetary restraint.

On the basis of the mission's evaluation, the World Bank in 1996 called an international donor meeting to discuss extension of SFD's mandate and to assure better targeting and sustainability. During the meeting, Phase II contributions totalling US\$ 526 million were confirmed by donors, including US\$ 20 million from the Netherlands, in addition to the Egyptian Government contribution. The latter pledged the equivalent of US\$ 120 million, double its Phase I contribution.

## 5.2 Netherlands programme aid

The Netherlands policy on programme aid has its origin in the balance of payment support instrument that was introduced in 1975. A special budget account was opened to assist the poorest countries and groups hit by the economic crisis. Initially, it was required that the aid be used to bridge foreign resource shortfalls of a temporary nature; from 1986 onwards programme aid became 'policy based' and was more closely tied to countries seeking to implement structural adjustment programmes.

Over the years, some Dfl. 333 million or roughly one-third of total Netherlands aid to Egypt was disbursed in the form of programme aid. A breakdown into main expenditure categories is listed in Table 5.3.

**Table 5.3 Netherlands programme aid to Egypt 1975-96 (in Dfl. 1,000)**

	1975-80	1981-85	1986-90	1991-96	Total
Food/emergency aid	16,359	0	8,695	638	25,692
Commodity Import Support	21,970	6,994	77,309	18,349	124,622
Debt relief	3,690	0	47,148	64,821	115,659
Co-financing Structural Adjustment	0	0	20,000	16,000	36,000
Direct balance of payments support	0	0	31,000	0	31,000
Total	42,019	6,994	184,152	99,808	332,973

Source: DGIS.

*Food and emergency aid* has been provided on an ad-hoc basis and represented only a small portion of disbursements. In the period 1977-78, some Dfl. 16.4 million was allocated for emergency supplies of wheat, wheat flour and seed potatoes. Another Dfl. 8.7 million was spent in 1987 on milk powder while, in the 1990s some Dfl. 0.7 million emergency cash contribution was made towards relieve of earthquake and flood victims.

*Commodity import support* was funded with resources from the special balance of payments support budget and the regular country programme, and was relatively free in the range of products that were eligible for funding. While there was no deliberate policy to restrict eligibility to specific economic sectors, a practice developed to concentrate funding of commodity imports in sectors or areas of the economy also benefiting from project aid. In a number of cases, it was even tied to project aid. This form of support is therefore analysed and evaluated under the sector aid chapters concerned.

Over the years, a substantial part of general balance of payment support was provided in the form of *debt relief*. During the initial stages, the largest part of the Netherlands assistance programme to Egypt was funded on the basis of development loans. In total,



nine such loans were provided in the period 1975–80 with a current value of some Dfl. 138.4 million. In addition, Egypt contracted mixed credit/less-concessional-loans for a total of eleven capital development projects worth Dfl. 50.4 million.

As the loans came gradually to maturity, repayments arrears accumulated in the periods of economic crisis described before. Under an agreement with the Netherlands Ministry of Finance all related debt relief and rescheduling charges (totalling some Dfl. 116 million) were charged to the development co-operation budget.

In the period 1977–79, some Dfl. 3.7 million was allocated to remit 1977 debt service obligations (at that time only interest was due) and cover interest subsidies on current loans. As a member of the Paris Club of creditors, the Netherlands participated in the major 1987 and 1991 debt rescheduling and/or remittance operations, apart from providing additional debt relieve assistance on a bilateral basis.

Early 1987, the Netherlands unilaterally announced its intention to remit all payment arrears up to 31 December 1986 and the 1987 debt service on the nine development loans in support of Egypt's structural adjustment efforts. The operation overlapped with the May 1987 Paris Club agreement which provided for debt consolidation and rescheduling only but covered all loans, including mixed credits. The Netherlands subsequently agreed to consolidate and reschedule the mixed credit debt service due in the period 1 January 1987–30 June 1988 in accordance with the Paris Club agreement.

A similar course of events developed with respect to the 1991 debt remission operation. Based on its own assessment of the economic-political situation, early 1991 the Netherlands unilaterally decided to remit the current 1991 debt service (interest and loan principal) and all payment arrears on the nine development loans as of 30 December 1990. The decision was announced a few weeks before the May 1991 Paris Club debt remission and a consolidation/rescheduling agreement was signed. Under the Paris Club covenant, the Netherlands agreed on a complementary debt remission package spread over three phases and to consolidate/reschedule the remaining debt. Because it was already formally confirmed, the preceding bilateral remission agreement was not revoked so that the procedure eventually amounted to a double debt remission operation. The first phase was effectuated in June 1992 and the second one in September 1993, when the follow-up IMF agreement was signed. As discussions over the implementation of the follow-up agreement dragged on, the third phase debt remission was delayed until September 1996.

Over the years, the Netherlands pledged Dfl. 36 million balance of payment support under *co-financing* arrangements with the World Bank. In October 1986, a grant of

Dfl. 20 million was approved to be utilised as incremental funds in an on-going World Bank-financed project. The Fifth Industrial Development Bank Project Loan was selected to receive these funds. The funds were released to the Industrial Development Bank through the World Bank regular loan disbursement procedure.

Joining the international donor community, in 1991 the Netherlands approved a Dfl. 16 million World Bank co-financing contribution to the Social Fund for Development to be disbursed in four yearly tranches of Dfl. 4 million. For efficiency reasons, both on the Netherlands and Egyptian side preference was given to a joint co-financing arrangement with the World Bank. The first tranche was released in 1992, the second in 1994 (following the presentation of a Mid-Term Evaluation Report) while the remaining Dfl. 8 million was transferred in the course of 1995.

Towards the end of 1990, when preparations for the liberation of Kuwait were in full swing, members of the anti-Iraq coalition all joined in awarding Egypt major financial assistance to compensate for the economic losses suffered and enhance the country's position in the region. Apart from remitting part of the bilateral debts and participating in a major Paris Club debt re-scheduling scheme, the Netherlands in November 1990 approved extra *direct balance of payment support* to the amount of Dfl. 31 million. Because time was too short for disbursing the allocation on a re-imburement basis before the end of the year, it was directly transferred to the Egyptian Treasury.

### 5.3 Assessment

#### 5.3.1 Policy relevance

In general, Netherlands programme aid was given in support of Egypt's macro-economic adjustment programme which aimed basically at restoring economic stability and achieving balance of payment viability. Although it amounted to one-third of the Netherlands assistance programme, programme aid support was relatively insignificant in monetary terms, representing only a fraction of a percentage point of Egypt's total foreign exchange needs and debt relief package. It had a strong political dimension and significance, however, insofar as it was linked to the actual implementation of the adjustment programme and to Egypt's participation in the anti-Iraq coalition.

In co-financing the Social Fund for Development, the Netherlands again joined the donor community in an effort to address social problems that had been exacerbated by structural adjustment. Co-financing the SFD was relevant in relation to the deterioration in social conditions and in relation to the Netherlands development aid principle to eradicate

poverty and social inequality. The allocation of balance of payment support funds to the World Bank Industrial Development Bank project had little policy relevance and was ill-conceived. Lacking clear onward-financing guidelines, the contribution was tacked onto the end of an almost completed project.

### 5.3.2 Effectiveness

Representing less than 1 per cent of macro-economic aid, effectiveness of the Netherlands contribution must be assessed in the wider framework of overall donor support. In this wider context, the effect of programme aid on Egypt's fiscal accounts and balance of payments was substantial. For instance, compared with a scenario in which payments would have been made according to original contracts, savings in total debt service, as a ratio to GDP, was about 8–10 per cent and savings in interest payments represented 3–4 per cent of GDP per annum. In general, a large external debt burden constrains economic growth by removing incentives for investment and discouraging policy reforms. The debt service reduction (from 26 to 13 per cent of current account receipts) made it possible to avoid rapid devaluation of the Egyptian pound while permitting it to float in a relatively unregulated market. The external current account deficit was kept below 2 per cent of GDP and foreign exchange reserves increased from minimum levels to over US\$ 18 billion in 1996. Commodity import support further assisted Egypt in overcoming the balance of payment crisis of the late 1980s. This support was provided without onward financing provisions. In general, the Egyptian Government's policy was to waive counterpart funding requirements in the non-productive or social sectors.

By and large, the effort contributed to stabilising the economy. Inflation, which hovered between 20 and 30 per cent in the late 1980s, is currently around 7 per cent and falling. Growth slowed down in the first two years of the stabilisation programme, but resumed from 1993/94 onwards. Investor confidence in Government policies was restored and investment capital inflows surged to record levels in 1996.

Evaluations of the Social Fund carried out by the World Bank and the EU ultimately proved positive in terms of employment generation, improvement of physical infrastructure and expansion of private enterprise. However, they also drew attention to weaknesses in the SFD programme relating to targeting and sustainability. Despite the references to mitigating the adverse economic consequences of structural adjustment, as such, the Social Fund was not integrated in the reform programme. Inadequacies in monitoring and evaluation make it difficult to assess SFD effects on 'selected vulnerable target population groups', one of its basic objectives.

According to the World Bank Project Completion Report, funds for the Industrial Development Bank project were disbursed in the period 1986–88. In principle, funds were used for the intended purpose. A total of 630 sub-loans to small and medium scale industrial enterprises were approved under the Bank loan and Netherlands grant to an amount of US\$ 126.2 million (of which the grant represented some 8 per cent). The textile sector received the largest portion of financing (25 per cent) followed by metals (15 per cent) and chemicals, construction and food processing sectors (13 per cent). Actual Economic Rate of Returns and Financial Rates of Return were for the most part satisfactory and ranged between 10 and 40 per cent. The investments created an estimated 12,600 jobs. Although the project's main objectives were met, the Industrial Development Bank had a large number of repeat clients in proportion to first time applications. This raises the question whether it devoted adequate attention to strengthening its growth perspectives, one of the main purposes of the loan.

### 5.3.3 Efficiency

General macro-economic assistance in the form of programme aid had immediate effect and was therefore an efficient means to restore the country's external financial balance.

The set-up of the Social Fund was laborious. Eventually, the Fund became operational by mid-1993 and worked at a reasonable level of efficiency. Benefiting from extensive financial support and an independent status, it has a highly competent staff and was well equipped to administer the diversified programme of activities.

Organisational performance was less satisfactory at the level of the Industrial Development Bank. In spite of the extensive technical assistance (provided by USAID and EU), institutional capabilities continued to be constrained by its status as a public-sector financial institution and weaknesses in internal management.

### 5.3.4 Sustainability

In the final analysis, programme aid to Egypt, including that of the Netherlands, contributed to Egypt's economic self-reliance to the extent that it restored the major trade and external payment imbalances and put Egypt back on a track of economic growth. Although a laudable attempt was made to address some of the social problems that have been exacerbated by the reform programme, the social chapter (SFD) was not really integrated in this reform programme and insufficiently targeted to ascertain that it had a noticeable and lasting impact on poverty alleviation.

## 5.4 Conclusion

Following the economic downturn of the mid-1980s, the IMF took the lead in the policy dialogue with the Egyptian Government owing to the high priority given to stabilising the economy and adjusting the exchange rate. A distinguishing characteristic of the strategy was its gradualism. The sequencing was orthodox in that it moved from initial emphasis on stabilisation to liberalisation and adjustment operations. The dialogue moved gradually towards deepening the adjustment programme in areas involving more difficult governance and institutional development issues, e.g. public enterprise restructuring, private sector development and civil service reform.

In the final analysis, Egypt achieved qualified success over the past decade in macro-economic policy reform. The successes have been in getting prices set by market forces, liberalisation of foreign exchange and other markets, reforming taxes and reducing subsidies, initiating cost recovery measures, and putting in place some important elements of an enabling environment for private sector development. The record on stabilisation is mixed. Although benefits have been slow in coming, it is widely agreed that these reforms were relevant and necessary. Less satisfactory progress was made in institutional reform (including the civil service and public enterprise divestiture and reform) casting a shadow over the sustainability of Egypt's growth in the longer term. Also with respect to poverty alleviation, the record is modest insofar as the adverse impact of Structural Adjustment on welfare and social services was mitigated, (amongst others by the set-up of the Social Fund for Development) but the incidence of poverty remained high with around 25 per cent of the population living below the poverty line. This percentage did not decrease since the mid-1980s (World Bank, 1991; INP, 1996).

Though relatively modest in terms of Egypt's massive assistance, Netherlands programme aid in the form of commodity import support, debt relief, co-financing and direct balance of payment aid was relevant insofar as it was part of a multi-donor (Paris Club, Consultative Group) effort to support the Structural Adjustment process and address binding constraints to Egypt's sustainable long-term development.

## 6 Water management and drainage

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### 6.1 Background

#### 6.1.1 Water resources

Egypt is an arid country with an average rainfall of less than 200 mm along the northern coast to almost nil south of Cairo. The River Nile is the only source of surface water and has provided the basis of agricultural development in Egypt for more than 5,000 years. Under the terms of the International Agreement for Full Utilisation of the Nile Water between Egypt and Sudan, Egypt receives 55.5 billion m<sup>3</sup> of water per annum. The actual use is greater as an estimated 5–10 billion m<sup>3</sup> of the annual quantity is re-used after having been discharged into the drainage system. In addition, some 2.6 million m<sup>3</sup> of groundwater is extracted for drinking water purposes and for supplemental irrigation along the fringes of the Nile Delta and Valley.

Egypt's water demand is known with less certainty than its supply. It is estimated that some three-quarters is for crop consumptive use and evaporation, one-fifth drains to the sea, while the balance is divided almost equally between industrial/domestic use and river transport. Per capita availability dropped from 2,100 m<sup>3</sup> per annum in 1960 to less than 1,000 m<sup>3</sup> per year at present, the target figure generally considered to characterise a 'water stress' situation. Under the circumstances, pressure on available water resources has increased substantially. With growing demand for water by the non-agricultural sectors, the total quantity for agricultural use has remained almost constant throughout the last twenty years. Increased agricultural demand was met through raising irrigation efficiency, re-use of drainage water, and complementary groundwater extraction.

#### 6.1.2 Irrigation and drainage

Egyptian agriculture has depended on the annual flooding of the Nile since around 3000 BC when irrigation was first started, including deliberate flooding and drainage by sluice gates and dikes. The system underwent only marginal change, until the first half of the

20th century, which saw tremendous improvements in the irrigation system. The first Aswan Dam and a series of barrages were built on the Nile to hold up the low summer water levels and to allow for the introduction of perennial irrigation. In the 1960s, the High Aswan Dam (HAD) was completed, protecting the land from devastating floods and further increasing the irrigated area. Since the early 1950s some 1.6 million feddan (650,000 ha) have been reclaimed. Yet, the net total cultivated area did not increase substantially because roughly 1.2 million feddan (500,000 ha) of old lands were lost to urban encroachment. As a result the cultivated area served by the irrigation network remained in the order of some 5.5–5.7 million feddan (2.2–2.4 million ha).

The Egyptian irrigation system is one of the oldest in the world and is characterised by its dependency on a single source, the River Nile. The system has always been centrally controlled and technological innovations in the system led to expansion and increasing complexity of the institutions involved. The irrigation system covers some 50 command areas or sub-systems each served by a main canal. These supply water to secondary canals which in turn feed clusters of farms through off-takes to a farm delivery system or 'mesqa' serving 50 to 500 feddan.

In principle, water supply is allocated on the basis of assumed cropping patterns and then adjusted in response to requests and complaints. Except in Fayoum, water is supplied below groundwater level, obliging farmers to lift water onto their land. The cost of doing so discourages excessive use of irrigation water by individual farmers.

Drainage became urgently necessary after the introduction of perennial irrigation. Historically, Nile water contained a very low concentration of salt, and the annual floodings of the valley also flushed salt from the soils. As a result of several decades of perennial irrigation however, a high water table gradually developed with a consequent rise in soil salinity. Around the turn of the century an open drainage system was constructed, but was not effective due to its incompleteness and inadequate maintenance. In recognition of its inadequacy, research was initiated in the late 1930s to try-out covered field drainage. The experiments were fairly successful. The covered field drainage system is made up of a network of lateral and collector drains. The former consist of corrugated and perforated pvc pipes which discharge water into collectors and subsequently into open drains. Collectors are generally constructed of plain concrete pipes. The drainage operation requires pump stations at various locations. At present, there are 76 main and 23 minor pump stations.

At the end of 1994, the total area with installed field drains slightly exceeded four million feddan, roughly 60 per cent of the total cultivated area. The figure is increasing annually by 170–190,000 feddan. The programme is the largest of its kind in the world.

### 6.1.3 Policy framework

The Ministry of Public Works and Water Resources (MPWWR) has overall responsibility for appropriating and distributing water and for managing drainage and groundwater. It is also responsible for controlling the inflow of pollutants into public waterways. At present, MPWWR employs some 88,000 people including an engineering staff of some 2,400. The Ministry is organised into four Authorities and three Departments. Most of these have regional Directorates. The Irrigation Department is by far the largest unit, currently employing some 39,000 staff or about 45 per cent of all employees of the Ministry. The Authority for Drainage Projects (EPADP) is responsible for the implementation of all drainage projects, for the design and construction of facilities, and for their operation and maintenance. Away from headquarters in Cairo, MPWWR's organisation is by Directorate. Many Authorities and Departments have field offices in some or all of the Directorates. The National Water Research Centre (NWRC) is a separate unit in MPWWR, responsible for all research activities carried out through its eleven affiliated research institutes.

The government's decision to reclaim large amounts of new agricultural land made it necessary for MPWWR to elaborate a more general strategy for the effective use of water resources. During the early 1980s long-range planning tools were developed and alternative scenarios worked-out for future water use and supply, based on various rates of agricultural development and water use increases. The planning effort culminated in the national Water Master Plan of 1986 for which the World Bank was the executing agency. This Plan made recommendations for future activities and studies and also developed a set of mathematical models for water resources planning. The exercise revealed that local capacity for policy formulation required further improvement.

While interaction among and feedback from policy-decision making bodies remained problematic, water demand management through the improvement of existing irrigation and drainage systems became the most important priority. This included measures to increase irrigation efficiency and to expand the drainage system. Recently, the Egyptian Government has come to recognise the benefits of privatisation and for greater user-participation in managing and maintaining water facilities and operations. In the period 1993–1995, Water User Association and Irrigation Advisory Service legislation was introduced and applied on a pilot scale to enhance participation and effectiveness in water management at the tertiary level. Reforms have not yet been initiated in the area of pricing water. Because the expansion of water supply was politically expedient, pricing and demand management received a much lower priority. Very recently the issue of water pricing is receiving more attention in the Middle East–North Africa region.



### 6.1.4 Main problems

The most pressing technical problem that confronts Egypt's irrigation system is the limited control over water supplies: many structures are only partially functional, and there are deficiencies in system management. Improved management of the irrigation system would reduce the need for drainage. Options for improvements are limited, however, because: (i) most irrigation canals are below ground level and irrigation water is privately pumped by farmers; (ii) the age-old rotation system would need to be altered; (iii) investments in irrigation structures and improvement of their operation would need to be throughout the entire system, probably resulting in higher costs than the construction of localised pipe drain systems.

With respect to drainage, the Egyptian Government has progressively developed design criteria adapted to the country's specific conditions. Further improvements are still needed, however, including capability for state of the art technical designs, construction management and quality control, techniques for rehabilitation of old systems, monitoring, and the evaluation of operations and maintenance.

There are several institutional constraints that affect efficient water management. The expansion of the Ministry of Public Works and Water Resources' elaborate organisational structure resulted in sectors and departments being created according to need. The process, however, also led to fragmentation of programmes and functions among many ministerial units and duplication of activities and resources, especially at the field level. Substantial investments in research infrastructure await the formulation of policies that will facilitate the communication of needs to researchers. Furthermore, the centralisation of decision-making makes the process of co-ordination and exchange of information within and between ministries rather bureaucratic. Finally, hierarchical staffing and career development policies affect institutional performance unfavourably (USAID, 1995).

## 6.2 Netherlands assistance

### 6.2.1 Donor support

Since the early 1950s, the Egyptian economy has benefited from extensive external support. A substantial part of total donor assistance has been spent on activities in the water management and drainage sector, with USAID and the World Bank being the principal donors. USAID support focused on irrigation improvement, contributing to an integrated research project to test farm level improvements in irrigation water delivery. It also supported a massive investment programme for the physical improvement of

the irrigation and drainage infrastructure, including a contribution to the construction of 37 pumping stations, the supply of three pvc pipe factories, and dredging and earth moving equipment. In addition, the agency has recently sponsored the first attempt at a comprehensive institutional analysis of MPWWR in a bid to formulate and execute an Action Plan for Strengthening Water Resource Management.

The World Bank has been heavily involved in the formulation and execution of Egypt's national field drainage programme. Since 1970, it has supported the implementation of a series of six drainage projects. Moreover, it served as the executing agency for two UNDP-funded projects, i.e. the Water Master Plan and the Irrigation Rehabilitation project. It also co-ordinated the drafting of the Egyptian Environmental Action Plan.

Apart from USAID and the World Bank, the Netherlands, Canada, Germany, Japan, Italy and the EU have supported activities in the water sector, but their financial contribution has remained far behind those of the two main donors.

### 6.2.2 Netherlands assistance

The bilateral assistance to water management and drainage is the largest in the Netherlands development co-operation with Egypt. The support has stretched over the full period of development co-operation between the two countries, i.e. 1975–1996. It represented some 20 per cent of total Netherlands bilateral aid to Egypt over that period and amounted to nearly Dfl. 160 million, or approximately LE 320 million at the current rate of exchange.

Expenditure increased both in absolute terms from Dfl. 4–5 million per annum in the 1970s to Dfl. 10–11 million per annum in the 1990s, and as a percentage of Netherlands aid from 15 per cent of total disbursements in 1980/84 to 29 per cent in 1985/91 and further to 38 per cent in 1991/96. The share of the research institutes in total disbursements decreased from over 60 per cent in the early years of the programme to slightly less than 40 per cent after the middle of the 1980s. Expenditure for activities at Governorate level rose gradually to the present 30 per cent of the total for the sector. This also reflects a shift to integrated water management and to a more direct orientation towards agriculture and the farming community.

The Netherlands support to water management and drainage has been in essence a technical assistance programme which sought to improve the performance of key research institutions and governmental agencies directly or indirectly involved in water resources management. During the early stages of the co-operation programme, when the sector portfolio was restricted to three projects, the annual assistance volume varied between



Dfl. 4 and 5 million. By 1986, the portfolio included ten projects and the annual disbursement rate had roughly doubled to Dfl. 9 million. It gradually went up to Dfl. 10–12 million during the 1990s. Commodity import support represented 11 per cent of disbursements to water management and drainage, mainly for equipment provided for the execution of drainage work and as co-financing of a World Bank project.

A recent development is the support given to the planning sector of the Ministry of Public Works and Water Resources (MPWWR). Although it is too early to identify concrete results, the request for such assistance, together with the shift to institutional strengthening activities, indicate the good relations that exist between Egypt and the Netherlands in support of the sector and the confidence that has been gained between the two parties during 20 years of co-operation.

The composition and evolution of the sector project portfolio is summarised in Table 6.1.

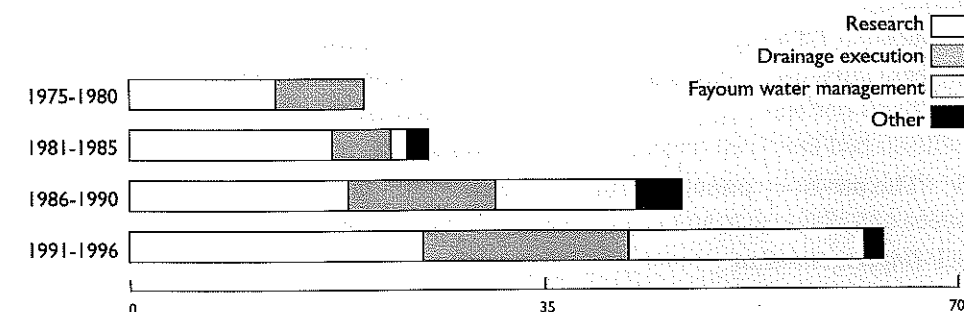
**Table 6.1 Netherlands contribution to water management and drainage, 1975–96 (Dfl. mln)**

	1975/80	1981/85	1986/90	1991/96	Total	%
<i>Advisory Panel on Land Drainage</i>						
Phase IV–VI (1983–96)	0	1.7	3.6	1.6	6.9	
Subtotal	0	1.7	3.6	1.6	6.9	4.3
<i>Drainage Research Institute</i>						
Advisory Panel on Land Drainage Phase I–II	2.7	2.8	0	0	5.5	
Drainage Technology and Pilot Areas	0	0.9	2.3	1.8	5.0	
Re-use of Drainage Water	0	2.8	2.1	3.1	8.0	
Drainage Research Programme	0	0	0	2.5	2.5	
Re-use Monitoring Programme	0	0	0.6	0.3	0.9	
Monitoring and Analysis of Drainage Water Quality	0	0	0	1.1	1.1	
Associate Experts	0.7	1.1	1.8	0.5	4.1	
Subtotal	3.4	7.6	6.8	9.3	27.1	17.1
<i>Research Institute for Groundwater</i>						
Hydrological Training Programme	0	2.7	1.4	0	4.1	
Development and Management of Groundwater Reserves	0	0	5.4	2.0	7.4	
Environmental Management of Groundwater Reserves	0	0	0	3.0	3.0	
Vertical Drainage Study	0	0	0.4	0	0.4	
Feasibility of Groundwater Development	0	0	0.9	0.1	1.0	
Pump sets	0	0	0.2	1.1	1.3	
Control of Waterlogging and Salinisation	0	0	0	2.5	2.5	
Associate Experts	0	0	0	0.3	0.3	
Subtotal	0	2.7	8.3	9.0	20.0	12.7
<i>Channel Maintenance Research Institute</i>						
Aquatic Weed Control	6.7	0.7	0	0	7.4	
Grass Carp Project	2.2	2.6	0	0	4.8	
Delta Breeding Station	0	3.6	0.2	0.5	4.3	
Subtotal	8.9	6.9	0.2	0.5	16.5	10.3

(Table 6.1 continued)

	1975/80	1981/85	1986/90	1991/96	Total	%
<i>Hydraulics Research Institute</i>						
Hydraulics Studies	0	0	3.3	5.9	9.2	5.8
Sub-total research institutes	12.3	17.1	18.6	24.7	72.7	45.9
<i>EPADP Drainage execution</i>						
East Bahr Saft drainage	7.4	2.4	0	0	9.8	
Drainage V	0	0	6.1	3.8	9.9	
PVC raw materials	0	1.9	1.1	0	3.0	
Drainage Executive Management	0	0.6	5.0	13.3	18.9	
Associate Experts	0	0	0	0.3	0.3	
Subtotal	7.4	4.9	12.2	17.4	41.9	26.4
<i>Fayoum Water Management</i>						
Fayoum Water and Salt Balance Study	0	1.0	0.7	0	1.7	
Batts Pumping Station	0	0	5.4	1.5	6.9	
Fayoum Water Management and Irrigation	0	0	2.0	3.6	5.6	
Fayoum Weed Control	0	0	3.6	3.8	7.4	
Fayoum Water Management	0	0	0	10.5	10.5	
Associate Experts	0	0.4	0.2	0.5	1.0	
Subtotal	0	1.4	11.9	19.9	33.2	20.9
<i>Other</i>						
Strengthening MPWWR Planning Sector	0	0	0	3.0	3.0	
National Water Quality Monitoring Network	0	0	0	0.7	0.7	
Other	0	0	0.2	0	0.2	
Subtotal	0	0	0.2	3.7	3.9	2.5
<b>Grand total</b>	<b>19.7</b>	<b>25.1</b>	<b>46.5</b>	<b>67.3</b>	<b>158.6</b>	<b>100.0</b>

Source: DGIS.



**Figure 6.1 Support to water management and drainage, 1975–96 (Dfl. mln)**

Slightly less than half of total funding was spent on support to four research institutes operating under the authority of the National Water Research Centre. The balance was spent on general and direct advisory support to drainage execution and water management. With the exception of three capital investment contributions (Dfl. 23 million), disbursements covered the cost of institutional support to the Egyptian Public Authority for Drainage Projects (EPADP: Dfl. 19 million), the Fayoum Governorate/Irrigation Department (Dfl. 33 million), four research institutes resorting under the Ministry of

Public Works and Water Resources in general (Dfl. 73 million) and the Ministry itself (Dfl. 10 million). The latter includes the Advisory Panel on Land Drainage and strengthening of the planning sector of the Ministry of Public Works. The Panel was an advisory body of high level Egyptian and Dutch experts for the implementation of drainage works. Between 1976 and 1982 it advised EPADP on a wide variety of issues affecting the execution of drainage works supported by the World Bank. Between 1983 and the present, the Panel has functioned mainly as a co-ordinating, monitoring and evaluation entity for projects supported by the Netherlands.

Technical assistance packages have invariably consisted of a relatively large manpower or consultancy component which also included on-the-job training (some 65–75 per cent), infrastructural investment such as cars, computers and measuring equipment (some 20–25 per cent), local operational cost financing, which also involved salary supplements in the form of so-called incentives (10–15 per cent), and general manpower training support (2–5 per cent). The majority of the packages were put out on contract to Dutch consulting firms. In most cases, tender requirements were waived and contracts were awarded directly to the Netherlands in-house or partner consultant. Through the regular 3–5 year project formulation process, long term co-operation relationships have developed. In the case of the Drainage Research Institute and EPADP the co-operation goes back to 1976; in the other cases assistance has been provided for periods of 10–13 years.

For the purpose of the present evaluation study, activities have been grouped into three main categories, i.e support to drainage and water research, support to EPADP, the drainage execution authority, and the Fayoum water management programme. Before dealing with these three categories, a brief analysis is made of the role of the Advisory Panel.

### **6.3 The advisory panel on land drainage**

#### **6.3.1 Implementation**

In the initial period 1976–83, the Advisory Panel on Land Drainage Project (APLDP), or the Panel as it became known, assisted the Egyptian Government in setting-up the Drainage Research Institute (DRI) and advised the Egyptian Public Authority for Drainage Projects (EPADP) on the execution of the on-going, World Bank financed, national drainage programme. In 1983, as the scope of the research programme widened, the 'all-in-one' approach was abandoned. Technical assistance for research and newly-formulated projects was continued under separate contracts and the scope of APLDP was narrowed down to activities of the expert Panel only. Since then, the Panel has formed the discussion platform of the Egyptian–Netherlands co-operation programme in drainage

and drainage-related water management. Apart from discussing general progress of the aid programme, a number of studies have been commissioned.

By the end of 1996, the Panel had met 30 times. The meetings basically consisted of 3–4 days of discussions on technical and progress reports and on consultancy reports directly commissioned by the Panel. In general, deliberations were characterised by intensive but loosely-structured discussions of a large number of project-related matters and general topics of differing complexity and priority. On each occasion, an extensive list of findings, recommendations, warnings and wishes was drafted.

#### **6.3.2 Results**

During the initial eight year period (1976–1983), APLDP was the main vehicle of the Netherlands co-operation programme in the drainage sector. As such, it advised EPADP on a wide variety of issues affecting the execution of the World Bank-financed drainage programme. Its impact on the execution of drainage work was limited. Throughout the period, progress of the two on-going projects (Nile Delta I and Upper Egypt I) was affected by massive delays in procurement and commissioning of equipment, shortage of complementary national funding and adequately trained staff, and poor contractor performance.

During this period, APLDP's main achievement was the build-up of a national drainage research capability at the DRI level. The impact of the six year research effort was limited: recommendations to modify field drainage design in rice-growing areas were not followed-up and a comprehensive economic evaluation programme was discontinued following the withdrawal of Netherlands support. Moreover, the Panel had insufficient leverage on EPADP, the organisation responsible for the execution of drainage works, to proceed with installation of the respective experimental drainage networks as a sequel to the pilot areas research. The re-use measurement programme, however, was a valuable contribution to Egypt's water sector policy of making optimum use of scarce water resources.

In the period 1983–1996, the Panel provided a framework for monitoring, guiding and co-ordinating the Netherlands financed water sector projects. As such, it was instrumental in creating a conducive policy environment for development co-operation between the two countries. In general, it proved a useful conduit between, and an effective response to, the hierarchical structures that characterise Egyptian bureaucracy. Its potential was not fully used, however, because of: (i) the dual function of a number of Panel members, with a direct interest in execution of the programme; and (ii) the restriction of the scope

of work to Netherlands-financed activities only and the resulting inability to deal with the even more urgent problem of donor co-ordination. During the period, the most visible output was the publication on Land Drainage in Egypt (1990).

The Panel's contribution to policy design and to policy implementation increased during the 1990s. Several policy issues were discussed and the meetings may have played an important role in getting ideas accepted. Yet, the actual policy framework in the drainage, irrigation and general environmental sectors was basically set under World Bank/USAID assistance covenants without explicit involvement of the Panel.

The position of the MPWWR is that the Panel is a unique institution in the Netherlands development co-operation with Egypt, which because of its permanency and its wide expertise was a valuable advisory body for Egyptian policy-makers. The MPWWR is also of the opinion that the combination of advisory and executive responsibilities of Panel members had obvious advantages

## 6.4 Water management and drainage research

### 6.4.1 Implementation

Out of the Dfl. 160 million budget some 45 per cent was spent on technical assistance to four of the eleven research institutes of the National Water Research Centre, i.e. the Drainage Research Institute, the Channel Maintenance Institute, the Research Institute for Groundwater and the Hydraulics Research Institute. The support varied in intensity, type and duration for the various institutes. The Drainage Research Institute was the main recipient with Dfl. 27 million over the two decades; the Hydraulics Research Institute was the smallest recipient of the four with some Dfl. 9 million.

Support to the *Drainage Research Institute (DRI)* focused on two main research programmes: drainage technology and re-use of drainage water. The former started in 1975 as part of the Advisory Panel Project, the latter in 1983. After three extensions, both programmes were terminated in 1994–95 and followed-up by respectively the Drainage Research and the Monitoring and Analysis of Drainage Water Quality projects, with scheduled execution periods of 4–5 years.

Drainage technology research focused on drainage design criteria, specifications for pipe and envelope materials, and installation techniques. It included observation surveys in regions already provided with piped drainage and performance surveys in an area with a modified drainage system for rice growing. An economic research programme, which

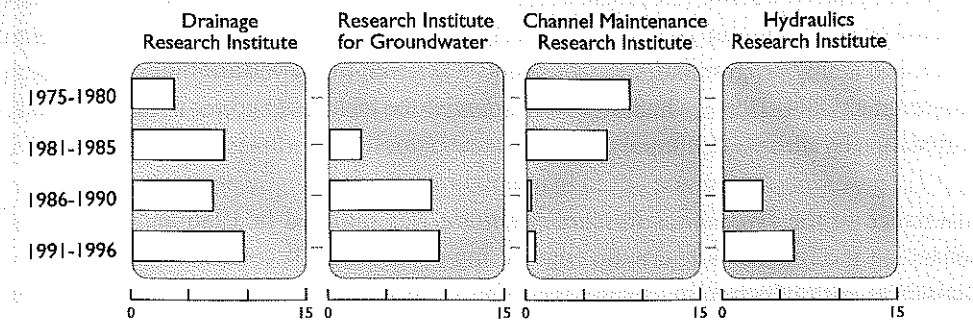


Figure 6.2 Support to research institutes in water management and drainage, 1975–96 (Dfl. mln)

formed part of the drainage technology research, was discontinued amidst doubts about the usefulness of this research under uncontrolled farming conditions.

The re-use of drainage water research project assisted DRI in: (i) setting-up a drainage water monitoring system, and (ii) developing a mathematical drainage water balance (re-use) model for the Nile Delta. The monitoring network project started in 1983 and was completed in 1990; assistance was resumed in 1995 when the scope of the monitoring programme was widened and expanded. The re-use model project also started in 1983 but experienced serious delay in design and implementation. Eventually, development of the model took twelve years. By the end of 1996 the model had not yet been used for investment planning purposes.

Assistance to the *Channel Maintenance Research Institute* was channelled through three projects: the mechanical weed control project (1975–80), the biological weed control (grass carp) project (1979–83), and the establishment of a grass carp breeding station (1982–86 and 1994). The first focused on the supply to and testing of weed control equipment; testing experiments were frustrated by technical and organisational problems and yielded little if any results. The second concentrated on rearing grass carp for biological weed control, and the third on setting-up a grass carp breeding station. While the carp breeding experiments were successfully completed, the attempts to introduce grass carp stocking of irrigation canals on a larger scale were not successful, due to fishing, removal of fences, and illegal dumping of waste and poisonous materials.

The support to the *Research Institute for Groundwater* started in 1983. At first, the Netherlands provided assistance for the formal training of staff; from 1986 onwards, emphasis shifted to in-service training. The latter covered the preparation of hydrological maps, the establishment of a geohydrological data base, and the formulation/execution of

a series of groundwater development and management studies. Since 1992, assistance has focused on the setting-up of a groundwater pollution monitoring programme. Parallel to the basic training programme, special support was given to the vertical drainage research programme (1984–1994), which sought to appraise the technical and economic feasibility of drainage by means of pumping groundwater.

Assistance to the *Hydraulics Research Institute* was initiated in 1986 and focused on enhancing the Institute's hydraulic engineering capabilities. It comprised the supply of equipment with which to modernise the research infrastructure, and manpower training mainly through a series of short-term missions by specialised engineers.

A comprehensive analysis of tasks and responsibilities of the various institutes under the National Water Research Centre, the relevance of these tasks in relation to the main constraints in the sector, and the objectives of the Netherlands development co-operation policy, was not made prior to the beginning of the support. Consequently, the research assistance programme consisted basically of a series of technical assistance projects with little or no inter-linkages, which materialised on the basis of individual initiatives of the Advisory Panel and consultants. In all cases, emphasis was on the transfer of technical know-how, with little attention given to a broader type of institutional strengthening. During recent years this situation has changed and for both the Drainage and Groundwater Research Institutes the support now gives more attention to manpower development and management issues.

#### 6.4.2 Results

The support provided to the four research institutes contributed to the establishment, technical strengthening, and development of valuable research capabilities. The institutes not only became leading research organisations in their respective fields nationally, but also gained stature in the international scientific community and established a valuable network of international contacts.

Many research activities were of an innovative nature such as the development of mathematical models with which to assess the impact of water management scenarios, and new hydrographic survey and data processing techniques. The modified drainage design research, the introduction of new mechanical and biological weed control methods and grass carp technology were also innovative in the Egyptian context, and that may have hampered contacts with implementing agencies and the application of results. Over the years, the focus of research has evolved from drainage technology and the re-use of drainage water to integrated water management and water quality aspects.

The research effort brought a wealth of data on groundwater potential, hydrogeological maps and groundwater development plans. The setting-up and maintaining of a monitoring network on drainage water quantity and salinity was also an important achievement. Results of the research have been published in an impressive number of publications and contributions to international conferences. At the policy level, the research has raised government's awareness of groundwater resources and of the potential for re-using drainage water.

The ultimate yardstick by which to assess the effectiveness of research is the application of the results to the concrete policies and activities of executing organisations. The establishment of a drainage water monitoring network and the production of hydrogeological maps seem to have been the most fruitful activities. The former contributed greatly to government policy in optimising the use of available water resources through the construction of re-use pumping stations. The groundwater maps, produced at the explicit request of the Ministry of Public Works and Water Resources, play an important role in licensing groundwater extraction and in the planning of land reclamation schemes in desert areas. Furthermore, the impact of hydraulics research is indicated by its practical use for clients of the Hydraulics Research Institute. Most of the research has been commissioned to support investment projects in the field of power generation and infrastructure. River sediment and hydraulics studies have played an important role in maintaining navigability on the River Nile.

Drainage research has had little or no impact on the progress and quality of the field drainage programme. The mathematical re-use model exercise has not yet been used in water resources planning. Hardly any use is made of the groundwater development plans, while the vertical drainage research programme and grass carp research programmes were terminated after ten years without concrete results for practical implementation.

The principal reasons for the limited effectiveness of research activities are the following:

- (i) The outcome of the research often confirmed current practices in Egypt or the findings of similar types of research elsewhere in the world (drainage pilot areas research).
- (ii) The long period needed to undertake the research and the late availability of research findings (drainage criteria and synthetic envelope criteria).
- (iii) The scientific and innovative nature of the research and the rather complicated presentation of research findings, insufficiently adapted to the practical needs of executing agencies (data books without analysis, complex mathematical models, too detailed envelope material specifications).
- (iv) Insufficient co-ordination with executing agencies in the design of the research and in the execution of practical experiments (construction of drainage pilot research areas, grass carp stocking experiments).



## 6.5 Drainage execution

### 6.5.1 Implementation

The Egyptian Public Authority for Drainage Projects (EPADP) is charged with constructing and maintaining the country's drainage infrastructure. Some functions are centralised at its headquarters in Cairo, but most of the implementation is delegated to regional Directorates. In 1995, EPADP employed about 6,600 permanent staff, compared to 3,600 in the early 1970s when the field drainage programme was launched. In principle, EPADP provides public and private sector contractors with self-produced pvc and cement pipes and self-imported drainage construction equipment. EPADP recovers equipment costs through pay certificates issued to contractors, according to progress of work.

Over the years, an arrangement has developed whereby the massive investment component of the national drainage programme was covered under World Bank financing. The Netherlands provided funds for technical assistance to improve EPADP's construction planning and management practices and to raise its drainage system design and supervising capabilities. During the initial 1976–82 period, indirect support was provided through short-term consultancy missions, planned and organised under the umbrella of the Advisory Panel. In 1983, the Training Programme for Drainage Projects heralded the beginning of a long-term training-cum-manpower development effort: the Drainage Executive Management Project (DEMP).

Technical assistance has been complemented with direct investment support for EPADP's field drainage programme. In the East Bahr Saft Project and the Drainage V co-financing arrangement with the World Bank, the Netherlands' contribution has covered the cost of procuring drainage construction machinery, a pvc pipe production unit and spare parts.

The East Bahr Saft project started in 1976. The supply of equipment experienced serious delays and the technical adviser spent most of his time in solving logistical and technical problems affecting construction of the pvc plant and deployment of the machinery. By the originally planned completion date, some 50 per cent of the collector network and 25 per cent of the lateral network was in place. The project was eventually completed in 1983, some seven years after being identified.

The Drainage V co-financing project began in 1988 and was inspired partly by alarming reports about the maintenance of equipment supplied earlier by the Netherlands. The project suffered from repeated revisions of the equipment list, deficiencies in pro-

urement procedures and disputes over the quality of the goods delivered. In addition, implementation was plagued by technical and organisational problems until 1992 when the last orders were placed.

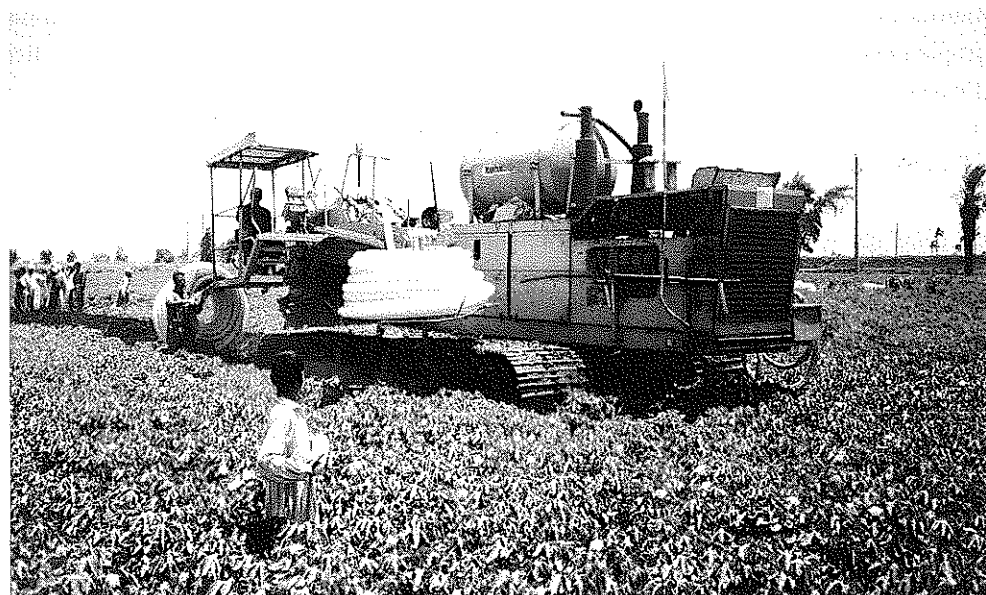
The Drainage Executive Management Project (DEMP) started in 1986 and was initiated on advice of the Panel. It was carried out to accelerate and improve the quality of execution of drainage works and to optimise the use of available manpower and equipment by strengthening the executive manpower of EPADP and contractors. In the longer term this would lead to improving the implementation of the national drainage programme. At first, training was a combination of short courses in the Netherlands and in-service training by mobile teams visiting the regional directorates. Subsequently, a Drainage Training Centre was set up in Egypt, which became operational in 1991, and in-service training was integrated into its regular training programme. Finally, in the early 1990s, a modest beginning was made with a broader type of institutional strengthening: the design of a long-term manpower development plan, including a Human Resources Development Unit and a data-base system of all EPADP staff.

### 6.5.2 Results

Since its establishment in 1973, EPADP has evolved into a technically capable and relatively well-managed authority for constructing and maintaining the national drainage network. The support provided between 1976 and 1982 under the Panel project was too dispersed to have a lasting effect on performance. After 1983 the technical assistance programme was instrumental in training substantial numbers of junior and senior engineers and contractors' personnel. Until recently the focus has been on the transfer of technical know-how and little attention was given to the broader range of institutional constraints that affect EPADP's performance. Since the early 1990s the agency had addressed some of these constraints and has made a start with formulating a long-term manpower development plan. In general, EPADP and contractors staff have appreciated the training, which was also seen as a means to boost working morale and motivation. By far the most important achievement has been the establishment of a sustainable in-house technical training facility.

Investment support (East Bahr Saft and Drainage V) made a small contribution to implementation of the national drainage programme, enabling the ultimate objective of installing field drainage in the planned area to be achieved. In the absence of an effective monitoring system, no information is available on construction quality and the functioning of the system since that time. The drainage machinery was reported to have been transferred to public and private contractors. The pvc pipe factory was a good investment;





*Pipe-laying machine for drainage system (photograph: Arcadis/Euroconsult)*

almost thirteen years old, it is now near the end of its technical and economic life and on the point of being decommissioned.

World Bank appraisal documents speak of a positive impact of technical assistance on performance, but the actual evidence of such an impact is rather thin. The goal of speeding-up the implementation rate of the field drainage programme through new technology and improved management has recently been achieved. Since 1993 the average yearly rate has been raised gradually from the pre-programme level of 170,000 feddan or about 70,000 ha to approximately 190,000 feddan per annum.

It has been mentioned that construction standards have also improved, due to training and experience. Firm conclusions with respect to quality are hindered by the lack of uniform standards of quality control. Nor is there any statistical evidence that drainage equipment has been better maintained or utilised by contractors over the years.

The ultimate objective of sub-surface drainage has been to increase yields through improving crop production conditions by lowering groundwater tables and decreasing or eliminating salinity problems. Farmers' demand for field drainage, and various studies, including World Bank appraisal documents, indicate increased yields and farm income in areas with field drainage. Attempts to assess economic benefits more accurately were not successful. Therefore, the question of the financial and economic viability of the national drainage programme cannot be answered yet.

## 6.6 Fayoum water management

### 6.6.1 Background

The Fayoum is a depression in the Egyptian Western Desert, 90 km south-west of Cairo, with sharp topographical and hydrological boundaries. The land slopes from 25 m. above sea level in the south-east to 43 m. Below sea level at Lake Qaroun. The water for Fayoum is diverted from the Nile at Assiout and enters the Fayoum through two main intakes, the Bahr Youssef and the Bahr Hassan Wasef. Irrigation is mainly by gravity, with a continuous supply of water to the rotational units varying between 8 and 200 ha.

Fayoum is inhabited by almost two million people who are largely dependent upon agriculture, the backbone of its economy. The cultivated area is now in the order of 150,000 to 160,000 ha. Roughly 90 per cent of the land is owned by some 125,000 farming families. Land distribution is rather skewed: 10 per cent of the holders own 45 per cent of the land. The remaining 90 per cent have no more than 0.6 ha on average. Moreover, over one-third of rural households are landless and share-cropping and off-farm employment are common for small farmers. Agricultural practice is very intensive and highly dependent on an effective supply of irrigation water. By the early 1990s almost half of all households were estimated to fall below the poverty line.

Up to 1970 Fayoum's water balance was largely in equilibrium. The supply of irrigation water corresponded more or less with cropping and leaching requirements, and the saline drainage water flowing into Lake Qaroun via two natural streams was roughly equal to the annual quantity that evaporated from the lake. Over time, the water and salt balance started to deteriorate as the annual intake of irrigation water was increased to meet the demands of reclaimed additional land and to stimulate cropping intensification. Irrigation efficiency remained low, much of the additional water ultimately drained into Lake Qaroun and the level of the lake rose at an alarming rate. To restore the balance, a new drainage outlet was built to the Wadi Ryan depression which now takes 30 per cent of the total discharge. At present, about two-thirds of the Fayoum has a relatively well-functioning open drainage system; one-third must be complemented with subsurface drainage, the installation of which is on-going. In the meantime, soil salinity and soil alkalinity problems are on the rise and affect agricultural productivity, especially in the lower parts of the depression.

The complex and not always transparent water allocation system results in an uneven geographical distribution of irrigation water. The main reasons for this are: the problematic nature of advance planning of water supply in accordance with crop needs, the universal problems of tail-end irrigation, the poor condition of canals and other structures, and the

system management which tolerates excess supply draining to the Wadi Ryan depression in order to avoid any extra rise in the Lake Qaroun level. Even more serious distribution problems are manifest at the secondary level, mainly due to neglected maintenance of structures and to successful but illegal attempts by farmers to change hydraulic conditions in their favour. At the tertiary or mesqa level there are also inefficiencies in water use: in certain areas tertiary canals are insufficient in capacity, in others there is excessive spillage of irrigation water into drains. There is also room for improvement of maintenance of irrigation and drainage canals.

### **6.6.2 Implementation**

Netherlands support to the Fayoum water management sector was intended to help the Fayoum Irrigation Department and the Fayoum office of the Ministry of Public Works and Water Resources to improve the operational aspects of irrigation and drainage management, with a view to increasing water use efficiency and, consequently, agricultural production and farm income. The Netherlands' involvement in the Fayoum goes back to the late 1970s when support was given to the Batts Pumping Station project and the Water and Salt Balance Study. The former provided technical assistance and direct financial support for the design and construction of the biggest re-use pumping station in the area. The second was instrumental in setting-up a water monitoring network and in developing a set of computer models to assess the impact of different water management scenarios on the area's delicate water and salt balance.

The total financial contribution to the Fayoum water management and drainage sector for the period 1975–1996 amounted to some Dfl. 33 million. Somewhat less than one-quarter of this was for investment in the Batts Pumping Station; the bulk of the support was for a series of technical assistance projects. Of the latter, approximately 60 per cent went to consultancies, 27 per cent to investments, and the balance was more or less equally divided over transport, operational costs and formal training.

The Batts Pumping Station project experienced serious delays during preparation and implementation due to discussions on the need for an appraisal study, the need for and role of an external consultant, and changes in design and project execution modalities. The station was eventually commissioned in 1994, some three years behind schedule and ten years after initiating the feasibility study. The Water and Salt Balance study started in 1984 and by the end of 1986 a basic irrigation and drainage water monitoring network consisting of 45 measuring points had been established. In addition, a water balance model was developed, the salt component being dropped due to lack of time.

In the second half of the 1980s and after a three-year identification and formulation period, two more projects were launched: the Water Management and Drainage Improvement Project, a sequel to the Water and Salt Balance study, and the Weed Control project. The former addressed the basic water distribution problems and irrigation efficiency of the Fayoum irrigation system. The latter was meant to assist the Fayoum authorities in testing and setting up a comprehensive irrigation channel maintenance organisation. At the time of completion in 1990, the Weed Control Project was still at the stage of testing equipment, data collection and surveying, and some 40 per cent of the original budget had not yet been disbursed. The Water Management and Drainage Improvement Project carried out four sets of activities (i) monitoring the flow measurement, (ii) surveying, advising and supporting rehabilitation of physical structures to improve water distribution in the main canals, (iii) on-farm studies and improvement in water distribution and drainage in pilot areas, and (iv) institutional development through technically-oriented training. The two projects were merged in 1993 and continued their activities under the ongoing Fayoum Water Management Project.

### **6.6.3 Results**

Since its completion in 1993 the Batts Pumping Station has been kept in good operational condition and is functioning to satisfaction. It has been operating at some 50–65 per cent of its capacity during the summer period and at some 30 per cent during the rest of the year when water demand is low. Pending the completion of a 10,000 feddan reclamation scheme, the recycled water is used by an unknown number of farmers in the reclaimed area and by some 400 to 500 on the old lands. No quantitative information is available on benefits derived from the extra water supply, but the much higher than expected salt content of the drainage water is a major constraint on the choice of crops and increase of yields. Contrary to the plan, the area has so far not been provided with a field drainage system and is seriously threatened by increasing salinisation.

The technical assistance projects addressed the more technical issues of inequity and effectiveness of water distribution in the main system by: (i) establishing a well-functioning monitoring network, and building a mathematical water management model, (ii) rectifying major bottlenecks in the distribution network, (iii) introducing improved methods of mechanical and manual weed control and (iv) carrying out on-farm studies and testing of integrated water management techniques in selected pilot areas.

The monitoring system has been extended and refined to such a level that it allows for timely adjustment of the water flow to crop demand in the main distributaries of the system. Unfortunately, water demand for the various command areas cannot yet be

established precisely, due to incomplete and inaccurate data on cropping patterns, and to co-ordination problems between the Fayoum Irrigation Department on the one hand and the Ministry of Agriculture on the other.

The Fayoum Operational Water Management model, which simulates and evaluates the water and salt management of the irrigation system, is a valuable instrument for better water management. Whether the instrument will continue to be used is doubtful: neither the regional directorate of the Ministry of Public Works nor the Fayoum Irrigation Department has developed a planning tradition in which use of the model is firmly embedded. The assistance has familiarised the technical staff of the Irrigation Department with the preparation of new designs and re-construction of main irrigation structures. Applied research has exposed the area's basic water distribution problems and major bottlenecks. Through rehabilitation of works, the assistance programme has been instrumental in creating the conditions for more equity in internal water distribution. There are indications that primary distribution imbalances still persist, however, and improvements in the supply of water to tail-end areas and in overall irrigation efficiency have been achieved mainly by raising drainage water re-use.

The Weed Control Component assisted in developing modern maintenance planning techniques and in introducing technically and financially viable mechanical weed control technologies that are less destructive to the irrigation and drainage infrastructure. Field tests with improved methods were partially successful and the institutional problems with improved weed control have yet to be solved. There is uncertainty about the organisation responsible for future weed control operations largely due to the lack of a clear government policy about the role of the private sector.

Finally, Netherlands assistance was instrumental in increasing the participation of farmers in water management. It opted for an approach which started by solving primary and secondary level distribution problems, followed by raising farmers' awareness of participation benefits and introducing the Water User Board concept at the tertiary level. The strategy to focus first on primary and secondary distribution problems was justified. Water user groups can be expected to co-operate in the equitable distribution of water, maintenance of the on-farm system and payment for irrigation services only when water delivery meets their needs and they have some control over the delivery schedule.

An overall judgement on the effects of the programme on the production and income situation of the farmers is hampered by non-availability of basic social and financial/economic information. Until recently, no systematic baseline or any other form of field survey of farm production or income in Fayoum had been made. Statements by the

Advisory Panel, evaluation missions and other parties, confirming the positive impact on farm income, were of a qualitative nature and not backed-up with figures.

## 6.7 Assessment

### 6.7.1 Policy orientation

The selection of the drainage and water resources management sector for Netherlands support has been in line with Egyptian priorities. The water sector is crucial for Egypt's economy, food production and food security, and the living conditions of a large proportion of its population. The focus on drainage addressed a crucial problem in the water sector and complied with Egyptian priorities to restore the country's deteriorating water and salt balance and to improve the management of scarce water resources.

The contribution by the Netherlands was complementary to the assistance of two main donors, USAID and the World Bank. The former provided aid for improvement of the irrigation system, the latter focused on the supply of equipment for implementation of the national drainage programme. Netherlands aid was a small proportion of that provided by these main donors (10–15 per cent). It complemented World Bank support by providing technical assistance for implementation of the drainage programme. As such, it was a vital element in overall donor support to the sector.

During the period under review, objectives broadened and increased in complexity, mainly reflecting the specification of activities on the basis of experience gained during implementation. Since the early 1990s some attempts have been made to incorporate more explicitly current policy themes in the projects, such as environmental conservation and women in development.

There were also changes within the three main components of the support programme: research, drainage execution and Fayoum water management. In research the emphasis shifted from drainage technology to re-use of drainage water for irrigation and subsequently to integrated water management and data collection for environmental problem identification. In drainage execution the technical training remained prominent throughout the period, but increasingly took place in Egypt and gradually came under full control of the recipient organisation, the Egyptian Public Authority for Drainage Projects (EPADP).

For both research and implementation, the initial emphasis on improvement of technical capabilities alone was recently broadened to general institutional strengthening. Recent activities have focused on inventories of training needs and design of human resources development plans.

In Fayoum the emphasis shifted from separate technical research and model building to broader water management issues integrating irrigation, weed control and drainage aspects, including the re-use of drainage water. Recently, experiments have started with water user organisation and farmer participation, and data collection on the socio-economic aspects of water distribution and agriculture.

Netherlands support has primarily been geared towards increasing Egypt's economic self-reliance. Marginal attention was given to alleviating poverty. None of the projects except one in Fayoum had a poverty alleviation dimension among its objectives. The focus on Fayoum is a correct choice in that respect. The area has a high incidence of poverty and substantial inequity in land and water resources. The focus on drainage and water management is in agreement with the general objective of environmental conservation.

There were two main feedback-mechanisms for the results of Netherlands support to Egyptian Government policy, i.e. the regular bilateral consultations and the Advisory Panel of Experts. The former provided a forum in which to review past experiences and to set the agenda for future co-operation between the two countries. The latter focused on technical aspects of co-operation in the sector. The evaluation did not find evidence of Panel intervention and bilateral consultations in terms of priority setting of areas such as cost recovery for drainage works, water pricing and privatisation of institutions in the sector. The actual policy framework in the irrigation, drainage and water management sector was established under USAID and World Bank covenants, which contributed almost two-thirds of donor support to the sector.

### 6.7.2 *Effectiveness*

Assistance to the research institutes has been instrumental in strengthening the technical capabilities of the recipient organisations. The programme stood at the cradle of three of Egypt's leading research institutions in the field of land drainage and water management. Over the years and through the extended support period, these institutes and the Hydraulics Research Institute gained in stature and established valuable contacts with the international scientific community.

The overall effectiveness record of research support in the sector was mixed. It was good in the case of contract research, which was demand-driven and responded to explicitly-formulated assistance requests from end-users. Some 70 per cent of the supported research programmes was not contracted, however. In these cases, effectiveness was rather low mainly because of deficiencies in co-operation between the research community and (potential) clients.

The drainage execution and Fayoum water management assistance programmes also helped to strengthen the recipient organisations through training large numbers of staff and through operational investment support. The goal of speeding-up the implementation rate of the field drainage programme has been partially achieved; from 1992 onwards there has been a gradually upward trend in the area annually brought under drainage, but the annual implementation rate remains well below the original target of 300,000 feddan. The increase in the annual rate is largely the result of massive investment in equipment. It is said that technical assistance had a positive effect on performance quality, but the evaluation found little concrete evidence of that.

In the process, all supported organisations produced a massive number of technical papers and documents which provided further insight into the country's water and salt balance and drainage problems, groundwater development potential and the scope for increasing water management efficiency.

The support has helped to improve technical capabilities of organisations in water management and drainage. Achievement of objectives in terms of overall strengthening of organisations, has been hindered by institutional and managerial problems. In general, assistance was insufficiently embedded in institutional development plans that would enable recipient organisations to benefit optimally from the assistance and to raise the standard of performance. Factors affecting institutional performance are those common for the public sector: low salary levels compared to the private sector, the Government's seniority-based staffing and career development policies, and highly centralised decision-making patterns. Broader organisational strengthening programmes have recently been introduced in Netherlands aid to water management and drainage. At the time of the evaluation, it was too early to establish the effects on organisational performance.

Measuring the overall impact of technical assistance to drainage execution in terms of increased agricultural production or farm income—the ultimate goal of the assistance—is complicated by deficiencies in yield data. The information is partial and based on estimates rather than on duly elaborated benchmark surveys. Available information points at sometimes substantial improvements in yield levels and favourable rates of return in areas with field drainage. This positive effect is also reflected by farmers' explicit desire to have drainage installed in their fields.

In Fayoum, the assistance programme has not led to a more equitable water distribution system. Moreover, the prevailing skewed pattern of land ownership seriously reduces the effect of a more equitable water distribution on farm incomes. Overall, irrigation efficiency has improved mainly through the increased re-use of low-quality drainage



water, thus creating substantial risks for soil salinisation and sustainable agriculture in the longer run.

### 6.7.3 Efficiency

Assistance was provided on a project-by-project basis. Over the period some 25 projects were implemented. The assistance was not embedded in a comprehensive diagnosis of sector constraints and there were no clearly formulated medium and long-term strategies. While there was a rationale for such an approach during the initial period of co-operation in the sector, there was little justification for it in the later stages.

Project identification and formulation took a substantial amount of time and manpower. Appraisal documents usually lacked a comprehensive review of manpower resources, needs for training and other forms of manpower development of the institutions concerned, or of the activities of other donors. Programming of activities and output paid little attention to the wider socio-political and institutional context. The identification and formulation of the East Bahr Saft project was not supported by a cost-benefit analysis or a comprehensive review of equipment availability and needs. For the Drainage V co-financing contribution, formally covered under the World Bank appraisal, the composition of the equipment was revised several times during implementation. For the Batts pumping station preparations were delayed by long discussions on the need for an appraisal study and the role of an external consultant, and by changes in design and construction modalities. Delays in preparation reflected differences of opinion between the host organisation and the donor.

Most projects were not completed within the originally planned time and frequent project extensions and additional funding were needed to complete planned activities. Implementation problems were particularly severe in the three main investment projects. Despite these problems, implementation was generally characterised by excellent working relationships between the staff of recipient organisations and the expatriate and local consultants.

For monitoring the Netherlands Embassy relied for a long period of time primarily on the judgement of the Advisory Panel, which was not officially assigned with a monitoring task prior to 1983. Later the Panel was hampered in executing that task as it consisted largely of persons who, in one way or another, were involved in the implementation of activities. Project files point at recent improvements in monitoring; in several cases the setting-up of a special Steering Committee and the input of the Sector specialist contributed to such improvement. Until very recently, monitoring paid little attention to output aspects.

Evaluations did not result in increased effectiveness and efficiency. During the first decade, activities were not evaluated. Thereafter, evaluations were largely directed towards project extensions rather than to assessing achievement of objectives and shortcomings in efficiency. Since the early 1990s, evaluations have improved, but in several cases they were insufficiently followed up.

The reasons for the relatively low efficiency were manifold. In most cases, implementation problems were attributable to project identification and formulation flaws. Projects were identified on an ad-hoc basis, largely in response to individual assistance requests of the Ministry of Public Works and Water Resources or the Advisory Panel, or to initiatives by Netherlands consultants. Proposals for technical assistance were invariably based on a perceived 'severe shortage' of technical expertise and limited governmental financial capabilities, rather than on institutional constraints, which were not typical for the sector alone, and which could not be dealt with successfully at the level of individual projects.

### 6.7.4 Sustainability

The period 1975–1996 has seen great technological change in the water management and drainage sector in Egypt. The most relevant developments have been: (i) the mechanisation of field drainage construction involving the use of high capacity trenching machines and plastic pipe technology, (ii) the development of new weed control technologies replacing traditional silt removal and chemical weed control, and (iii) the large-scale introduction of computerised data processing and modelling techniques, enhancing management capabilities of all organisations in the sector.

During the early stages external aid, including that of the Netherlands, played an important role in the introduction of these new technologies: they had to be imported; there was an acute shortage of foreign exchange; Government revenues were inadequate to finance these technologies; and staff was insufficiently trained to make optimum use of them. In the meantime, Egypt's foreign exchange position has improved substantially and there is now a considerable number of well-trained Egyptian engineers. Therefore, in terms of technology, the results of the co-operation in the sector are sustainable.

With respect to the research sector, the maintenance of a high quality research capability hinges on the Egyptian Government's ability to introduce institutional and managerial reforms that will improve motivation as well as the salaries of productive staff, enhance the role of the end-user throughout the entire research cycle, and reduce dependency on Government funding through contract research. The outlook is best for those institutes, that have started to develop structural links with society and the economy, and



have secured a more solid financial basis on which to retain and/or recruit motivated staff.

For the drainage executing agency EPADP, organisational and financial sustainability is fairly secure. The technical assistance programme made a valuable contribution to institutionalising the in-service training effort through establishing a self-sustaining Drainage Training Centre and Human Resources Development Department. In view of the Egyptian Government's high priority for the field drainage programme operational and investment support for EPADP is certain.

At the level of the Fayoum water management authorities, organisational and financial sustainability of the results of the assistance effort is also a point of concern. In Fayoum, neither the water management nor the weed control assistance effort have as yet been sufficiently integrated into the regular organisational pattern to sustain benefits also in the longer term. Uncertainty also prevails about the financial sustainability of project operational support in Fayoum. Complete transfer of financial ownership will involve a substantial increase of the Irrigation Department's current operational and investment budget (by as much as 100–200 per cent) which has yet to be sanctioned by the Egyptian Government or otherwise secured (e.g. through direct cost recovery).

## 6.8 Conclusion

The support to water management and drainage was the largest component of the Netherlands development aid to Egypt. Over more than twenty years of co-operation activities have changed from purely technical support to institutional strengthening. The support was innovative in several respects: the introduction of physical and computer models in research; biological weed control by means of grass carp; the re-use of drainage water for irrigation; and experiments with water user associations in Fayoum for improved water management.

Netherlands' assistance to the drainage, water research and water management sector addressed serious problems in a crucial sector of Egypt's development. It was in line with Egyptian priorities, supplementary to that of other donors, and instrumental in strengthening the technical capabilities of relevant Government organisations. Support to research institutions was insufficiently demand-driven, which reduced its effectiveness. The success of assistance to the executing agency EPADP and Fayoum Irrigation Department has improved over time. Efficiency of project implementation was rather low.

Support to drainage and water management has concentrated on the contribution to economic self-reliance. There are indications that the assistance was effective because

of higher crop yields following improved drainage. This has contributed to GDP growth and balance of payments improvement.

Due to the technical/engineering orientation of the support, the absence of baseline data, and weaknesses in monitoring, the effects of the programme in socio-economic terms and, consequently, its contribution to poverty alleviation, cannot be assessed properly. Available information points at little specific effect for poor farmers, apart from estimated overall increases in yields. Also, as little is known about the socio-economic consequences of improved drainage in Egypt, it is not possible to establish with certainty which groups in society have profited from this type of assistance.

In supporting the sector, the co-operation programme addressed one of Egypt's most fundamental problems of preventing the land from becoming waterlogged and salinised, thereby reducing and ultimately losing its productive capacity. Support to the executing agency for drainage works has contributed to the recent increase of annual output and improved quality of drainage, and as such has had a positive effect on sustainable land use. The support to the re-use of drainage water for irrigation is a two-edged sword. While raising output in the short term, continued use of low quality drainage water may seriously endanger the agricultural production base in the longer term. Specific environmental components related to water quality have recently been incorporated in the programme.

In the 1990s attempts have been made to operationalise the women-and-development theme both at the project and sector level. The possibility to integrate the theme in the sector programme was limited because of the latter's technical/engineering nature and the primary concern for improvement of key Governmental agencies.

## 7 Agriculture and animal husbandry

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### 7.1 Background

#### 7.1.1 *Agriculture in the economy*

The Egyptian economy has traditionally relied heavily on the agricultural sector as a source of growth. This dominant role was reinforced by agriculture's strong performance between 1955 and 1969, when production increased over 3 per cent annually. In the 1970s and 1980s the pace of growth declined to 2.0–2.5 per cent. The sector's share in GDP fell from 30 per cent in the early 1970s to less than 20 per cent in the mid-1990s. Its share in the labour force decreased from 58 per cent in 1960 to 50 per cent in 1980 and 30–35 per cent in the 1990s. That the sector's share in GDP is so much lower than the share in employment indicates that labour productivity in agriculture is much lower than in the rest of the economy. This relatively low labour productivity is reflected in average farmers' incomes.

Agriculture contributes about 25 per cent to the value of merchandise exports, while another 25 per cent of merchandise exports are manufactured products of agricultural origin (World Bank/Arab Republic of Egypt, 1993). Its share has dropped from over 80 per cent in the 1960s to the present level, primarily as a result of the sharp increase of oil exports. Cotton has for a long time accounted for 60–70 per cent of agricultural exports and it is still the dominating agricultural export with oranges and potatoes in second and third place.

The agricultural trade balance has been in deficit since the mid-1970s and until 1980 increasingly so. This is due primarily to food production falling short of domestic requirements despite the high cropping intensity (around 180 per cent) and relatively high crop yields. Although the degree of self-sufficiency for major food crops has improved since the mid-1980s, it remains low for wheat (36 per cent) and edible oils (35 per cent). This increase in self-sufficiency took place thanks to important production gains for those crops that were decontrolled as from 1987, and despite rising per capita consumption levels of most high value foods, such as fruit, vegetables and meat.

Public investment for agriculture by the Ministry of Agriculture and Land Reclamation and the Ministry of Public Works and Water Resources during the Second Five-Year Plan (1988–92) were only 7 per cent of total public investment. The importance of the private sector in agricultural investments has gradually risen, in particular in the processing and marketing of fruits and vegetables, grain milling, and the supply of specialty inputs (World Bank, 1993).

### **7.1.2 Main sector characteristics**

Agriculture is entirely dependent on irrigation. Available water resources allow at present the cultivation of 5.7 million feddan (2.4 million ha). About three-quarters of the cultivated area are the so-called Old Lands situated along the Nile and in the Delta. Virtually all of the remainder are the New Lands, i.e. desert land that has been brought under cultivation in recent times. A distinction is usually made between the old New Lands reclaimed in the 1950s and 1960s and the new New Lands developed since the construction of the Aswan High Dam. The Old Lands are highly-fertile, deep-clay soils; the soils of the New Lands vary in suitability. Some of the more loamy soils allow rapid development; others require some 20–25 years of judicious cultivation to bring their texture and composition up to standard. They have in common that they require farming and irrigation techniques as well as cropping patterns that are quite different from those practised on the Old Lands.

Of the total cultivated area, about one million ha. are used for perennial crops (fruit orchards and sugarcane), and the remainder is double-cropped and more or less evenly divided over winter crops (wheat, beans, vegetables and berseem, a type of clover) and summer crops (maize, rice, cotton and vegetables). The last decades have seen a growth of the total cultivated area by about 0.8 per cent per annum, despite annual losses of Old Land of an estimated 40,000 feddan for building purposes. There have been sharp increases in the acreage of vegetables, orchards and wheat. The area under cotton has fallen substantially. These changes stem mostly from the relaxation of compulsory cropping.

The value of animal production is about one-quarter of total agricultural output, which is low in view of the acreage under feed grains and berseem. Traditionally, Egyptian farmers practice mixed farming, i.e. each farmer grows a variety of crops and has a few head of cattle and sheep, for which the feed is grown on the farm. The last 20–30 years have seen the emergence of a number of large-scale poultry units and specialised dairy farms.

The construction of dams and diversion works has marked the beginning of double-cropping. Since completion of the Aswan High Dam two crops per year has become

common practice. Favourable climatic conditions and a high level of farming techniques are at the origins of Egypt's traditionally high crop yields. Further gains in recent years have put the yields of most crops among the highest in the world. Most observers agree that there is scope for further yield rises. Unfortunately, much of the benefit of high yields is undone by the poor state of storage, processing and marketing activities, which causes post-harvest losses of 20 per cent or more. There is also scope for higher yields in livestock production, since productivity is far below world average levels. This is particularly true for milk production.

Before the land reform of 1952 land distribution was quite uneven. The land reform had two components, tenancy regulation and a limitation of land ownership, with the surplus to be transferred to the near-landless. The reform improved tenancy regulations for half the farming population and had an equalising effect on land distribution. It did not stop the pressure on land and mean farm size dropped from four feddan in 1950 to two feddan in 1977 and one feddan in 1985. Since then, it has continued to fall. Although the reform was quite profitable to a large majority of farmers and boosted production, its effects were not lasting because tenancy legislation was largely reversed after 1975 and again in 1992. Moreover, the pressure on land remained strong due to population growth and insufficient employment creation in the non-farm sectors (Riezebos, 1985; APC, 1995).

There are sizeable differences in farm income. Households on farms of 1.5 feddan earn the equivalent of US\$ 250 if the land is owned, or US\$ 200 if tenants. For the smallest farms off-farm income provides the lion's share of household income. In contrast, incomes of households in the above-50 feddan group average the equivalent of about US\$ 30,000 per annum. Furthermore, there are significant regional differences in farm incomes, with those in Middle and Upper Egypt generally being lower than in the Delta and on the New Lands.

Women take a much more important part in Egypt's agriculture than statistics suggest. Of all landowners, some 10 per cent are women and almost 30 per cent of all farm household workers are women. The proportion of women as paid farm workers is much lower: about 10 per cent in 1982 and less than 7 per cent in 1990. Most women are unpaid family workers; they are particularly active in animal husbandry, in processing such as cheese-making, and in marketing; and also in periods of peak labour demand, such as harvesting (Mansour 1994).

### 7.1.3 *Government policy*

Government control over the economy was pervasive up to the beginning of the Economic Reform Programme in the early 1990s. The agricultural sector was no exception. Since the 1950s the government had controlled the supply of all major inputs including irrigation water, prescribed the cropping pattern, and set the prices and delivery quota for major crops. In addition, it undertook the processing and marketing of basic foods and cotton, and incorporated some 300,000 feddan of New Lands into a number of inefficiently run state farms. The reduction of government control in the agricultural sector started in the mid-1980s, i.e. earlier than in most other sectors of the economy.

An overview of the role of Government in agriculture during the last 40 years reveals that the period 1952–74 was characterised by the land reform, the installation of state-run co-operatives, the nationalisation of cotton marketing, and a land reclamation programme directed towards small farmers. It was also a period of high rates of growth in farm production, partly as a result of the completion of the Aswan High Dam in the 1960s. The Open Door Policy of the mid-1970s had little stimulating effect on the agricultural sector. State domination continued, public investment levels dropped and agricultural production fell sharply. The food gap that developed as a result of low producer prices and the extreme subsidisation of bread and other foods became unsustainable. In the early 1980s, the Government took a number of corrective measures: input subsidies were removed, as well as controls on output and prices on crops other than cotton and sugarcane. Constraints on private sector activities in input and credit supply and foreign trade were lifted. As from 1991 the Government embarked upon a comprehensive economic reform and structural adjustment programme. For agriculture the measures included interest rates at market level instead of heavily subsidised rates, the privatisation of all state marketing except for cotton, and first steps towards the privatisation of state farms.

Thus, in a relatively short period of time agricultural production has turned from being the most controlled part of the economy to the most decontrolled. In the processing and marketing of agricultural produce the role of the state is also gradually diminishing, although still quite important.

### 7.1.4 *Main problems*

The agricultural sector in Egypt is facing several serious problems. Water is the scarcest production factor which calls for two types of measures: the reduction of on-farm and system water waste, and the cultivation of crops with the highest productive value per unit of water. Donors, the World Bank in particular, have advocated the introduction of

water fees as a main instrument for economic water use, but Egypt is resisting this on financial, social and political grounds. It should be mentioned that virtually everywhere the system is designed in such a way that farmers bear the cost of lifting the water to field level. This is obviously an incentive to reduce waste of water, at least on the farm.

The growth in rural population has led to a continuous size reduction and fragmentation of landholdings. Today about half of all holdings are less than one feddan, which obliges the operator to look for employment outside the farm. At the same time, the gradual abolition of the provisions of the 1952 land reform has recreated a substantial number of large farms, which are highly mechanised and employ little labour. Moreover, as an increasing number of male farmers have to engage in off-farm work, women take care of the operations on the mini-farms. Recently, the Ministry of Agriculture established a special unit to analyse problems and possibilities for support to the mini-farms, and the role of women in farming.

The positive effects of price liberalisation, free cropping patterns and the gradual privatisation of state farms are to a large extent undone by the huge product losses in storage, processing and marketing. Many attribute these losses to the fact that these stages in the production cycle are still in the hands of public companies, which also suffer financial losses. Privatisation is hampered by the potential buyers' lack of freedom to manage the depreciated capital and surplus labour as they see fit.

The highly-intensive agricultural system requires a constant input of fertilisers and chemicals in order to maintain and increase yield levels. This has serious environmental consequences as residues enter the drainage system, with adverse effects on irrigation and drinking water supply (World Bank, 1993; USAID, 1992; APC, 1995).

## 7.2 *Netherlands assistance*

The Department of Foreign Agricultural relations of the Ministry of Agriculture is in charge of the co-ordination of external assistance to the sector. The department does not keep a complete record by donor and type of activity. Available information points at a large number of donors supporting the sector, the absence of a particular sub-sectoral or geographical pattern of support, and the occasional occurrence of joint co-financing, such as the World Bank sponsored Master Plan for a network of grain silos in the early 1980s.

The USA, EU and the World Bank are the principal donors in the sector, The USA's main project was the National Agricultural Research Project, which stretched over the period





*Intensive agriculture (photograph: Arcadis/Euroconsult)*

1985–94 at a total cost of US\$ 200 million. Much of the budget was spent on fellowships for Egyptian researchers to study in the USA and on studies by joint US/Egyptian teams. It is followed by the Agricultural Technology Utilisation and Transfer Project (US\$ 50 million for the period 1996–2002), specifically designed to support initiatives in applied research by the private sector, and to promote the production and export of a selected number of fruit and horticultural produce.

The European Union is the second largest donor for the sector. Its chief activity has been the US\$ 50 million nation-wide Food Sector Development Programme, whose main components include dairy production, training, credit and institutional support to the Animal Production Research Institute of the Ministry of Agriculture. This was continued in 1996 as the Agricultural Sector Development Programme focusing on dairy development and production, processing and marketing in the fields of poultry, horticulture and aquaculture (USAID, 1992).

The World Bank, with disbursements averaging some US\$ 15 million per annum over the past ten years (including drainage and irrigation infrastructure), focuses its support on private sector development, agricultural extension and marketing in particular. All other donor budgets and projects are much smaller in size.

### **7.2.1 Policy and programme**

Netherlands support to the agricultural sector dates back to the beginning of development assistance to Egypt in 1975. In 1977 a policy memorandum provided the arguments for the support: more than 50 per cent of total employment is in this sector and the government gives high priority to agriculture. In fact, public investments in the sector were low and the high share of the labour force in agriculture would suggest emphasis on employment creation in non-farm sectors. Within the sector, the Netherlands aid emphasised food production and more especially the production of animal protein, as this was expected to create the best possibilities for the improvement of living conditions, it complied with government policy, it would have a downward effect on food imports and food subsidies, and it corresponded with Netherlands expertise. Moreover, support to the agricultural sector was seen as complementary to that to water management and drainage, which focused on the improvement of agricultural infrastructure.

Subsequent policy documents for the period 1980–89 do not provide further specifications of policy on the basis of experience gained or in relation to changes in Egyptian policy. The priority for food production was confirmed and integrated rural development and horticulture were mentioned as new priorities. In the 1990s the country policy plan mentions the possibility to support activities focusing on food production by means of programme aid.

Netherlands support to the sector over the period 1975–96 totalled Dfl. 160 million, i.e. some 20 per cent of total Netherlands aid to Egypt. It has been highly diverse and consisted of 40 to 45 separate activities. The number of projects and shipments of goods is not easily determined, because in several cases one type of operation consisted of a series of successive activities or phases. Aid to the sector included some Dfl. 30 million of programme aid, which was often combined with, or hard to distinguish from, project aid. Like project aid, programme aid sometimes lasted several years and often had a technical assistance component.

There was a substantial proportion of commodity supply in the support to the sector. This ranged from capital goods such as hatcheries, greenhouses, milk factory equipment and a grain silo, to inputs such as several types of sprayers, fertilisers and vaccines against foot and mouth disease. With some exceptions, all commodities were supplied by firms from the Netherlands.

Some activities were financed as a grant, others as a soft loan. From 1989 onwards all aid to Egypt was in the form of grants. One activity (a hatchery for the state poultry company) has been financed by so-called mixed credit, i.e. financing by two types of



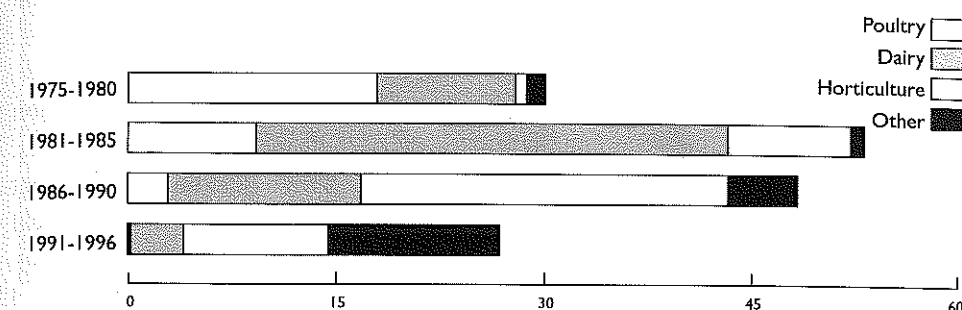
loans, one at concessional and the other at commercial terms by a private bank. There were no fundamental differences between the type of goods provided under the various arrangements: for example, hatcheries were supplied on wholly commercial terms, with mixed credit facilities and as grants.

The support shows a concentration on three sub-sectors: poultry, dairy and horticulture, with respectively 19, 38 and 32 per cent of total disbursements in the sector. The present review covers 17 sets of activities, representing 90 per cent of total disbursements. Table 7.1. shows the amounts and timing of the sets of activities supported.

**Table 7.1 Assistance to agricultural/animal husbandry sector, 1975-96 (Dfl. mln)**

	1975-80	1981-85	1986-90	1991-96	Total	%
<i>1. Poultry industry</i>						
Fayoum poultry project	7.6	3.0	2.7	0.3	13.6	
Hatchery equipment	-	4.0	-	-	4.0	
Helwan/Tahrir project	10.4	-	-	-	10.4	
Damietta duck station	-	2.4	0.2	-	2.6	
Sub-total	18.0	9.4	2.9	0.3	30.6	18.7
<i>2. Dairy industry</i>						
Damietta dairy project	9.2	13.3	0.9	-	23.4	
Milk factories renovation	-	19.6	4.0	2.4	26.0	
Vaccine supply	-	-	5.8	-	5.8	
Artificial insemination centre	0.7	0.2	-	-	0.9	
Supply of fodder seeds	-	-	1.2	1.4	2.6	
Other	0.1	0.9	2.0	-	3.0	
Sub-total	10.0	34.0	13.9	3.8	61.7	37.7
<i>3. Horticulture</i>						
Greenhouse development	-	3.6	8.5	0.8	12.9	
Fayoum horticulture	-	1.8	3.5	5.6	10.9	
Potato cultivation	-	1.3	1.6	2.1	5.0*	
Soluble and other fertilisers	-	-	8.0	-	8.0	
Agricultural inputs	-	-	4.9	2.0	6.9	
Other	0.7	2.1	-	-	2.8	
Sub-total	0.7	8.8	26.5	10.5	46.5	31.5
<i>4. Miscellaneous</i>						
Fayoum grain silo	-	-	-	12.2	12.2	
Other	1.4	1.0	5.0	0.1	7.5	
Sub-total	1.4	1.0	5.0	12.3	19.7	12.1
Grand total	30.1	53.2	48.3	26.9	158.5	100.0

\*Excl. seed potatoes under food aid (5.0 million).



**Figure 7.1 Support to the agricultural sector 1975-96 (Dfl. mln)**

### 7.3 Poultry

Poultry production in Egypt takes place in two distinct systems: (i) through the traditional backyard method and on medium-sized farms, which in 1994 produced a quarter of the meat and a third of the eggs; and (ii) the industrialised system in specialised production units. For a long time the only large-scale producer was the state-owned General Poultry Company (GPC, now United Poultry Company or UPC), but as from the early 1980s government policy allowed the private sector to establish large-scale units. At present, there are about 12,000 private poultry farms with at least 15,000 birds each. The large producers have massively adopted highly productive hybrids, whereas the traditional sector uses local breeds.

After a long period of stagnant production levels, the production of poultry meat and eggs showed a sharp increase during the early 1980s as a result of a policy of feed subsidisation. When this policy was abandoned in the second half of the 1980s, output gradually dropped and three-quarters of the 20,000 private enterprises went bankrupt, also as a result of the importation of frozen poultry products at dumping prices. There is still a huge over capacity in the sub-sector, particularly in the public companies. Only 30-35 per cent of broiler production capacity is used and there is also excess slaughterhouse capacity. Much of the consumption of poultry meat is by higher income categories and by institutional consumers. Since 1990 no imports of poultry meat and eggs have been allowed.

Since 1975 the Netherlands has supported four activities to strengthen the poultry industry, all by means of the supply of modern equipment (hatchery equipment, a feed mill, climate control equipment, generators) and prefab buildings. Two involved the General Poultry Company units at Helwan, Tahrir and El Salam; the other two concerned co-operation

with the Fayoum and Damietta Governorates (the Fayoum Poultry project focusing on indigenous breeds and the Damietta Duck Station project).

The objective of all four activities was to stimulate domestic egg and meat production in order to reduce dependency on imports, and involved the supply of stock to farmers. Only in one case, the Damietta duck station, had objectives been quantified. Equipment was provided to large-scale public companies without being accompanied by technical assistance. In fact, they were all turn-key projects with standard equipment provided by Dutch firms already operating in Egypt. In spite of this, preparations took a substantial amount of time, i.e. some five years between submitting the request and commissioning the installations. The reasons for the delays were the sending of several missions to identify and formulate the projects, budget adjustments in relation to changes in the type of commodities, bureaucratic procedures, changes of location for the projects, and delays in construction. Moreover, in several cases breakdowns occurred because of the recipient's inadequate level of operation and maintenance.

The present state of the equipment is quite satisfactory: the hatching equipment, although 10–15 years old, is generally in good working condition, mainly thanks to the suppliers having well-stocked representatives in Cairo. The poultry houses in Fayoum are still in good order, those in Tahrir much less so. There have been substantial problems in maintaining and operating climate control and other modern peripheral equipment, and most are out of order.

The results of the support to the poultry sub-sector have been rather good. The favourable government policy during the 1990s has contributed in no small measure to this satisfactory outcome. The current output of the Damietta duck station considerably exceeds the objectives. Performance is positively influenced by the high demand for ducklings, and the possibilities to use revenues for running costs and topping up of staff salaries.

Results have also been quite satisfactory for the Fayoum project. The poultry farm has been operating at full capacity, while other units elsewhere show considerable under-utilisation. The likely reason is that the Fayoum farm can offer a variety of breeds and crossbreeds that are much in demand, also abroad. However, the feed mill operates well under capacity; it cannot compete with other suppliers who offer much better conditions. Also, the hatching equipment supplied to the United Poultry Company is under-utilised and at present operates at about 50–70 per cent of its capacity.

#### 7.4 Dairy

Egypt's dairy herd of an estimated 5.7 million animals consists of 3.0 million buffaloes, 2.4 million local cattle, 0.2 million cross-bred and 0.1 million foreign pure bred cattle. Some 3.2 million are adult females. Almost all dairy cows, i.e. 97 per cent, are held in herds of less than 10 animals, mostly not more than three head, on small mixed farms. The remainder are kept on medium and large-scale specialised farms and consist of pure bred and cross-bred animals only. The proportion of cross-bred and pure-bred on small holdings is much lower, about 50 and 20 per cent respectively.

Total milk production is estimated at 2.5 million tons, of which two-thirds is buffalo milk. Yields vary per type of animal and type of farm. The yield of buffaloes on small farms averages 900 kg of milk per year, that of local cattle is as low as 500 kg. The yearly output of pure-bred cows on large specialised farms is 3000 kg. An estimated one million tons or 40 per cent of total output is marketed as fresh milk; the remainder is consumed on the farm, or processed into cheese.

There are three marketing channels: Collector-peddlers of buffalo and cow milk, small collector-cheese makers who sell on local markets and absorb the bulk of marketed milk; and modern dairies. These dairies take in part of the milk they process from individual large-scale farms and village collection centres; the remainder is imported as butter oil and skimmed milk powder. The major player among the modern dairies used to be the Misr Milk and Food Company (MMFC), a public company that operates seven dairies. Since the Open-Door policy MMFC has lost its dominant position to half a dozen private companies

Three policy decisions have influenced the present state of the dairy industry: (i) the subsidisation of feed between the mid-1970s and the early 1990s, which strengthened the competitiveness of domestic milk production, at least for large-scale farms; (ii) the Open-Door policy that allowed private dairies to enter the scene as from the early 1980s; and (iii) the decision to allow free imports of dairy products, which kept farmgate prices of locally-produced milk at unprofitable levels up to the late 1980s, i.e. at the time when world market prices remained low due to EU surpluses (APC, 1995).

The Netherlands support to the dairy industry consisted of seven activities of which five have been reviewed, including the two major ones. These were the Damietta Dairy Project (DDP; 1975–88) and the renovation of two milk factories of the Misr Milk and Food Company (MMFC; 1979–96), together representing about 80 per cent of total Netherlands support to the dairy sub-sector. The evaluation also included support to artificial insemination, the supply of vaccines against foot and mouth disease and of fodder seeds.

The supported activities varied considerably with respect to the goods and services supplied, recipient institutions, ultimate beneficiaries, types of aid and financing conditions. The goods supplied ranged from vaccines to fodder seeds, to dairy processing equipment and vehicles, to equipment for artificial insemination, and breeding stock of pure-bred Frisian cattle. Technical assistance consisted of courses in animal husbandry and operating a credit programme in DDP, and training in maintenance and spare parts-handling in the support to MMFC. All recipient institutions were public entities, but their nature differed from veterinary services to agricultural research, to a large-scale dairy farm, to a milk processing company. The actual beneficiaries varied from all cattle holders (vaccines supply), to large cattle farms (the supply of fodder seeds, introduction of artificial insemination and supply of imported pure-bred cattle to the state farm in DDP), to small farms (credit programme and training in DDP). The beneficiaries of support to the MMFC were supposed to be low-income consumers.

The implementation of activities was often characterised by substantial delays due to bureaucratic rules and regulations on either two side, and differences of opinion between Egypt and the Netherlands about priorities. For example, eight years passed between the identification and installation of equipment in the Misr Milk plants, mainly due to protracted procedures by the Egyptian bureaucracy. In the Damietta dairy project the Egyptian authorities did not share the interest expressed by the Netherlands in promoting smallholder development. The support to the Misr milk factories suffered in particular from the initial refusal of technical assistance by the recipient organisation. The pace of implementation of the Artificial Insemination Project was hampered by the absence of a power supply, improper positioning of machinery at the sites, and lack of continuity in the technical assistance.

The direct output of the various activities differed considerably for projects and project components. In the Damietta project the pilot farm component has been characterised by extremely low milk yields and overstaffing. It is a non-viable enterprise, which recently has been put up for sale. The large-scale parastatal farm, another component, is understocked and overstaffed; it has been unable to replace worn-out machinery because of lack of funds. A third component, the training centre, had a useful function during its ten years of existence. A large number of smallholders, extension officers and veterinarians were trained, but the number remained well below the targets set at its creation. The activities were discontinued after donor funding was terminated. The smallholder component was quite successful: a total of 500 farmers were supplied with dairy cattle and their training resulted in improved animal husbandry. It had a positive effect on their output and incomes, in many cases an effect that still lasts today.

The renovation of the Misr milk factories at Cairo and Alexandria was conceived at

the time of pervasive state control of the economy. There was a belief in the feasibility of combining profitable domestic milk production, efficient processing in state dairy plants, and supplying consumers with low-priced milk. The factories suffer from frequent breakdowns, low fresh milk intake and shortage of spare parts. They operate at less than 25 per cent of capacity, and due to this and overstaffing the MMFC is incurring losses. The possibilities of privatising the factories are now being studied.

Fodder seeds were supplied in two shipments. The first was primarily for research purposes; results differed for the various fodder types, but were generally positive. A second shipment was made of the same types of seed despite it being known that local production of these seeds was not possible and that farmers were unwilling to buy seed at import prices.

The supply of equipment for two Artificial Insemination (AI) stations resulted in the creation of a new type of service provided at subsidised rates to large cattle owners. Present output levels are half of normal capacity in one station, but were satisfactory where another donor continued support. The effort to assist in shaping a national AI-plan was poorly timed and did not achieve a positive result.

The supply of vaccines against Foot and Mouth Disease fitted into a vaccination campaign coordinated by FAO. The vaccine provided by the Netherlands was effective; no further cases of the disease were reported on farms where it had been used and the protective potency of the vaccine contributed to the rapid extinction of the disease. Furthermore, Netherlands support helped to establish production facilities in Egypt, which presently cater for total domestic demand.

## 7.5 Horticulture

In 1990 horticulture, including orchards, occupied some 15 per cent of the cropped area and used as much of available irrigation water. It contributed 22 per cent to 26 per cent of agricultural value added, in economic and financial prices respectively. Vegetables including potatoes, have a high return to the scarcest production factor, i.e. irrigation water.

Horticultural production is widespread in Egypt with the New Lands having a preponderant share. This is particularly true for cultivation under low and high plastic tunnels, so-called protected cultivation. High tunnels are not allowed in the Old Lands. Five crops cover 75 per cent of the area: tomatoes, potatoes, oranges, grapes and onions, with tomatoes representing 60–70 per cent.



*Marketing of tomatoes in Fayoum (photograph: Arcadis/Euroconsult)*

In spite of the rapid growth of vegetable exports, they still represented only 5 per cent of all output in the sub-sector in 1994. The principal markets are the Gulf States and the EU, the latter of which is rapidly expanding. The leading export crops are oranges and potatoes, followed at a distance by garlic and onions. Tomatoes are primarily grown for the domestic market, but exports are rising.

Commercial vegetable producers are typically medium-size farmers with 5–10 feddan of land. Because of the risks involved the small farmer with less than one feddan avoids horticulture, grows staple food crops and attempts to supplement his income by off-farm work. Farms producing for export are usually large farms, able to time output and control quality and often using greenhouses.

Horticultural production has not been subjected to the same measure of state control as most other crops. Significant problems are post-harvest losses, virus infection in tomatoes, and the lack of adequate market information.

The Netherlands support to horticulture comprised six activities of which two, started in 1980 and 1981, were still operational at the end of 1996: the Fayoum horticulture project and the potato project. The other four were support for a potato cold store, supplies of inputs and soluble fertilisers, and the greenhouses project. The six activities varied considerably in nature and in level of disbursements. Three activities comprised over

70 per cent of total expenditure: the supply of greenhouses (some 30 per cent of aid disbursements to horticulture), the Fayoum horticulture project (about 25 per cent) and the supply of soluble fertilisers (20 per cent).

Commodities supplied to the sub-sector ranged from greenhouses with computerised climate control to hand-operated, mechanised and tractor-pulled sprayers and other agricultural inputs such as soluble fertilisers. All recipient institutions were public or semi-public entities.

The greenhouse project consisted of the supply and construction of some 210 fully equipped greenhouses and two packing stations, accompanied by some operational assistance, subsequently followed by technical assistance. The greenhouse structures and air heaters were supplied by a Dutch firm but were virtually all of Italian origin. An analysis of Egyptian policy on protected cultivation was made after the supply, when doubts arose about water quality and scope for large-scale production at the original site (El-Qassasin, near Ismailiya). Egypt decided to shift the 1986 supplies to a new site (Bossaily, near Rosetta), although there were differences of opinion between Egypt and the Netherlands and also among the Netherlands authorities about the suitability of that area. Moreover, during storage at the El-Qassasin site part of the 1986 supplies disappeared, and the Netherlands provided additional greenhouses and equipment. As Egypt did not arrange on time for the essential amenities (water, fuel and electricity) at Bossaily, the installation could not be tested properly at the time of hand-over. Subsequently, Egypt was not satisfied with the quality of the installation at either site, and accepted technical assistance as a way to make up for the allegedly defective installation. However, technical assistance suffered from lack of clarity about the actual purpose of the project: large-scale production of vegetables, research, or the training of young graduates who would soon operate their own farm.

In 1988 the El-Qassasin complex was transferred to a private firm, which left the installations in ruins after only three years. In 1996 a new owner started rehabilitation of some of the greenhouses. In Bossaily all Netherlands-financed greenhouses are in production, although the technologically-advanced climate control system is out of order and there is a backlog in maintenance. About one-third of the complex is used for applied research; the remaining part focuses on production. Revenues from vegetable sales are used to pay for inputs and the wages of casual labourers; half of the surplus is for topping-up staff salaries. Another part of the activities concerns training, the operational costs of which are paid from an EU-funded project

The Fayoum Horticulture Development Project assists horticultural production, in particular of tomatoes, by providing technical assistance and equipment. The project was



identified in 1981 and started in 1984. During the first three years activities were limited to the supply of a shade hall and plastic tunnel, and to some farm surveys. During an interim phase (1986–88), the project quickly gathered momentum when it began to sell improved tomato seedlings to growers, until in 1989 the Yellow Leaf Curl Virus suddenly took on epidemic proportions and threatened to wipe out the tomato crop in the Fayoum. From then on, the project focused on controlling the virus disease, which was contained after discouraging and confusing initial results. At the beginning of the third phase (1993–97), in addition to the technical difficulties, the project was confronted with a broadening of objectives (research into the farming systems of tomato growers, involvement of small farmers and women) and contradictory recommendations by several evaluation and reformulation missions about incorporation of the project into regular government structures. The project's main achievements are the screening of varieties resistant to Yellow Leaf Curl disease, the adoption of these varieties by growers, work on pest and disease management which may lead to the use of ecologically less harmful biocides, and the training of specialised horticultural staff.

The Netherlands has supported potato cultivation in Egypt in several ways. In 1977 it provided food aid in the form of seed potatoes amounting to Dfl. 5 million. In 1978 a project for a 200 tons improved traditional potato cold store was identified, with the double purpose of introducing effective intermediate storage capacity and serving the storage research in the National Programme of Potato Cultivation (NPPC). The store has been used only for about one month for its original purpose; since a breakdown in the cooling cell, it has been used for general storage.

The main activity with regard to potato production is support to the NPPC. This started in 1982 for a three-year period, concentrating on testing varieties, seed production and inspection, pest control, mechanisation, storage of tubers, and staff training. In 1989 when a training centre was established at Tanta, project headquarters shifted there from Cairo. Research activities are carried out at the premises of the nearby North Africa/Middle East outreach station of the International Potato Centre, which also provides essential technical support. Basically, research and training have focused on technical aspects. Technical research covered (i) testing of varieties for their suitability for different forms of processing; (ii) mechanisation to overcome the perceived shortage of labour, to substitute for draught animals and to improve cultivation; and (iii) up-grading of traditional farm-level storage. Short training courses were provided for extension officers and farmers, all in all some 1100 persons in the period 1988–95.

Although the research was effective in turning-out new findings, it is not known to what extent these findings have affected the potato industry due to lack of information on adoption rates of innovations. Research on storage improvement has indicated a

substantial decrease in losses, so much so that the need to subsidise this improvement is doubtful. Mechanisation research enhanced the local production of machinery adapted to Egyptian circumstances. At present, mechanisation is fully accepted on the large farms in the New Lands and becoming increasingly important in the Old Lands. Up to 1996 requests of evaluation missions to demonstrate the economic viability of research results went largely unheeded. The effects of training on production and on the incomes of potato growers have never been monitored.

Other activities supported by the Netherlands in the horticulture sub-sector refer to the provision of inputs, chiefly soluble compound fertilisers, and various types of sprayers (5230 hand-operated, 8160 motorised knapsack sprayers and 300 sprayers to be mounted on tractors). These were provided in four batches in the period 1985–91; fertilisers were sent in two batches of respectively 1500 tons in 1986 and 2700 tons in 1989. All commodities were made available as programme aid and on a grant basis to public agencies. The latter sold the goods almost exclusively to state farms and to medium and large private farmers, with the exception of the hand-operated sprayers. There is little or no quantitative information about the effects of these inputs in terms of employment, production and income. The use of soluble fertilisers has become widespread; the introduction has been successful from the point of view of satisfying a demand, primarily from large-scale private and state farms, that has since been shown to be technically, economically and environmentally sound. At present these fertilisers are imported on commercial terms (although not from the Netherlands), which is indicative of a positive effect on output.

## 7.6 Other activities

In the support to the agricultural sector, there has been one major activity outside the three sub-sectors, i.e. the Fayoum grain silo. This project consisted of the supply and construction of a 23,000 ton grain storage facility, the supply of seven dump trucks of 30 tons capacity, accompanied by assistance in the design, tendering and supervision of the silo construction. The activity fitted into a World Bank-sponsored master plan for a country-wide network of silos.

The first request for assistance was made in 1985; it was followed by a number of expert missions and reports in which the principal issue appeared to be the capacity of the facility. In 1990 the Netherlands agreed to finance the project and a consultant was contracted to prepare the design, organise the tendering and supervise the construction. Tendering took place in 1992, i.e. a period of almost eight years was needed for the preparation of a run-of-the-mill construction, involving costs for work that could have been provided free

of charge by the builder. Construction started in 1993 and was completed in 1994. The complex has been in use since then, with an intensity of five cycles per year.

The principal objectives of the grain silo project were to improve the quality of storage and to reduce storage costs by introducing bulk transport as part of a chain in which imported wheat would move from ship to mill in bulk and by train instead of by bagged road transport. Compared to the customary method, the new method was intended to reduce transport and handling costs as well as grain losses.

Available reports do not provide insight in how the expected benefits were expected to develop. In the absence of a proper economic analysis, a partial proxy involves quantitative information on the extent in which the project achieved its objectives. In 1995, the annual throughput was 150,000 tons against an estimated 175,000 expected. Some 10 per cent of the grain taken in was reported to be in bags and 90 per cent in bulk. Recent increases in wheat production in Fayoum has raised the proportion brought in in bags. All wheat has come by truck, mostly from Alexandria, but increasingly also from local producers. Of the outtake, about half goes in bulk to the mills in Fayoum, and half in bags for open-air storage elsewhere in the governorate. In other words, storage quantity objectives were largely achieved, but the advantages of bulk rail transport have not yet materialised, and savings from handling in bulk rather than in bags have only partly been achieved. There is no information on changes in storage losses.

One small-size project must be mentioned separately. The promotion of women's role in food production focused on training in food production and home economics and on the supply of credit for productive purposes. It was implemented in six villages in three governorates, including Fayoum, and was prepared and monitored by FAO and executed through the Ministry of Social Affairs. The project had a positive impact on a number of low-income women despite considerable inefficiencies such as the long gestation period, the complicated and top heavy organisational structure, and the large proportion of the Dfl. 1.2 million project costs spent on peripherals (almost 50 per cent on study tours, FAO commission, topping-up of salaries). There was a high participation in the training, and the target group continued to be interested well beyond the official project period. An important non-material side effect has been that participants have begun to deal with institutions such as the local bank, health care and family planning units and veterinary services, on their own and not through their husbands and male relatives. The principal factors in achieving these good results were the provision of a package that corresponded to the needs of the target group, the combination of training and credit facilities, and effective local supervision.

## 7.7 Assessment

### 7.7.1 Policy orientation

Activities supported under Netherlands aid have addressed relevant priorities in Egypt's agricultural sector: the need for increased food production, animal proteins in particular, in support to the poultry and dairy sub-sectors; and the need to make more effective use of available land and water resources in the aid to horticulture. The potential to contribute to the solution of prevailing problems was not fully used; the assistance was not preceded by an analysis of sector characteristics and constraints. At present, such a sector aid strategy is in preparation.

A 1977 policy note on Netherlands aid to Egypt justified selection of the agricultural sector by referring to the assumed priority that Egyptian policy gives to agriculture. However, by subjecting the distribution and pricing of farm inputs to strict state control, by fixing most farm-gate prices at very low levels, and by taking on itself the collection, processing and marketing of major products, the Egyptian government in fact did not give priority to agriculture but rather attempted to promote the development of non-agricultural sectors by a 'cheap food' policy. This policy changed by the mid-1980s.

In the rather general terms in which priorities were formulated in country and project documents, compliance with Egyptian policy was high. All activities submitted for financing to the Netherlands were presented as priorities. In addition, during the period of development assistance in which the state had pervasive control over the agricultural sector, it was almost unavoidable to work through and for statal and parastatal entities. With the advent of the reform process in the early 1980s this approach persisted, rather than activities being selected that could have enhanced Egypt's new policies. Moreover there is no evidence that Egypt requested support that would enhance the transformation of its economy. Rather the reverse, in fact: all the requested support continued to be directed towards public enterprises.

As for priorities within the sector, the Netherlands focused its support in the late 1970s on state organisations in animal husbandry, disregarding the Egyptian context of the time in which public companies were overstaffed and underfinanced. In the case of dairy there were also a large number of milk vendors and small producers of cheese; in the case of poultry there were many backyard producers. Moreover, both industries suffered from the competition of imports at below cost price. This situation ended in the late 1980s when imports of poultry meat were banned, and the world market for dairy products became somewhat healthier following EU measures to reduce excess production.

In the mid-1980s Netherlands assistance shifted its emphasis to horticulture, partly as a result of vigorous marketing efforts by Dutch suppliers of equipment and inputs. However, the priority for horticulture was a rational choice in the Egyptian context as horticulture draws maximum value added from scarce resources, and was not subject to much state control. On the other hand, very few small farmers venture into horticulture because of the risks involved, and activities were hardly focused on the target group of Netherlands aid.

In the period 1975–96, two activities in agriculture were explicitly directed towards a target group, i.e. the Promotion of Women's Role in Food Production and the smallholder component of the Damietta dairy project. The latter is also an example of how the objectives of Egypt and the Netherlands diverged: whereas the Netherlands aimed at a larger share of the project to benefit smallholders, the Egyptian authorities did not want such a component at all. A compromise was struck but the smallholder component was discontinued soon after the end of Netherlands support. In sum, most activities supported in the sector focused on increasing economic self-reliance rather than on direct poverty alleviation.

### 7.7.2 *Effectiveness*

An assessment of the effectiveness of Netherlands support to the agricultural sector is hampered by the general nature of the objectives without further quantification, and by the absence of feasibility studies. With the exception of the Fayoum grain silo, no projections have been made of the effects of the goods provided, nor specific agreements on the type of recipients or their obligations.

Overall effectiveness was rather disappointing: of the seventeen activities reviewed six showed a successful performance (three of the four poultry activities, the supply of vaccines against foot and mouth disease, the Fayoum horticulture project, and the project to promote women's role in food production). Together, they represent one-quarter of total Netherlands aid disbursements to the sector.

In contrast, six activities showed disappointing results and achieved only a small part if any of their objectives. These activities represented over 40 per cent of disbursements in the sector, and included most of the larger projects in financial terms: the renovation of milk factories, a large part of the Damietta Dairy Project, and the supply of greenhouses. The results of other activities were mixed. This included the support to the grain silo. In spite of its intensive use, the expected advantage of bulk transport, i.e. the main justification for Netherlands support, was only partly achieved.

In terms of type of support, the supply of capital goods was successful in the poultry sub-sector because of a favourable government policy context and the reliable supply of spare parts. The effects of the supply of capital goods to dairy and horticulture were disappointing because of the lack of sufficient technical assistance, the inadequate design of goods, and institutional deficiencies. Supplies of other inputs were partly successful, mainly where they addressed a clear need and goods were of proper quality. Technical assistance had a relatively favourable outcome because of its orientation towards prevailing technical problems, the effects on the motivation of Egyptian staff through incentive payments from donor funds as supplement to low salaries, and the easy access to auxiliary equipment and funds for operational costs.

The effectiveness also differed for the various industries. Assistance to the poultry industry (only commodity supplies) was quite successful. That to horticulture was mixed, which especially positive outcomes for Fayoum horticulture and the supply of soluble fertilisers. However, activities in horticulture focused on the larger farmers. The effectiveness of the support to the dairy industry was rather low, and objectives were achieved to a minor extent. The most successful activities were the supply of vaccines against foot and mouth disease and the support to smallholder dairy farmers in the Damietta project. The former succeeded in avoiding a reduction in the national dairy herd, most of which is held by smallholders. The latter achieved a structural strengthening of the economic position of 500 small dairy farmers. The main reason for this low effectiveness was the concentration of support on an inefficient public sector which was already facing serious problems due to the lack of protection against imports at artificially low world market prices, largely caused by EU dumping practices. Moreover, there was increased competition as a result of new policies that favoured the private sector.

All in all, the main determinants of success appear to be, in order of importance, a favourable government policy and the availability of adequate technical assistance. The favourable policy environment was especially noticeable for the poultry industry. Resident technical assistance contributed substantially to the results in the smallholder component of Damietta dairy, Fayoum horticulture and the promotion of women's role in food production, and favourably influenced the outcome of the greenhouses project in Bossaily.

### 7.7.3 *Efficiency*

In terms of project cycle management, the efficiency of Netherlands assistance to the agricultural sector was rather low. It was clearly unsatisfactory for more than half the projects, representing 55 per cent of disbursements. For some 15 per cent efficiency was good, i.e. the support of poultry production and the successful supply of vaccines. The

remaining projects took an intermediate position. Straightforward supplies of goods were no more efficient than more elaborate forms of support that involved recruitment of staff, and the organisation of long-term collaboration between recipient and donor institution/consultant.

Project preparation was often prolonged over several years due to communication problems between the two parties, and to delays in decision-making by either party due to complex rules and regulations. Extreme cases of such delay are the milk factory renovation and the grain silo, for which preparation took almost eight years. The quick and adequate response to the outbreak of foot and mouth disease marks the other extreme. Identification and formulation was in most cases a donor activity, i.e. carried out and financed by the Netherlands. This led to differences of opinion about objectives, often buried temporarily in compromises and re-appearing during implementation. A frequent source of disagreement was the need for, and the magnitude and duration of, resident technical assistance. Egypt was convinced that this was superfluous and a waste of resources. The Netherlands considered it essential for achieving the objective, in most cases correctly so.

Implementation was hampered by differences of opinion about the quality of goods supplied, changing donor policy priorities (which led to more complex project objectives), and inadequate monitoring. Until the late 1980s there was no system of regular monitoring. The Netherlands did not ask for project completion reports and such reports were made for only two projects. Evaluation became a regular phenomenon in the mid-1980s but was applied only to projects with a technical assistance component. Evaluations differed considerably in thoroughness and had a limited effect on project implementation.

#### **7.7.4 Sustainability**

Several activities for which Netherlands aid has been terminated, still continue: all supplies to the poultry sub-sector, part of the greenhouses, the AI facilities. The sustainability of the Fayoum grain silo is not clear. Although it operates at a relatively high intensity of throughput, it is an expensive type of storage as long as bulk supply by rail is not operational. Moreover, the silo is owned and managed by a public company which does not (yet) operate under commercial conditions. Other activities appeared to be non-sustainable: the milk factory renovations, the large-scale public dairy farm, the Qassasin greenhouses, the potato cold store. The sustainability of inputs is mainly decided by continuation of their use: this appears to be high for soluble fertilisers, for vaccines against foot and mouth disease, and for insecticide sprayers.

Technological, financial, and institutional factors influence sustainability. Many commodities supplied to the agricultural sector were technologically advanced and sometimes new for Egypt. Outstanding examples of such innovations are the supply of soluble fertilisers, of automatically climatized greenhouses, of a centre for artificial insemination, of seeds for certain fodder crops, and of Frisian cattle for small-holders.

Part of the modern equipment is still in use, particularly in the poultry sub-sector where an appropriate after-sales service contributed to the long lifespan of capital goods. Soluble fertilisers were eagerly accepted by vegetable growers and are now imported commercially. In several cases, however, vulnerable technology appears to be no longer in use: for example, the climate-control equipment for the greenhouses and equipment in the poultry projects.

The financial dimension of sustainability is closely related to the institutional one. It depends on demand for the products offered, the possibility to charge realistic prices, and the opportunity to use revenues for recurrent costs and salary improvements. All assistance in the sector has been provided to public agencies. None of the activities had the explicit or implicit objective to strengthen the institution directly concerned. The incidental nature of the assistance and its relatively small scale made such an effect also impossible. Technical assistance was literally technical, and there were neither requests nor attempts to become involved in managerial or institutional aspects.

Institutional sustainability is high for those activities for which there is a clear demand, and which involve public organisations that are allowed to keep part of the revenue to pay for recurrent costs and to supplement salaries. The Damietta duck station and the Bosailly greenhouses are good examples.

#### **7.8 Conclusion**

Netherlands aid to the agricultural sector was a highly diverse package of activities largely provided to three sub-sectors: poultry, dairy and horticulture. The activities addressed relevant priorities and focused primarily on production growth. Since production growth would imply a reduction of food imports, the aid was oriented towards an increase of economic self-reliance. In terms of production, activities were successful in poultry and partly in horticulture, more especially tomato growing in Fayoum. There was little impact on poverty alleviation, mainly because activities focused on the larger farmers, or were incorrectly supposed to address the problems of poor farmers. There were two exceptions: the smallholder component of the Damietta dairy project and the 'women's role in food production' project. Apart from this food production project, women may have benefitted



indirectly, chiefly in terms of employment, from the Fayoum poultry project (supply of local breeds), Fayoum horticulture (employment in horticulture), and the Damietta duck station (supply of ducklings).

None of the activities had noteworthy adverse environmental effects. Questions have been raised about the distribution of biocide sprayers and the supply of greenhouses. Egyptian farmers use vast amounts of pesticides, but supply of the sprayers did not aggravate the situation. Protected horticulture is also notorious for its use of pesticides, but the quantity per unit of output is reported to be lower than in the case of production in the open air. Nevertheless, the supply of these commodities and the technical assistance to the greenhouses project could have provided an opportunity to give more attention to environmental issues in horticulture. The use of soluble compound fertilisers had a positive environmental effect as they are mostly absorbed by the plants in contrast to the usual chemical fertilisers where part of the nutrients end up in drainage water.

It may be concluded that support to the agricultural sector contributed to economic self-reliance rather than to poverty alleviation. It was successful in those cases where there was a clear need for the commodities supplied, where Egyptian policy was favourable, and where public sector rigidities could be circumvented.

## 8 Drinking water and sanitation

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### 8.1 Background

#### 8.1.1 *Water and sanitation conditions*

In Egypt, potable water is obtained from wells and from the river Nile and irrigation canals. South of Cairo, groundwater is usually free from salinity and it normally requires little treatment other than disinfection by chlorination. North of Cairo and in the Fayoum depression, it is generally brackish and needs blending with fresh surface water. In the coastal area, groundwater is unsuitable for drinking purposes and communities depend on surface water from irrigation canals and the Nile river. This surface water often requires long transmission pipelines to reach demand centres.

In the Greater Cairo and Alexandria areas, where about one-third of the country's population lives, almost all households are served by house connections but in other parts of Egypt urban house connection coverage varies between 40 and 70 per cent. Whereas in the two main cities, water of generally adequate quality is provided 24 hours a day, the cities of provincial Egypt receive a lower quality service. System breakdowns are more frequent and water quality is often poor. By and large, operating agencies find it difficult to keep pace with demand for new connections and, particularly in poorer neighbourhoods, people have to rely on public standpipes or private vendors.

In rural areas, where people live concentrated in villages, some 60 per cent of the households is currently estimated to receive water from a piped public system including public standpipe users. Compared to a service coverage of 10 per cent in the early 1970s, this has been a clear improvement but service levels and conditions remain deficient. Systems providing 24 hour supplies are rare, large quantities of water are unaccounted-for and deficient operation and maintenance of treatment facilities often render the water unsuitable for drinking purposes. The remaining 40 per cent of the rural population relies wholly or in part on non-public, and often highly polluted water resources (World Bank, 1992).