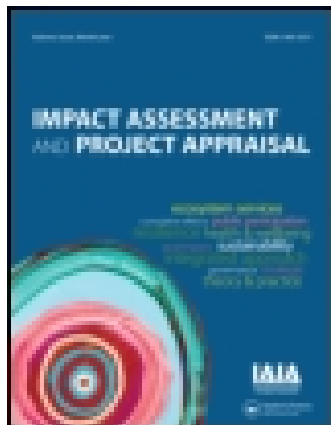


This article was downloaded by: [Universidad de los Andes]

On: 20 May 2015, At: 22:37

Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Impact Assessment and Project Appraisal

Publication details, including instructions for authors and subscription information:
<http://www.tandfonline.com/loi/tiap20>

Logical framework approach to project planning, socio-economic analysis and to monitoring and evaluation services: a smallholder rice project

David Akroyd^a

^a Operations Evaluation Office, African Development Bank, Abidjan, Cote d'Ivoire
'Weavers', 1 Oaklands Road, Groombridge, Tunbridge Wells, Kent, TN3 9SB, UK Phone:
+44 1892 864570 Fax: +44 1892 864570

Published online: 20 Feb 2012.

To cite this article: David Akroyd (1999) Logical framework approach to project planning, socio-economic analysis and to monitoring and evaluation services: a smallholder rice project, *Impact Assessment and Project Appraisal*, 17:1, 54-66, DOI: [10.3152/147154699781768007](https://doi.org/10.3152/147154699781768007)

To link to this article: <http://dx.doi.org/10.3152/147154699781768007>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Logical framework

Logical framework approach to project planning, socio-economic analysis and to monitoring and evaluation services: a smallholder rice project

David Akroyd

The retrospective application of the logical framework approach to the planning of a smallholder rice production project is reviewed. The assumptions and risks contained in the project's logical framework matrix are equated to those considered in sensitivity and risk analysis. Distinctions between project efficiency, effectiveness and impact are examined, as is the role of the project manager in the achievement of the project outputs, objective and sector goals. A socio-economic issue and the provision of monitoring and evaluation services are examined. Nowadays an environmental impact assessment report and socio-economic baseline studies would be required prior to project appraisal. Increased consideration would also be given to socio-economic factors in relation to the likely achievement of crop production targets.

Keywords: logical framework; project appraisal; project monitoring

David Akroyd was Principal Post-evaluation Officer, Operations Evaluation Office, African Development Bank, Abidjan, Cote d'Ivoire. His present address is 'Weavers', 1 Oaklands Road, Groombridge, Tunbridge Wells, Kent TN3 9SB, UK; Tel/fax: +44 1892 864570. This paper does not necessarily represent the views of any of the international organisations cited in the text.

SYSTEMS OF RICE (*Oryza sativa*) production in the Gambia, particularly under the aegis of the Taiwan rice mission, were described in 1976 (Ministry of Overseas Development, 1976). In 1988, Carney explained that, during the period from 1966 to 1980, several pump-irrigated rice production projects were implemented in the Gambia (Carney, 1988). Nearly 2,400 hectares (ha) of swamp rice land were converted to irrigation schemes for the production of two rice crops per year. These projects, which were supported by the Government of Taiwan (1966–74), the World Bank (1973–76) and the People's Republic of China (1975–79), led to the introduction of 'Green Revolution' agricultural strategies to peasant producers but failed to achieve two fundamental objectives: rice production areas were seldom double-cropped; and consequently marketable surpluses were negligible.

By 1980, less than one-third of those projects remained in cultivation. While the projects added to the subsistence security of smallholders, they contributed little towards the realisation of the agricultural-sector goal concerning the substitution of domestic rice for imports. Gambian rice imports during this period climbed from 8,000 to 33,000 tons per annum.

By 1980, the Government had adopted an agricultural development programme which stressed increased crop production and the improved provision of agricultural support services. At that time it was envisaged that a dam would be built across the

Gambia River at Yelitenda. This would stop salt water intrusion and guarantee a consistent supply of fresh water upstream such that 24,000 ha of irrigable land would become available. Much of this could be devoted to irrigated rice production. It is within this context that the Jahaly-Pacharr Smallholder Rice Project was identified, prepared, appraised in March 1981, implemented and then *ex post* evaluated in 1995.

The project

Prior to the construction of the dam, the proposed Jahaly-Pacharr Smallholder Rice Project would be implemented, located on the site of an earlier Commonwealth Development Corporation (CDC) project dating from the 1950s and using feasibility studies produced in 1976 and 1979/80. In 1981, rice was already being produced in the proposed project area by the farming community. However, the proposed project would be implemented as a pilot venture and the design would include a requirement for the production of irrigation and farm management data to be used in the planning of subsequent rice production projects (Akroyd, 1995a).

The project is located on the Gambia River in the McCarthy Island Division of the Gambia near Sapu, 280 kilometres east of the country's capital, Banjul. At this location the river is still tidal. The project area has a rainy or wet season from June to September and a dry season from October to May. The project Executing Agency was the Ministry of Agriculture and Natural Resources (MANR). Under the aegis of this project, the MANR sought to improve the Jahaly and Pacharr swamps by rehabilitating existing flood embankments and constructing new ones, installing irrigation and drainage water control gates and constructing causeways.

District co-operative societies for the supply of farm inputs and the marketing of produce would be strengthened, and agricultural credit, extension, farm machinery and rice storage services provided. Day care centres would be built for the children of female farmers. Offices, houses and farm buildings would be constructed and vehicles and farm machinery procured.

An internationally recruited team, comprising a Financial Controller, a Senior Resident Engineer, a Rice Irrigation Specialist and a Workshop Manager; would be appointed to strengthen the planned Project Management Unit (PMU). A Project Co-ordination Committee would be created comprising representatives of all concerned ministries. The planned project implementation period was the five years from 1 July 1982 to 30 June 1987. In 1981, the envisaged project cost was equivalent to US\$16.96 million, to be funded as shown in Table 1.

At the time of project appraisal the planned project beneficiaries comprised some 15,000 persons, living in 1,000 family compounds in 40 villages, who had

Table 1. Funding of project (1981 costs and exchange rates)

Funding Agency	US\$ million
Government of The Gambia	1.00
African Development Bank (AfDB) Group	5.10
International Fund for Agricultural Development (IFAD)	5.22
Government of the Netherlands	2.60
Government of the Federal Republic of Germany	2.60
World Food Programme (WFP)	0.44
Total project cost	16.96

Source: AfDB (1982)

'user rights' in the Jahaly and Pacharr swamps. Each family would be allocated 1.5 ha of developed land leased from the MANR. Overall, 1,510 hectares of land would be cropped, the planned water regimes and cropping intensities are given in Table 2.

Bearing in mind that 660 hectares would be double cropped, the total area under crops per year, at full project development, would be 2,170 hectares. Production per year in the 'without project' situation was estimated to be 1,020 tons of paddy rice (or 663 tons of milled rice, using a conversion factor of 65%). Incremental production per year was planned to level out in 1987/88 at 6,854 tons of paddy rice (4,455 tons of milled rice) rendering a total production of 7,874 tons of paddy rice (5,118 tons of milled rice).

Retrospective logical framework matrices, produced in 1995, have already been presented in *Project Appraisal* (Akroyd, 1995a) both for the project as a whole and for the subsidiary land preparation output or component. The project had four stated agricultural sector goals:

- the acquisition of irrigation, farm management and socio-economic planning data;
- the improvement of the food self-reliance position of the country by means of increased domestic rice production;
- improvements in the employment, income and welfare situations of the target beneficiary families; and
- improvements in the status of women in the rural development process.

The envisaged project objective was the increased production of rice, for subsistence consumption and commercial sale, on a sustainable basis with zero or

Table 2. Planned water regimes and cropping intensities

Water regime	Dry season (ha)	Wet season (ha)
Pump irrigation	560	560
Tidal irrigation	100	240
Rainfed/swamp	-	710
Totals	660	1,510

Table 3. Planned project outputs and costs

Output or component	Cost (US\$ million)
Project Management Unit	4.17
Land development and irrigation installation	8.00
Land preparation and irrigation operation	3.18
WFP food supply during the land development period (1983/84)	0.44
Day care centres for the children of women farmers	0.06
Farmer group credit services	0.33
Rice stores (five bulk stores: total capacity 264 tons)	0.13
Institutional support and training and extension services	0.45
Monitoring and evaluation services at Sapu	0.20
Total project cost	16.96

Source: AfDB (1982)

negative environmental damage. Planned project outputs or components to be developed, constructed or established on an operational basis and their costs are shown in Table 3.

Planned project implementation activities included:

- Recruit national and expatriate staff and establish a PMU.
- Establish a project monitoring and evaluation unit (MEU) at Sapu.
- Appoint an independent civil works supervisor.
- Recruit civil works contractors.
- Initiate tendering and bidding procedures and select suppliers of goods and services.
- Procure equipment, farm machinery, vehicles and other goods and services.
- Develop the land and construct irrigation and other civil works.
- Allocate the developed irrigated rice land areas to farmers.
- Organise training courses for project staff and farmers.

Given the planned activities and a first set of assumptions, it was hoped that the envisaged outputs would be established on an operational basis. This first set of implied assumptions included: implementation delays would not arise, bids received would be in line with budgeted costs and, as a result, no major project design revisions would be required.

Given the established outputs and a second set of assumptions, it was intended that the project objective would be achieved on a sustainable basis. In this case the implied assumptions (listed with the benefit of hindsight) embraced: sufficient labour would be available throughout the year to cover both men's and women's work on pump-irrigated, tidal and swamp rice; competition for labour between rice (660 ha of which would be double cropped) and upland crops

Careful and considered wording and reasoning are required when logical framework matrices are drawn up: the precise drafting of logical framework matrices is not an easy task

such as groundnuts would be accommodated; socio-economic problems would not be experienced relating to responsibilities for the production of crops controlled by the family group and those controlled by individuals for their own private benefit; planned rice cropping areas and yields would be achieved; complementary agricultural support services would be supplied; markets with acceptable farm gate prices would be available; and the project would operate within a sound macro-economic and sector policy framework.

Given the achieved project objective and a third set of assumptions, it was hoped that the sector goals would be realised. Here significant implied assumptions concerned the validity or otherwise of projected trends in domestic rice production and imports, the distribution of farm produce and income between the family group and individuals within that group, and the improved access of women to agricultural inputs.

Efficiency, effectiveness and impact

As a result of an improved definition of the project objective (now framed so that it states that the production of rice is for both subsistence consumption and commercial sale) and consideration of the findings of Carney (1988), some of the assumptions and their positioning in the logical framework 'means to ends' hierarchy for the overall project have been revised in relation to those presented in 1995 (Akroyd, 1995a). Careful and considered wording and reasoning are required when logical framework matrices are drawn up. The precise drafting of logical framework matrices is not an easy task. The assumptions or risks shown in logical framework matrices are, perhaps self-evidently, those which are examined in sensitivity analysis (delays, costs, yields and crop prices) and risk analysis: they are those assumptions or risks which entail significant consequences in terms of project implementation and the realisation of the planned project objective and sector goals (AsDB, 1987).

The phrase 'project efficiency' may be used to describe the manner in which planned activities are converted into established outputs. 'Project effectiveness' is the extent to which the provision of the established and operational outputs leads to the realisation of the envisaged project objective. The

relationship between the objective and the achievement of the sector goals may be called the 'project impact' (EC, 1995).

The area under the direct influence of the project manager concerns the implementation of the envisaged project activities leading to the realisation, in a timely manner and on an operational basis, of the planned project outputs or components. Here the concern is with project efficiency. This is assessed with reference to the appropriate summary observable verifiable indicators or OVI (expressed in terms of quantity, quality and time) set out at appraisal in the logical framework matrix for the project and in subsidiary matrices for project outputs or components relating to the production of agricultural services.

Reference will also be made to the detailed implementation schedules and the lists of goods and services to be procured which are agreed between the government and external funding agencies and to the expenditure and disbursement schedules of all the agencies which are providing funds. The project manager will use his powers of co-ordination, influence and persuasion to ensure the timely participation of other complementary parties, institutions and agencies external to the project.

Whether or not the rice production target is reached (project effectiveness) is outside the direct control of the project manager and depends, certainly in terms of rice produced for commercial sale, on farmer responses to project initiatives and incentives and on the macro-economic and sector policy framework within which the project is expected to operate, particularly with reference to input costs and the availability of markets for rice with acceptable market prices. Similarly the project manager has no direct control over the extent to which the envisaged agricultural sector goals (the project impact) are attained.

The situation with regard to the key perceived assumptions and risks, outside the control of the project manager, will be monitored throughout the activities implementation period and subsequently during the project's development period. The staff of the project executing agency will be alerted if it is believed that key assumptions are likely to fail and risks become realities. If required, appropriate follow-up action will be taken, project design revisions put in hand and the logical framework matrices amended.

Three points may be made concerning the identification, preparation and appraisal processes relating to this project. First, the logical framework approach to project planning was not in general use in 1981.

Secondly, no detailed analyses of the possible environmental implications of this project were carried out in 1981. At that time, few government or external funding agencies required a pre-appraisal environmental impact assessment (EIA) report.

Lastly, the project planners did not explain that the social systems in the project area are complex, in that the villages are inhabited by four ethnic groups, Mandinka, Fula, Serahuli and Wollof (Carney, 1988), each of which has its own principles of land tenure,

decision-making mechanisms and intra-household resource control and allocation. Any attempt to influence resource allocation mechanisms from outside (for example, by introducing a new rice production project with double cropping) is fraught with difficulties, and the net impact, particularly on, say, women's access to resources and the achievement of planned crop production targets, is hard to assess.

A socio-economic issue

Carney's evaluation study (1988), concerning the access of the male and female beneficiaries of the Jahaly-Pacharr Smallholder Rice Project to land, resources and farm produce was significant and is of relevance to the work of project planners. Carney states that social factors were central in terms of the success or otherwise of irrigation projects implemented in the Gambia prior to 1980. Developed land and inputs were channelled to male household heads on the assumption (later shown to be incorrect) that the household is a homogeneous production unit in which members pool resources and share benefits.

However, first, this arrangement did not facilitate double cropping as a household head only had the traditional right to uncompensated family labour for one crop per year. All the able household members would participate in dry season rice cultivation but during the wet season male labour would be diverted to the production of upland, rainfed crops such as groundnuts. If a household head wished to produce a second wet season rice crop, labour had to be remunerated. So only about 10% of developed rice plots were cropped for a second time in the wet season.

Secondly, awarding the developed plots to males established a basis for male control of developed rice land. As a partial solution to these problems, land developed under the aegis of the Jahaly-Pacharr Smallholder Rice Project was leased by the MANR to farm families, which gave the MANR the right to remove plot usufruct (use and profit, but not ownership) from those farmers deemed to be unproductive. Despite this arrangement, the planned achievement of rice production targets, particularly of double cropped rice, was still constrained by the limited availability of labour, particularly of female labour.

Two features characterise farming in the Gambia: first, cropping patterns have evolved in response to a four-month wet season, and second, the principles governing resource use and access have been adjusted to labour shortages rather than to land shortages. Carney's discussion focuses on the Mandinka, the dominant ethnic group and primary rice cultivators in the project area. However, the basic features of the farming system are similar across the production systems of the other participant ethnic groups.

Two main types of land tenure arrangements have evolved called *maruo* and *kamanyango*. *Maruo* relates to land held in customary tenure by the household or compound residence unit, which provides the

material basis for the survival of the household. This concept also refers to a set of labour obligations whereby all able family members are expected to provide labour for household subsistence. Men's *maruo* obligations are traditionally met on the rainfed uplands, which produce crops such as groundnuts. In rice-growing areas, women cultivate rice as their *maruo* crop. *Maruo* crops come under the control of the male compound head, who arranges their storage and distribution.

In exchange for providing labour towards household subsistence, dependent males and females are allowed to cultivate some *maruo* land for their own needs — known as *kamanyango* land rights. As long as the cultivator remains a member of the household, he or she controls the use of the plot and the rights to the crops produced. Individually-owned *kamanyango* land also exists, where individual claims are established by means of clearing unclaimed land. This occurs in tidal and rainfed/swamp rice areas, but not on pump-irrigated plots where men have established control.

Carney states that disputes arose over women's *kamanyango* land and crop rights particularly when causeways and access roads were constructed in the tidal swamps. Women would clear land areas for cultivation, which men then contested as clearance established the basis for land ownership by women. This resistance centred on the issue of divorce, as plots became alienated from household control when marriages dissolved. Frequently the result was that the improved land areas would be claimed by males as *maruo* land.

The effect of this was to erode women's individual crop rights and bring female labour power and the products derived from it increasingly under the control of the male household head. However, women were still only required to work the *maruo* land for one crop per year. Whether leases for irrigated rice plots were signed by men or women made little difference, since the male household head retained *de facto* control over *maruo* land areas. A comprehensive and equitable solution to these issues is yet to be established.

Farm models for the project, set out at appraisal, related solely to the technical possibilities for rice production. The *maruo* and *kamanyango* crop production systems and the fact that households would be involved, particularly during the wet season, in the

Two types of evaluation were noted: on-going, defined as the continual analysis of outputs, effects and impact during project implementation; and *ex post*, defined as the analysis of effects and impact after the completion of the project

production of other upland crops were not considered. It would have been better if the project planners had adopted a more holistic approach to farm planning, management and modelling.

Project monitoring and evaluation

Monitoring and evaluation services for the Jahaly-Pacharr Smallholder Rice Project would be managed and directed by the Socio-Economic Survey Unit of the MANR's Planning, Programme and Monitoring Unit (PPMU) in Banjul. The PPMU was supported by the UNDP (United Nations Development Programme) and FAO (Food and Agriculture Organisation) and staffed by both Gambian and expatriate specialists. The staff of the PPMU had already gained experience as a result of monitoring the first phase of the Rural Development Programme (supported by the World Bank). Under the direction of the PPMU, a permanent team of seven evaluators and two support staff would be based at an MEU in Sapu. The PPMU would be independent of the PMU but PPMU staff would liaise closely with the staff of the PMU. The planned costs of the project's MEU at Sapu in 1981 are shown in Table 4.

Monitoring would be in accordance with the then IFAD (International Fund for Agricultural Development) *Operational Guidelines* (IFAD, 1979), in which monitoring was defined as "the timely gathering of information on project inputs and outputs and on conditions and complementary activities that are critical to the attainment of project objectives". Evaluation was defined as "the analysis of the information gathered during monitoring to determine the efficiency and effectiveness with which a project delivers its outputs and thus generates the expected impact". Two types of evaluation were noted: on-going evaluation, defined as the continual analysis of outputs, effects and impact during project implementation; and *ex post* evaluation, defined as the analysis of effects and impact after the completion of the project.

Table 4. Planned costs of the MEU

Item	Cost (US\$ thousand)
Staff	115.0
Two motor cycles	3.3
Five bicycles	1.1
Office equipment	11.1
Operating costs (including housing allowances)	8.3
Base cost	138.8
Physical contingencies 10%	13.9
Base cost plus physical contingencies	152.7
Compounded price contingencies	48.1
Total cost	200.8

Thus, in broad terms, monitoring activities were to provide information about what happened, whilst evaluation activities were to provide explanations about why events turned out in the manner observed. To some extent these two activities run together, in that a good project quarterly progress report will explain, for example, that a road construction delay arose, the reason for this being the late arrival on site of the civil works contractor.

It was envisaged that baseline socio-economic surveys would be initiated by the MANR in May 1981 (the project having been jointly appraised by the external co-financing agencies in March 1981) and be completed by the end of 1981, in advance of the planned start of the project implementation period on 1 July 1982. Separate surveys would be carried out for the Jahaly and Pacharr swamps as it was recognised that there were significant sociological differences, not set out in the appraisal documents, between the two areas.

Using the results of the surveys as points of reference, the staff of the PPMU would, on a regular basis, provide the staff of the PMU and the Project Co-ordination Committee with information concerning project performance. This would include details about the number of participating villages and compounds, the effectiveness of farmer co-operative societies in providing supplies and marketing services, the responses of farmers to project initiatives and the success or otherwise of the credit programme.

The staff list for the PMU included a position for a Gambian rural sociologist, funds being provided for this post for the entire five-year implementation period. Funds were also provided, as part of the PMU output or component, for 20 person-months of short-term consultancy services to be employed during the second, third and fourth years of the project implementation period.

Some of these services would be used to carry out evaluation studies concerning the operation and maintenance of the irrigation system. The staff of the PMU's Irrigation Department would collect climate and irrigation data: rainfall, river flows and levels, and information about the salt water/fresh water interface. The health status of the target beneficiaries would be monitored: particularly in relation to any incidence of malaria and *schistosomiasis*.

The staff of the PMU would produce quarterly project progress reports written in line with reporting formats supplied by the external funding agencies. Annual project and loan financial audit reports would also be produced.

Implementation experience concerning the production of monitoring and evaluation services proved to be unfortunate. Between June 1981 and January 1983, external support for the PPMU in Banjul fell away and PPMU operations came close to a halt. Supervision by the PPMU staff in Banjul of the project-funded enumerators in Sapu was weakened.

Two attempts were made to complete the baseline surveys, in 1981 and 1983, but the results were not

entirely satisfactory, particularly in terms of the coverage of socio-economic issues. The role of the MEU at Sapu, as envisaged at appraisal, fell away and the staff were employed in support of newly required land reallocation and farming systems analysis activities.

Difficulties encountered

In 1982/83, a situation of food scarcity arose and the farmer-leaseholders agreed to a reduction in the size of each holding from 1.5 ha to 0.6 ha. (At project appraisal it was planned that 1,510 ha of land would be developed for the use of 1,000 leaseholders, an average of 1.51 ha per leaseholder. At project completion 1,407 ha of land had been developed and there were 2,200 leaseholders, an average of 0.64 ha of land per leaseholder.) The position for a Gambian rural sociologist within the PMU not having been filled, a consultant sociologist was appointed in 1983 to help resolve land reallocation problems encountered.

Problems were also perceived, from the point of view of IFAD, concerning the numbers of plots leased to men and to women in the first round of plot allocations, the number allocated to women being relatively small. As Carney (1988) states, in 1984, an IFAD mission team visited the Gambia in an attempt to resolve this issue. In 1986, a Farming Systems Unit (FSU) was set up to investigate farming systems, women's issues and the effects on rice production of upland cropping, mostly of groundnuts.

The FSU operated for two years, supported by funds and a technical co-operation farm management systems specialist from the Netherlands, but was wound up in 1988. Various monitoring and evaluation reports and studies were produced, but in some instances the findings of these reports and studies proved to be unreliable. Many primary data were collected many of which were never processed, analysed or presented. By 1990, the MEU at Sapu had effectively ceased to operate.

Quarterly project progress reports and sets of annual project accounts were produced by the staff of the PMU on a regular basis and in a satisfactory manner. Three irrigation manuals were published in December 1989 by the staff of the PMU's Irrigation Department: "Tidal irrigation: experience and lessons 1984 to 1989", "Manual for rice cultivation in tidal-irrigated areas" and "Manual for rice cultivation in pump-irrigated areas". The proposed dam at Yelitenda has not been built, however, the irrigation data are still useful. There was no formal environmental monitoring during the project implementation period and subsequent project development period. No environmental impact assessment study was carried out at the time of project completion.

Benefit of hindsight

In terms of contemporary monitoring and evaluation practice and with the benefit of hindsight the following points may be set out:

The operation of the monitoring and evaluation component was complicated by the fact that the PPMU staff were based in Banjul whilst the project's MEU enumerators were in Sapu. Two questions arise: how were the PPMU staff to manage the MEU staff properly and, in particular, how would the PPMU staff be able to oversee the quality of data recorded? This situation became more difficult when external support for the PPMU was withdrawn.

The monitoring and evaluation function was separated from the project management function and was focused on the responses of farmers to project initiatives. The staff of the PMU were responsible for the production of quarterly project progress reports, which initially reported on the installation of the planned project outputs and subsequently on the operation of crop production services and cropping areas, rice yields and rice production.

The roles of the PPMU and MEU were sketched out in general terms in the appraisal reports. The quality of the appraisal reports would have been better had they included detailed information concerning the monitoring and evaluation of socio-economic, health and environmental issues. It would have been better if the required qualifications, past experience and skills of the enumerators to be recruited for the MEU at Sapu had been set out in the appraisal reports.

Two attempts were made at producing baseline surveys but with limited success.

The monitoring and evaluation staff at Sapu were diverted from their planned role to facilitate land reallocation and farming systems analysis activities. When these tasks came to an end, the MEU at Sapu withered away.

Some of the data collected by the staff of the MEU proved to be unreliable. Much of the data collected was never processed, analysed and presented.

These findings are in line with those of Coleman (1992) who presented an overview of lessons learned from the experience of monitoring and evaluation in agricultural and rural development projects, drawing on the experiences of 104 projects supported by the World Bank and 127 supported by IFAD. Coleman pointed out that, despite almost three decades of practice, the results derived from monitoring and evaluating agricultural and rural development projects have not been encouraging. Problems encountered concern the design and the operational performance of MEUs.

Design issues include: the need for precise descriptions in preparation and appraisal reports of the role of a given MEU; the determination of staff requirements and of their training, experience and terms of reference; provisions for adequate staff salaries and career development opportunities; the provision of vehicles and personal computers; the design of sound baseline surveys; the selection of the key OVI and MOV; and the design of a sound project management information system (PMIS).

Operational issues include: the organisational location of a given MEU; high staff turnover and the diversion of staff time to other duties; the acceptance by project managers and farmers of the need for monitoring and evaluation; the organisation of participatory beneficiary contact monitoring; reporting and the provision of follow-up action as a result of reports submitted; and avoidance of the 'data trap' whereby complex surveys are initiated which generate much data many of which are never properly processed, analysed, presented and acted upon.

Monitoring and evaluation in 1998

In 1981 agricultural project planners tended to focus their attention on technical, financial and economic issues and paid relatively little detailed attention to the analysis of socio-economic, gender, institutional, environmental and health issues. At that time the logical framework approach was not in common use as an agricultural project planning tool.

If the Jahaly-Pacharr Smallholder Rice Project was to be appraised in 1998 there would be a requirement for a pre-appraisal EIA report. In June 1990, the Board of the African Development Bank Group (AfDB) approved an environmental policy paper (AfDB, 1990) which was followed by the production of technical and procedural guidelines. From December 1991, all projects in the AfDB's annual lending programme became subject to mandatory environmental screening, as a result of which they were assigned to one of three categories of risk. The evolution and status of the AfDB's environmental policy was reviewed in 1994 (Akroyd, 1994).

Nowadays external funding agencies would expect that pre-appraisal baseline surveys, embracing farming systems analysis and socio-economic and gender issues, would be completed as part of the project preparation process, using rapid rural appraisal and participatory rural appraisal approaches.

The European Commission (CEC, 1993) and the AfDB now require that the logical framework approach be adopted at each stage of the project planning cycle, from identification to *ex post* evaluation. The use of the logical framework approach, as part of the AfDB's project- and policy-based loan planning,

Monitoring and evaluation are now perceived as essential in project implementation: the European Commission and the African Development Bank require that the logical framework approach be adopted at each stage from identification to *ex post* evaluation

monitoring and *ex post* evaluation activities, became mandatory with effect from 1 January 1993 (Akroyd, 1995a).

Logical framework matrices may be drawn up, one for the project as a whole and several concerning the provision of agricultural support services, which specify and define the appropriate OVI, their MOV and lists of key assumptions and risks. Using the matrices as guidelines, relevant information can be provided, for project management purposes and for the use of the staff of the project executing agency and external funding agencies, hopefully in a timely manner, expressed in terms that are relevant, useful and to the point.

Essential part of project implementation

A combined and revised view, endorsed by IFAD, the FAO and the World Bank, concerning project monitoring and evaluation in agriculture, was set out in 1987 (Casley and Kumar, 1987). Now, when projects such as the Jahaly-Pacharr Smallholder Rice Project are prepared and appraised, the monitoring and evaluation function is perceived primarily as an essential part of the process of project management and implementation, created to provide information required by the project manager. A secondary but important function concerns the provision of information required from the project manager for the use of the staff of the project executing agency and external funding agencies.

The usefulness and importance of monitoring and evaluation services, in terms of meeting information needs, are now fully recognised. It is hoped that monitoring and evaluation are no longer regarded by some project managers and beneficiaries as a surveillance function installed by the staff of the project executing agency or external funding agencies.

If the Jahaly-Pacharr Smallholder Rice Project was being planned today then, as part of the project preparation process, a workshop could be held, with participants drawn from all interested agencies (the Ministry of Finance, the MANR and prospective external funding agencies), to determine the role, terms of reference, size, staffing, equipping and cost of the required MEU. The desired qualifications and experience of the staff of the MEU would be specified, together with details of their proposed salaries, conditions of service and career development prospects.

Any perceived requirement for short-term consultancy services would also be set out. The PMIS together with modest and pragmatic monitoring and evaluation targets would be designed, and provision would be made for succinct and timely reporting using agreed simple formats (Casley and Kumar, 1987).

In these ways good lines of supervision, command and direction would be established. The MEU staff would be answerable to the project manager and probably to a monitoring and evaluation co-ordinator in the MANR.

At the outset of project implementation, the incoming management team would review the findings of

the baseline surveys, the EIA report, the project's OVI and their MOV and the planned implementation and expenditure schedules in relation to the monitoring and evaluation of project efficiency, effectiveness and impact. The PMIS would be reviewed, finalised and then maintained in an organised, systematic and co-ordinated manner. In this way realistic baseline plans and targets would be established (Akroyd, 1988) such that monitoring and evaluation could be carried out in a meaningful manner.

Physical and financial monitoring

Initially the prime role of the staff of the MEU would be to monitor and report on the efficiency of project implementation. Monitoring procedures would be set out in the PMIS which would show how required information (including copies of significant memoranda and minutes of weekly departmental meetings) would be transmitted to, or collected by, the staff of the MEU, and how the data would then be processed, analysed and presented in a timely manner and in forms appropriate to the needs of the project manager and his senior staff, the staff of the project executing agency and of the external funding agencies. Much of the data processing would be done by computer, the work being carried out by a graduate administrator with clerical support.

Physical issues would be covered output by output. Progress would be measured in relation to the OVI contained in the logical framework matrices and project implementation schedules.

Financial data would be collected, processed, analysed and presented by output or component, category of cost or cost centre and by funding agency. Expenditure data would embrace the initial financial allocations, expenditure to date, cumulative expenditure to date, remaining balance and analyses of variances. Reference would be made to the project budgets and to the financing, expenditure and disbursement schedules set out in the appraisal reports.

Physical and financial monitoring by output or component tends to be most useful for external reporting, especially when specific outputs or components are financed by different funding agencies. Cost accounting by category of cost is more useful for the purposes of internal project management (Casley and Kumar, 1987).

Progress reports

Progress reports would be required most likely every two weeks by the Project Manager. Emphasis would also be given to the timely production of quarterly progress reports, required by the staff of the MANR and the external funding agencies. These would be written according to an agreed, standard format. In this way, given a series of such reports, a technical staff member of the MANR or of an external funding agency will know, for example, that every section 3.4 covers the subject of, say, the development of rice

land areas. This makes for ease of reference and also ensures that no item is overlooked.

Evaluation analyses would provide explanations for problems encountered: for example, that building construction delays had arisen because of civil works contractor recruitment problems, which in turn had given rise to cost escalation leading to the adoption of cost-cutting revisions in the designs of houses. Implementation delays, the possibility of cost escalation and any consequent requirement for project design revisions or the reallocation of funds from one component to another would be given particular attention.

Any potential failures in project assumptions encountered at the primary level of the project hierarchy would be reported and recommendations would be made concerning remedial actions to be put in hand. It is important that external funding agencies respond to the findings of quarterly progress reports received. If the government officials and project monitoring and evaluation staff concerned receive no responses, they might become discouraged.

Project effectiveness

As rice production came on stream, the monitoring and evaluation functions would be augmented to include project effectiveness. Reporting requirements during a cropping cycle would include:

- data concerning envisaged cropping areas and seed and fertiliser sales;
- the demand for agricultural credit and the repayments and arrears situations in relation to past credit issued;
- the supply of inputs of the right type, to the right places and at the right time;
- water control and the maintenance and repair of irrigation structures;
- the demand for tractor hire services and the situation with regard to spare parts, tyres and fuel; and
- the provision of farmer training and extension services together with details of meetings held, topics covered and farmer attendance.

Data concerning the operations of the tractor hire unit (Akroyd, 1995a), the credit and input supply unit and the extension unit would be supplied by the staff of those units to the staff of the MEU, using the OVI set out in the logical framework matrices for agricultural support services and the reporting formats specified in the PMIS.

Other issues concerning project effectiveness might be the subjects of special diagnostic studies or evaluation reports, including, say, the attitudes of farmers to the co-operative society approach for the provision of input supply and crop marketing services or an analysis of the participation of the farmers in the project's credit scheme (which farmers requested credit, which ones came back for more credit, which ones did not participate in the credit scheme, and the reasons why).

At the end of each cropping season information would be required concerning meteorological conditions encountered and actual cropping areas, yields and production. It has been rightly stated (Maddock, 1993) that the estimation of project crop yields and production is complex, difficult and unreliable. The staff of the MEU would participate with farmers in relation to the estimation of cropping inputs, activities and results.

Crop-cutting yield samples might be collected from selected fields. A few farms might be made the subjects of case studies. These would provide details concerning the uptake of recommended inputs and practices, labour constraints and crop yields and production. However, the results of case studies cannot be generalised to the wider population. It might also be possible to cross-check the information gathered with data obtained from demonstration plots established on farmers' farms by the project's extension staff and from unit-improved peasant farms established at nearby agricultural colleges (Akroyd, 1975).

With the passage of time, crop production data would be presented on a comparative basis: the current season compared with previous seasons. Reports would be given on the uptake of any farming innovations, such as the introduction and use of donkey carts or powered tillers. The failure of any of the secondary level assumptions would be noted and remedial actions put in hand. MEU staffing requirements would be augmented to include at least an agricultural economist experienced in socio-economic survey work, together with enumerators for farm survey work.

For the past two decades one useful source of agronomic data, particularly for crops in West Africa, has been *An Agricultural Notebook* by Tom Phillips (1977). Information provided includes details of average yields for upland, swamp and irrigated rice, milling percentages and hand labour requirements in person-days. This source provides a point of reference for the agricultural economist/planner, employed by an external funding agency, who may be called upon to review agronomic data presented in a project preparation report written by a national or consultancy planning team. At the very least, reference data are available of the right orders of magnitude.

Project impacts

With the passage of time, monitoring and evaluation work would be carried out to assess project impacts. For the Jahaly-Pacharr Smallholder Rice Project these would include the collection, processing, analysis and presentation of data concerning irrigation and farm management practices, socio-economic issues and environmental impacts, including any incidence of water-borne diseases. Farming systems data studied and evaluated would include crop labour and tractor inputs required per hectare for each crop by task and month in relation to any farming models and/or enterprise and farm gross margin accounts set out in the appraisal reports.

Information would be produced concerning employment patterns; the home use and commercial sale of rice; market prices and changes in income (or in proxy expenditure) and the distribution of income between family members. Welfare and gender issues considered would include women's literacy; the education and schooling of children; and general health and nutrition, particularly of children, using indicators such as weight at birth, weight for age, height for age, weight for height, infant and child mortality rates and morbidity rates (Casley and Kumar, 1987).

Assessments of income and wealth may be difficult if farmers have a vested interest in understatement. Here use may be made of quasi-indicators such as changes in the sizes of houses and in building materials for houses, the household ownership of consumer durable goods and the construction of village facilities such as clinics, mosques or churches. The status of women in the development process would be assessed in terms of their access to farming inputs. MEU staff requirements would include a socio-cultural specialist, perhaps a farming systems specialist and a visiting environmental specialist.

Reports required

External funding agencies require quarterly project progress reports written in accordance with set formats, frequently a mid-term review report and finally a project completion or implementation report. The coverage of quarterly progress reports includes (Casley and Kumar, 1987):

- current status of the project;
- major activities undertaken during the period under review cross-referenced to agreed work plans;
- project cost performance;
- number of beneficiaries served, relative to targets, and their responses;
- current and potential problems and remedial actions planned or recommended;
- plans and schedules for major activities during the next review period.

As crop production comes on stream the issue of planned and actual cropping areas, yields and production will be included, together with any information concerning perceived project impacts. External funding agencies also require an annual financial audit report covering the project as a whole and the status of external loans employed.

Nowadays the staff of a project's MEU are expected to produce a project completion report (PCR) or project implementation report, being in effect the last in the series of quarterly progress reports, which sums up the entire project experience. The PCR will be ratified by the staff of the executing agency and copies will then be sent to the external funding agencies. The technical staff of the concerned operational department of each external funding agency will produce their own draft PCR, marking the completion

of implementation activities and the closure of the loan account. Copies will be sent to the government for review and comment. Comments received will be incorporated into, or annexed to, the final version of the PCR. In the case of the AfDB, copies of the PCR are then passed to the AfDB's Operations Evaluation Department.

Ex post evaluation represents the completion of the project cycle (Gittinger, 1982) and concerns the process whereby the staff of an external funding agency, with the participation of government officials and inputs from local leaders and project beneficiaries, seek to learn lessons from the project identification, preparation, appraisal and implementation experiences. In this way, those dealing with the design and planning of second phase or new projects of a similar type will be able to improve their performance, and design projects of improved quality.

Ex post evaluation reports (presented together with, and cross-referenced to, the PCR) also provide a means of accountability for the use of borrowing governments and those governments which provide loans and grants for the use of multi-lateral funding agencies. *Ex post* evaluation takes place usually two to three years after the production of the PCR. This process and the format of an *ex post* evaluation report, as carried out by the AfDB, have already been described in *Project Appraisal* (Akroyd, 1995b). Reference may also be made to the format used for the *ex post* evaluation analysis of projects and programmes funded by the European Commission (EC, 1995).

Overall project experience

The need for a smallholder irrigated rice production project was well identified in 1981 in view of the proposal to construct a dam, the consequent availability of more irrigable land and the need for irrigation studies.

With the benefit of hindsight and taking into account conceptual developments introduced into the project planning process since 1981, more attention could have been given during the project preparation and appraisal stages of the planning cycle, to socio-economic and environmental considerations. One problem associated with this project (Whitehead, 1990) was that the farm model adopted at appraisal

In hindsight and taking into account conceptual developments introduced into project planning since 1981, more attention could have been given during project preparation and appraisal to socio-economic and environmental considerations

did not reflect the realities of the complex social relations concerning the use of resources and the sharing of crop production benefits.

There was little consultation with the farmers (and particularly with women farmers) about the design of the project, arrangements for land development and reallocation, and opportunity cost and trade-off situations concerning the production of irrigated rice and rainfed upland groundnuts (Carney, 1988). Institutional and technical arrangements made for the implementation of the land development and irrigation installation and land preparation and irrigation operation outputs or components could have been better. The selection of a pumped irrigation and drainage total water control approach was unfortunate in view of the high capital and operating costs involved, particularly the foreign exchange costs.

The PMU was established as planned; however, difficulties were experienced concerning the recruitment, training and retention of senior Gambian staff. A formal PMIS with a set of performance indicators was not established. The development, by a firm of internationally recruited contractors, of the 560 hectares of pump-irrigated land was completed in 1984 ahead of schedule.

The development, by the Government of The Gambia, of the remaining 950 hectares of land was delayed as a result of land-levelling problems (resolved by the introduction of laser levelling), machinery breakdown, inexperienced machine operators, spare parts procurement problems and the over-estimation of the duration of the dry period during which land development work was possible. Work ended in 1990 with 847 hectares of the proposed 950 hectares of land having been developed.

Some items of machinery procured for the use of the project's Land Preparation Unit proved to be inappropriate for the heavy soils encountered in the project area and had to be replaced. The problem was to identify a range of equipment powerful enough to do the required ploughing yet light enough not to become bogged down when the soils were wet, and having water resistant parts and systems. The pumped irrigation and drainage systems proved to be expensive to operate and maintain. From time to time shortages of fuel and spare parts were also encountered.

The correct operation of the tidal irrigation system depended on the strict adherence by farmers to schedules for opening and closing flood gates. This was sometimes difficult to achieve, the tidal irrigation routines being dictated by the timing of the tides. Problems could be encountered when high tide occurred in the middle of the night.

The WPF food-supply component was successfully implemented as planned. Two day-care centres were built and used in the manner envisaged at appraisal. The credit component, operated by the Gambia Co-operative Union (GCU), worked well between 1985 and 1987. However, under the aegis of a structural adjustment programme, institutional changes were introduced with the result that the GCU

withdrew from input supply, credit and rice-purchasing operations. For a time, the responsibility for these functions was transferred to an Inputs, Credit and Marketing Unit established within the PMU. In terms of credit provision, Village Savings and Credit Associations were subsequently established with financial support from the Federal Republic of Germany.

The rice stores were found to be unnecessary and were not built. In-service training courses for the project's extension staff were provided as planned and the Training and Visit System was adopted for the provision of extension services. Crop demonstration plots were also established. The system worked well, and improved technical skills were successfully transferred to the farmers.

In May 1995, the project had six extension staff (one of whom was female), with an extension agent:leaseholder ratio of 1:367. The Project Manager deemed this to be satisfactory as the leaseholders and their families were living in village communities and the extension staff were provided with motor cycles. Following the withdrawal of the GCU from credit operations, part of the task of credit administration fell on the extension staff. The problems encountered concerning the provision of monitoring and evaluation services have been reviewed above.

The land area actually available for cropping each year was 2,331 hectares (double-cropped pump-irrigated, 560 ha; double-cropped low tidal-irrigated, 364 ha; single-cropped elevated tidal-irrigated, 339 ha; and single-cropped rainfed, 144 ha) being 7.4% greater than the planned 2,170 hectares. However, in most years not all the potential 2,331 hectares would be cropped.

From 1987/88, it had been envisaged that paddy rice production would settle down at 7,874 tons per year. Data provided by the staff of the PMU state that actual production over the seven years 1987/88 to 1993/94 averaged 5,119 tons per year or 65% of the planned target. This is explained by social factors (Carney, 1988), delays in the completion of the land development programme and the fact that, with the advent of structural adjustment in 1985 and the devaluation of the dalasi in January 1986, input costs and crop-selling prices had to reflect economic costs and returns.

The macro-economic and sectoral settings for the project had significantly changed, representing the 'failure' of a key background assumption. Newly required demand management measures inhibited domestic rice supply responses (Akroyd, 1995a). Rice prices on the world market, expressed in terms of constant 1990 US dollars per tonne, fell from \$571 in 1980 to \$279 in 1995, or in current US dollar terms from \$411 in 1980 to \$321 in 1995 (IBRD, 1996).

Data concerning the operation of the tidal- and pump-irrigation systems were published in 1989. The envisaged farm-management systems and socio-economic data collection and analysis exercises were not accomplished. In terms of food self-reliance, some 5,100 tons per year of paddy rice (3,315 tons per

year of milled rice) were produced between 1987/88 and 1993/94. This is of relatively little significance in relation to national milled rice imports which are on a rising trend — 21,400 tons in 1988 and 72,400 tons in 1994 (Government of the Gambia, 1995).

However, this was a pilot project set up mainly to gather information and data. Food availability within the project area has increased during the lean months of June to September. Both the level and stability of food availability have improved. Pre-project farm production and income data are unreliable, and appraisal projections of changes in income were based on rice production only and were over-optimistic.

In terms of income, a study undertaken by the International Food Policy Research Institute (IFPRI, 1989) stated that the project was reasonably successful in targeting poorer farmers, and that rice production was relatively more important for the poorest farmers. In terms of location, farmers in lowland villages are generally poorer than those in upland villages, and lowland villages depend more on rice than do upland villages. Thus the project appears to have had a positive effect, in terms of income distribution, in that it catered particularly for the needs of relatively poorer lowland farmers.

The position of women in the development process depends a great deal on the relationship between *maruo* and *kamanyango* crops, which, in turn, determines the size of any personal income derived by individual women. Overall, it is believed that women gained, in that more family food became available and the use of machinery for land preparation reduced the requirement for heavy hand-labouring work in the fields. In terms of health, the Institute's study did not find a clear and positive association between the health of pre-school children and access to rice land.

Conclusions

The adoption of the logical framework approach in relation to the planning of agricultural and rural development projects and their services components makes easier the formulation of good quality projects and should be used at each stage of the project cycle. This approach accustoms planners to think in terms of logical causes and effects within a project hierarchy, and obliges them to consider the key assumptions and risks which underpin success and to specify key OVI and their MOV.

The assumptions and risks listed in a project's logical framework matrix correspond to those considered in sensitivity and risk analysis. The distinctions between project efficiency, effectiveness and impacts have been examined as has the role or influence of the project manager in the achievement of the project outputs, objective and sector goals.

Nowadays, an EIA report and socio-economic baseline studies are usually produced prior to project appraisal. Their production might be financed by a project preparation facility provided by an external

funding agency. The significance of socio-economic factors in relation to the achievement of crop production targets should not be ignored or underestimated. Careful attention should also be paid to institutional arrangements and to technical issues.

Problems experienced in relation to the design and operation of this project's MEU have been highlighted in relation to findings concerning the monitoring and evaluation of agricultural and rural development projects funded by the World Bank and IFAD. The expected role of an MEU and the terms of reference of MEU staff should be clearly set out in appraisal reports. Monitoring and evaluation targets should be modest and pragmatic. The temptation to collect a lot of data, much of which is unlikely to be processed, analysed and presented, should be avoided.

Monitoring and evaluation in the 1990s is perceived primarily as a support or aid to project management during the implementation period. Essential information required by the project manager and his senior staff is provided on a regular basis and in appropriate forms. A secondary but important role concerns the provision of information required from the project manager for the use of the staff of the project executing agency and external funding agencies. Information will again be provided as required and particularly in the form of appropriately structured quarterly project progress reports culminating in the production of the project completion report. At a later date, the staff of each external funding agency will produce an *ex post* evaluation report.

The extent to which any project is judged to be a success or failure must be determined by subjecting the known results to analysis which makes use of 'success rating criteria'. Where possible, these criteria will be objective in nature and will include: data concerning project start-up and implementation delays (measured in months in relation to implementation schedules set out in the appraisal report — assuming that these schedules are realistic, being based on past historical experience in the country concerned); cost escalation by component and/or category of cost; achieved cropping areas, yields and production; planned and achieved economic internal rates of return and an assessment of the achievement of project impact. Account will also be taken of the likely longer-term sustainability of each project.

Analyses of this type will be carried out using a computer, making possible further comparative studies of groups of projects by sector and sub-sector. This is another story in its own right.

References

- AfDB, African Development Bank Group (1982), *Appraisal Report* (January) page 24.
- AfDB, African Development Bank Group (1990), "Environmental policy paper".
- AsDB, Asian Development Bank, Economics Office (1987), *Guidelines for Economic Analysis of Projects* (second edition, August), appendices 7 and 8.

- H D Akroyd (1975), "Observations on the organisation of a unit improved peasant farm at the Institute of Agriculture, Ambo, Shoa Province, Ethiopia, 1969–1974", *Agricultural Administration*, 2, pages 307–319.
- H D Akroyd (1988), "A pragmatic approach to the planning of crop development projects in less developed countries with particular reference to the procurement of goods and services and the calculation of benefits and costs", *Agricultural Administration and Extension*, 30, pages 143–157.
- H D Akroyd (1995a), "Steps towards the adoption of the logical framework approach in the African Development Bank: some illustrations for agricultural sector projects", *Project Appraisal*, 10(1), March, pages 19–30.
- H D Akroyd (1995b), "The logical framework approach and the post-evaluation of health-sector projects by the African Development Bank", *Project Appraisal*, 10(4), December, pages 210–222.
- T D Akroyd (1994), "The evolution of the environmental policy of the African Development Bank Group", M Phil thesis, Wolfson College, University of Cambridge, August.
- J A Carney (1988), "Struggles over crop rights and labour within contract farming households in a Gambia irrigated rice project", *Journal of Peasant Studies*, 15, pages 334–349.
- D J Casley and K Kumar (1987), "Project monitoring and evaluation in agriculture" (John Hopkins University Press for the World Bank).
- CEC, Commission of the European Communities (1993), "Manual: project cycle management: integrated approach and logical framework", February.
- G Coleman (1992), "Monitoring and evaluation in agricultural and rural development projects: lessons and learning", *Journal of International Development*, 4(5), pages 497–510.
- EC, European Commission, Directorate-General for Development (1995), "Format for terms of reference of an evaluation" April, pages 3–5.
- J P Gittinger (1982), *Economic Analysis of Agricultural Projects* (John Hopkins University Press) pages 21–26.
- Government of The Gambia, Ministry of Agriculture and Natural Resources, Planning Department (1995), "National agricultural sample survey 1994/95", April, page 24.
- IBRD, International Bank for Reconstruction and Development (1996), "Commodity markets and the developing countries: a World Bank quarterly", May, pages 35, 36.
- IFAD, International Fund for Agricultural Development (1979), "Operational guidelines on monitoring and evaluation", December, pages 10, 11.
- IFPRI, International Food Policy Research Institute, (1989), "Irrigation technology and commercialisation of rice in The Gambia: effects on income and nutrition", Research Report 75, IFPRI, Washington DC, USA.
- N Maddock (1993), "Has project monitoring and evaluation worked?", *Project Appraisal*, 8(3), pages 188–192.
- Ministry of Overseas Development, Land Resources Division (1976), "The agricultural development of The Gambia: an agricultural, environmental and socioeconomic analysis", pages 182–189.
- T A Phillips (1977), *An Agricultural Notebook* (Longmans) page 24.
- A Whitehead (1990), "Food crisis and gender conflict in the African countryside" in H Bernstein, B Crow, M Mackintosh and C Martin (editors), *The Food Question: Profits versus People* (Earthscan) pages 63–64.