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7. Conservation education

Introduction

In the administration and exploitation of the natural environment the role of education is often neglected and misunderstood. Increasingly it is being recognised that development programmes, particularly those in the rural sector, must include a substantial training component to ensure the rapid diffusion and efficient employment of inputs and techniques. In addition, it is now appreciated that this education component should focus on a range of levels. Previously, programme training concentrated upon the production of local counterparts to ex-patriate personnel, a valid enough exercise but which failed to reach the majority of the programme participants.

The education of this group, normally composed of innumerate and illiterate adults, demands the construction of an informal pedagogical strategy. The rigidly structured academic base of formal schooling has proved totally unsuited to the needs of this particular type of student. The reformulation of educational philosophy and teaching methodology to cope with the requirements of informal training is discussed in this chapter through a brief review of the academic literature. From this, a package of guidelines may be identified with which to construct an informal education programme. To illustrate these points, a description of conservation education strategy in Lesotho then follows. Upon the recognition of the chronic problem of soil erosion in Lesotho and the documentation of simple remedial conservation techniques, the Ministry of Agriculture has established an extension unit to educate local farmers in the dangers of, and combative measures against, soil erosion. The administration of the programme is discussed in the final section of the chapter.

From Formal to Non-formal Education: Changes in Educational Philosophy

The late emergence of informal training in developing countries as a viable and acceptable component of the educational sector must be traced back to developments immediately following the colonial period. In the late 1950's and early 1960's, the elitist school systems developed by colonial powers in the Third World came under increasing attack (Adetoro, 1966; Foster, 1965; Thomas, 1975) and attention turned towards education as an agency of national, as opposed to individual, develop-

ment (McKown and Finlay, 1976; Odunukwe, 1958). In addition, during this period, economic development planning was heavily influenced by Rostovian prescriptions for self-sustaining growth (Rostow, 1971). The effects on educational development were twofold; first, education was seen as an important factor within the Rostovian "pre-conditions for take-off" (Barnett, 1963), and second, educational objectives could be achieved primarily through quantitative expansion and the manipulation of parameters within the formal system.

As a result, expenditures in training were treated as investments yielding measurable returns in the form of increased productivity and research in the 1950's revealed a powerful relationship between educational development and economic growth (Curle, 1963; Harbison and Myers, 1964; Schultz, 1971; Vaizey, 1961). The most significant outcome of this approach to educational development was the attempt to match investments in educational resources to future manpower goals as defined by national development programmes. Consequently, since the policies emphasised modern sector developments, the most urgent sectoral requirements were identified within the higher education brackets. Although improvement in the quality of education and the formulation of non-formal programmes was urged by some (Adams, 1963; Beeby, 1966) in general these were considered subjects of secondary importance.

In Lesotho, the influence of this philosophy may be seen in the prime education sector objective listed in the First Development Plan (1970-75) which was one of:

... selective concentration of government efforts in primary education, coupled with a policy of determined expansion in secondary education ... (Government of Lesotho, 1970, 29).

The irrelevancy of the traditionalist school system, which remained rigidly academic and pyramidal, was recognised however but only to the extent that technical training was to be encouraged through an expansion of, and curriculum reform within, the secondary sector (Government of Lesotho, 1970, 164) and would therefore continue within the structure of formal education. Programmes to introduce practical, vocational and agricultural training at primary and post-primary levels both within and in addition to the formal sector received only cursory attention and failed to attract any substantial support in the plan period.

However, in recent years, the econometric approach has met with less enthusiasm and manpower planning has become increasingly confined to the tertiary sector. One reason for this is that although the correlation between economic growth and educational development is undisputed the parameters of this relationship are unclear (Anosike, 1977). In particular, agreement has not been reached upon which educational

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level generates the largest return on investment. In practice, investment in primary education has proved more popular than economists would have recommended, partly due to relative costings and partly due to political appeal. Furthermore, education, as a political issue, cannot realistically be held to the minimum levels which might be defined by the manpower inputs necessary to meet development goals. In addition, many of the early claims made on behalf of the unfettered quantitative expansion of educational opportunities have been shown to be greatly exaggerated and, in many instances, simply false (Todaro, 1979, 236).

That mistakes have been made is now clearly understood (Elliot, 1977a; Hassad, 1981; Obanya, 1980) and, although underdeveloped countries no longer tenaciously subscribe to the tenets of the economic approach its effect has been to compound the already considerable inertia of the traditional system which, despite calls for radical change, remains firmly entrenched. One implication of this is that non-traditional education has received little support simply because the opportunities it provided were perceived as inferior (Godfrey, 1979; Marvin, 1975; Sifuna, 1976).

However, in the 1970's formal education faced severe criticism for two basic reasons. One of these was political in nature and related to the system's tendency to generate an elite (Scudder and Colson, 1980); the other focused on the inability of economies to accommodate the demand for higher level employment (Hoppers, 1980). In addition, rural development programmes were the recipient of much greater attention and the conclusions of academic research were enthusiastic in their evaluation of this form of investment as a promising strategy for the generation of self-sustained and equitable growth throughout the rural/agricultural sector (Karp, 1976; Lele, 1976; Livingstone, 1979). Analysis suggested that small scale rural educational schemes devoted to the promotion of literacy and awareness of technical and agricultural skills and practices were economically feasible (Thomas, 1974) and indeed essential for the success of rural development policy (Brown, 1977; Vanzetti and Bessell, 1974). In consequence, strong academic support has focused on rural-oriented educational projects (Adams, 1977; Carnoy, 1975; Dove, 1980; Elliot, 1977b; Kashoki, 1980; Kooijman, 1980; Sinclair with Lillis, 1980; Van Rensberg, 1978; Ward, 1972).

Despite this, in Africa only Tanzania has seriously adopted a national informal education programme (Maliyamkono, 1980; Vinzen and Hunsdorfer, 1979). In Lesotho, little progress has been made since 1975. Curricula and teaching methodology reforms are still listed as objectives of the Third Plan (Government of Lesotho, 1980, 328) but nonformal programmes such as the Lesotho Distance Teaching Centre (LDTC)

have expanded considerably and the administration of them substantially improved (Government of Lesotho, 1975, 185; Government of Lesotho, 1980, 334-335). Nevertheless, the Community Outreach Programme, the Institute of Extra-Mural Studies and the Multi-Purpose Education Centre in conjunction with LDTC reach only a fraction of the disadvantaged population and this is the main criticism of the government's commitment to informal training. The traditional sector still absorbs the bulk of the available capital.

In Lesotho then informal education is still in its infancy and evaluation of individual projects is needed to assess progress and modify methods and objectives. The experimental research of Paulo Freire in South America (1972a; 1972b) provides the most cogent package of guidelines with which to perform such an evaluation. They may be listed as:

1. Teaching should be practical rather than theoretical and academic. Learning through experimentation would therefore replace the internalisation of abstract concepts.
2. Discourse should replace textual examination since participants will probably be illiterate and innumerate.
3. Discussion should be employed in preference to instruction -- students would therefore feel involved in their own education and that of the group and less likely to reject new ideas through suspicion of externally imposed knowledge.
4. The teacher should employ rapid "acceptors," particularly if they are relatively senior in rank and age in the community, to explain and interpret information to slow learners.
5. The teacher should continually revisit the community to assess impact of his classes and engage in discussion around them.
6. The teacher should never presuppose the correctness of externally derived knowledge but should strive to comprehend local beliefs and practices since dismissal of them will breed resentment and suspicion.

In light of these recommendations, a critical examination of the Lesotho Conservation Education programme now follows.

Conservation Education: The Problem

The intensity of soil erosion in Lesotho is documented elsewhere in this book. It is sufficient here to note that the seriousness of the problem was recognised as far back as the mid 1930's when the colonial authorities introduced conservation measures the failure of which led to the

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realisation that such programmes should be accompanied by basic conservation education.

In the 1930's, contour, grass and diversion buffer strips were constructed by the then Department of Agriculture at locations throughout Lesotho including areas which were already eroding as well as others considered susceptible to severe degradation. By the late 1950's, however, it was apparent that the pace of erosion had not slowed but ironically it had gained momentum in many areas. The basic reason was simply that after construction, the conservation measures were allowed to fall into disrepair, in some cases lack of maintenance was at fault and in others, farming practices led to a decline in the efficiency of the constructions. Contours were breached, allowing the formation of dongas, grass strips became gradually narrower each season due to plough cut, and diversions silted up.

Both of these problems could have been avoided had local farmers clearly understood the function, and operation of, and their role in, the programmes. However, no preliminary studies were conducted to evaluate the acceptability of these innovations, and the consultations between the authorities and the local chiefs or headmen were directed only towards gaining an assurance that the engineers and labourers working on the projects would suffer no interference. Accordingly, no attempt was made to impress the urgency of the problem upon the local farmers nor explain the purpose of the conservation measures. The result was that local understanding of these externally imposed constructions remained low and suspicion of government motives high. It is now quite clear, therefore, that the success of conservation programmes depends to a large degree on the participation and enthusiasm of the local people. In the light of these observations and in line with the gradual shift in priorities within the education sector, the Division of Soil and Water Conservation in the Ministry of Agriculture has now been charged with the responsibility for carrying out programmes of conservation education in Lesotho.

Conservation Education: Policy

Conservation education has been primarily based upon identification of ecological and environmental problems in the exploitation of the land for the production of food. These are fully documented elsewhere in this book but, in addition, policy has been influenced by the recognition of the negative effects of traditional Basotho ranching and agricultural practices. Three in particular deserve close attention.

Firstly, since individual wealth in rural Lesotho is gauged largely by the possession of livestock, Basotho men tend to keep large herds and continually add to them whenever possible with the result that rangelands which have a low carrying capacity anyway, are generally overstocked. Trampling and over-grazing exacerbate erosion locally through the reduction of the vegetative cover.

Secondly, it is common practice for farmers to plant maize and sorghum, the staple crops, with relatively wide spacing between rows. This provides ideal conditions for erosion since run-off is channeled along unprotected soil.

Thirdly, these crops are commonly planted at the bottom end of steep slopes and are therefore directly in the path of run-off from the overgrazed slopes above. The combination of all three factors contributes considerably to the formation of gullies on the croplands.

Accordingly, a comprehensive package of conservation objectives have been prepared by the Ministry of Agriculture. Although the finer details, in connection with individual and local problems, need to be formulated in consultation with the people directly concerned, the following broad concepts have emerged (Government of Lesotho, 1980, 209):

1. The utilization of land in accordance with its capabilities.
2. The introduction of practices to improve and maintain the physical structure of soils.
3. The adoption of inputs and techniques to improve and maintain soil fertility.
4. The construction of conservation measures to protect land from erosion during spells of high intensity rainfall.
5. The maintenance of soil conservation measures.

Conservation Education: Administration

The Division of Soil and Water Conservation provides specialised services not only to the area-based conservation programmes but also to small scale individual projects. In the case of the latter, requests are made through application. In both situations, the first procedural administrative step is to consult the chief of the area concerned. It is essential that these negotiations are positive and that a clear understanding of the objectives and methodology of the programme is reached. The administrative powers of the chief are such that conservation projects cannot operate efficiently without his approval and support.

If this consultation proves successful, then arrangements are made for the Division officer, appointed to the project, to address the com-

munity at a "pitso". This discussion focuses on the full spectrum of conservation issues and the participation of local people in, and commitment to, the formulation and implementation of a conservation programme is emphasised. It is considered important here to gain the confidence and support of local people before proceeding to the appointment of a village conservation committee.

This committee has a vital role in the administration and implementation of the project since it provides a link between the Division and the community. All communications, in both directions, are channelled through its office. The Division formally recommends to the community that the chief be appointed as permanent chairman and that the other members (from five upwards normally) should be elected by the community. It is usual and advisable that they are people of some standing in the community and possess an above average educational background.

The bulk of village level training is conducted by this body and, after the initial involvement, the Division officer makes only periodic visits to the community to assess progress (but at least once every three months), listen to and clear up problems, and advise upon the formulation of plans for the immediate future. In the case of the area-based schemes, the participation of the officer is more intense since the development of a comprehensive conservation programme is the primal objective. An officer may therefore be appointed full time to a particular project.

Conservation Education: Training Methodology

The training programme commences with regular sessions conducted by the Division officer. In this initial stage, only the Village Committees are involved and it is therefore termed "Committee-level training." In the case of the large area-based projects the training is given to selected representatives of the relevant village committees, this being termed the Project Committee. The content of these sessions is based on the package of conservation objectives outlined above and is sufficiently comprehensive and thorough to ensure that members of the committee are able to efficiently transmit the information on to the community.

"Village-level training," then, is conducted by members of the community. This most certainly helps in accelerating the process of acceptance since respected village residents are much more likely to find a receptive audience than outsiders and also because they are fully familiar with local geomorphology, agricultural practices and the problems of individual locations. The teaching, although at a basic level, concentrates on three main issues: the importance and meaning of conservation; the

construction and maintenance of waterways, diversions, terraces, and dams; and the optimal utilisation of land in accordance with its capacity. Classes are normally small and are convened only weekly, bi-weekly or monthly depending on the urgency of the programme and enthusiasm of the committee and community.

The project committees of the large programmes have a more involved function since they are also concerned with the development of a full conservation package for the area in consultation with the Division. Once agreement and mutual understanding has been achieved, the Division may commence operations the most important of which are conducted in the following sequence:

1. Soil surveys.
2. Soil evaluation and classification of land potentials.
3. Designation of a development plan offering recommendations for the utilisation of all land within the area and detailing the locations, functions and engineering specifications of suggested constructions.
4. Construction of the conservation measures by the operations unit.

Village-level training is given in these situations in conjunction with pitso's, films, radio broadcasts, lectures and simplified literature produced and organised by the Division as well as the Project Committee. Local people can assist with construction but, more importantly, they should be involved in maintenance and in the utilisation of land in accordance with the development plan. For example, the plan would indicate, on the basis of the soil map, which crops would do best in a particular area given that there is a bias towards those that maximise ground cover in their normal growth patterns. Therefore, it is essential that the community thoroughly understands the purpose of, and need for, the programme. This can only be ensured through regular training sessions and all committee members are actively involved in them.

Soil Conservation: Evaluation

In Lesotho, as in many other African nations, informal training is gaining a measure of acceptance. Thus, now that conservation education has been recognised as a prerequisite for rural development in this country, informal training schemes have begun. As yet it is too early to evaluate results in terms of reduction in the pace of erosion but, in the light of the preceding discussion, it is clear that the programme has considerable potential.

As Freire (1972a; 1972b) rightly recommends, the local people are directly involved from the outset in negotiations, plans development and the training itself. This is the most positive facet of the training and represents a welcome move in educational philosophy. However, in terms of the training methodology, three weaknesses may be identified. In the first place, the teaching lacks an experimental or demonstrative component. Such an addition would undoubtedly increase the cost of the programme and the involvement of the Division but its value is unchallenged. Secondly, it is quite possible that the conservation message may be distorted as it passes from the Division to the community. Feedback is limited by the relative infrequency of return visits by the appointed officer and no real procedures exist to monitor performance in village-level training. Thirdly, the concentration of the education effort on the committee may lead to, or at least to accusations of, a form of institutionalised inequality for it is apparent that the programme could potentially benefit these community members more than others.

Of course, the major criticism lies in the programme's insufficiency in depth. Lesotho has a predominantly rural economy and, given the constraints on development in other sectors, it will remain this way. Since conservation has been identified as one of the main problems in rural development it is consequently illogical that conservation education is entrusted primarily to a Division of the Ministry of Agriculture and is not broader based although it is clear from the opening discussion that this situation is not uncommon in Africa. There is an urgent need to expand the programme and include school age children through the provision of training at both primary and post-primary levels and within both the formal and informal sectors. In addition, conservation education needs to be established as an important component of distance and extra-mural teaching. Once this is recognised, the objectives of the Lesotho conservation programme may be that much closer to realisation. However, given the current directions in educational innovation in Lesotho, this prospect seems unlikely to be fulfilled at least in the immediate future.

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