4. THE UYOLE AGRICULTURAL CENTER: A TARGETED BENEFICIARY

4.1 Introduction

The Uyole Agricultural Center is located about eight kilometers to the east of Mbeya town along the main highway to Dar es Salaam. The negotiations to establish this institution between the Governments of Tanzania and the Nordic governments of Denmark, Finland, Norway and Sweden began in 1968. After two comprehensive feasibility studies - one by the Nordic agricultural experts and another by the Nordic Appraisal and Planning experts-- a technical cooperation agreement was signed in 1972. The Nordic-Tanzania Consultative Committee was established to oversee the implementation of the project. Like in the Mbegani project, the local expertise in agricultural sciences community were left in the cold. The Finnish Government was appointed as the project executor on behalf of other donors. In March 1976, the Uyole Agricultural Center became a parastatal organization by the President Order No. 17 under the Public Corporation Act of 1969. This Act enabled the Center to operate relatively freely with regard to decision making and program planning and implementation.

The Uyole Agricultural Center was mandated to carry out the following three broad functions:

- to conduct agricultural, livestock and related applied and adaptive research with smallholder farmers as the target group;

- to train students at certificate and diploma levels so as to enable them join in the implementation of Tanzania's national agricultural policy; and,

- to engage to some extent in the production activities to demonstrate the results of research and generate revenue to supplement the Government's subvention.

The Uyole Center owns 4,095 hectares of land in those four different agro-ecological zones. About a fifth of that land was under cultivation at the time of research in 1992; a tenth of that was for experimental plots and the rest was for seed multiplication or commercial production. About two-fifth is pasture or rangeland. The Center had adequate facilities for offices, laboratories, greenhouses, workshops and a well supplied library.

In 1972 Iceland became a supporting member of this project. Finland withdrew from the project. From 1985 to 1992 the Finnish Government alone supported the Uyole project.

4.2 Project Implementation: Problems and Prospects

By 1975, most of the research and training offices had been completed and so were the laboratories, greenhouses, workshops and livestock facilities. The training program became operational two years later. Until the early 1980s, both the research and training programs were understandably dominated by Nordic experts. Gradually, however, that picture began to change as Tanzanians returned to the Center from studies with graduate diplomas.

In March 1976, the Tanzania-Nordic project at Uyole was incorporated by an Act of Parliament into a public corporation. Uyole Agricultural Center was established by the Act of the Parliament as a semi-autonomous zonal agricultural and training center for the four regions of Mbeya, Iringa, Ruvuma and Rukwa. The Southern Highlands of Tanzania cover an area of about 249,347 square kilometers with an estimated population of 4,163,414 of whom well over 90 percent are engaged in agriculture. The zone is, to say the least, the granary of Tanzania. It produces about 80 percent of the national maize output (Mussei and Shiyumbi, 1992:85). The Center was mandated to undertake production-oriented research and training activities in order to solve the immediate technical problems of the farmers. To this effect, its crop research programs include the major staples of those regions like: maize, rice, phaseolus beans, potatoes, wheat, fruits and vegetables. In turn, each crop research covers breading, agronomy, crop production and on-farm research. The livestock programs concentrate on pasture development and pasture nutritive value studies for dairy cattle.

In brief, unlike the Mbegani Fisheries Development project, the objectives of the Uyole program were unambiguously stated, carefully operationalized and strategized. Specific capacities to be developed were identified right from the start and so was the time horizon. The inputs to be provided by foreign TC resources were directly derived from the expected output. However, the Government's contributions to the project over the initial and subsequent project renewal were not categorically specified. This, in our view, largely explains some of the dramatic successes and failures of this project.

Despite occasional brain drain from the Uyole Center to other more attractive local and international jobs, the project has relatively succeeded in training and managing a handsome pool of its professionals. As of December 1992, the Center employed 83 professionals and 138 technicians. Moreover, a very negligible percentage of them had left the Center for other "greener pastures" within or outside the country. In this sense we can confidently argue that one of the primary objectives of this technical assistance project of training Tanzanian researchers and trainers had been accomplished.

Relatedly, one can add that the program has managed to build and strengthen national research and training capabilities. Uyole's professional capability in searching and identifying critical agricultural problems facing the farmers, has been demonstrated by its immense capacity to define appropriate research projects and programs and deliver appropriate and indeed acceptable scientific solutions to their clients. In this regard, the Center has long debunked the received conventional research and development approaches whereby research priorities were solely determined by scientists who generated technologies in their research field plots and laboratories, and who, through the extension system, finally transferred the same to farmers.

To be sure, the poor and semi-illiterate farmers of Tanzania in general and those of the Southern Highlands in particular were less likely to exert a "demand-pull" on the ivory tower research agenda. Deliberate attempts must be made to elicit farmers' views and to observe in the field how and why farmers accept or reject new technologies. This, as was earlier suggested, calls for the need to integrate farmers in all stages of research and development cycle. Farmers should be made to participate as equal co-collaborators and evaluators of alternative technologies

in their communities. This is community empowerment par excellence. Loppe *et al.* (1980) put forward this argument pointedly that:

> ... rather than being left out of the development process, the poor have an integral part, both as a resource and as victims. The poor have provided their labor, their products and often their land. The issue then is not to bring the poor into the development process but the poor to achieve the power they need to direct a development process in their interest...

The Uyole Agricultural Center has, in recent years, indefatigably strived to encourage constructive dialogue and interaction with farmers in order to understand each others' objectives, interests and capabilities. Commenting favorably on the overall performance of the Uyole Agricultural Center, the 1988 World Bank evaluation team remarked that:

> The Uyole Agricultural Center has been more successful than others... in reaching farmers, helped by its extension section... it can be regarded as a useful model for regional adaptive research which could be replicated. The experiment of combining training and research has also worked well (World Bank, 1988:8) (our emphasis).

The Uyole's Unit for Extension was established with a brief to liaise with farmers in order to identify their problems and inform them of the results of research. The Center has implemented its research-extension functions through a variety of mechanisms:

- adoptive/farming systems research directed towards small agriculture;
- publication of research findings;
- production of leaflets and fact sheets which popularize research findings and recommendations for farmers and extension workers;
- research-extension workshops and seminars for extension workers, their supervisions and NGOs;
- field days organized by the Center and at its sub-stations;
- on-farm (farmers' field) trials;
- demonstrations, complemented by the International Committee on Food Crops efforts;
- regular and informal contacts with other donor program staff, for example, FAO/Ministry of Agriculture program; Sasakawa Global

2000/Ministry of Agriculture; FAO Women in Irrigated Agriculture program etc.;

The Southern Highlands Maize Improvement research and development project graphically demonstrates the Uyole research and development competence. The maize program began in the 1970-71 cropping season under the Tanzania-Nordic agriculture project. The long-term objectives of that program included forming agro-economic packages of maize for different agro-ecological zones and farming systems found in the Southern Highland regions; breading hybrids and open-pollinated varieties; and , monitoring pests and diseases of maize. In the last twenty years or so, the maize research program has successfully provided the requisites information on land preparation, varieties, planting time, rates and methods of fertilizer application, the use of organic manures, rotations, plant density, and weed and pest control. This valuable information has been passed on directly to the farmers or indirectly through Uyole's extension system. A number of impact assessment studies of the maize project have been carried out. Three basic elements were studied. These were, among others, level farm inputs consumption; productivity per farmer; and production packages recommended and adopted by the majority of farmers. Most of those studies reported, almost invariably, that maize production from the studied regions has substantially increased as a result of acreage expansion as well as the adoption of improved production technology and management practices. To be even more precise, estimates of maize production by region between 1984 and 1987 show that the Southern Highlands accounted for 46 percent of the total maize production in the country (Moshi and Nnko, 1989). It should perhaps be emphasized that similar successes have also been reported for other crops such as sorghum, millet, rice, wheat and grain legumes (Moshi and Marandu, 1988; Lyimo and Temu, 1992).

Secondly and equally important, a comprehensive three-year monitoring study by Mwakyembe *et al.* (1992) of a smallholder farm enterprise combinations and production practices in the Southern Highlands of Tanzania, concluded that Uyole's technological impact was phenomenal. The study observed that this zone alone bought and used more than 65 percent of Tanzania's total fertilizer consumption. The majority of this fertilizer was used in maize production. The study further revealed that there was a general awareness among the zone's farmers about the benefits of improved seeds and their accompanying package of inputs. In a study of three districts of Njombe, Mbozi and Songea, it was found

that about 55 percent of the farmers used improved seeds and inorganic fertilizers. The figure would have been even higher, the study concluded, had prices been far much lower and deliveries made on time (Mwakyembe *et al.* 1992:102-3). Another study by Lyimo and Temu (1992:157-58) noted that the improved seed sales in the country increased from a meagre 25 tons of seed in 1970 to over 6,000 tons on average between 1987 and 1991. Finally, the same study found out that most of that improved seed was sold mainly to smallholder farmers of the Southern Highlands of Tanzania.

Table 9: Farmers' responses to modern technology applications

Item	Levels of input intensity out of 20 interviewees			
	Very much	Moderate	Never	Total
Herbicides	5	12	3	20
Hybrid seeds	6	10	4	20
Fertilizers	4	8	8	20
Rotations	12	8	0	20
Use of manure	11	9	0	20
Plant density	13	7	0	20
Extension officers	12	8	0	20
On-farm trials	14	4	2	20

Source: Survey data

Although the adoption of Uyole developed maize production technologies has proved beneficial to many farmers in the Southern Highland, there are still several major constraints that derail its expanded diffusion in the area. We should, however, hasten to add that those constraints lay largely outside Uyole's institutional competence. Just like that artisanal fishermen on the Mbegani Fisheries Development project, small farmers in the Southern Highlands of Tanzania have a poor resource base. Our survey interview data of twenty farmers in the Uyole neighborhood clearly demonstrated that all the farmers interviewed were well aware of what it takes to produce a quality maize crop. However, fifteen out of the twenty farmers interviewed admitted that they were too poor to afford most of the recommended modern agricultural packages from their meagre savings. Moreover, like the Mlingotini fishermen, the small Uyole farmers had no official property titles to their land that could be used as collateral for official bank loans.

As Table 9 indicates, almost all farmers in our survey sample tended to use intensely the Center's facilities that did not demand costly inputs like rotations, plant density and the use of free extension officers. However, the use intensity rate fell when it came to relatively costly inputs like herbicides and hybrid seeds. It was further revealed that precisely because of their weak purchasing power, small farmers tended not to use those crucial but expensive agricultural inputs in scientifically recommended levels.

The recent dramatic increase in yields achieved in these Southern Highlands is attributed to a good number of farmers who have taken advantage of the favorable credit facilities provided by the Sasakawa-Global 2000 project clearly demonstrates the centrality of poverty.[15] Five out of the twenty farmers interviewed were relatively well to do. These were the potential users of modern agricultural packages. They could either resort to their own savings or borrow from the formal banks. They were, however, faced with different kinds of problems. The delivery of seeds, herbicides and other related inputs were rarely made at the right time and the right place. The impact of such delays on the quality and quantity of the harvests, it was confirmed, tended to be almost always devastating.

A variety of imaginative incentive schemes had been created to motivate and retain qualified researchers and trainers. These include, among others, subsidized rent, free medical care, free facilities and highly subsidized rental charges on the Center's farming equipment for private use. Those research incentives had markedly facilitated unequaled retention rates in any public institution in Tanzania.

On the training side, the Center's training Institute has had commendable performance since its inception. It houses five academic departments namely: agricultural engineering, agricultural extension and farmers training, animal science, crop science, and food production and nutrition department. The Institute also conducts three different programs: diplomas, certificates and short courses for farmers. It opened its doors to the first intake in January 1975 to 29 students for a five-month certificate course in agro-mechanization. The student population has steadily grown over the years. For the 1992/93 academic year, the Institute has 363 students enrolled, of whom 70 are female and 293 are male. (See table 10.) A total of 2,830 graduands have trained at the Institute between 1975 and 1991: 2,117 at the diploma level and 713 at certificate level.

Table 10: Student enrollment at Uyole Training Institute Sept. 1992

	Male	Female	Total
First Year			
Certificate in Agric and Livestock Production	-	-	-
Diploma Animal Production	40	9	49
Diploma Crop Production	54	5	59
Diploma Food Production and Nutrition	15	9	24
Total first year	109	23	132
Second Year			
Certificate in Agric and Livestock Production	-	-	-
Diploma Animal Production	41	9	50
Diploma Crop Production	55	13	68
Diploma Food Production and Nutrition	12	7	19
Total second year	108	29	137
Third Year			
Certificate in Agric and Livestock Production	16	12	28
Diploma Animal Production	-	-	-
Diploma Crop Production	-	-	-
Diploma Food Production and Nutrition	-	-	-
Total third year	76	18	94
Diploma	217	69	286
Diploma and Certificate	293	70	363

Source: Hiza et al. 1992 Table 1 p. 384

With the benefit of a hindsight, one can plausibly argue that the phenomenal achievements at the Uyole Agricultural Center would hardly have been possible without the unfailing generous donor support. Its up-to-date infrastructure for research and extension schemes for example, had been uninterruptedly maintained by and supported with TC resources. For how long can such support last? Are the programs sustainable after donor withdrawal? These and other similar questions are the subject of the subsequent discussion.

Despite those apparent praises and accomplishments, the TC management for the Yuole Center has not always been rosy. The perennial question of sustainability stands out prominently. During the initial construction phase (1971-1976) for example, the Nordic governments extended about Tshs 256 million to the project while the government of Tanzania contributed Tshs 240 million or 58 and 42

percent respectively. Under normal circumstances, donor require host governments to make a formal commitment of finances and institutional support as a precondition for development assistance. In the same vein, one would have naturally expected that the local financial contributions would have gradually been raised for a penultimate take over. Surprisingly, subsequent agreements between the donor and recipient government paid neither sufficient attention to the exact size of the national contributions over time nor to an agreed phasing out time-table. This oversight, in fact, explains, among other things, why the project was renewed several times. On the one hand, at each time, the Government of Tanzania was simply not ready to tack over. On the other, FINNIDA was still willing and able to pour more money into the project. As a result, the project seemed to owe its continued existence to foreign assistance.

The 1980 joint Nordic-Tanzania Mission Report on the project casually commented on the relatively unincreasing Government contributions to the project. The Report recommended, therefore, that the Government substantially raise its annual contributions to the Center. Curiously, however, no exact estimates were proposed nor deadlines suggested. Once again, this rather disturbing omission, it will be argued, came to contribute significantly to the Center's sustainability problems after the withdrawal of the Finns technical assistance funding.

The withdrawal of the Finns at the end of 1992 plunged the Uyole Agricultural Center into a deep management crisis. This was, in fact, the problem of sustainability. All along the project years neither the Center nor the Government took trouble to study various ways of raising the requisite resources to sustain the programs when the time for the take over was at hand. And when that penultimate hour came, the Government of Tanzania was not ready to finance all the Center's operations single-handedly. At the same time, the Center did not have in place well researched possible alternative sources of financing. All hopes were based on an expectation of a change of mind on the part of the Finns. Unfortunately those hopes failed to materialize.

Some experiences from other countries have shown that a well designed project unambiguously stipulates various strategies for smooth take overs. All possible recurrent costs contingencies are carefully addressed well in advance. These include a combination of gradual low cost delivery systems, aggressive government financing and the introduction of user charges (Gow and Morss, 1988). Let us

explain each briefly. A service delivering institution would limit its costs by involving the local population in the project design and implementation. More often that not, the local population's knowledge of the local situation permits cutting corners with the resultant direct savings. Moreover, if the beneficiary population is interested enough in the services in question, it will make a direct recourse commitment to it, then the cost problem can be alleviated.

Secondly, it is the whole question of increased Government subventions to the project. This would largely depend on the prevailing political and economic climate as well as the lobbying capacity of the local project managers. If the top Government leadership were committed to the cause of the project then chances of aggressive Government financing would be great. The reverse would be true if little interest was shown in the project by the leadership.

Finally it would be the interdiction of user charges over and above the two suggested strategies. User charges are usually based on the premise that the people benefiting from a particular service should pay at least a portion of the cost. The rest would automatically be borne by the Government. In practice, however, this would lead to withholding benefits from those who need those services most but are the least able to pay. One way would be to structure charges in such a way as to allow for differing payment abilities.

Table 11: Finnish and Tanzanian Financial Contributions to Uyole in 1985-86 to 1989-90

Year	1. Finnish	2. Tanzanian	3. Total	2 as % 3
1985/86	25.0	29.0	54.0	54%
1986/87	98.0	52.0	160.0	39%
1987/88	108.0	72.0	180.0	40%
1988/89	158.0	138.0	296.0	47%
1989/90	279.0	151.0	430.0	35%

Source: Uyole Center Accounts (Several Years)

As Table 11 clearly shows, between 1985-86 and 1989-90 the Government of Tanzania contribution to Uyole averaged only 43 per cent. In fact, there seems to have been no conscious efforts on the part of the Government of Tanzania to gradually increase its relative annual contributions to the Center for purposes of an

eventual smooth takeover. A further breakdown of the 1988-89 and 1989-90 budget figures in Table 12, for example, ably demonstrates that FINNIDA had, until the final days of the project, continued to financially support the core activities in the research and training activities at the Uyole Center. For those two years, FINNIDA contributed about 69 per cent and 50 per cent to finance the Center's research and training activities respectively. In the light of our burning concern for TC sustainability, this is surely a clear indicator of a poor project management capacity on both sides of the aid relationship.

Table 12: Tanzania and FINNIDA Contribution to Uyole 1989 and 1990 Government and FINNIDA Expenditure Comparisons 1989 and 1990 (Mill Tshs)

Items	Govt.	FINNIDA	Total	Govt.	FINNIDA	Total
1. Research Institute	36.0 (39%)	56.0 (61%)	92.0	34.5 (26%)	100.0 (74%)	134.6
2. Training Institute	26.2 (53%)	23.2 (47%)	49.4	31.0 (48%)	33.9 (52%)	64.9
3. Others (collaboration & training)	- (0%)	17.7 (100%)	17.7	- (0%)	17.4 (100%)	17.4
4. Rehabilitation	- (0%)	26.8 (100%)	26.8	- (0%)	54.6 (100%)	54.6
5. Institutional Support	72.1 (68%)	34.4 (32%)	106.6	76.9 (51%)	73.2 (49%)	150.0
6. Development	9.0 (100%)	- (0%)	9.0	3.6 (100%)	- (0%)	3.6
Total	**138.0 (47%)**	**158.2 (53%)**	**296.3**	**151.5 (35%)**	**279.4 (65%)**	**43.9**

Source: FINNIDA/Uyole Annual Meeting Uyole 11-12 November, 1991.

5. INSTITUTION TWINNING: THE CASE OF FORESTRY FACULTY

5.1 Introduction

Despite the absence of a national policy framework on TC, the Sokoine University of Agriculture's two Faculties of Forestry and Veterinary Medicine have effectively managed to acquire and assimilate technology through TC arrangements. The secret behind that phenomenal success is the University's relatively strong institutional capacity which was a significant bottleneck in our earlier case studies. Indeed, as the 1989 Development Assistance Committee Report (1989: 107) poignantly observed, "sustained and self-reliance development depends on the