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REPORT ON AGRICULTURAL PROJECTS IN MAZIMBU AND DAKAWA TANZANIA

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INTRODUCTION

Mazimbu farm falls under the category of large scale farms. This is characterised by its increasing acreage and its standard of mechanisation. In Tanzania land belongs to the state, and, as such, cannot be bought or sold or even transferred through traditional land laws. Land reforms put an end to private ownership of land. This greatly affected large sisal estate farmers. Following these many private farmers abandoned their farms. The rapid fall in sisal prices on the world market also resulted in large uncultivated farm lands. Mazimbu came about as a result of this.

The development of farm projects in Tanzania is of vital importance, to meet the growing demand of food, which does not only face Tanzania but is in general a world-wide problem. The ANC as well, is faced with this problem. Land usage in Mazimbu developed unevenly and therefore this made farm planning a little complicated. By this we mean that a situation arises whereby the ratio of farm equipment remains relatively stagnant as compared to the growing acreage of 250 to 4,000 acres with 3 tractors and one planter in good operational condition. Under Tanzania's unpredictable weather conditions which changes year by year, the vegetative period is greatly affected, making yields drop severely.

Whilst it is true in many cases that agriculture, even in highly developed countries, is heavily subsidised by the state, it actually means that the state invests millions of a given currency at a given time and is expected to regain it and put it into circulation.

A. Set-up and development in agricultural organisation in Mazimbu

Certain conditions need to be created for the organisation of a particular production process. The creation of these conditions requires the solving of the following organisational programmes:

- a) Organisation of production units with supplementary directing units
- b) Forming of groups of people fit for performing production tasks equipped with instruments of labour and determination of tasks.
- c) Appropriate supervision.

In the organisation of the work we should start from the given production task.

In other words form a structure of production. Main purpose of activities in an enterprise is the production of agricultural goods. The formulation of objectives and aims of the enterprise is the task of the establisher. The establishment of Mazimbu agricultural farm is the task of the ANC(S.A.) and therefore sets the main directions of production. The highest organ in Mazimbu agricultural department is the MANAGEMENT and directly under management is the PRODUCTION UNIT. The size of the production unit is influenced by:-

- a) Material and technological level of development of the enterprise
- b) Modernness of agricultural production
- c) Skills of the managing specialist
- d) Carticulation of the enterprise
- e) Level of intensification - farming lines.

At present in Mazimbu we have the following lines:

A) Plant production

- 1) Maize
- 2) Sorghum
- 3) Sunflower

B) Animal husbandry

- 1) Poultry
- 2) Pigs
- 3) Goats

Within the enterprise, various farming lines connect with each other. This connection can be vertical or horizontal. We talk about vertical connection if one line uses the main by-products of the other line, and horizontal connection, if one production line utilises a group of producing forces which are joined, e.g. plant varieties, forage producing areas. With the introduction of cattle-breeding in Mazimbu, we would be faced with the question of choosing which line suits our development.

B. Set-up and development of structure of plant production.

By structure of plant production we mean distribution of the total producing area according to sowing and planting areas. Their set up and development is influenced by various factors:-

- a) Number of members within the enterprise - regular working members.
- b) Degree of mechanisation in the enterprise
- c) Professional skills of manager and workers
- d) Utilisation of transport and other economic possibilities, infra-structure
-water and electricity.
- e) Proportion in area of main production for the people.
- f) Financial stimulation used for production
- g) Profitability of the farm

1. Structure of production in Mazimbu

Maize - 70%

Sorghum - 20%

Sunflower - 5%

Beans - 5%

11) Farming considerations

- a) Various soil types and size of farm
- b) Relief conditions
- c) Transport distances and road conditions
- d) Need for food crops and forage crops
- e) Even use of farm capacity

111) Mechanisation

Machine tools and other agricultural equipment are the highest groups of assets in an agricultural enterprise. The machine requirements can be determined by:-

- a) comparing the task to be performed by the machine and the producing capacity too. i.e. $\text{Machinery need} = \frac{\text{Task (in ha)}}{\text{Seasonal output of given type of machine in ha.}}$

$M = \frac{a}{b}$ for example. The task is to plough 300 ha (a). Seasonal output of machining = 100 ha.

$$M = 300/100 \text{ ha} = 3$$

- 2. On the basis of various machine demands key numbers e.g. key No. every 150 - 200 ha of maize need 1 combine harvester. The producing capacity is influenced by:-

- a) Weather
- b) Knowledge and skill of workers
- c) Repair job capacity
- d) Speed
- e) Method of organisation.

The operation hours used to express the output of stable tractors and the expected output for operated hour of various types of tractors (machines) are given as norms for each type of work. The effect of output on soil conditions should be taken into consideration. Soil and relief conditions in Tanzania vary and therefore tractor demands are different. The first phase of mechanisation is called Basic Mechanisation. This means generally the mechanisation of ploughing and other hard soil work, harrowing, cultivation, harvesting transport and threshing. In agriculture, tractors and working machines should form a synchronised system with each other. This is directly connected with agricultural machine requirements:-

- a) university
- b) efficiency of machines
- c) high producing capacity
- d) modernness of machines
- e) outer connections between individual machines.

ii) Assets

Instruments of production get used up during the production process and the whole of their value goes into new products. It is characteristics of current assets that, in order to repeat the production process, they need to be used again and again. Whilst circulating assets in constant motion they are functioning in the sphere of production as materials, i.e.

A. Basic materials

- 1. Fertilizers
- 2. Sowing seeds
- 3. Forage

B. Subsidiary materials

- 1. Chemicals
- 2. Weed killers
- 3. Fuel, petrol, diesel, lubrication
- 4. Spare parts, stationery.

In agriculture, due to biological requirements of plants and animals, the speed circulation differs from brach to branch.

Review of Mazimbu College Farm

Although it is defined in this report under "large scale enterprise", it is important to note that Mazimbu farm developed without extention work. Extension programmes can be carried out by non-specialised personnel under such conditions. The common weakness is that there is always an attempt to solve too many problems at once without making significant contribution to any of them. Care must be excercised to select a few problems for attention in one year. Goals set for accomplishment in a given time should be practical and achievable. At Mazimbu, due to the method applied during the transfer of land to us, as foreigners we were unable to participate in the organisation of legal protection of the land given because we were surrounded by subsistence farmers. We were forced to partly invest in land that we were not ready to develop, just to prove to local persons that the land no longer belong to them. This not only affected the development but the whole infra-structural changes. And Mazimbu can be looked at as a national agricultural development project equal to any such projects in Tanzania.

1. Personnel power and labour force.

In agriculture there are four categories of work:

- a) Work in the farm not required physical strength and qualifications-messenger.
- b) Physical strength necessary but no qualification-bush clearing, ton boys, road maintenance, grading.
- c) Strong physical work without special qualifications-sisal cutters, slashing, loading sacks, picking up and loading hay.
- d) Physical effort is necessary and special qualification-prunning of trees, plant protection.

At Mazimbu to organise personnel power according to the above-mentioned categories it is possible, both locally and internal.

In agriculture generally, people are working together and the output cannot be established individually but for the whole working group together and then the established wage for whole output is divided for a single worker according to working categories. Common in Tanzania is the efficiency wage system, especially in crop production, e.g. harvesting of maize. One of the main problems at Mazimbu is lack of constant personnel power. In solving the problem we might have to resort to either local labour force for certain categories of work. i.e. experienced tractor drivers, combine drivers, etc.

2. Production unit.

The primary functions of agricultural enterprise is agricultural production. Production in agriculture can only be ensured if the guiding apparatus secures continuous, planned, reliable and foreseeing activities of the enterprise. At Mazimbu the highest organ in production is the PRODUCTION UNIT. The functions of this body is the management of the production process. By its activities it points, directs and supervises all spheres of production. Its leader is generally the chief of production, i.e. manager, engineer agronomist. Their administrative tasks are generally performed by farm assistance. At Mazimbu we are engaged in the sphere of production where various assets are involved and therefore all the above-mentioned concerns us well.

3. Labour management and personnel.

The organisation of labour matters settlement of wage accounts, the fulfilment of wage management tasks (material incentives) some personnel problems, social and health welfare, education, recording of matters, household form - size, materials, all belong to this enterprise department under the chief of personnel and labour management. Many problems that arise during production are dealt with by the production unit, i.e. problems connected with production. personal problems of any nature should be dealt with by this department. To quote an instance; At Mazimbu a comrade refused to work and gave himself a holiday without tangible reasons at a critical time during the planting season.

As a rule, farm workers at this time of the year are not allowed to go on holidays. Anyway disciplinary steps were taken against the comrade. In cases of misconduct the chief of personnel has the right to dismiss or suspend any member of staff. When taking such a decision he should consult with his committee. The farm director or manager cannot impose his will. The assistant directors heading the departments have an autonomy. They act on general decisions taken at a meeting with the director. The director receives and takes orders from the executive body. After harvesting season there can be other sittings with the executive to review matters related with production and exchange opinions on leading enterprises in the area. Commissions should be formed, occasionally visiting the enterprise. Sometimes the executive forgets about the enterprise and this usually leads to devastation.

4. Caretaking department.

Unauthorised persons who are not concerned with production are strictly forbidden to enter farm premises. Dairy, piggery and poultry areas are strictly out of bounds. Special permits are to be obtained for any visits to such units. This measure serves to prevent epidemics and outbreaks of diseases unknown in the area by carriers, and in many cases against biological warfare. In the farm premises especially where there are drinking places, both for stocks and human consumption, careful observation should be made. Outbreaks of fires are common. These fires are sometimes caused by neighbouring farmers through veld burning, but in many cases by irresponsible passers-by. In Mazimbu we lack this department.

5. Purchasing and supply department.

Large quantities of materials and equipment are moved from one area to another, are received by the department and sometimes produced. This involves new births and purchasing livestock, new agricultural produce, machinery, etc. Supervision, handling of materials and money plays a very important factor in the existence of a farm enterprise. We shall quote a very simple example. In Tanzania an egg tray costs 5/- Tanzanian and at a go, 500 of them are purchased and delivered to the establisher (ANC). The supply department receives them with eggs to be supplied

The consumer uses the eggs, throws away the tray and in a year 20 trays lost per consumer. Now let us say we are having 20 consumers and each is losing 20 egg trays per year. This loss gives us the cost of a new disc harrow. A second example. Let us say we purchase 2,000 empty sacks to be filled with maize at harvesting. Each empty sack in Tanzania costs 18/- Tanzanian and the marketing price of maize is 90/- Tanzanian per 100 kg, i.e. a bag. Now if our yield is a record of about 1,000 bags, only the price of bags will give us half the price of a new planter (40,000). Now this is the truth about simple things that are ignored. The purchasing and supply department are generally subordinated to the chief accountant or head of the department - accountant.

6. Specialisation.

The direction of specialisation in farm enterprise is greatly influenced by agro-climatic conditions, soils, PH, and the ratio of NPK. Some crops grow well in acidic soils, some in alkaline soils. Some are drought resistant and others are less drought resistant. All these conditions put together determine conditions under which crops could be grown. Areas of agricultural development are greatly influenced as well by these conditions hence agricultural areas are divided into areas of grain growing, oil seeds growing and fibre crops growing. A further division can be made to determine whether areas are favourable for cattle breeding or both animal and crop production. Besides the above-mentioned conditions there are other basic conditions that greatly influence agriculture:

- a) Level of economic development.
- b) Level of industrial development
- c) Level of scientific development.

Whilst developing agricultural projects in various countries these factors should be taken into account especially when embarking on a diverse form of farming. At Mazimbu, before the acreage increased there was no specialisation. And the rates of investments were insignificant. Mazimbu has become more diverse agriculturally, and new systems of crop rotation are necessary to meet the new demands. This involves setting up of a specialised crop rotation to feed 50 dairy cows and 20-30 head of beef cattle.

Under our present crop condition this would be practically impossible. There are proposals to set up a 25-50 ha irrigation scheme. This is ofcourse a good idea. But a careful study will have to be made before setting up such a scheme. Wrong practices under irrigation has, especially in East Africa, resulted in desert lands. One of most important principles of modern farming is soil conservation from various forms of erosion. To study drainage systems and methods of irrigation, we would suggest that a detailed investigation be made about possibilities of irrigation from nearby research centres. Who may possibly tell us why they are not attracted by the idea?

DAKAWA

1. Geographical position.

Dakawa falls under the Morogoro region. 56 kilometres from the town of Morogoro along the Morogoro - Dodoma road and 8 kilometres from Mvumero, one of the biggest village centres in that area. A bound surface road from Morogoro passes Dakawa, whilst other motorable tracks and footpaths lead to the scattered settlements in the neighbourhood. It is a fairly flat land area with ideal cattle and other stock grazing. Although at present it faces over-grazing by large herds of Masai cattle. This matter could be improved by proper farming methods. The search for water is a major problem for the large Masai herds as the seasonal rivers dry up during the dry season. Underground water is found at different levels/depths from 17-200 metres. At shallow depths, in many cases, the water is salty. But with increased depths beyond 100 metres to 150 metres, sweet drinking water is found.

2. Rainfall

February is the most critical month for Tanzanian agriculture. This is because the area between the unimodal (centre and south of the country) and bimodal (north east and north) can be called a transition zone, only in statistical sense. In practice it is either unimodal or bimodal, depending on the year. The farmers usually plant at the end of the year in order to benefit from the water accumulated in the soil during the short, dry spell (season). Nevertheless it is worth noting that the onset of the long rainfall season should not be expected in February but in March. Therefore in Morogoro only the very early planted crops can be stricken by the weather conditions recorded in February, see Table 1.

From Table 1 the following conclusion can be drawn:-

- a) Morogoro region has unevenly distributed rainfall that has adverse effects on crop growth.
- b) Morogoro is a region of risk farming for crops with low drought resistant ability.

3. Soils

Are generally (or locally) referred to as Wami soils. These are soils east and west of the river banks of Wami (Wami farms). Wami soils are classified as Oxy and Montmorionitic soils. They are sandy and clay loam types. They are not uniform. A rapid transition from greyish black to red tropical soils often occurs sometimes from Oxy to montmorionitic. This usually leads to incorrect soil tests.

Because of the nature of rainfalls, and soil structure, water that runs over the soil surface is a far more serious cause of erosion in most parts of Morogoro. Water only runs off the soil surface when the rate of rainfall exceeds infiltration of water into the soil. Hence every factor that reduces the permeability of the soil increases the likelihood of water run-off just as the case with sandy soils of Morogoro.

4. Vegetation

Is composed of scattered trees and scrubs. Carpeting the soil are the star grasses. There is no significant vegetation changes.

5. Soil preparation and crops.

Tilling begins at the end of November. Late tilling can be carried out at the end of December just before the heavy rainfall in January.

Disc harrows are commonly used in Tanzania. Deep cultivation is not necessary. After ploughing, depending upon the weather conditions the fields are heavily infested by weeds. Therefore it is advisable to use planters with triple operations, i.e. planting, cultivation, and fertilizing the soil. If such planters are not available then it is necessary to carry out cultivation. Seed rates can be adjusted from 38,000 to 48,000 seeds per hacter depending upon the purpose. Maize planted for silage can have increased rates of up to 50,000. Seeding depths depend upon the weather conditions.

In years with little rainfall seeding depths should not exceed 7-8 cm whilst in years with good rainfall 4-5 cm. If good soil preparations are made, spraying is not necessary. To suppress the fast growth rate of weeds many fold discing can be done. The chief crop is maize although it is not suitable for Morogoro. This makes maize a risk crop in that region. Sunflower, ground-nuts and sorghum do well and this makes Morogoro a sunflower growing region. Other crops like rice, sugar cane do relatively well, for irrigation schemes in Dakawa can be used after investigating the underground water resources of the area. Livestock breeding, especially beef cattle, would be much preferred to dairy farming. As we have mentioned above that whenever dealing with stock farming we must always take into consideration the government policies towards that particular farming line. This would assist in the readjustment of assets.

6. Organisation and Mechanisation.

Enterprise organisation is nothing other than the sphere of activities of the production forces within the conditions of enterprise. In large scale farms enterprisal organisation of agriculture is based on economically smallest units of production. The tasks of the enterprise is to develop an organisation in which the economical and political aims of the establisher are achieved. In Dakawa, the ANC (S.A.) aims at establishing such an enterprise, which ought to carry out the above. Before land use in Dakawa we are considering the fundamental rules of farming:-

- a) Planning
- b) Topography
- c) Soil texture
- d) Land class capability
- e) Partial budgeting on crops giving higher returns
- f) System of crop rotation.

Having made the following assessment we are faced with the question of how best we can mechanise the enterprise for intensive farming. The backbone of intensive farming is mechanisation. This comes about through the level of technical and scientific development.

Conclusion

Having made a study of the nature of problems facing our agricultural projects, we reach the following conclusions to:

- a - set up a properly planned crop rotation system and use crop charts to determine various conditions under which crops can be grown.
- b - set up a planned, even economic development of both enterprises (Dakawa and Mazimbu), taking into account the unpredictable weather trends of Tanzania's agro-climatic conditions that vary from year to year.
- c - set up methods of agricultural extention in the case of Dakawa, considering the distances between brigades. A communication system will be of great importance. If is at all possible, we should put up a sound production system. This will keep the farm community up to date with both internation and local information. We should bear in mind that not everybody reads and writes but listens to news broadcasts and music in different languages. Moreover, farm work is such that it is not always possible to hold political discussions and yet the community needs some form of political information e.g. our President's speeches or the latest sounds of our Amandla Group. Another form of recreation could be the showing of films or slides taken during competitions at work. This type of farm extention work do the following:
 - a brings the farm community closer together and helps them to understand one another.
 - b brings them closer to our administrative bodies.
 - c curbs malicious propoganda that so easily spreads in a farm community.
- d - create pure agricultural structures in Dakawa which have defined fuctions

Recommendations

Considering the problems we face in Mazimbu because we do not have the proper organisation of our labour force, because our students at Mazimbu cannot form a constant labour force, we make the following recommendations:

- a - that three Comrades from the Transkei group and six students should be taken from the Lusaka farm to Dakawa. The group of students would create a nucleus for our Dakawa administration.
- b - that we get clearance for some of the Transkeians that are in Botswana. If we have this complement, problems of personnel power at Dakawa would be partially solved.
- c - that a liaison officer between the ANC and organisations like UNDP be considered as of utmost importance. This form of extension work in the Office of the Treasurer-General, Projects Department, will serve to facilitate our work and will give us legal status on technical matters, that we might not be aware of, and as well, control and advise on matters concerning the projects. We are dealing with international organisations. We need to consider their legal status and they should consider our legal aspect as an organisation. The international lawyers that we have, should be used to meet their counter-parts who deal directly with us.
- d - that students that are holders of junior degrees in Biology should be encouraged to further their post graduate studies, using the possibilities we have at the two main projects (Dakawa and Mazimbu). Such possibilities could be made through research programmes of e.g. UNDP, NORAD, FAO

DAKAWA - RAINFALL IN MM

YEAR	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	TOTAL
1975	124.0	22.4	392.5	227.5	65.5	19.5	3.0	0	6.0	14.0	0	57.0	931.4
1976	99.0	84.0	147.0	225.0	94.0	26.0	23.5	0.5	14.5	23.5	16.5	32.5	786.0
1977	172.5	253.0	71.0	151.0	120.5	0	12.5	12.5	82.0	57.5	112.5	82.3	1126.8
1978	176.0	51.0	184.0	121.0	51.0	9.5	4.0	1.5	0.5	7.0	149.5	308.0	1063.0
1979	254.5	203.0	94.5	97.5	85.5	64.5	6.5	5.0	8.5	29.5	3.5	115.8	968.3
1980	156.0	256.0	97.5	164.0	28.5	0	10.0	14.5	2.5	8.5	94.5	226.5	1058.5
1981	102.5												

DAKAWA RAINFALL IN MM