

PROBLEMS OF LIVESTOCK PRODUCTION IN THE BLACK STATES OF SOUTHERN AFRICA AND FUTURE STRATEGY

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Development of the rural areas of the Black States of Southern Africa is the major political priority in the field of human relations on the sub-continent. There is no doubt that the economic viability of the Black States, especially as regards agriculture, is the key to successful development of these areas.

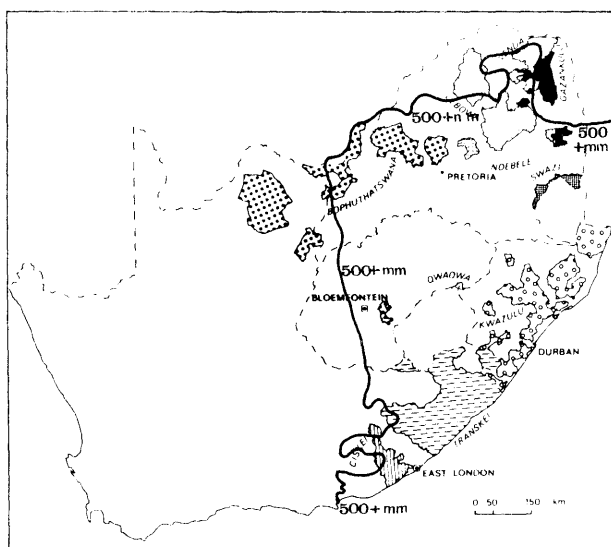


Fig. 1 Proposed consolidation of the present and former Homelands of South Africa showing areas within 500 mm mean annual rainfall. Source: Benbo, 1976

After consolidation the ten Black States will comprise approximately 17 000 000 ha comprising 27 separate blocks, of which approximately 76 per cent enjoys a rainfall of greater than 500 mm and, therefore, have a good potential for dryland agriculture (Fig. 1). The agricultural potential of the Black States is estimated at more than 23 per cent of the total of South Africa, whereas at present they produce only 5.8 per cent of South Africa's agricultural contribution to GDP (Benbo, 1976).

Agriculture is the most important economic activity in the Black States and is responsible for the greater part of the Gross Domestic Product and provides by far the greatest employment (Fig. 2).

However, agriculture in these areas is largely subsistence production orientated and per capita food production is declining to the extent that grain production

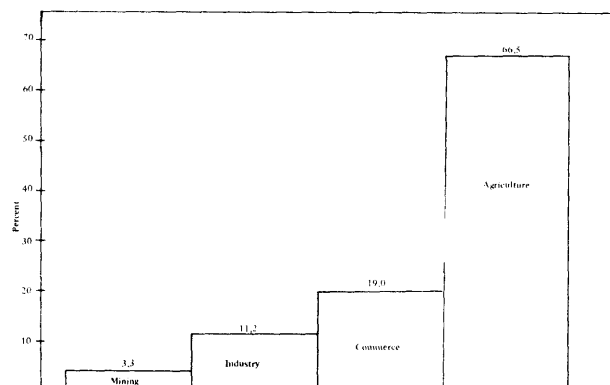


Fig. 2 Employment of economically active Black workers in the present and former Homelands of South Africa (147 million = 21% of total) Source: Benbo, 1976

is only 28 per cent of the requirements of the present population (Fig. 3), and there is a considerable shortfall of animal and vegetable protein. This situation brings with it hardship and social stress.

Indeed, even without detailed figures there is strong evidence to suggest that judged by the standards of other less developed nations, intake levels of calories and proteins are low and deficiency diseases common (Davel, 1965; Edington, Hodkinson and Seftel, 1972; Butler, Rotberg and Adams, 1977). This affects the development capability of human resources — without minimum nutritional requirements people are unlikely to be motivated to develop beyond the self-sufficiency stage.

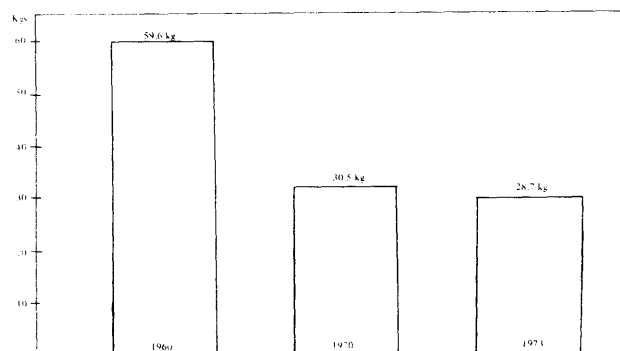


Fig. 3 Annual per capita grain production (kgs) in the present and former Homelands of South Africa 1960 to 1973. Source: Department of Statistics

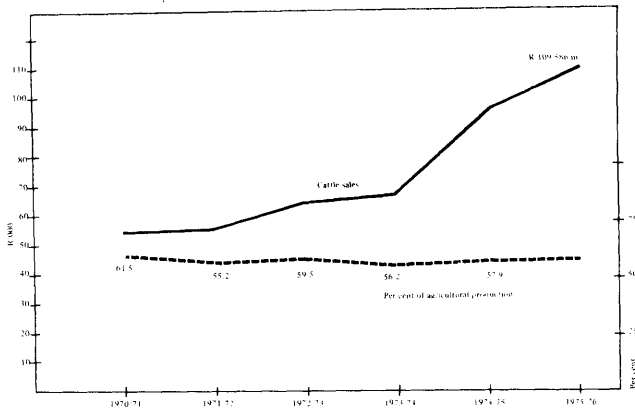


Fig. 4 Cattle sales and percentage contribution of cattle to agricultural production
Source: Benbo, 1978

The production potential of the Black State under dryland farming is sufficient to provide for over 25 000 000 people which is greater than the present total population of South Africa, including the Black States (Grobler, 1972). It is no exaggeration to state that crop and livestock production can at least be trebled in a comparatively short time, by improving present traditional farming systems.

Livestock is a major component of agricultural production, and always will be, because 80 to 85 per cent of the Black States potentially can be used only for grazing. Today livestock production accounts for approximately 58 per cent of the gross value of agricultural production (Fig. 4). The relative importance of livestock in the Black States in terms of numbers is given in Fig. 5. In terms of production the average gross returns on total cattle livestock units in the Black States is R1,66 per livestock unit (BENSO, 1978) compared to R46,90 in South Africa.

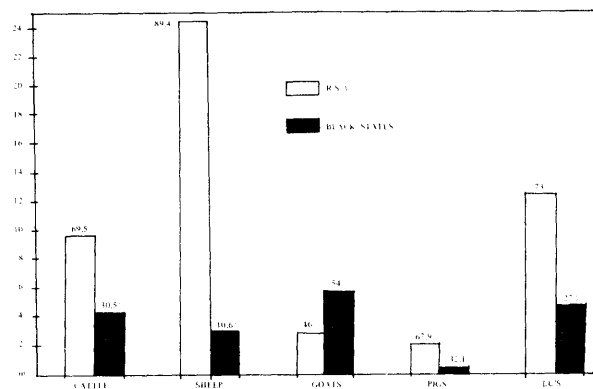


Fig. 5 Relative importance of livestock production in the Republic of South Africa and present and former Homelands, 1978
Source: 1) Department of Statistics; 2) Benbo, 1978

The object of this paper is to define some of the livestock production problems in the Black States and make recommendations for an improved strategy for stimulating and increasing livestock production through development of the human potential.

Because of the wide variation in land-use and agroeconomic conditions in the various Black States it is not within the scope of this paper to go into details, but rather emphasise aspects of general application and make general recommendations which will have wide application in increasing efficiency of livestock production in the Black States. Attention is focussed on large and small ruminants, with most emphasis on cattle since they offer the greatest opportunities.

A systems approach

It is useful to consider agricultural production and rural development as a system (Fig. 6). By definition, farmers are working with the environment to produce food and fibre for national and international consumption. Extension and servicing organisations, comprising Government and commercial research and extension services, commercial firms and industry, all contribute directly or indirectly to the farming industry.

In any system, one crucial requirement is a complex of information, knowledge and understanding, so that the system can be maintained, evaluated and developed. Basically the system exists in order to bring about some kind of improvement within itself, and especially among farmers or farming families, as a means of satisfying the objectives of research, extension and servicing organisations.

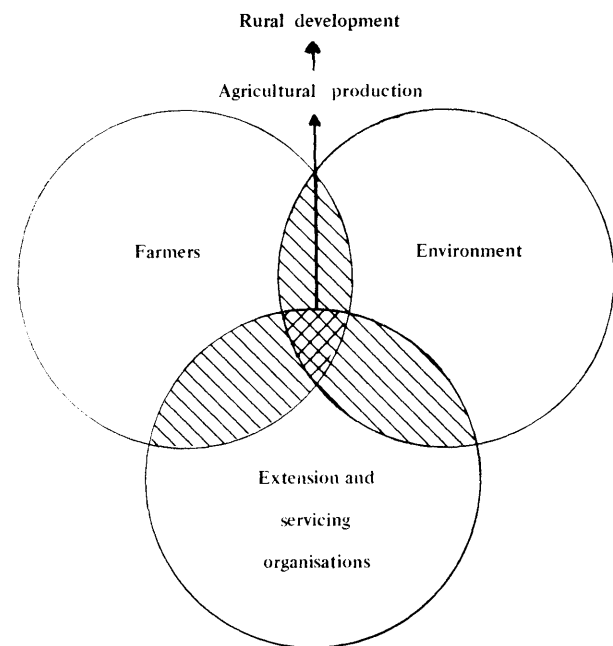


Fig. 6 Structure of the Agricultural Industry

What do we know about the functioning of this system in the Black States? Unfortunately, information on inputs and outputs, population data and income as well as information on most factors relating to agriculture, development and welfare are sparse and incomplete. Since the Tomlinson Report of over 24 years ago (Tomlinson, 1955), there has been little concentrated research until the recent statistical reports compiled by BENBO (BENBO, 1976). Despite these deficiencies, available data at least provide a useful guide to trends. However, as will be pointed out later there are many gaps in our knowledge concerning the "grass roots" agricultural and development problems at village and family level, especially as regards livestock production.

Environment

Environment is basically concerned with climate, topography, soil and vegetation into which the farming system must be fitted to ensure optimum sustained land use, and comprises land, livestock and natural resources at the disposal of land holders.

As regards environment, an accurate assessment of the agricultural potential of an area or individual holding is an essential prerequisite for the achievement of objectives in terms of optimal resource utilisation. Already a good deal is known about the livestock potential of the Black States, and, with the aid of research, some norms have been established in different agro-ecological areas, but at the same time it should be stressed that there is still a need in many areas for more accurate resource surveys as a prerequisite to sound rural development planning.

The vegetation of the Black States consists, for the most part, of Bushveld with open grassland along the inland border of the south-eastern states. The veld types are mainly sourveld with sweetveld only in isolated areas. Both veld types have a good potential for beef and small stock production.

How is the environment being used today? A recent tour to examine livestock farming and land-use, indicated that gross deterioration is taking place on a large proportion of the grazing land. In fact, the very developments which have done so much to improve livestock production in South Africa have contributed towards grazing deterioration in the Black States. If people continue to treat grazing land as they are doing today it is only a matter of time before our best pastoral land will become unproductive. The lack of conservation consciousness and ecological knowledge is a fundamental stumbling block to development of the livestock industry, since the essential base of knowledge is lacking. Tomorrow's farmer must be a conservationist or the consequences for future generations are grave indeed.

Livestock production

The main concern in this paper is with the farmers or more appropriately, farm families, and the research, extension, veterinary, development and various servicing organisations, but more specifically the interrelationships between these two sub-systems. What do we really know about the peasant farmers? Unfortunately, we know very little!

It is ironical that tremendous financial and human resources have very successfully been channelled into the physical and biological aspects of livestock production, and so little into the human problems of communication, adaptation and adjustment, because in the end it is these human problems which will determine our political and economic destiny. Both agro-technological and socio-cultural research must go hand in hand and take place from within each Black State. It is essential to investigate the whole agricultural production system if the results of research are to be effectively applied for development of the Black States.

Stock numbers and off-take

Recent investigations have convinced the author that any assessment of present livestock production has to contend with unreliable estimates and statistics. This is unfortunate because without accurate data it is difficult to devise sound development strategies. Nevertheless, a number of general trends and conclusions are justified from available data.

Probably due to a run of several good seasons there has been an overall increase of 10,5 per cent in livestock units over the past four years (Fig. 7), caused entirely by an increase in cattle population. Sheep and goat numbers have declined by 15,4 and 5,4 per cent respectively over the same period.

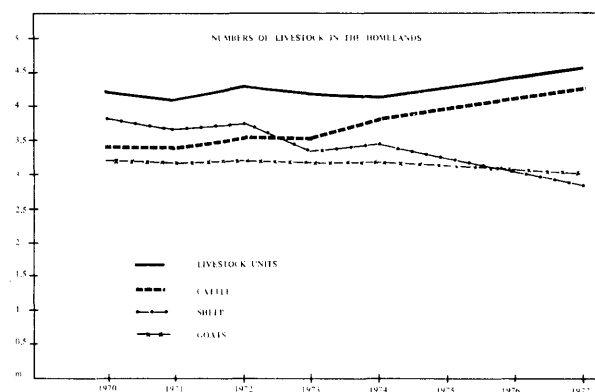


Fig. 7 Livestock units, cattle, sheep and goat populations of present and former Homelands, 1970 to 1977. Source: 1) Benbo, 1978; 2) Department of Agriculture, Transkei, 1978.

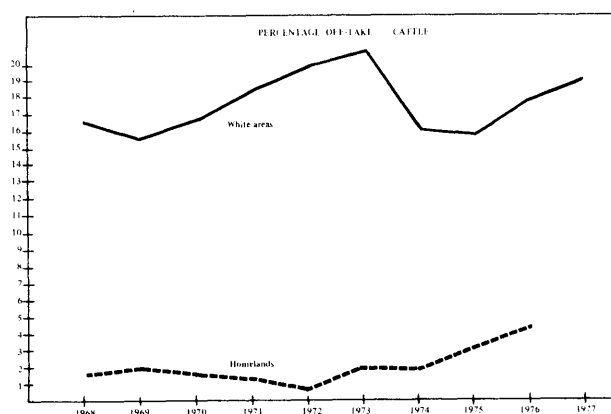


Fig. 8 Percentage cattle sales from the present and former Homelands of South Africa, 1960 to 1977. Source: 1) Benbo, 1978; 2) Department of Statistics

Although the low off-take (Fig. 8) suggests very low levels of production, it should not be equated with individual herd off-take in the Black States. For example, a recent finding in two areas of the Ciskei and Transkei showed the average annual off-take of 2,1 per cent was completely counterbalanced by purchases and acquisitions within the area. Slaughterings within the area constituted 4,8 per cent of the herd.

Efficiency factors

Reproduction rates

As regards cattle reproduction rates, the average weaning rate would appear to be in the vicinity of 43 per cent (Table 1) as against a potential for Sanga type cattle of 78 per cent (Hamburger, 1978).

Similar disparities occur in sheep and goat reproduction rates. Sheep weaning rates vary between 45 and 60 per cent (Brown, 1969; Seobi, 1979), as against a potential of 90 per cent. Woolled sheep which are confined mainly to the Ciskei and

Transkei, yield a lower quality wool clip, about half of the average yield per sheep in South Africa (Brown, 1969). Goats, being hardier, have a higher reproductive rate than sheep of approximately 70 per cent (Brown, 1969; Seobi, 1979).

Table 1

Cattle weaning rates in some Black States

Area	Source	Weaning %
KwaZulu	Du Casse (1974)	47,5
Ciskei	Bishop and Stampa (1975)	40,3
Ciskei	Hundleby (1978)	32,5
Bophuthatswana	Seobi (1979)	53,0
Mean:		43,3

All the Black States are nett importers of milk and dairy products. Previous efforts to encourage co-operative dairy schemes failed because of managerial problems (Hamburger & Waugh, 1968). Because of high feed costs and managerial problems, commercial pig and poultry production do not play a significant role in the economy of the Black States.

Mortality rates

Available evidence suggests that mortality rates, particularly in young stock, are extremely high, as shown in Table 2.

A herd mortality of 11 per cent compares with 3 per cent for commercial farmers in South Africa. Sheep mortality is of the same order as for cattle, and goats somewhat lower (Brown, 1969; Seobi, 1979). Such a high mortality obviously represents a considerable loss to producers, so much so that the 8 per cent disparity in cattle mortality represents more than six and a half times the present value of actual sales.

Table 2

Cattle mortality rates in some Black States

Area	Source	Per cent mortality		
		Adult stock	Calves	Herd average
Ciskei	Brown (1969)	5,80	20,00	8,00
KwaZulu	Du Casse (1974)	14,10	16,00	14,67
Bophuthatswana	Seobi (1979)	5,00	21,00	9,70
Mean:		8,30	19,00	10,80



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Livestock practices

The reason for the large disparity between present and potential production can be highlighted by briefly analysing the application of practices necessary for livestock production.

Nutrition

Malnutrition is undoubtedly the most important cause of high mortality and low reproduction rates (Bishop & Stampa, 1975). Du Casse (1974) reported that in KwaZulu 88 per cent of deaths could be attributed to malnutrition.

"The old Zulu and Xhosa chiefs would hardly recognise the landscape where they looted cattle and made war" (Robertson, 1978). The traditional ecological relationship has been shattered by technical change and growing pressure and deterioration of the land. It is interesting that over 150 years ago, in 1828, Bowker makes reference to overstocking in the Ciskei (Darrow, 1978). Since then, numerous authorities have commented on this situation. According to Hamburger (1978), today the Black States are approximately 30 per cent overstocked. Statistics show that approximately 60 per cent of the Black States have been planned with a view to implementing grazing management systems and the same author (Hamburger, 1970) reported in 1970 that 38 per cent had been "brought under grazing control". Since individual Black State Governments assumed responsibility for agriculture, the extent of grazing management has declined to almost zero.

Not even the most patent and obvious need for winter supplementary feeding to prevent mortality has been adopted by peasant farmers. Other than crop residues, present inadequate food production precludes devoting cultivated land to livestock feed production.

Breeding and selection

Driving through the Black States today, one can see a very heterogeneous cattle population. Since the early 1950's, Agricultural Departments have increasingly encouraged the use of improved sires through subsidies to individuals and groups of farmers. However, improved breeding and selection, even under good management is unlikely to lead to increased economic production unless the effects of environmental factors are sufficiently appreciated.

Management

The overall low adoption rates of simple manage-

ment practices, such as castration, dehorning and use of weaning plates, is a reflection of the generally poor standard of cattle management prevailing. Furthermore, many simple management practices such as inoculation and castration are done by extension workers for the farmers and not by the farmers themselves.

Disease control

Except for epizootic diseases, veterinary control in the Black States is quite inadequate (Agricultural Technical Services, 1978). Although, as mentioned by Du Casse (1974), there is little relevant information regarding cattle and small stock diseases, erosion diseases such as internal and external parasites and fertility diseases are prevalent.

Socio-economic factors

From the foregoing it may be argued that all peasant farmers have to do to increase production is to adopt modern technology. We certainly have the technology, but how does it fit in with the traditional land use, economic system and social values of the peasant farmer? Scientists have given a great deal of attention to understanding the relationship between animals and their substrata, but far less attention has been given to the relationship between Man and his grazing animals (UNESCO, 1973). Without such knowledge it is difficult to predict the outcome of livestock development strategies.

Role of cattle

Various values of cattle in Tribal society are well documented, but today there is little empirical evidence as to the extent and proportion of such uses. The phrase "basic needs" is fashionable in development literature. What does this mean to the livestock owner? Development must clearly be specifically aimed at satisfying *basic human motivational needs* of food, shelter, transport, health and education, and eventually security, a healthy environment and a sense of achievement (Maslow, 1943).

If we wish to wean the peasant farmer away from his present, largely subsistence, type of production, it is important to have some appreciation of the overall role of cattle in tribal society. Figure 9 is a conceptual framework illustrating the hierarchical role of livestock in peasant farming.

It is important to appreciate that in the natural developing situation, primary needs for survival and subsistence as well as sociological needs must be satisfied before secondary or development needs can be satisfied (Theisen, 1974). These

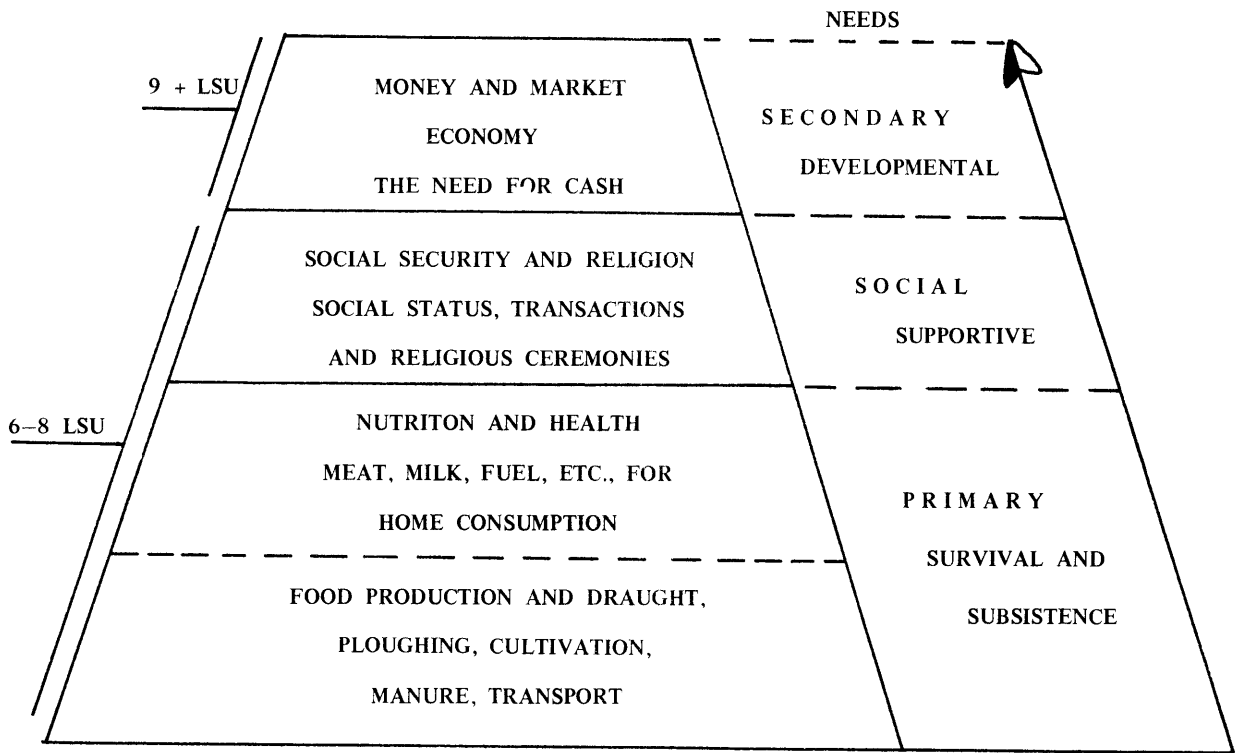


Fig. 9 Hierarchical role of livestock in peasant farming

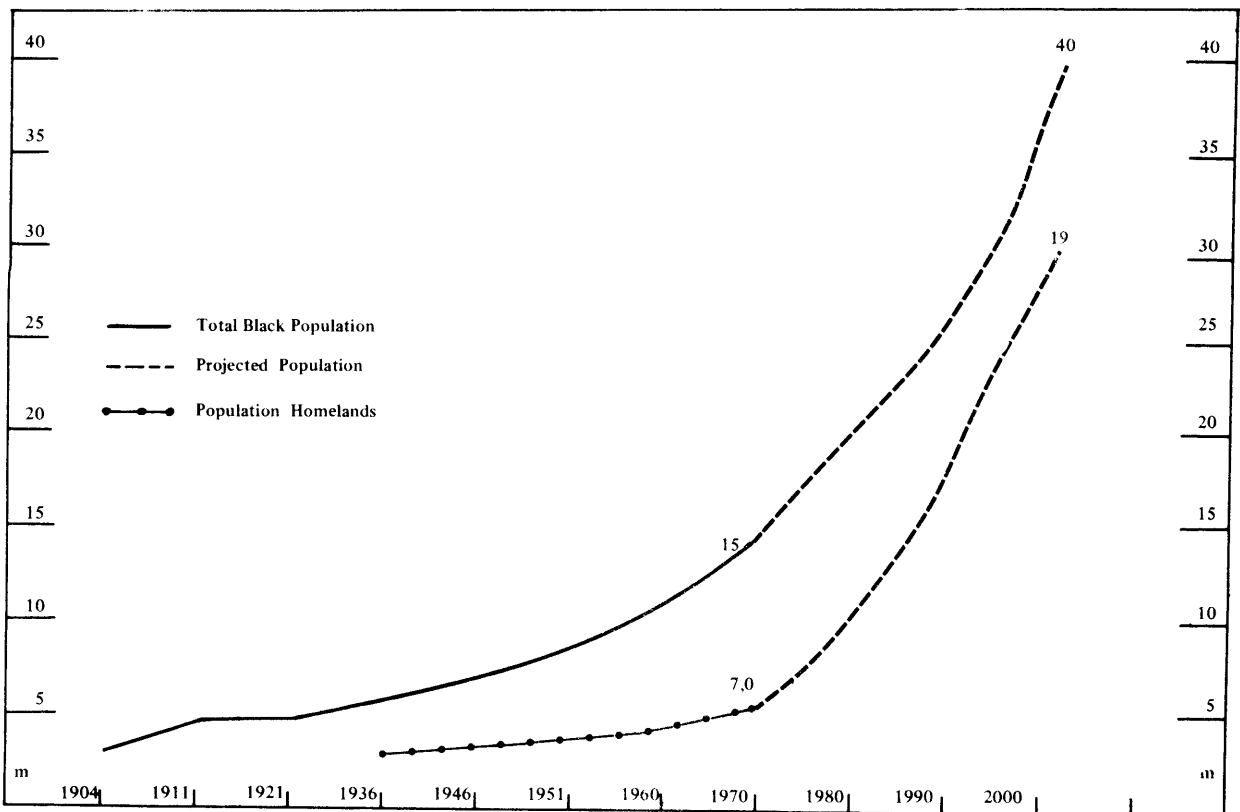


Fig. 10 Present and projected population in South Africa and the present and former Homelands, 1964 to 2000
Sources: 1) Sadie, 1970; 2) Department of Statistics, 1970

Table 3

Cattle herd size in some Black States, 1979

Number of livestock units	Area			Mean %
	Bophuthatswana ¹ %	Transkei ² %	Ciskei ³ %	
1- 4	49,4	51,3	47,5	49,4
5- 8	25,9	30,4	28,5	28,3
9-12	13,6	11,5	13,0	12,7
13-16	3,7	4,3	6,0	4,6
Over 16	7,4	2,5	5,0	5,0

Source: 1) Seobi, 1969; 2) and 3) Department of Agriculture Ciskei/Transkei

needs are not mutually exclusive, but illustrate that primary and social needs need to be satisfied before voluntary motivation can be expected towards a market economy and conservation of natural resources. This, together with the small size of herds (Table 3), largely explains the low off-take of livestock (Fig. 8). For example, in two areas of the Ciskei and Transkei, 80 per cent of slaughtering was used to fulfil ceremonial and cultural obligations. Lobola is becoming less important as evidence by the fact that, during 1978, of a sample of 154 households, only 2 per cent acquired or gave a total of eight animals for this purpose.

The basic difference between the commercial livestock producer and the subsistence farmer, is that the latter makes greater direct use of his livestock in fulfilment of his production, consumption and social needs, whereas the commercial producer sells animals to meet similar needs related to his higher living standards.

Cattle ownership

A further important factor is that only approximately 22 per cent of livestock owners have sufficient livestock units (Table 3) to be in a position to sell any animals for cash (Fig. 8), except sometimes to meet educational obligations for their children. Therefore, it is quite clear that the behaviour of peasant livestock owners is quite rational within the constraints of their system of subsistence production.

Herd composition

Detailed herd composition data are not available, but most figures show that there are almost as many oxen and bulls as there are cows and heifers,

confirming the general dependency of farmers on draught oxen for subsistence crop production. Certainly at present crop production levels, large scale mechanisation can only result in economic disaster.

Rural population structure

Exploitation of the latent managerial ability of the human potential is fundamental to development of the Black States. Management is a function of man, and personal and socio-psychological factors all exercise an influence on the complexity of human beings and consequently on farming progressiveness. For effective development, these things must be understood.

Too often knowledge of farmers and communities is presumed to exist among professional agriculturalists, but from the author's assessment and experience this is rarely systematic and usually partial and superficial in character. Let us look at some of the key statistics on the population of the Black States.

Population

Today 48 per cent of 7 000 000 people are resident in Black States (Fig. 10). However, this is misleading because a large proportion of the population outside the Black States still look to these areas as a source of security and housing for their families. Purely statistical calculations relating population density to land potential is not necessarily of significance, since actual land use systems (eg. irrigation) are of importance. Nevertheless, as already pointed out, there is undoubtedly a good deal of pressure on land under existing farming systems, and projected population increases of almost 3,0 percent (Sadie, 1970) indicate increasing pressure on the land in the future (Fig. 10).

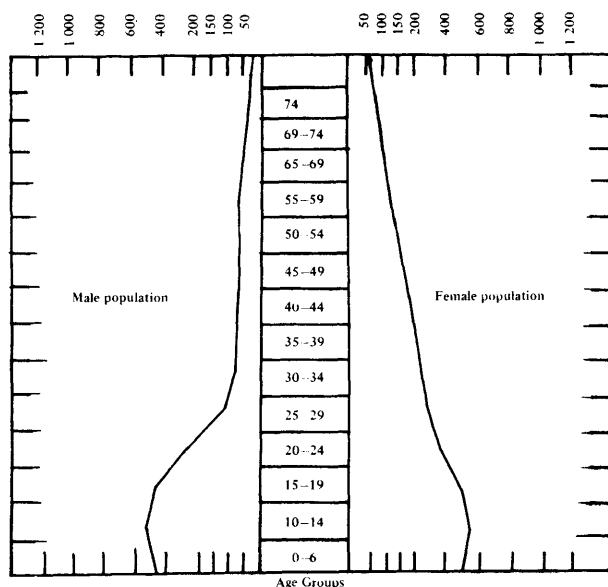


Fig. 11 Age and sex distribution of the present and former Homelands population of South Africa, 1970. Source: Benbo, 1976

Age and sex distribution

Figure 11 gives an indication of the age and sex distribution of the population in the Black States and shows the predominance of young people (59 per cent under 20 years of age). Because of labour migration, women predominate among the adults, especially in the 20 to 50 age category where women outnumber men by two to one. Women 15 years and older make up 32 per cent of the population compared to a figure of 18 per cent for men (Republic of South Africa, Dept. of Statistics, 1970).

Migration

Because of the markedly dual nature of the economy, labour migration has been a predominant feature of life in the Black States for many years. Due to lack of urban security, families straddle both economic sectors – they have a partial subsistence base and security in the Black States and at the same time attempt to realise adequate cash income in the commercial sector of South Africa.

Existence of the relatively high earnings outside the Black States constitutes a barrier to enlisting manpower in internal rural development. The money sent home by the bread winner acts as an economic cushion and militates against farming efficiency. This situation is unlikely to change unless agriculture can be shown to provide at least an equally good living as urban occupations. This is the challenge for organisations concerned with rural development!

It is clear that in terms of sheer size the youth and female population are the most important targets for rural development in general. Further, even if there is a dramatic drop in the birth rate, the projection of population growth of women who are or will be in the child-bearing ages (15 to 44 years) will ensure an enormous expansion of younger age groups in the next 20 to 30 years. Women in the rural areas are not merely important because of their numbers, but also because they are often the *de facto* decision makers. For example, in an area of the Transkei it was found that two-thirds of the women not only provided the labour input, but were also the *de facto* decision makers in livestock management.

Education

The past two decades have witnessed a considerable expansion in educational facilities and levels of education. However, the present education system draws the most dynamic youths from the rural areas. This continuous skimming off does not promote development, neither does the education system equip people for rural living. Today, most people go to school for social advancement, not to be a peasant farmer nor even to be a good farmer. The low status of agriculture is partly a result of its own financial rewards, but also from negative attitudes, particularly teachers, towards agriculture as a traditional occupation. Considering that 60 per cent of the rural population are illiterate (Fig. 12), there needs to be new thinking on educational programmes directly related to rural development such as ongoing programmes of adult education, covering such fields as adult functional literacy, technical knowledge, manual skills and ecological relationships. Literacy skills are of the utmost importance for successful agricultural development as well as family welfare and for general and potential awareness. Uneducated people generally have weak attitudes which are difficult to change. The main barriers to effective communication are attitudinal and cognitive.

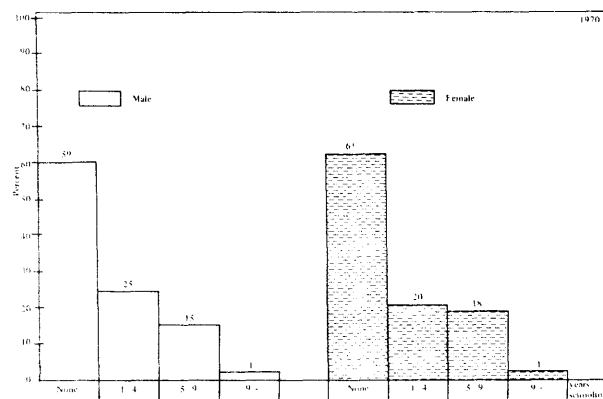


Fig. 12 Level of education in the present and former Homelands of South Africa, 1970. Source: Department of Statistics, 1970.

Income

Although calculation of output and income are only very rough approximations, in 1975 the average per capita income earned inside the Black States was less than half of the global middle income standards of R260 to R430, which indicates the enormity of the task of increasing productivity.

Socio-psychological factors

The foregoing are generalisations based on crude statistics. Of even greater importance is a knowledge of farmer's values, needs, managerial ability, knowledge, perception, potential, norms and motivational factors. For example, in a recent study in Bophuthatswana it was found that 85 per cent of farmers perceived the grazing to be in good condition (Seobi, 1979), whereas it was in poor condition and 55 per cent overstocked. Such over-optimistic tendencies towards the environment pose a tremendous educational challenge.

Research, extension and servicing organisation

Against this background of increasing population, social stress, low production levels and deteriorating agricultural environment, a dedicated band of development workers and agricultural staff have persevered with programmes to boost livestock production. While progress has undoubtedly been made, the crude statistics indicate little, if any, improvement in efficiency of production over the past decade.

Governments of the various Black States are well aware of the need for increasing livestock production, but accelerated progress will not come about without adequate provision of technical and professional staff on a far greater scale than at present. It needs no emphasis that requirements in terms of expertise are immense, covering almost every facet of livestock production, from the provision of skilled manpower for research, disease control and extension, through to marketing and processing.

Table 4

Present and estimated professional and technical personnel requirements in the Black States, 1979

Category	Present Number	Required staff	Increase
Veterinarians	11	28	17
Animal husbandry specialists	5	30	25
Pasture specialists	2	18	16
Extension officers	1 290	2 660	1 370

Over ten years ago Hamburger and Waugh (1968) stated that professional staff were completely inadequate. From Table 4 it can be seen that this is still patently true today. Seven professional animal husbandry officers (all expatriate) in the Black States are completely disproportionate in terms of stock numbers to approximately 229 Animal Scientists in South Africa (Joubert, 1978).

The major constraint is not so much in the training facilities as in the capacity of the various Governments to finance, recruit and train sufficient personnel at all levels. At intermediate level, Animal Husbandry is taught as one of the subjects at the five Agricultural Colleges in the Black States. Undergraduate and post-graduate courses in Animal Husbandry are offered at Fort Hare University. To date the latter has produced only 27 graduates. Of these 11 have majored in Animal Husbandry, one at Honours level. However, because of the shortage of professional staff, these relatively young and inexperienced graduates all occupy senior administrative positions. The lack of Black professional expertise is a block to progress. The present number of extension workers, with a ratio of approximately 1:650 farmers, needs to be substantially increased concurrently with the necessary professional staff.

A strategy for livestock production

Strategies

Thus far the sub-systems of environment, human potential and servicing organisations and their inter-relationships have been discussed. In order to design a strategy for increasing livestock production, the situation in each Black State must be analysed so as to provide a comprehensive understanding of the interacting variables which govern livestock production, so that these variables can be manipulated in the most efficient manner possible. This requires a programme of research and extension specifically designed to bring about economic production by working with livestock producers.

The various strategies for rural development can be simply summed up as suggested by Röling (1978):

1. The **DO TO** approach,
2. the **DO FOR** approach, and
3. the **DO WITH** approach.

The **DO TO** approach has been attempted since the Tomlinson Commission Report in 1955 (Tomlinson, 1955). In this approach the development agencies decided on certain objectives and appealed to farmers to adopt the planned changes. Regrettably, the "betterment" programmes have had little positive impact on livestock production and today grazing schemes are implemented on only a very minor scale and few farmers have viable livestock holdings (Butler, Rotberg & Adams, 1977).

Failure is often blamed on the farmers themselves, but even if the programme had been enthusiastically received it would have done little to raise animal production without the essential inputs of research, extension, credit and marketing. Suffice to say that previous planning efforts to re-allocate residential areas, arable land and grazing areas provides a useful starting point for a desperately needed new strategy to improve land-

use and livestock production.

The **DO FOR** approach has resulted in many expensive failures simply because the development agency decided on the objectives and content of the scheme, and failed to investigate the "grass roots" cultural and socio-economic problems of the people for which the various schemes were intended. We must surely learn from past experiences!

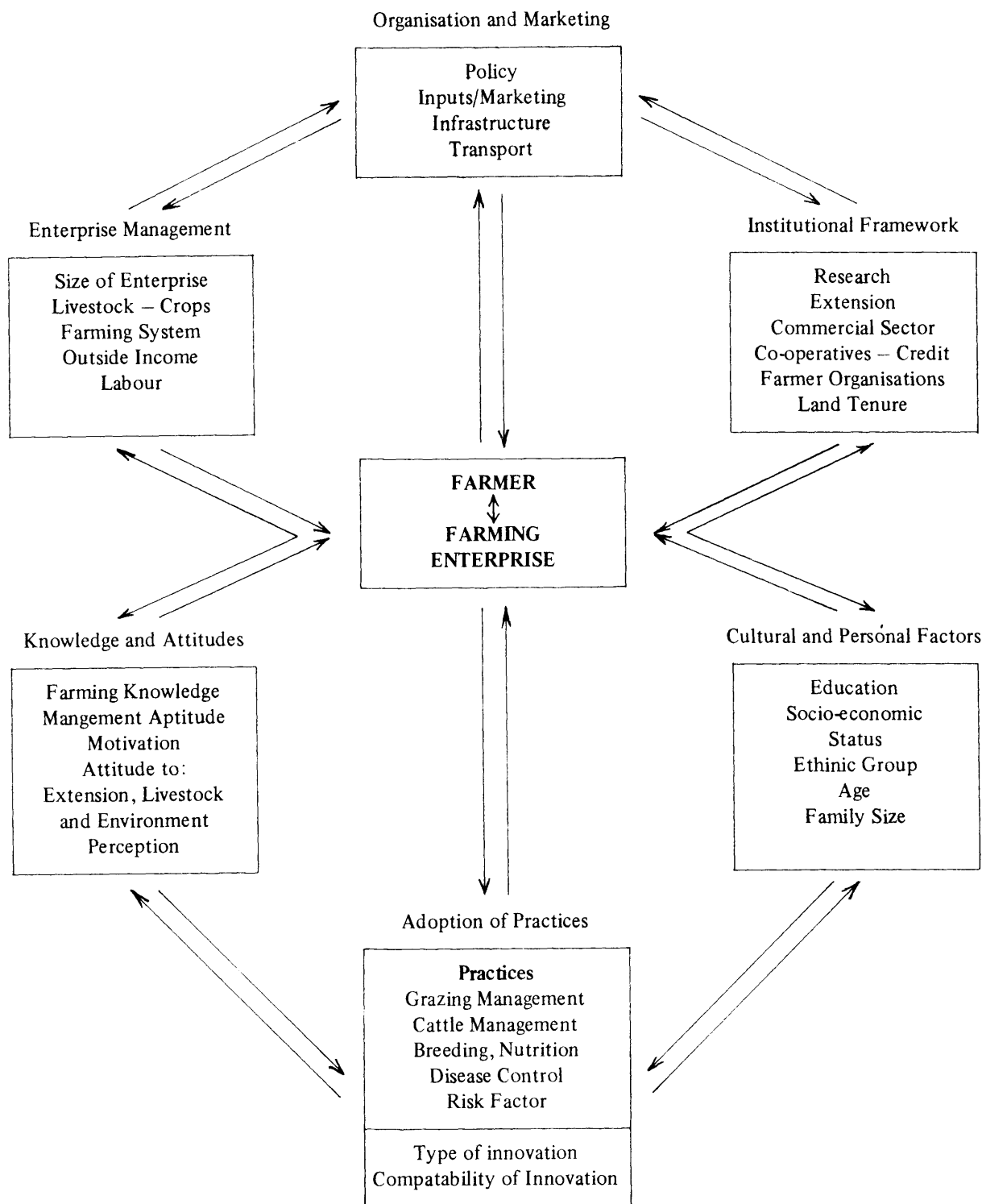


Fig. 13 Factors influencing efficiency of livestock production in less developed countries

The **DO WITH** strategy is preferable and is most likely to be effective over the long-term, but in practice it must be recognised that there are certain political and institutional restraints which need to be overcome. "There is no long-term in politics" (Baker, 1974b). The **DO WITH** approach emphasises helping peasant farmers to solve their own problems and in creating conditions for farmers to achieve their own goals (Röling, 1978). For such a strategy to succeed the Black States themselves need to form institutional structures and policies which are able to provide the necessary inputs and services in order to mobilise the human resources and commercialise livestock production. Blacks have proved they can adapt rapidly to industry, why not to agriculture?

What is needed is an approach which synthesises all the complementary elements of peasant livestock production (Fig. 13) so that planners and researchers are drawn towards inter-relationships rather than dealing with watertight compartments (Baker, 1974). There is no stereotyped formula for development of the agricultural industry in the Black States. Planning must be integrated, flexible and in accordance with the needs and potential of each area. Any strategy which pursues only one facet of human development is doomed to failure.

Organisational

It follows that a multi-disciplinary approach with co-ordination from top to bottom, is indispensable for successful implementation of a livestock development policy, and this can only be achieved as somebody has observed when varied disciplinary contributors are blended under one skull. Such an approach requires highly co-ordinated research, extension and commercial services. It appears that a livestock production strategy does not require large investments, except in the provision of fencing and water development and in establishing sound research, extension, education and training. Much progress can be achieved through a sound strategy aimed at improving management at farm level.

It has been demonstrated in some less developed countries that by adopting a **DO WITH** approach, and provided the essential inputs are available, the peasant farmer will respond, often quite dramatically, to well planned and executed development programmes.

Marketing

Sound marketing systems are no panacea, but improving sales outlets with adequate price differentials for quality livestock could play an important role in improving stock management, as well as encouraging investment in supplementary feeding and fattening. A marketing system that will afford the stock-owner an opportunity to exchange trek oxen for a younger beast and for cash could play a role in increasing off-take.

Marketing organisations should also facilitate the supply of necessary inputs (vaccines, medicines, feed, etc.) to the producers, as well as provide credit on a selective basis for essential inputs. There is also a need to make livestock marketing centres more attractive, by siting them near growth points or providing facilities for sellers to obtain capital goods, as well as facilities for encouraging savings. Remember, it was the trading store which gave birth to the money economy in the Black States.

Development of grazing areas

Further development of stock water supplies, dip tanks and cattle handling facilities are needed, but should be restricted to grazing management schemes implemented and controlled by tribal authorities.

Institutional framework

Manpower

The shortage of well trained agriculturalists and development personnel is one of the important reasons for the failure of past development projects and a major constraint to future successful development. It is not so much lack of finance, but lack of technical and administrative capacity to create a skilled permanent farming class.

Manpower training to meet the requirements of the industry falls into two broad categories:

(a) Professional:

This category is sadly lacking in the fields of veterinary science, animal husbandry and pasture science. In the interim, professional expertise will have to be provided by expatriates, but in the interests of the Black States, it is essential that local staff be trained to fill these positions as soon as possible.

(b) Middle level personnel:

It is equally, if not more important to provide further in-depth training for existing middle level personnel because it is these people who will have to execute livestock policy over the next 10 to 15 years. They will have to lay the foundations, and the success or failure of efforts during the next decade or two will depend on them. This group, trained and guided by professional staff, could constitute a formidable extension service.

In order to improve the effectiveness of present middle level extension manpower, specialisation within the two broad fields of animal and pasture, and agronomy will undoubtedly result in greater efficiency and job satisfaction, especially in more diverse and progressive farming areas.

To provide greater coverage and to accelerate mobilisation of the human potential, middle level extension workers could be usefully reinforced by progressive practical farmers acting as lay extension workers in specific livestock development projects. These people could also play a useful role in assisting with marketing. However, such a strategy cannot succeed without the necessary professional staff to carry out research, train field staff and provide specialist knowledge. This would undoubtedly be a sound investment in maximising returns on available scarce manpower resources.

Unless decisive steps are taken in connection with the training and development of personnel, little progress can be expected in furthering the livestock industry and developing rural communities.

Research needs

This paper has already highlighted that much of the basic data required for planning still remains to be collected. We can no longer afford to work on subjective views and generalisations regarding farming systems, cultural, personal and socio-psychological factors, etc. (Fig. 13) of the peasant farmers.

The need is to reassess the situation on an interdisciplinary systems approach basis, for it is evident that in most instances we do not have the information to plan a sound strategy based on real constraints and problems. We must research and build on the traditional economy and give due recognition to the institutional framework within each State. We must deal with causes, not effects.

There is a need for more research into micro-ecological factors and local production techniques before attempts to change such techniques, in an endeavour to find farming systems best suited to agro-ecological areas, ensuring a sound balance between crops and livestock. Factors of the peasant economy as a cohesive and rational decision making process are not always understood by researchers and planners, and research into traditional peasant livestock economies has been neglected, possibly because scientists consider it to be less prestigious and often consider the social and cultural dimension as "someone else's baby".

Land reform

Mobilization of human resources will not be fully developed until the farmers have a minimum level of security of tenure to encourage them to improve grazing areas, or at least to stop destroying them. There is no ready made solution to this problem -- tenure must evolve in a manner suited

to the people in each State. Existing tenure at ward and district level needs to be studied in depth, and change must be evolutionary and acceptable to the people concerned.

Because urban employed Blacks have until recently been generally unable to freely invest in their own homes as security, they often turn to investment in livestock in the Black States, as a form of security which in turn aggravates pressure on the land. Therefore, urban security of tenure is also of importance for development of the livestock industry.

Since communal grazing and livestock production are so interwoven in the present farming system, rather than attempt to make radical changes which may not be acceptable to tribal authorities, there should be a reassessment of the present communal grazing system with a view to increasing livestock production by co-operative grazing schemes run by the tribal authorities with the necessary technical guidance. A recent survey in the Transkei showed farmers to be overwhelmingly in favour of such an approach.

The central problem is to break down existing barriers to economic allocation of arable land and grazing rights. It is important that land and grazing rights on whatever farm is decided upon should be negotiable, so that market forces can develop, with land and grazing rights changing hands to allow bona fide farmers to achieve an acceptable living standard. However, for this to be effective, security for the rest of the population, wherever they are employed, is necessary. In the long-term it is not so much the system of tenure but the way the land is used which will ensure optimum livestock production.

Development of human resources

The development process in the Black States must be initiated in an evolutionary manner with participation of the farmers themselves, within the existing culture and value structure. The peasant farmer will have to be motivated and this can only result from the wider development process. It is interesting to note that in one area of the Transkei, rural women generally attached less importance to acquiring more cattle than they did to other motivational factors. We must capitalise on this.

Success depends on the creation of a skilled farming class, but unless the Black States can provide as good a living as in the Urban areas it will be difficult to achieve. The peasant family and community must be regarded as a tightly knit unit of production, and therefore it is equally important to teach women new skills and techniques -- the men will soon be convinced of the advantages in terms of increased production.

Applicable livestock practices

Livestock improvement programmes should concentrate initially on the most limiting factors and later deal with other constraints. Because of the deterioration of grazing (feed) resources, rotational grazing management schemes in selected development areas should be accorded the highest priority, with a view to demonstrating what can be done to improve the environment and increase production on a sustained basis with their own capital and skills. The capital is there in the form of livestock -- the skills have to be developed.

Expecting people to de-stock under present circumstances is not being realistic, but the author believes spectacular improvements can be achieved by the application of the other principles of grazing management.

Extension and cattle management practices should be integrated with grazing schemes as part of a "package". Priority should be given to health and nutritional practices which are easily communicated, involve little cost and bring quick returns, followed by practices which impel the farmer to learn new skills, and therefore are likely to be implemented more slowly. Breeding and selection comes into the latter category, but nevertheless attention must be attached to this problem in breeding adapted animals which are available when the time comes.

Successful strategies along these lines in a few areas could provide the necessary blueprint and stimulus to more widespread adoption in the Black States.

Conclusion

This paper raises more questions than it answers, but attempts to illustrate the lessons to be learned from the present situation and the implications for future planning of livestock production in the Black States. There is no reason why the Black States which have significant livestock resources, should not be able to establish a viable livestock industry with moderate investment in infra-structure, marketing and skilled manpower resources.

It is not the characteristics of farmers as much as it is the characteristics of development agencies and strategies which will determine future success. Lack of opportunities rather than resistance to change is the main bottleneck to development of the livestock industry in these areas.

There is no viable alternative to increasing productivity of agriculture in the Black States, if the twin problems of food production and sustained economic growth are to be solved. The future will be determined according to what we do about these problems today!

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