

3. FARM SIZES, LAND USE AND VIABILITY CONSIDERATIONS*

3.1 Introduction

This chapter provides a conceptual and empirical framework for understanding the structure of farm holdings in agriculture, taking into account current farm size regulations and the existence of various types of large scale and small, intensive on-going agricultural concerns in Zimbabwe. The Land Reform Programme has changed the structure of the rural community by creating a large number and a wide range of new holdings in terms of farm size. This provides one guide for the choice of agricultural commodities to be produced, while raising questions concerning economies of scale and economic viability among various land size classes for a variety of commodities. The actual utilisation of land is also influenced by the distribution of beneficiaries among the various size classes in relation to their access to capital, skills and technology. In both the A1 and A2 farms there is a differentiation of both the farm sizes allocated and the endowments of beneficiaries.

The key research question we sought to answer was: what farm sizes are suitable for different enterprises (crops, horticulture, livestock, plantations, wildlife, forestry and woodlands) in various provinces and agro-ecological zones in relation to the envisioned technological mix. Emerging land use patterns in the new settlements are assessed in relation to issues of agro-ecological potential and farm holding sizes. Small samples of emerging land use systems, production profiles and productivity trends are examined in relation to the variety of farm holding classes in various agro-ecological regions. The interaction of landholders in the sharing of land for extensive uses is explored.

3.2 Background, Concepts and Policy Context

3.2.1 Land allocation and farm size policy aspects

During the Fast Track Land Reform (FTLRP) government maintained the old Model A scheme type of land allocation for small scale redistribution

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schemes (Model A1), but at significantly reduced plot sizes. Whereas households are allowed 5 arable hectares in the wetter regions and 10 arable hectares in the drier regions, land reserved for grazing per beneficiary has been drastically reduced to between 7 and 60 hectares from between 20 to 200 hectares in the old Model A scheme. Thus the official policy on farm size allocation in the different schemes, sub-schemes and natural regions (NRs) creates a *priori* variation in the structure of land holding and related benefits. This is part and parcel of an approach, which differentiates what could be called an official notion of social (or for some 'subsistence'/survival') farming from commercial farming, at farm size levels below their historical level.

The prescribed farm sizes for A2 land allocations provide for four categories of farm sizes, namely small, medium and large scale farms, and peri-urban plots. The amount of land allocated in this gradation varies with agro-ecological zone, with larger farm sizes prescribed as we move from Natural Region I to V. The small, medium and large scale commercial farmers are expected to engage in either crop or livestock farming, or a combination thereof, while the peri-urban farmers are expected to engage in horticulture, market gardening or crop farming. The actual farm size allocations in practice, however, showed wide divergences from pronounced policy.

3.2.2 Farm Infrastructure policy aspects

The nature of existing infrastructure on land plots allocated to new farmers and its utilisation, the utilisation of land in relation to farm size, is of critical importance to farm viability in particular. Existing farm infrastructure range from productive facilities (agricultural processing units, tobacco curing barns and grading sheds, off and on farm dams and irrigation infrastructure and associated water rights, dip tanks and cattle spraying facilities), to social infrastructure (schools, clinics etc.) and residential

facilities (farm homesteads and farm worker compounds). Since the redistributed plots have varied farm infrastructure endowments or opportunities to access these, their choice of enterprises, land use and productivity levels can vary among different plot holders irrespective of farm size differences.

Uneven access to farm infrastructure raises various policy concerns over the equitability of resource distribution among beneficiaries, the nature and effectiveness of their tenure security (ownership/leasehold), the effective utilisation of infrastructure capacity, the beneficial maintenance and improvement of the infrastructure, the valuation and distribution of the costs of acquiring and/or leasing the infrastructure, and the co-ordinated utilisation of the infrastructure towards targeted production.

The current policy on infrastructure allocation, use and management varies between the A1 and A2 settlement schemes. In A1 areas GoZ policy treats social infrastructure (schools, clinics etc.) as state property to be used for specified public purposes, and productive properties (irrigation, barns etc.) as state assets to be used on a shared basis through various sharing mechanisms. In general, the infrastructure policy concerns in A1 schemes pertain more to the efficacy of 'sharing' mechanisms and the adequacy of infrastructure capacity utilisation. These problems, as well as those of assets ownership, access and equity, bedevil the potential utilisation of A2 infrastructure. The chapter's focus on farm size and viability issues compels us to concentrate on the issues which affect A2 farmers, given the concerns with farm size viability for that scheme.

The policy pronouncements on the allocation and utilisation of A2 farm infrastructure are found in various sources: the conditions stipulated in the letters of offer; in verbal and in written statements made by Governors, local government and other GoZ officials to settlers on particular farms, in farm subdivision plans which either

site or do not site such infrastructure on particular beneficiary plots; and more recently, in the draft 'A2 and A1 self contained Lease Agreement'.

The letters of offer stated that the plot holders on whose plots the infrastructure is located are the 'custodian' of the infrastructure. The letters did not definite custodianship or mention the access and use rights of other settlers on the same farm. In practice, most A2 infrastructure tends to fall within certain individual plots, while field evidence shows some cases (e.g. Norton) where some infrastructure falls in plots on 'no man's land', and is treated as 'state property'. These two scenarios of custodianship of infrastructure lead to varied experiences of the control, use, maintenance and distribution of access to infrastructure among the new farmers.

The procedure for assessing lease rental fees for A2 schemes and their implementation has not yet been clarified. Standards and procedures for full cost recovery charges for infrastructure, based upon transparent inventories of infrastructure need to be set.

3.2.4 Farm size, land and productivity trends

Studies in Zimbabwe (Bruce 1990, Roth 1990, Chasi et al 1994) have demonstrated that there was significant under-utilisation of a land in the large scale commercial farming (LSCF) areas. Research on the relationship between gross turnover per hectare of land owned, representing farm productivity, and farm size in the different agro-ecological zones, shows that productivity decreases exponentially with increase in farm size in all natural regions of Zimbabwe .

3.2.5 Exceptional cases for larger farm sizes

Even though smaller sized farms are in general efficient, there are a number of enterprises which, due to a number of factors, may need extra amounts

of land. One reason could be the ecological needs of the enterprise. Examples of enterprises in this cluster of special enterprises include forest plantations and wildlife enterprises.

Another reason in the existence of significant sunk costs in enterprises. The problem of huge sunk costs is that such enterprises have not had enough time to recuperate initial costs and special provisions need to be made to allow such enterprises to realise their investment. Enterprises in this class include huge agro-industrial complexes which need certain minimum throughputs to remain viable. In such cases it is prudent for the concern to maintain enough land to cover minimum throughput requirement. Where such concerns are used as the core estates for some form of out-grower scheme, extra land might be needed to support the out-grower venture, including land to provide planting material, research and training plots for out-growers. Examples of enterprises in this cluster include seed company farms, horticultural exporting company farms, as well as plantations with processing infrastructure.

Yet another factor requiring special consideration in land provision is the technology embedded in some production forms. For example, some irrigation systems are designed to operate as one integrated system. Breaking them up into smaller units may involve substantial costs and/or loss in efficiency. The same can be said of some dairy production units in which a milking parlour and support infrastructure was designed in such a fashion that units broken down from the main farm will not optimally use the existing infrastructure. Closely linked to sunk costs is the issue of market organisation in which a company owning land again needs a substantial amount of core estate land to ensure minimum export quantities.

In A2 production systems, the relatively large sizes of plots preclude the use of animal traction as they need mechanical traction and implements. These

require huge investment by farmers and hence would need high levels of production to recuperate the costs. Producing the commodities and their processing needs large infrastructural investments. Cattle production needs dipping facilities and cattle handling facilities. Tobacco production needs curing facilities while wheat production needs combine harvesters. Reducing the need for such investments is key in containing costs and enhancing the viability of beneficiaries of the land reform programme.

Before looking at farm size adjustments to enhance whole farm incomes, there is a need to thoroughly review the effects of government price and taxation policies on the profitability of farming. In the past three years government has sought to keep down the prices of food commodities at the expense of farm profitability. Granted, government has controlled both official selling prices of maize and wheat and the main inputs that go into their production. However, few farmers manage to obtain all their input needs from official markets, fulfilling their total requirements through the unofficial markets where prices have been at least twice official input prices, leading to negative margins if farmers sold on official markets.

For soya beans government has affected producer prices indirectly through export bans. This effectively insulates local production from the international market leading to depressed producer prices. For tobacco, the over-valued official exchange rates have depressed net realisations from sales at a time when imported inputs used by farmers are being sourced using parallel exchange rates. This has greatly reduced margins and affected viability.

Viability in high technology industries, such as horticulture, has been significantly affected by government policy. Customs duty on imported farm inputs and equipment increases the costs of input acquisition, thus reducing profitability. All plant material for the export horticulture industry is imported

from overseas breeders who require payments of royalties for use of their genetic material. Currently the Zimbabwe Revenue Authority (ZIMRA) is taxing these royalties, which are legitimate costs of doing business. Given the tight margins the industry operates under, these taxes have a significant impact on the viability of producers.

3.3 Land Allocations, Infrastructure and Farm Sizes: Issues and Conclusions

3.3.1 Land allocation aspects

The various issues and conclusions pertaining to the patterns of land allocations, particularly in relation to the prescribed A2 farm sizes, can be summarised as follows. Firstly, there is wide variation between the official farm size prescriptions and the sizes of land demarcated for allocation, across the natural regions, in both the A1 and A2 schemes. Farm size allocation patterns also vary within provinces as various districts located in similar agro-ecological regions also demarcated varied sizes of farms for allocation to beneficiaries. There is further variation across the provinces in the land sizes demarcated for the farm size categories – small, medium and large – even within similar agro-ecological regions.

Thus there is much greater diversity in the range of land sizes offered to beneficiaries because land allocations in general tended to be given below the prescribed maximum to accommodate more smaller and medium scale beneficiaries. The prescribed farm size maximum tended to be used as a broad guideline, adapted to local circumstances.

However, in most provinces a small percentage of oversized (exceeding the maximum) large scale A2 plots were allocated to new farmers. In addition there is a sizeable number of remaining LSCF (indigenous and white) which are above the prescribed farm sizes. A number of plantations which are well above the farm size prescriptions also exist as agro-industrial concerns and 'de-listed' entities.

3.4 Farm Size Viability and Suitability: Issues and Conclusions

We conclude that if A1 farmers depend on family labour and animal based traction, the current plot sizes are adequate. They are limited in the amount of land they can crop by available production technology and labour. Increasing the cropped areas under such schemes would entail moving to tractor based traction power and hired labour. The minimum land allocated per household if settlers decide to opt for 'self contained' (SC-A1) and A2 types of schemes is adequate to boost cropped areas to about 15 hectares. Two specific farming activities in this category are discussed below:

- **Cropping:** We argue that the smallest plot sizes allocated are capable of giving reasonable returns using common enterprises. Even for tobacco in which there has been an argument for increasing plot size to take care of rotation and fallow needs, our analysis demonstrates that a reasonable income can be derived by planting 4 hectares of tobacco on a small scale (20 hectare) A2 plot. Viability of tobacco production is instead threatened by non-land factors. These include high set-up costs for curing infrastructure, and tillage, the shortage of coal and fertilizers, and the high cost of borrowed capital.
- **Ranching and Livestock:** A2 Land allocated to pure beef ranching in the large scale commercial (LSC) plots in NRs IV and V is enough to give reasonable returns. Our analysis demonstrated that herd sizes of 170 Livestock Units (LU) operating breeding for weaner production or buying in weaners to sale at 3.5 years, can yield reasonable farm returns and can be managed sustainably in the larger plots allocated in NRs IV and V. In the medium scale plots, scaled down beef herds mixed with small ruminants, or pure small ruminants, should yield reasonable farm returns. However, small scale plots are not viable as pure rangeland based livestock enterprises. Combinations of small ruminants, poultry, pig production and vegetables, where there is water, should yield more reasonable returns.

Our analysis finds that while current farm sizes are suitable for the viable production of most agricultural commodities,

there are few special commodities which will require larger land allocations. These include seed production, wildlife, dairy and on-going or new plantations with large 'sunk costs'. They are discussed below:

- **Seeds:** There is concern that more land for seed production be allocated to seed companies and individual seed producers. Seed companies will need larger farm sizes in all agro-ecological zones in order to accommodate sizeable areas of seed growing, seed research, seed processing (cleaning) and storage. Individual seed producers will need larger seed growing areas and space to ensure seed isolation.
- **Dairy:** Livestock farming is a long term investment. At current rates of interest, it is difficult to finance such investments using debt. Moreover, most financial institutions do not offer long term finance for livestock production. Dairy production involves economies of significant scale in on-farm production and in milk collection. The dairy cow requires large amounts of food and milking infrastructure requires a large enough herd to absorb the cost of putting in such investments. For this reason, there is a need for large plot sizes in the dairy sector. Plot sizes in the larger A2 farms in NRs I – III, where conditions are favourable to dairying, are not adequate to run economically sized herds.
- **On-going large and integrated irrigation farmlands:** There is concern that there are few well established large irrigation farms. Plots are not easily divisible without loss of efficiency in the utilisation of the invested irrigation infrastructure as single units of a few land-equipment modules. Some of these have been subdivided into small units in which attempts to co-ordinate production and use of equipment has been failing. Although this problem does not apply to the majority of irrigated farmlands which have been acquired, the selective right-sizing of these few problematic farms is necessary.
- **Wildlife and forestry:** Wildlife ranching and forestry have demonstrated the ability to earn critically important foreign currency. However, ecological constraints require that these be operated as large units, with 50 000 hectares being suggested by some as the minimum for an ecologically

viable unit. In very rough grazing and rugged terrain, this may be a land use to consider. However, the idea of one person owning such a vast amount of real estate can be socially alarming. The long term cyclical growth and rotation requirements of sustained forest production as well as scale of economies embedded in harvesting equipment also require large farm sizes, particularly in on-going plantations.

3.5 Land Tenure and Land Administration: Issues and Conclusions

3.5.1 Land sharing, subletting and rental tenure arrangements

There are cases where real, generalisable farm size limitations exist, such as in the case of dairy farms with high sunk costs, and in which some farmers could benefit from formally renting a little more land from neighbours. There is also evidence of some plot holders with large farm infrastructure (barns etc). that could only be used to optimal capacity of the custodian plot holders or their neighbours could gain access to more arable land.

Then there are also cases where 'ecologies of scale' would require new farmers to enter new land use sharing arrangements or re-demarcation of plots into natural conservancy corridors, which would require the partial ceding or renting out of land among equity shareholders or to new conservancy landowners by non-shareholders on contiguous plots. These and other cases in the long term will all call for flexibility in the tenure rules to allow plot holders and local communities to redefine their landholdings and tenure relations.

The adjustment of land allocations to new farmers and encouraging the use of under-utilised A2 land, particularly among A2 scheme beneficiaries and to other potentially effective land users who do not have land, given the existence of 'unallocated' land, is a potentially critical mechanism for increasing the production of various crops other than maize, small grains and cotton.

Thus, re-planning and the re-allocation of some arable land, where demarcations lead to inequitable distribution, is called for.

The land allocation policy refinement process should focus on prohibiting land alienation and re-concentration.

3.6 Recommendations

3.6.1 The land allocation process

We recommend that this immediate term (2003/4) period, in which land allocations processes are adjusted and completed, be treated in land policy formation terms (farm sizes, land allocations, land sharing and land access mechanisms) as the baseline period *for levelling of the new land distribution structure*. Accordingly, during this immediate and medium term period, the current farm sizes should be maintained, with the exception of some 'special commodity land use' cases, for reasons already discussed.

Flexibility in access to varied land sizes within current official farm sizes should be promoted especially among new allocatees, and land sharing and land use partnerships arrangements should in some cases be allowed in the short term. In the medium and long term (5 years and beyond) the farm size policy and land transfer mechanisms should then be reviewed towards further 'right-sizing' and to accommodate land transfer (rentals/sub-letting and sales/market) mechanisms which restrict either excessive land concentration or land fragmentation.

During the transition, greater attention should be paid to removing the various land use, production and support system constraints, which appear to be more critical to meeting targeted outputs than the question of farm sizes in general. At any rate, it is in the next 5 years that we can realistically expect most plot holders to have made the 'minimum developments', required.

This is when greater and materially invested activism for freehold title and land markets can be expected from a larger constituency of landholders, and then would be an appropriate time to review land tenure, land markets and farm size policy.

Given these land allocation problems, land access needs and land use constraints, the GoZ should promote farm planning in general and adjust some of the land allocations to improve access to arable land in relevant cases. There is no need for the generalised upward revisions of A2 farm size prescriptions, except in special cases.

3.6.2 Infrastructure allocation

3.6.2.1 Productive infrastructure use and access

A clear pronouncement on infrastructure allocation, use and maintenance needs to be made, namely: that infrastructure is not meant to be free; the state owns the infrastructure and intends to lease and sell it at full cost to new farmers; and that the state will lease and sell to both groups of new farmers where they can form effective contracts or to individuals where this is a transparently feasible option.

Rental charges for the use of infrastructure or for its price when exercising the 'option to buy' should be valued on the basis of the full costs of developing the infrastructure as established by independent valuers. Standards of full cost recovery charges for appropriately inventoried and valued infrastructure should be set.

Once these policy clouds are cleared, model rules and regulations for group utilisation of infrastructure can be designed. Infrastructure sharing can be promoted on the basis of co-ordinated agricultural production, output processing and infrastructure expansion plans promoted by extension specialists. These should be given due legal recognition and

support by financial institutions. In general, however, the capacity of GoZ land and extension personnel to monitor land use and infrastructure utilisation and maintenance, and the capacity of its land information system (LIS), let alone its capacity to mediate disputes which arise over the use of infrastructure, should be expanded.

Those who do not use the infrastructure adequately could be relocated to land with fewer infrastructure or be compelled to grant access to other farmers, or else the infrastructure could be excised and turned into state or share equity property owned by groups of other new farmers.

GoZ agricultural policy should deliberately provide targeted subsidies for the development and improvement of farm infrastructure. The benefits of this subsidy should be spread to those A2 plot holders without infrastructure or access to common or sublet infrastructure, as well as to other smaller farmers in A1 and communal areas. This subsidy should be transparent and contingent upon visible production outputs (e.g. tax breaks reimbursements).

3.6.2.2 Farm compound infrastructure use and control

Policy revision towards the collective management of farm compounds by groups of farmers and local authorities with the latter playing a more direct role in farm workers' welfare and social service provision, is the most desirable option. The idea of creating satellite rural service centres or hamlets within the redistributed lands, through excising the land with farm compounds and social facilities from any individual plot holder's farm, is recommended. Government, local authorities, non-governmental organisations (NGOs) and farmers should invest large amounts of resources towards the planned development of these centres and their social services.

3.6.2.3 Investment in new infrastructure

New farmers suffer viability problems due to the high capital requirements to erect essential infrastructure on their farms, including curing facilities, dipping facilities, pack houses etc. In most cases, such facilities are only used sparingly and they represent a significant drain on the farmer. Where these can be shared among many farmers, government could encourage agencies to invest in such infrastructure for custom servicing to farmers. This could be accomplished through provision of financial incentives as well as an enabling regulatory environment facilitating such developments.

3.6.3 Land use recommendations

Specific recommendations related to land use are:

To encourage correct land use patterns, we propose that government institute measures such as land taxation (and in this case subsuming the present unit tax), land use regulations and production incentives.

All landholders in A2 and remaining LCSF's as well as state agencies (ARDA and CSC) should pay land taxes as shown above to compel them to adopt the most appropriate land use.

- **Optimising capacity through diverse intensification on small farms:** Small ruminants (goats and sheep) should receive more attention due to their hardiness especially under the conditions in NRs IV and V, low veterinary costs and ability to utilise pasture through browsing. Government can assist in this regard through the provision of market facilities.
- **Optimal use of irrigation resources:** Water resources are essential for stability of yields as well as for intensity for production on farms. In addition,

effective use of water resources improves farm viability. To achieve these benefits, regulations and incentives must be put in place to make sure existing water delivery infrastructure is shared by most beneficiaries of the reform programme. Incentives are needed to encourage more efficient water usage through use of efficient delivery systems as well as choice of water efficient crop enterprises.

3.6.4 Farm size suitability, productivity and viability

Specific recommendations relating to areas of production requiring greater land size are discussed below:

- **Seeds:** Seed security is essential for the nation and the needs of seed production must be accommodated.
- **On-going large and integrated irrigation farmlands:** The GoZ should openly identify those integrated and high cost, large on-going irrigation farms that are truly not amenable to being subdivided into small plots. These should be re-planned and sold at full value to those with resources to acquire and use them, and equity share holding arrangements promoted amongst them.
- **Dairy:** Given the high feed requirements of dairy cows and special technology and milk collection economy requirements, we recommend that land provisions be made for dairy production including the following;
 - a) Increased plot sizes for some plots with large infrastructure;
 - b) Existing dairy infrastructure being shared among adjacent farms to lower the overall infrastructure cost, and
 - c) Government facilitating provision of such financial assistance if the sector is to recover and prosper.

- **Wildlife and forestry:** Given the ecological demands of wildlife and the scale and volume sequencing needs of forestry production, we recommend that such enterprises be allocated more land than provided for under current government policy guidelines. However, to ensure equity in the distribution of the benefits thereof, we propose that ownership of these concerns be given to broad consortiums under special management arrangements.

- **Custom services and reduction of machinery costs to farmers:** As is the case with large infrastructure investments, costs of acquiring tractors and equipment can overburden most farmers. We propose:
 - a) That Government facilitate the setting up of private and quasi-public mobile machinery services by agencies through financial and regulatory incentives;
 - b) Removal of duties on imports of machinery and parts; and
 - c) The GoZ expand the tractorisation of both A1 and A2 farming areas;

Development of small-farm-friendly technology:

Most technology that has been developed or adopted in Zimbabwe have tended to be geared to the needs of large scale commercial agriculture. To optimise on the small land holdings of the new farmers, SIRDC and the research and extension services should put emphasis on the development of appropriate technology.

In general, government should adopt a pro-farm macroeconomic and sectoral policy stance including giving priority in foreign currency allocation to industries supporting agriculture (fertiliser, packaging, machinery, seeds and stock-feeds), lowering or removing duties on imported agricultural inputs, and ensuring farmers get the best prices for their produce.

3.6.5 Land tenure policy recommendations

The land tenure rules which govern access to, and use of, both land and infrastructure found on A2 leaseholds should be modified to accommodate the need for larger pieces of land for land uses such as wildlife and forest plantations, a few large scale dairy farms and company based seed production agro-businesses. These should merely be allocated leases on larger farm sizes commensurate with the specified production plan based on overall national targets. The GoZ should provide technical support to the development of appropriate tenure and management arrangements for the equity shareholding of such larger land concerns.

The GoZ should create certainty and security of land tenure by rapidly issuing of land leases in A2 areas with appropriate terms of tenure and conditions of land and infrastructure use. The GoZ should shortly begin to evict those who do not use their land based upon transparent criteria and procedures.

3.6.6 Land policy administration

A new integrated system of land administration should be set up as an autonomous agency. This should co-ordinate the administration of future land allocations, land tenure particularly the A2 leases, charges, developments, 'evictions', land sub-letting, supplementary rentals, land utilisation intensities, enterprise mixes, land infrastructure access and rentals, and land conflicts resolution. This agency should rationalise access to land and its utilisation while promoting and facilitating land tenure lease variations which enhance tenure security and land use optimisation. An important concern of this system should be to guarantee the physical security of leases and their infrastructure and equipment, as well as their products (cattle and crops) in collaboration with security forces. This will require a more advanced LIS, incorporating data on land, leases, micro agro-

potential, actual land uses, rental and levy payments, and cadastral information and surveys. This should be funded adequately and well staffed. Public access to its information and reports on land control, use and transfers should be adequately catered for.

To mitigate the concern over under-utilisation of land, and encourage full time farming, is recommended that a cost be attached to the holding of land. This should be enforced in the form of a land tax applicable to all forms of land ownership including resettlement land and land owned by state agencies. These should be additional to lease fees, infrastructure fees and local unit taxes.

3.6.7 Land policy improvement strategy and time frame

Some policy flexibility in the above recommended land policies is required, especially to allow for the adoption of desirable policy positions in the long term, while building empirical evidence in the short to medium term on the emerging patterns of land use and tenure among new farmers. Three categories of land policy evolution should guide decision making:

1. Immediate term – the levelling off of the landholding structure under current farm sizes should be given time to settle as more beneficiaries are allocated land;
2. Medium term – policy analysis measures should seek to discover optimum farmer practices and capacity, and evaluate the potential effects of the various land policy options and mixes (learning by doing), and some flexibility in the use of specific policy instruments should be encouraged.
3. Long term – once land allocation and the economy have stabilised, land policy should accommodate the evolving social demands, resource utilisation opportunities and the differentiation of needs among new farmers, markets and state capacity to finance or implement policy.