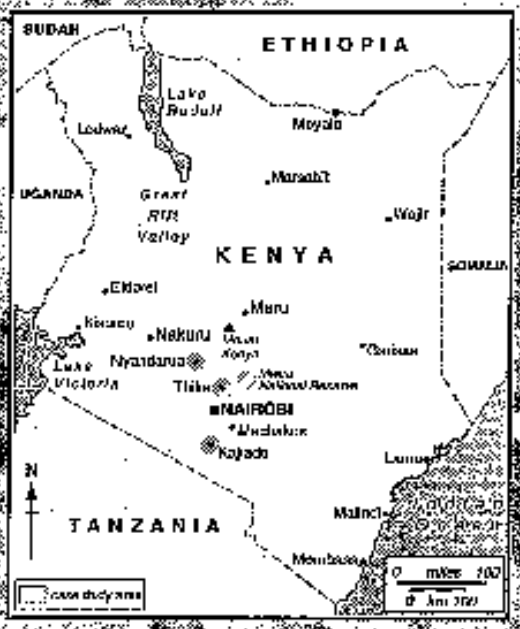
policies that work
for sustainable agriculture and regenerating rural economies

Policies for agricultural sustainability in Kenya



J.K. Nyoro and
H.K. Muiruri

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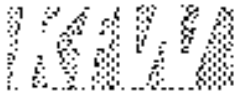
A country case study report for:
Policies that Work for Sustainable Agriculture and Regenerating Rural Economies

DFID



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Policies that work for sustainable agriculture and regenerating rural economies series

There are enough examples world-wide to suggest that agriculture which is pro-sustainability and pro-people is working. We now understand the concept of 'sustainable' agriculture is not confined within the farm boundary, but has strong links (and a potential to be a dynamic force within) a wider rural economy. So, 'sustainable agriculture' not only contributes to greater agricultural production, but also environmental regeneration and local economic development.

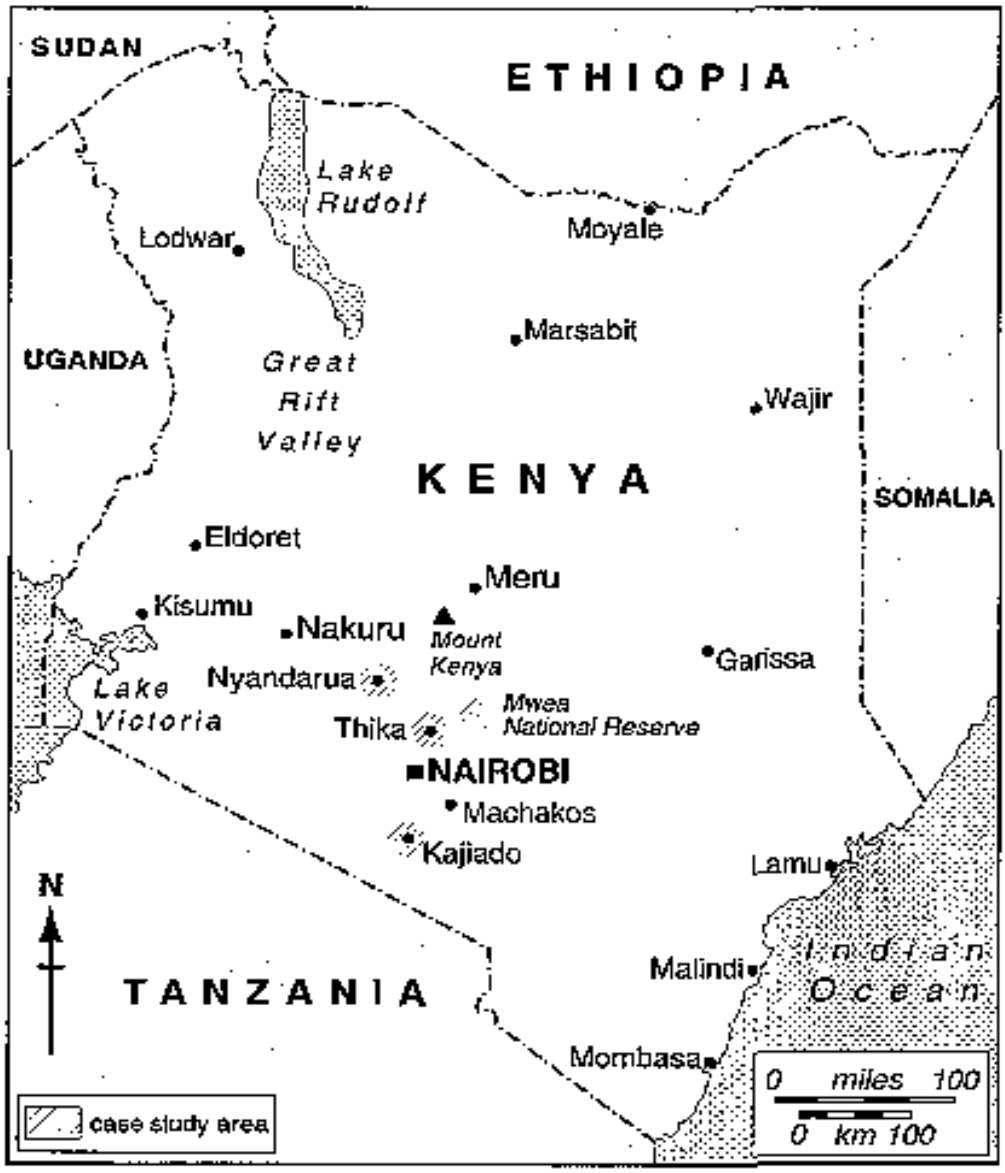
IIED's Sustainable Agriculture and Rural Livelihoods Programme has undertaken collaborative research to look at 'Policies that work for sustainable agriculture and regenerating rural economies'. The overall objective of this research is to understand the policy contexts and instruments that can promote sustainable agriculture and social change. This has been done in high, medium and low income countries in both the South and the North. 'Success stories' have been identified and the policy environment that has permitted these to emerge has been investigated. Are there lessons we can learn from these 'islands of sustainability' that will help us turn islands into continents?

This paper is one of a series of reports from the Policies that Work project, which give the research and methodological background and country specific findings. *The views and opinions reflected in this material do not necessarily reflect those of IIED, it's partners or the project donors.*

Acronyms

AEZ	Agro-ecological zone
AFC	Agricultural Finance Corporation
AI	artificial insemination
CBK	Coffee Board of Kenya
COMESA	Common Market for Eastern and Southern Africa
DFID	Department for International Development (of the UK)
FAO	Food and Agriculture Organisation of the United Nations
GAP	good agricultural practices
GTZ	German society for Technical Cooperation
IEA	Institute for Economic Affairs
IIED	International Institute for Environment and Development
JICA	Japanese International Cooperation Agency
KARI	Kenya Agricultural Research Institute
KCC	Kenya Cooperative Creameries
KFA	Kenya Farmers' Association
KGGCU	Kenya Grain Growers' Co-operative Union
KNSQCS	Kenya National Seed Quality Control Service
KTDA	Kenya Tea Development Authority
NCPB	National Cereals and Produce Board
NGO	Non-Governmental Organisation
NIB	National Irrigation Board (of Kenya)
O&M	Operation and Maintenance
PE	Provincial Extension
PRG	Policy reference group
PTW	Policies that Work
SACCOS	Savings and Credit Cooperatives
SAPs	structural adjustment policies
SARL	Sustainable agriculture and rural livelihoods
USAID	United States Agency for International Development
WTO	World Trade Organisation

Contents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ETHIOPIA
Lake Rudolf
Lodwar
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Marsabit
UGANDA
Great Rift Valley
Wajir
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SOMALIA
Eldoret
Meru
Kisumu
Nakuru
Mount Kenya
Garissa
Nyandarua
Lake Victoria
Mwea National Reserve
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NAIROBI
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Kajiado
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Introduction

Agriculture, which is the lifeline of 80 percent of Kenya's population, must provide food for the growing population, provide employment for the increasing labour force, and provide rural income and foreign exchange earnings. Agriculture must also maintain high growth rates to spur industrial growth and provide industrial inputs while also raising demand for consumer goods, inputs and equipment. In order to do this, agricultural productivity must be improved. This implies more intensive use of technologies and rapid commercialisation of agriculture.

As these objectives are pursued, the agricultural practices adopted impose negative effects on the environment, such as the pollution of rivers and water resources, depletion of ground water resources and soil erosion, amongst others. Natural resources also continue to be used to enrich current production at the expense of future production potential. If such practices continue, current agricultural production and consumption patterns will deplete or reduce the quality of natural resources. This will in turn undermine the contribution agriculture has made in Kenya to rural employment, foreign exchange earnings, and rural incomes, thus weakening the long term goal of poverty alleviation and the improvement in rural living standards of the population (IEA, 1998).

The intensification and commercialisation of agriculture could therefore threaten the long-term sustainability of the development process. It is was out of this realisation that in 1997, Tegemeo Institute of Egerton University, Kenya, and the Sustainable Agriculture and Rural Livelihoods Programme of the International Institute for Environment and Development (IIED), London developed a collaborative research project on *Policies That Work for Sustainable Agriculture and Regenerated Rural Economies (PTW)*.

The objective of the project was to establish the policies and policy processes that have influenced sustainable agriculture in Kenya. It also traced the impacts of such policies on poverty alleviation and sustainable livelihoods. Using the policy systems identified, the study explored policies that could make agricultural practices more sustainable.

In addition the study identified key policy milestones in Kenya that either supported or constrained sustainable agriculture and poverty alleviation. This study was complemented by a national survey on the perceptions and concepts of sustainable agriculture. This was also because of the increasing evidence to suggest that some agricultural practices in the country could be pro-sustainability and pro-people. It was necessary to understand why these emerging success stories have remained isolated islands of sustainability.

A fundamental challenge therefore was to understand why these 'islands' have not become 'continents of sustainable practice'. In other words, why have most examples of effective, efficient and equitable agriculture and resource management remained localised successes? What prevents most of them from increasing in their scale and scope? And in the few cases where sustainable practices, processes and technologies do spread beyond the local level, what factors supported their diffusion, adoption and adaptation?

The overall aim of the project was thus to improve the understanding, formulation and implementation of policies and policy processes that support the spread of forms of sustainable agriculture in order to alleviate poverty, increase food production and access to entitlements, conserve natural resources, and stimulate strong rural social enterprises.

Tegemeo Institute divided the research into three main phases.

Phase I: SARL Profiles. The first phase constituted a study of the current state of sustainable agriculture in the country. It involved case studies of 'islands of sustainability' in different farming systems in high, medium

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and low-potential areas of the country. A combination of participatory research methods, household socio-economic surveys and secondary data were used to assess changes in farming patterns and practices and identify the policies and policy processes that may have contributed either positively or negatively to the emergence of more sustainable forms of agriculture and rural change in those places.

This detailed empirical work was complemented by a broad national survey of key public and private policy actors regarding their opinions, activities, impacts and visions of sustainable agriculture in Kenya.

Phase II: Policy Profiles. In order to have a full picture of policy-agriculture-livelihood interactions, it was necessary to learn how the country arrived at the present situation. Thus, in a second phase, Tegemeo charted the political economic history of agricultural policy and institutional change from the colonial era to the present, post-liberalisation period. This provided insights into the pivotal policy 'milestones' (Chapter 5) that have had a major impact on agriculture and food security in the country and traced the trajectory of agricultural transformation over a 50-year period.

In this second phase, Tegemeo also attempted to understand the specific policy instruments and processes that have led to or constrained the emergence of the 'islands of sustainability' in the case study sites.

Phase III: Policy Options. The third phase consisted of a series of roundtable discussions and seminars. These was an opportunity both to present the findings to all the stakeholders involved, as well as to develop policy alternatives to tackle some of the obstacles to sustainable agriculture encountered.

These components of the research project were conceived to commence sequentially, ultimately leading to a set of lessons and recommendations that could be used to inform and influence key policy makers.

Methodology

2.1 SARL profiles: study sites

The first phase of this study set out to identify and analyse farming systems that showed signs of being 'islands of sustainability'. These are systems that have been able to persist over time, withstand periodic shocks and stresses, and which show signs of being more productive, stable and equitable than other systems sharing similar ecological and social characteristics. In addition, a number of 'unsustainable' systems were examined to allow for comparisons of 'good' and 'bad' practice and the policies and processes that have led to improvement and decline.

Initially, four research sites were chosen in different parts of the country: Mwea/Tebere, Kajiado, Nyandarua, and Thika. These represented a range of farming systems in different agro-ecological zones, from humid upper highlands, to semi-arid lower midlands and arid lowlands. Box 1 outlines the criteria used in site selection.

Mwea/Tebere (Central Medium Potential zones) is classified as an AEZ type IV (dry woodland/bush midlands). Altitude is 4,000 to 5,000ft above sea level, with an annual rainfall of 600-1100mm. It has medium potential for plant growth and suitable crops for this area include millets, cowpeas, cotton, oil crops, and fruit trees. The major limitations to crop production are soil fertility, rainfall and husbandry. This zone was selected to demonstrate how policies that initially are considered appropriate can lead to unsustainable practices, thus threatening both the environment and household livelihoods in these areas. Here agricultural production is dominated by rice and horticulture. The production system is highly regulated by the National Irrigation Board (NIB), which has title to the land, holds the license for irrigation water and determines which crops will be produced. It is involved in the processing and marketing of rice under a monopoly arrangement. The

Box 1 Site selection

The site selection criteria initially considered how to identify and isolate the islands of sustainability. However, due to the multi-cropping nature of Kenyan agriculture, one system could be sustainable in one commodity production system yet be unsustainable in another within the same system. Thus more broad-based criteria for site selection were chosen. These included:

- Agro-ecological zones (AEZ) which influence the diversity in cropping patterns and general agricultural land use, farm size and to some extent, agricultural potential.
- The presence or absence of some elements of sustainable agricultural practices based on key informant interviews where some were categorised as less sustainable than others.
- Agricultural systems dominated by production cash crops like coffee, tea, pyrethrum and cotton, which are sold to raise income that is then used to buy food from the market. Other production systems produce food for consumption, with sale of the surplus production to raise income to meet non-food expenses.
- Production systems with crops that are produced mainly for food for consumption and sale of surplus production to raise income to meet non-food expenses.

Source: Nyoro & Muiruri 1999a.

Board sets the producer price for rice. Farmers have introduced horticulture, maize and beans in plots allocated to them by the board for growing their own food (Nyoro & Muiruri, 1999a).

Olgulului in Kajiado falls into AEZ type VI, described as scrubland and dry bush lowlands. Altitude is 3,000 to 4,000ft above sea level, with an annual rainfall of 450-900mm. It has low potential for plant growth and suitable crops for this area include bulrush millet, pigeon peas and cassava. Crop production is severely limited by rainfall and the area is suitable for ranching. It is located in the southern lowlands, and falls within the arid and semi-arid zones. Livestock is the main economic and livelihood activity. Pastoral farming provides income to families to buy

food and meet other needs, such as health and school fees. This site was selected to demonstrate the impacts of over-reliance on a single activity like livestock production on the environment and household livelihoods (Nyoro & Muiruri, 1999b).

Geta in Nyandarua falls into AEZ type II, described as moist forest cool upper highlands. Altitude is 8000-9000ft above sea level with an annual rainfall of 1000-1600mm. It has very high potential for plant growth and suitable crops for this area include potatoes, peas, pyrethrum, carrots and temperate fruits. The major limitations to crop production are soil fertility, drainage, occasional pests and husbandry. Nyandarua lies in the Central Highlands, a high potential zone that produces surplus food. The site possesses some untapped potential in food, dairy and horticultural production, which is constrained by poor infrastructure, unavailability of credit, poor extension services and lack of market information. Despite this, the site demonstrates strongly sustainable practices that are now threatened by lack of coherence in government strategies to improve agricultural productivity (Nyoro & Muiruri, 1999c).

Thika falls into AEZ type III, described as semi-humid, moist weedlands in the lower highlands. Altitude is 5000 to 6000ft above sea level with an annual rainfall of 800 – 1400mm. It is of high to medium potential for plant growth and the suitable crops for this area include maize, beans, potatoes, coffee, tea and citrus. The major limitations to crop production are soil fertility, husbandry and rainfall. The site has enterprises such as coffee, tea, horticulture, dairy and maize. The zone is in food-deficit and specialises in the production of coffee and tea to generate income to buy food from the market. Recently horticulture has replaced coffee and maize crops (Nyoro & Muiruri, 1999d).

Research at these sites was conducted using a combination of Participatory Rural Appraisal (PRA) tools and household socio-economic surveys. Thus the qualitative information gathered through the PRA process was corroborated through quantitative information collected in the economic analysis of the alternative options or possible

interventions. In addition, key informants in the community were interviewed to supplement the information collected at the household and community levels.

The final output of this interaction was the development of a Community Action Plan (CAP) which the individual community members undertook to implement first by mobilising resources and then in expectation that eventually, more resources could become available to the community from outside[1].

2.2 The national study

The national study adopted a face-to-face method of interview with the key personnel of the various organisations and businesses involved in sustainable agriculture (Boit, 1999). These included policy makers, corporate leaders, policy analysts, donors, farmer representatives, development professionals and practitioners of sustainable agriculture, representing the Ministry of Agriculture (MOA), the Ministry of Planning and National Development (MPND), the private sector, government parastatals, farmer organisations, national and international research institutions, NGOs, and bilateral and international agencies. The interviews were guided by a structured questionnaire.

In the national survey, the perceptions of sustainable agriculture represented expert opinions on this subject, as viewed by the different stakeholders.[2] The key informants and respondents were later invited to the stakeholder seminars and workshops. The participants in the PRA process in each research site were also invited to a community seminar where the results of their case study were presented and discussed. This allowed for additional cross-checking of information and clarification of key lessons.

1 The full text of these case studies will be available on the Policies that Work web-site http://www.iied.org/agri/prog_ptw.html

2 However it is important to point out that, despite an emphasis on seeking institutional/ organisational views it was sometimes difficult to differentiate between personal views and those of the respondent's institutions

This was the first time that Tegemeo Institute and Egerton University combined participatory methods with economic techniques and policy analysis tools, so there was an element of methodological experimentation throughout the research process. This led to a synergy in the use of these methods that enriched the research findings because the top-down approach adopted in the policy analysis was augmented by the community-based assessment of policy. The combination also built linkages between stakeholders at different levels.

Box 2 shows the methodology used, while Box 3 summarises some definitions of sustainable agriculture by different stakeholders.

Box 2 Study methodology

In order to present a balanced picture of the views on issues relating to the sustainable agricultural perceptions and practices of the various stakeholders, the national survey was conducted through face-to-face interviews with key personnel in each of the institutions or organisations. The interviews were guided by a standard questionnaire developed using the terms of reference. The institutions interviewed were chosen from a list that was compiled by Tegemeo Institute, based on earlier preliminary work.

It is assumed that the perceptions represent expert opinions on this subject, as viewed by the different stakeholders. However it is important to point out that, despite an emphasis on seeking institutional/organisational views (a point which was stressed in every interview), some of the respondents expressed some difficulty in differentiating between their personal views and those of the institutions they work for.

For ease of analysis, stakeholders were grouped into six categories: (i) Government ministries, programmes and departments, (ii) private sector and commodity programmes, (iii) farmers' organisations, (iv) research institutions, (v) NGOs and (vi) donors/international agencies. Since there exists a wide diversity of views on various issues concerning sustainable agriculture, responses were grouped together into common subject areas (where necessary) in order to draw out some trends and carry out some quantitative analysis.

Source: Boit (1999)

Box 3 Understandings of the concept of sustainable agriculture

Government ministries, departments and programmes

"A self propelling system in which farmers are able to maintain a respectable standard of living, sustain their operations and which ensures a reasonable balance between agricultural production and the environment in which it takes place".

Private sector/commodity organisations

"Attaining an efficient agricultural production and marketing system, including all the necessary supporting activities, while maintaining and preserving the natural resource base in which it takes place".

Farmers organisations

"Involves agricultural practices that ensure that resources are available for current and future production".

Research institutions

"Availing and promoting appropriate and adaptable technology to ensure that farmers maintain and increase yields over time, without detrimental economic, social and environmental consequences and impacts".

NGOs

"An environmentally friendly system of agriculture in which resources are utilised to ensure that outputs do not deplete the necessary inputs so that they are available for future use".

Donors and international agencies

"Adopting a farming system under which desired levels of production are sustained over a given period of time while ensuring that the natural resource base is not depleted and the needs of the farmers are satisfied".

From the above attempts at defining SA, it can be noted that despite some variation, common areas of emphasis or importance emerge, as follows:

- The importance of avoiding irreversible damage to the environment (mentioned by all groups of stakeholders)
- Ensuring that resources are available in the future (mentioned by 3 out of the 5 stakeholders)
- Attaining and maintaining the desired levels of output to satisfy the needs of farmers (mentioned by 3 out of the 5 groups of stakeholders)

Source: Boit (1999)

2.3 Policy Milestones study

The Policy Milestones study comprised a review of relevant policy-related documents, supplemented by face-to-face interviews with knowledgeable individuals currently or previously involved in formulating, influencing or implementing agricultural policies. A cross-sectional design (Mwangi, 1999) was used to solicit relevant information from the respondents.[3] Box 4 gives more details of the policy milestones methodology and some of the constraints faced.

Box 4 Policy Milestones methodology

Data was gathered from document reviews and face-to-face interviews with knowledgeable informants. A cross-sectional survey design (Fraenkel & Wallen, 1990) was used to solicit relevant information from the respondents. Those selected were interviewed by the researcher using structured questions. This technique provided an effective way of enlisting the cooperation of the respondents because it placed less of a burden on the reading and writing skills of interviewees and permitted more time with them. Through it, rapport was established, questions clarified, unclear or incomplete answers followed, the subject covered in depth, and problems of no response, unanswered items and incomplete questionnaires easily avoided. Selection of the respondents was based on the objectives of the study.

An attempt was made to discuss policies related to issues specified under the terms of reference and the policy documents reviewed during the study are included in the reference list. People consulted were those currently or previously working in government departments; parastatals/corporations; research, marketing, educational and financial institutions such as commercial and co-operative banks; development authorities; non-governmental and religious organisations; as well as private companies involved in agricultural development.

Source: Mwangi (1999)

3 The full-text of this study will be available at the Policies that Work web-site: http://www.iied.org/agri/prog_ptw.html

2.4 Dissemination

Policy Reference Group

Different methods for disseminating research findings from this project were devised. A Policy Reference Group (PRG) was established to review the research findings and consider a range of policy options for promoting the move towards more sustainable agriculture in Kenya. In addition, the PRG was used to sensitise the stakeholders to the project and identify the possible end users of the PTW work, identify the possible collaborators in this study and confirm and approve the study sites.

Membership of the PRG was drawn from Egerton University, the private sector (represented by seed companies), the Kenya National Farmers Union (KNFU), the Ministry of Environmental Conservation, the Agrochemical Association of Kenya, the Pest Control Products Board, the Ministry of Agriculture, Soil and Water, the National Council of NGOs, the Ministry of Research, Science and Technology, the Kenya Agricultural Research Institute, the Sustainable Agricultural Community Development Programme (SACDEP) which is a local NGO promoting sustainable agriculture, the Fresh Produce Exporters Association of Kenya (FPEAK) and the Kenya Institute of Organic Farming. Since the members of the PRG participated in the research process, they were expected to influence the policy making process in the organisations they represented so that only policies that could be sustainable were formulated and implemented. Further the PRG was also used to lobby for policy changes that could promote sustainable agriculture within government organisations, NGOs, private sector and other stakeholders.

Site specific community seminars

Site specific community seminars were held in the study sites. The objectives of these were to disseminate the research results and also bring together the community, district heads and sectoral representatives. Sectors represented in these meetings included agriculture, livestock, health, water, county councils, social services, education, wildlife, works and forestry. The community action plan was discussed at length with a view to ensuring its implementation. In these

meetings, the community was given an opportunity to confirm whether the research findings presented at the seminar were arrived at with their participation and whether their perceptions of the problems and interventions were included. The technical feasibility of the proposed interventions to problems identified was presented to the heads of technical departments for confirmation.

Stakeholder seminars

Seminars were also held at the national level, giving different stakeholders the opportunity to discuss challenges facing specific commodities, such as coffee, pyrethrum, maize, wheat and horticulture, and thus develop a way forward for implementation by all involved. The workshops also suggested ways commodities could be streamlined in order to enhance sustainable agriculture. It is expected that these seminars will strengthen intra-country alliances, consensus building and conflict resolution processes to open the agricultural policy formulation process to a wider range of stakeholders, especially those who have traditionally been excluded from participating in these arenas. This method of dissemination of research results has proved to be effective, particularly in resolving disputes. An example of a coffee stakeholder seminar is shown in Box 5 (Nyoro, 1999).

Box 5 Coffee stakeholders seminar

Coffee production has declined in the last ten years, prices have dipped to probably the lowest level in the decade and farmers are complaining of low and delayed payments. Coffee farmers continue to agitate for splitting of co-operative societies to levels that may not be viable and a press war has ensued between different stakeholders.

The reliability of supply of the once famous Kenya coffee and the credibility of its prime quality are at stake as importers and international coffee roasters seek more secure and stable alternative sources of coffee.

The Tegemeo Institute of Agricultural Policy and Development, which is a public research institute of Egerton University, held a stakeholders' workshop on Wednesday 17 November 1999 at the Serena Hotel Nairobi that was attended by 48 participants. The purpose of this workshop was to suggest the way forward for the coffee industry and therefore develop a

plan of action by all parties concerned in order to create a conducive environment for coffee production. The workshop discussed many issues pertaining to the coffee industry and suggested how the industry could be streamlined to make coffee processing and marketing more competitive and thus enhance coffee production in the country.

Present in the seminar were stakeholders drawn from the small and large-scale coffee growers, coffee millers, coffee exporters, representatives from co-operative societies, the Coffee Growers' Association, government officials from the Ministries of Co-operative Development and Agriculture, the print and electronic media, policy analysts from both public and private institutes, local commercial banks and other lending institutions, and Members of Parliament representing the Agricultural and Environment Committee of the National Assembly.

The stakeholders made several resolutions to streamline the coffee industry and thus revitalise the production, which included:

- Streamlining the roles of the government and other institutions
- Availing credit for coffee rehabilitation,
- Retention of central auction as the main coffee marketing system
- Reduction of transaction costs by farmer organisations
- Devising of strategies to reduce coffee production costs
- Recommendations to review the Coffee Act to bring it in line with the liberalisation process
- Redefining the functions of the Coffee Board of Kenya to separate its regulatory and commercial functions.
- Restructuring farmers' representatives in their organisation in line with a liberalised coffee market

Source: Nyoro J.K (1999) Way Forward for the Coffee Industry

NGO Seminar

To share the research experience, and research results, and disseminate the findings, a series of dissemination seminars was organised in conjunction with the Policy Analysis for Participatory Poverty Alleviation Project (PAPPA) that Tegemeo has also been carrying out since 1997. Participants in the first seminar were drawn from NGOs that are directly involved in agricultural development and livelihoods systems and those dealing with poverty alleviation interventions. A total

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of 26 participants attended the meeting. Two presentations were made, one covering the PTW methodology and the other covering the results. The presentation on methodology emphasised the merits of the participatory methods because of their ability to collect both the qualitative and quantitative data on policy and policy processes. The results emphasised the importance of public goods in ensuring sustainable agricultural development and poverty alleviation that includes the provision of water, health, education, and infrastructure. Although poorer households dominate the communities studied, it was quite evident that lack of sustainable development and incidences of poverty are relative because in these communities, there were also wealthier households, even if they were in the minority. Progress towards sustainable development and improvements to the communities resulting from changes identified by that community affect both the poor and the better off, thus maintaining the differences in income between the groups. However, the poor would benefit more because they have more potential for improvement than the better off. Further, changes that make agriculture more productive are also likely to raise

household incomes and thus contribute to the alleviation of poverty because of the importance of agriculture in the local economy. However, though such improvements are necessary to raise farm income, they may not be not sufficient to alleviate poverty in rural areas. Instead, what is needed is enhanced access to income generated off the farm, through either engaging in agricultural processing and/or other informal activities such as in cottage industries, thus increasing salaried income.

National workshop

A national workshop to disseminate the findings of both the PTW and the PAPPA projects was held on 26th October 2000. The objective of the seminar was also to disseminate and share the findings from the two projects. The seminar was attended by 45 participants who were drawn from government ministries (Agriculture and Rural Development, Economic Planning, Water, Health, Treasury, Poverty Commission of Kenya, members of the Interim Poverty Reduction Strategy paper and the members of the Medium Term Expenditure Framework (MTEF) secretariat), donors, (DFID, FAO, JICA, USAID, Ford Foundation, and GTZ), NGOs, public universities, private sector and representatives of communities where the work was carried.

Two papers were presented: one covering the methodology and the other on results. The paper on methodology highlighted the merits and demerits of using a participatory method that combined the traditional PRA methods with the economic analysis. This involved a hybridisation of both the qualitative and quantitative methodologies of mobilising communities. The results paper highlighted that lack of sustainable agriculture has been attributed to a failure to involve communities in making decision that affects their livelihood. Participants felt that work from these two projects should be used as the poverty reduction strategy paper is finalised and as the Ministry of Agriculture prepares its Rural Development Strategy.

Multiple definitions of 'Sustainable Agriculture'

There exists a wide diversity of views on key issues around, and definitions of, sustainable agriculture in Kenya. This diversity is not only prevalent between different groups of stakeholders but is also very noticeable among stakeholders in specific sectors and groupings. Thus, despite making the analysis more difficult than originally expected, this diversity formed an important finding of this survey.

The majority of stakeholders viewed sustainable agriculture from a wide perspective and stressed the importance of the integration and interdependence of various factors, such as the ability of farmers to sustain farming operations and maintain farming practices that accrue benefits to the farmer.

Thus, sustainable agriculture ensures

- That the practices carried out enhance and maintain productivity while also ensuring the protection of the environment and natural resource base
- Resources are used in such a way that use does not deplete or destroy resources that are required for future use
- Agricultural production is approached in an integrated way, through an understanding of the whole system, consideration for all stakeholders, understanding of cultural beliefs and the environment, having the right policies, realisation of incremental benefits (not necessarily cash) and having policies that ensure the creation and maintenance of markets for access to inputs and an outlet for outputs

A few stakeholders took a more narrow view, and understood sustainable agriculture to mean either the use of least cost technology, such as making manure compost; low output agriculture, as practised by

subsistence farmers; or self-sufficiency in inputs with little or no use of external inputs.

These definitions, although appearing consistent in including the need to conserve natural resources, do anticipate the conflict of achieving the various objectives for the different stakeholders. For example, whereas the private sector and commodity organisations emphasised efficient production and marketing systems as key elements of sustainable agriculture, it was evident that they were aware that sometimes this was achieved at the expense of the environment.

Box 6 National survey of sustainable agriculture in Kenya

Socio-economic factors

The majority of responses from government ministries/departments and programmes are related to economic factors. The private sector and commodity organisation responses were also more related to economic factors and more focussed towards efficient production and the importance of derived demand and marketing information in ensuring sustainability.

Environmental factors

Environmental conservation is the second most important area of concern in the understanding of sustainable agriculture. This was more important for the private sector/commodity groups while donors and international agencies stressed the importance of ecological soundness and non-depletion the natural resource base.

Institutional Factors

Other responses and comments to be noted were related to maintaining and increasing productivity and ensuring pragmatic resource use. A number of organisations made the important point that according to the key players or the central stakeholders (farmers and the community who are the actual owners of resources) sustainability is not a critical issue at the moment. Instead more efforts should be focussed on addressing the current key constraints to agricultural production, which include infrastructure, research and extension, seeds and technology, institutional problems, credit availability and co-ordinated investment.

Overall analysis of the responses revealed that over half (about 57%) of the definitions were related to economic factors, and about 20% were related to the protection of the environment. The rest of the responses (about 23%) defined sustainable agriculture mainly as maintaining and increasing agricultural productivity through rational resource use. Box 6 shows some of the responses given by stakeholders in National Survey of Sustainable Agriculture.

Box 7 Conflicting views in perceptions of sustainable agriculture in Kenya

Consensus

In almost all cases, the stakeholders identified the need to raise agricultural production while at the same time ensure that the quality and quantity of resources utilized in the process are not reduced thus ensuring their availability for future generation.

Conflicting views

Some stakeholders, particularly those from the private sector, considered the trade-off existing between increasing of their profits and the need to avoid depletion of natural resources at least in the short run. They argued that charging for the externalities could increase their production costs and thus reduce their profits, thus making them less competitive. They therefore maintained that it is impossible to raise productivity without having some negative effects on the environment.

There was also a conflict particularly between farmers and some extension agents on the level of optimal production. Whereas the farmers were more conscious of costs, thus foregoing some extra production if they cost more than the income they generate, the extension staff insisted on increasing production until all the inputs are exhausted.

Likewise some producers maintained a narrow view of sustainable agriculture. They for example argued that that it is a least-cost production method such as making manure from compost. Some also expressed fear that sustainable agriculture is low output agriculture such as practiced by subsistence farmers while others believed that it is a self-reliance method of production that requires little external inputs.

Some stakeholders, particularly the poor, expressed the view that poverty alleviation needs to be tackled effectively. There is a need for the very poor

to access resources that are near to them. Whereas they therefore appreciated the need to sustain the environment, they wanted the forests and water catchments around them to be subdivided so that more households could access land and thus engage in activities that may improve their livelihood. They thus downplayed the longer-term effects of soil degradation.

Consensus Building

All stakeholders could get the correct perception of sustainable agriculture through the evolution of grass-root community participation in developing community action plans.

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Elements of success

The results indicated that as the agricultural sector in Kenya is dominated by the primary production of a few commodities; only six crops account for 68% of agricultural GDP, and 17% of total GDP. Agriculture, on which over two thirds of the population depends for a livelihood, grew steadily during the first two decades after independence in 1963 and has since registered a mixed performance. In that first period the sector recorded one of the most impressive growth rates in sub-Saharan Africa, growing on average at 5.6% per annum. Between 1980 and 1990, the sector recorded an average growth rate of 3.5% annually. Agriculture grew from 1.0% in 1997 to 1.5% in 1998 and 1.3 % in 1999, while manufacturing declined from 1.9% in 1997 to 1.4% in 1998 and 1.1 % 1999. Currently agriculture suffers from high costs due mainly to the high taxation of essentials like diesel, spare parts for machinery and processing plants. Poor infrastructure has also raised transport costs thus reducing the competitiveness of agricultural production and investment. The sector has therefore performed very poorly in the recent past.

Poor agricultural performance has adversely affected a vast majority of the population who continue to suffer from both food and income poverty. The incidence of poverty has therefore risen rapidly and alarmingly. The poor constitute slightly more than half of the population of Kenya, who cannot afford basic food and non-food items. About 75 percent of the poor live in rural areas. The incidence of rural food poverty stands at 51% compared to 38% in the urban areas while overall poverty levels reached 53% of the rural population compared to 49% in the urban areas. Between 1972/73 and the year 2000, the number of poor people increased from 3.7 million to about 15 million. Women are more prone to poverty than men. They depend mainly on

unpredictable subsistence farming. The release of women's productive potential is therefore pivotal to breaking the cycle of poverty so that women can share fully in the benefit of development and in products of their own labour.

Results also indicate that food production has lagged behind consumption thus creating deficits between production and consumption. Maize production has lagged behind consumption meaning that even in normal production years, maize has been imported to fill the gap. Production fluctuates between 16 and 32 million bags while consumption is estimated at 34 million bags. Maize consumption has increased at a rate higher than the population. Domestic production costs for maize are higher than their corresponding import parity prices thus making it less competitive than imports.

Wheat production has also decreased while consumption has been increasing. Domestic production now meets less than 40 percent of domestic needs. The import parity price of wheat is also lower than the domestic price thus making it less competitive.

On commercial crops, the results showed that despite the high demand for Kenyan coffee in the world market, its production has declined. Between 1988 and 1999, production declined from 130,000 tons to a mere 50,000 tons despite an increase in coffee acreage of more than 65 percent. Coffee quality has also declined thus affecting coffee prices at auction.

Tea production has expanded tremendously since independence from 18,000 tons in 1963 to over 200,000 tons in 1998. Tea production is projected to reach 310,000 tons by 2005 at its present growth rate. Tea processing capacity has not expanded enough to cope with the increasing production thus causing severe congestion in factories, which has affected tea processing efficiency. The increase in production may also have negative effects on internal tea prices as Kenya's production continues to account for a higher proportion of world exports.

The horticultural sub-sector has grown considerably mainly due to the expansion of exports. Export volumes grew from 57,363 tons valued at Ksh 2,516 million in 1992 to a total of 84,143 tons valued at Ksh 8,810 billion in 1998[4]. These exports are dominated by cut flowers that account for 52% of the total value. However, the sub-sector faces several challenges such as increased competition from other countries like Morocco for French beans and Israel for fruits and flowers thus reducing the volume of Kenyan exports in international markets. Increasing requirements by importing countries for strict compliance with environmental and social conditions also threatens Kenya's horticultural export markets.

Production for domestic consumption has also recorded substantial growth. Currently about 1.3 million metric tonnes of fruits and vegetables are marketed locally. Small-scale farmers dominate this production. Like export horticulture, the exploitation of domestic horticulture is faced with several constraints such as poor infrastructure and overcrowded, filthy and unkempt markets, among other factors.

In sugar, Kenya produces about 400,000 tons of raw sugar compared to a consumption of 600,000 tons. Domestic production is frequently supplemented with imports. But because of high domestic production costs, imports are heavily taxed to protect domestic producers. In the past, cane production increases were achieved through large government investments in sugar factories. However, severe cost overruns and other problems have led government to not invest in new production capacity, apart from efforts to improve throughput in existing schemes.

The cotton industry had all but collapsed when the government began to liberalise it in 1991. Cotton production fell from 7,700 tons (42,000 bales) in 1980 to barely 2,500 tons in 1999. Likewise, the area under cotton dropped from about 140, 000 ha in 1980 to a mere 20,000 ha in 1999. However, new market opportunities in countries such as the USA have stimulated new interest in the revitalisation of cotton production in the country.

4 1 US Dollar = approx 77 Kenyan Shilling in 2001

Although Kenya produces about 80% of world pyrethrum extract, its production has fallen from 10,550 tons in 1994 to a mere 4,000 tons in 1999. Among the factors influencing production are low and delayed payments to farmers, adverse weather conditions, ethnic clashes, and high production costs. Pyrethrum processing is also affected by low capacity utilisation while markets are considerably threatened by synthetic flower production.

Livestock production has been affected by the poor genetic potential of the existing herd and an inappropriate policy and institutional framework, among other factors. Although dairy production has been a success story, the liberalisation of the industry has been accompanied by constraints that have limited its growth. Some private milk processing has emerged to fill the gap left by the collapse of Kenya Cooperative Creameries (KCC). These private processing units have however tended to concentrate on areas close to urban centers. This coupled with the collapse of KCC has adversely affected milk producers. White meat production has also increased although its growth has been adversely affected by high production costs due to the escalating costs of feeds, socio-economic factors, poor infrastructure, and market and policy factors.

4.1 How policies have constrained or supported sustainable agriculture

Policies and policy making process that have constrained and/or supported sustainable agricultural practices are the inadequate involvement of beneficiaries in policy formulation, a poor legal and regulatory framework, poor infrastructure, insecurity, low research priority, inadequate extension services, poor market information, limited access to credit, over dependence on rain-fed agriculture, and fluctuating and declining world commodity prices among others.

Food production policies

The focus of food policy in Kenya over the years has been to encourage self-sufficiency as a means of achieving food security. But production costs for most food crops are very high because of the taxation of farm

inputs such as diesel and machinery spare parts, poor infrastructure, the use of inappropriate technologies and poor quality inputs like seeds and fertilizers. This implicit taxation of the agricultural sector invariably raises the cost of production, making the prices of domestically produced maize, wheat, rice and sugar higher than world market prices.

To protect domestic producers from competition from imports, the government imposed high import tariffs on major food items like maize, wheat, sugar and rice. Overprotection of domestic production through high tariffs penalizes consumers on account of inefficient domestic producers. Most rural smallholders, even in the major agricultural areas of the country, are net buyers of maize throughout the year, and are thus directly hurt by higher maize prices. In the 22 agricultural districts examined, 52% of farmers were net maize buyers. High food prices have inhibited the transfer of resources from food systems to other parts of the economy as it takes more resources from non-food sectors to buy a unit of food. High food prices force consumers to demand higher wages, which thus makes the industrial and manufacturing sectors less profitable and competitive internationally.

In addition, overprotection breaches multilateral and bilateral tariff and trade agreements such as COMESA, East African Cooperation and the WTO. Kenya must thus choose whether it will continue to grow these foods behind high protective tariffs, or make domestic production compete with imports. Overprotection also defeats the objective of poverty alleviation. As the majority of maize producers are net buyers of maize, they are therefore penalized more by high maize prices through high maize tariffs. Kenya will perhaps eventually lower import tariffs.

Inadequate involvement of beneficiaries in decision-making

Most policies and projects have been initiated for rural areas without adequate consultation with the target beneficiaries. As a result, policies and projects have not addressed the key problems affecting development in specific communities. There have also been very few attempts towards devolution of power. The District Focus for Rural Development attempted to devolve power to the grassroots level but could not attain its set objectives. In essence, some policies such as liberalisation and privatisation of public services have been hurriedly formulated and implemented with serious consequences for producers and consumers. Among the sub-sectors and services that have been affected by inadequate stakeholder consultation during policy formulation and the subsequent abrupt withdrawal of public agencies are maize, cotton, coffee, tea, artificial insemination and livestock clinical services.

Legal and regulatory framework

Over the last few years, the government has been implementing liberalisation in various sectors of the economy. As a result there are, for example, 65 Acts touching on agriculture that are no longer appropriate in a liberalised environment in which the role of the government is being reduced and private sector participation is being encouraged

The rapid growth of the civil service from 60,300 at independence to a peak of 274,000 in 1993 resulted in serious effects on the budget deficit.

The result was an increased imbalance between the P.E and O&M, hence low and depressing levels of service delivery to the public. Most affected have been extension, AI, clinical services, fisheries surveillance, medical services, policing and project monitoring.

Insecurity

Increasing insecurity and conflicts, more so those that threaten property, deter economic growth by reducing investor confidence. It also increases the cost of production through increased security expenses during production and transportation of the produce. This also affects the skilled labour that will only work in those places if they are well compensated. Access to markets is also disrupted.

Poor infrastructure

Roads

The major problem that hinders rural development is the poor road network. Most roads in agricultural areas are impassable, especially during the rainy season. As a result, a number of high rainfall areas remain untapped by farmers. It also results in heavy losses due to wastage on the farms and deterioration of produce quality during transport to the market. Furthermore, the poor road network increases transport costs for inputs and produce thereby reducing the margins to farmers. Besides leading to wide regional price variations within the country, the poor road network adversely affects the competitiveness of Kenyan produce in both local and international markets.

Telecommunication, electricity and water

Telecommunication services are inadequate, expensive and unreliable. This has hampered the quick and efficient flow of information to farmers, traders, and other investors in the rural areas. The supply of electricity is inadequate, more so for the rural areas. This has resulted in frequent power rationing and blackouts, which adversely affect the establishment of agro-industries, irrigation, health facilities and cold storage, among other things. Furthermore, installation and utility costs are high.

Water for irrigation, livestock, processing and domestic use is a limiting factor in rural development. Besides supply being insufficient, the quality is also not assured. The monitoring and protection of water supply against pollution and the preservation of water catchment areas have been considerably neglected.

Inadequate marketing infrastructure

Marketing infrastructure, such as storage, markets, and the cold chain are poorly developed, leading to high post-harvest losses. This has been exacerbated by the fall of the traditional marketing channels such as cooperatives and marketing boards.

Inadequate capital and technological transfer

Low research priority

The level of research for horticultural and drought resistant crops has been low for many years. Furthermore, the poor dissemination of research findings has aggravated the problem leading to poor yields in crops, milk, and meat. As a result, farmers continue to rely on imported seeds, planting materials and other technologies so as to keep pace with the changing trends of production and consumer demands. Moreover, little effort has been put into developing gender sensitive technologies. Other constraints include:

- High reliance on donor funds for research with little contribution from the government and beneficiaries;
- Weak research-extension-farmer linkages;
- Lack of formal coordination of research activities among researchers and research organisations in the country; and
- Limited collaboration between research organisations and other stakeholders when determining the research priorities.

Inadequate information services

The agricultural, livestock and fisheries extension services in Kenya are weak and inadequate. The services are poorly funded, with insufficient funds for operation and maintenance. Furthermore, they have weak linkages with research findings. The extension service lacks the

philosophy of target group participation and motivated staff. There is inadequate market and technical information and inadequate use of the same by farmers and traders. This results in a lack of knowledge on how and when to grow produce as well as when and where to market it, thereby leading to wide price variations between regions.

Limited access to credit

In the recent past, the cost of production for farmers has risen considerably due to the rising cost of inputs such as fertilizers, irrigation equipment, pesticides, livestock drugs/vaccines, AI, seeds and other planting materials, fuel, machinery and spare parts. Besides high interest rates on credit, commercial banks require securities that most farmers do not have. This has been made worse by banks' reluctance to accept rural land title deed as collateral. This has limited farmers, fishermen and small-scale traders to only low self-financing production levels with evident low productivity and low levels of production.

Over-reliance on rainfed production

Kenyan agriculture is particularly weather determined to the extent that production is seasonal and any poor rains result in poor agricultural years. This has partly led to the perennial food insecurity, especially in the marginal areas. Irrigation and drainage potential lie largely unexploited. The exploitation of irrigation potential has been slow due to, among other causes, a lack of capital and lack of research in appropriate irrigation technologies.

Limited value-adding activities

Investment opportunities for value adding activities for agricultural commodities have not been exploited to increase farm incomes and off-farm employment. This is despite the fact that adding value to a crop like tea through packaging can fetch up to six times more revenue than unpacked tea.

Elements of Sustainable Agriculture

Despite the dismal performance of the agricultural sector, certain sustainable agricultural practices were identified.

The positive cases identified were only relatively successful. We defined successful cases as those where there were reasonable indicators of sustainability and where household welfare was being maintained or improved. Successful cases thus had household incomes that were higher than expenditure, ensuring that the community was able to meet its basic needs and that its food security was assured. Indicators such as the extent of soil and water conservation practices, agro-forestry, crop rotation, the extent of intercropping, fallow, the extent of livestock/crop production interfaces, grazing systems, and the extent of wildlife-livestock production interfaces were also assessed.

Of the research sites examined in detail, three were deemed 'successful' (Thika, Kajiado and Nyandarua), while one (Mwea) had a farming system that was clearly unviable. In this case, high levels of external inputs such as fertilizers and pesticides were being used. The residuals of these external inputs were dissolved in the paddy water, which was eventually washed downstream into the river. Other practices included cultivation on steep slopes resulting in soil erosion and monocropping and a lack of integration of livestock with crop production, resulting in increased household costs and reduced returns. As a result, the ability of households to sustain their livelihoods was eroded as their productivity was reduced due to high incidence of diseases.

Table 1 Examples of sustainable and unsustainable farming practices

Sustainable practices	Unsustainable practices
Subukia valley: rational use of low water availability for irrigation	Kisii valley bottom: poor drainage and water-logging
Parkerra Valley in Baringo (area around Marigat – Sandai): rotational/shifting cropping	Intensified maize production in the North Rift: soils becoming acidic due to use of limited types of fertilizers without soil analysis
Integrated Pest Management (IPM) by Kenya Agricultural Research Institute (KARI) and Coffee Research Foundation (CRF) (Box 7)	Central Province/Naivasha area: high use of agro-chemicals that have contaminated water sources and polluted rivers. Monoculture practices

Sustainable practices	Unsustainable practices
Horticultural production in Kenya (Box 8)	Bura Irrigation scheme and National Irrigation Board: rice growing was foreign to Kenyans and was not introduced in phases. Kenyan communities are not used to cropping and working in water
Mixed farming practices in high rainfall areas: diversification and flexibility	Indiscriminate deforestation e.g. Kinungi, Naivasha: indiscriminate land allocation, lack of enforcement of forestry regulations
Kenya Tea Development Authority (KTDA): successful transfer-of-technology project. Farmers (especially smallholders) have received full support (credit, input supply, marketing, research, infrastructure development)	Soil erosion e.g. Longonot: neglect and lack of effort from those concerned
Coffee growing: support given by key players in the industry e.g. Coffee Board of Kenya (CBK), farmer driven and run	Introduction of floriculture: applying too many chemicals which can be detrimental to the environment
Settlement scheme programme of 1960s: access to land for big percentage of peasants, transfer of technology	Mwea irrigation scheme: Poor rice production and marketing policies by former detainees during colonial era
Tree nursery project: incorporates ecological concerns and economic viability is clear. Agro-forestry areas and techniques used participatory approaches therefore benefits are clearly seen and understood by farmers	Agricultural Finance Corporation: has failed to provide credit to farmers as planned. It has also failed to be transformed into an agricultural bank as envisaged
Central Kenya (e.g. Embu, Mwea case study): zero grazing and organic farming	Big/commercial farms that rely on imported materials and spares

The successful cases of sustainable agricultural development are also dynamic. One of the case study sites (Nyandarua) that was thought to be a success story 30 years ago cannot be considered so today. The change from a sustainable to a less sustainable situation can be attributed to various policy changes and high population growth leading to substantial land subdivision over time that has encouraged or forced the community to adopt less sustainable practices. These practices include the cultivation of steep slopes resulting in soil erosion and encroachment into forests and monocropping. The sustainability of agriculture and the ability of families to sustain their livelihoods have thus been threatened. However, most of these problems could be addressed through policy interventions.

It was thus concluded that though some policy and policy processes may encourage sustainable agriculture at one point in time, they need to be adjusted to reflect changes in the local community and the wider regional economy, otherwise they may become irrelevant and hence undermine sustainable agriculture.

Box 7 IPM Horticulture Project

Horticultural production for local and export markets is one of the most profitable agricultural enterprises in developing countries, including Kenya. The export of vegetables and tropical fruits to Europe has increased in recent years and substantially contributes to foreign exchange earnings. However, intensive production of vegetables all year round has induced a rapid build up of pests, in some cases to epidemic proportions. Consequently growers, who are mostly smallholders, are prompted to injudiciously use pesticides. This trend, if not corrected, will lead to environmental pollution, resistance in pests, the destruction of beneficial pests, and a build up of hitherto minor pests and unacceptable levels of pesticide residues in vegetable production. Against this background, the IPM Horticulture project was initiated in 1994.

The IPM Horticulture project is funded by the German Ministry of Economic Co-operation and is being executed by GTZ. It is a regional project covering Kenya, Malawi, Mozambique, Tanzania, Uganda and Zimbabwe. The project, which supports research activities directed at economically

the major aspects of excellence and market acceptability related to the following:

i) **Labour:** labour regulations, industrial safety and occupational health
ii) **Good practice:** Good Agricultural Practices (GAP) including agro-chemical use, handling and storage
iii) **Traceability:** identification of origin of produce
iv) **Environment:** environmental and natural resource preservation

All participating companies must also consent to the following:

- Publication of company name (if necessary) in a list of conforming companies
- Random checking by a third party appointed by FPEAK to verify strict local compliance with the declarations
- Random testing of export produce for quality and chemical residual levels, and
- Removal of company's name from the list mentioned above if the results of any check are negative.

Source: Boit (1999)

important pests of brassica, citrus, French beans and tomato, has the following main objectives:

- To facilitate pest management strategies which are less dependent on pesticides for horticultural production through the training of researchers, extension agents and farmers.
- To enhance interaction between horticultural researchers within and between countries through joint planning of, and shared responsibilities for, research programmes on specific crops.
- To refine biological control methods so that insect predators and friendly insects are reared and released in order to reduce pesticide use.
- To reduce the use of pesticides in horticulture in line with market requirements such as reducing levels of pesticide residues for European Union bound horticultural exports. IPM has also helped to reduce production costs as the amount of pesticides is reduced.

Source: Boit (1999)

Box 8 Fresh Produce Exporters Association of Kenya (FPEAK) – Code of Practice

The Code of Practice was developed in response to the increasingly exacting requirements that Kenyan products had to meet in international markets, regarding the employment of labour, the use of pesticides, traceability of products and the maintenance of environmental health. In today's markets, it is not enough simply to offer a good product. It is becoming increasingly necessary to be able to demonstrate that the product has been produced under acceptable conditions at all stages. Therefore the concept of "due diligence" has become more important.

The Code is intended to encourage, reward and publicise responsible production and marketing practices. It is also intended to enhance the reputation of Kenya's export produce in general and be a more useful marketing tool for individual conforming exporters. The Code is intended to be voluntary, open to all full and ordinary members of FPEAK and covers

Policy milestones

The analysis of key policy milestones revealed that these could be categorised as:

- Colonial era policies
- Post independence policies (government control era)
- Structural adjustment policies (SAPs)
- Market reform policies
- Beyond market reform policies

5.1 Colonial era policies

During this era, two types of policy were formulated and implemented. On one hand, the policies that were formulated were coercive in nature and promoted the use of force to ensure policy implementation. In addition, there were other types of policies that were objective and that accelerated land ownership among local communities. The coercive policies included:

- Policies that discouraged burning in crop and pasture
- Policies that controlled grazing and stocking rates
- Policies that governed cropping patterns and mixed cropping
- Policies on soil and water conservation

Because of their coercive nature and the use of force, farmers resented their implementation and they actually aroused more interest in the political struggle of the local population as a result of the widespread discontent and political agitation of people. These policies therefore had little effect in influencing sustainable agricultural practices.

The other types of policies implanted during the colonial era included:

- Land consolidation
- Land tenure policies
- The development of cooperatives

Policies related to land were widely accepted by the communities because they gave individuals the sense of security in possession. It also allowed individuals to own and dispose of land at will on a 'free buyer free seller' basis. This encouraged long-term capital investment and a more secure basis for raising credit through mortgaging of the land title. It also encouraged landowners to invest in long-term measures that ensured land conservation.

The individual land tenure policy was introduced in the 1940s following the recommendations of the Carter Commission and the Royal Commission in response to political pressure from Africans, and the need to improve agriculture. It aimed to give individuals a sense of security in possession, allow them to purchase and sell land at will, use land productively and acquire credit to invest in agricultural development. As a spin-off from this policy, other policies on land consolidation and the registration and issue of individual title deeds embodied in the Swynnerton Plan of 1954 were implemented (Bates, 1992). This accelerated agricultural development in African areas through the introduction of cash crops and livestock improvement. The plan aimed to allow every family to be self-sufficient in food and cash income. Fully consolidated and registered land rose from 600,000 hectares in 1963 to 6,700,000 hectares in 1984. Between 1965 and 1975, Kenya's marketed coffee production rose from 40,000 to 80,000 metric tonnes while tea production rose form 20,000 to 55,000 metric tonnes per year. In dairy production, investments were made in fencing, forage improvement, water supplies and milk cooling equipment, more than doubling milk production within 10 years. While some people argue that the plan stimulated agricultural production, others feel it promoted inequality of land ownership and landlessness. Still others assert that Kenya's ability to sustain agricultural growth resulted more from the removal of restrictions on African cultivation of cash crops, technological innovations and cultivation of previously unutilised areas than from particular forms of land tenure (Kiriro and Juma, 1991, Juma and Ojwang, 1996).

On closer comparison of land ownership, tenure and user rights across the four study sites, sustainability profiles are different. In Thika and Nyandarua, where land tenure is freehold with individual title deeds, farmers avoid practices that would lead to land degradation while investing in land improvement and soil and water conservation measures. In Mwea where the farmers are tenants of the National Irrigation Board (NIB), there are no incentives to invest in land improvement and conservation measures. There is a high level of external input use such as chemical fertilizers and other agricultural chemicals to maximise annual production of rice with no regard to environmental pollution and soil erosion (Box 9). The land tenure system in Kajiado is communal in the form of group ranches. A recent shift in policy is to subdivide the group ranches and issue individual titles. This would lead to land enclosures, the sale of land to well-off individuals, and would curtail movements of livestock and create landlessness. This could lead to conflict and negative impacts on a sustainable pastoral system (Box 10).

Box 9 Input use in Mwea

Rice and horticultural production in Mwea are characterised by the use of high levels of external inputs like fertilizers, herbicides and pesticides. The NIB supplies these inputs to farmers on credit. Farmers are required to use certain minimal levels of inputs. If not, the NIB drops them in the following crop season. The residual of these external inputs dissolves in the paddy water and is eventually washed away. The paddy water is thus returned to the rivers, contaminating and polluting them. This river pollution could cause drinking water related health problems downstream. Horticultural production also involves the use of high levels of external inputs, some of which contain both nitrates and phosphates, which easily leach into the soils and affect downstream water quality. This has also led to the destruction of aquatic fauna. Water from the river is used for consumption in Ndindiruku, the village downstream where both the Tebere and Murubara rivers converge. Although the full impacts of such river pollution may not be known, it is widely recognised that some of the pesticides and herbicides used in rice and horticultural production leave residuals that are associated with carcinogenicity, reproductive consequences and other chronic effects that can affect humans and animals.

Source: Nyoro and Muiruri (1999a)

Box 10 Changes in Land Tenure In Kajiado

Poor management of the group ranches, and intense political pressure to sub-divide the group ranches have intensified since individual land tenure in 1983. Many group ranches have been sub-divided. New co-operative arrangements in group ranch resources have emerged where the individual community members share facilities such as dips, boreholes and pasture. There are fears that the subdivision of ranches and the issuing of individual title deeds to group members could lead to livestock movement/grazing restrictions. This would lead to lots of conflicts and interference with the traditional system, which has worked up to this day. Communal resources (e.g. water points and dry-season grazing) will be difficult to manage and sustain. Individual land ownership with livestock movement restrictions will not be sustainable. It would lead to land sales, overgrazing and massive land degradation. Sub-division that leads to the allocation of parcels to individuals within the ranches could also interfere with wildlife migration because most of the ranches lie within a migration corridor.

Source: Nyoro & Muruiri (1999b)

The Swynnerton Plan was thus a key milestone in Kenya because it accelerated agricultural development and the promotion of sustainable agricultural practices in the country. It encouraged individual land tenure and also encouraged the local population to get involved in the production of cash crops such as coffee, tea and pyrethrum. The introduction of cooperatives contributed to the nation's economic development. It has contributed to the mobilisation of local resources for investment, the creation of employment directly through the engagement of staff and by providing opportunities for self-employment. It also assisted in improving income distribution as it allowed large sections of population to engage in various income-generating activities and small-scale commercial agriculture.

5.2 Post independence policies

Policies adopted by independent Kenya also varied in their formulation and implementation. Key among them included:

- Human settlement and land subdivision policies
- Formation of quasi-governmental organisations in processing, marketing, financing and input provision

- National research and extension services provision
- Natural resource management and conservation policies
- National food production policies

Human settlement policies

Colonial policies set aside the rich farming areas of the country for European settlements, thus concentrating Africans in native scheduled areas. Resettlement policies at independence, from 1961, aimed to effect a rapid and orderly transfer of land ownership to Africans, allow them to settle anywhere in the country, reduce acute population pressure and unemployment in high populated areas and avoid further fragmentation of farms into uneconomic units. The historic "one million acre settlement scheme" started in 1961 and settled the landless on 200,000 acres annually for five years. Many squatters who were working in the former European farms were settled in the Haraka or Hasty settlement schemes from 1965 to 1975. The Geta scheme in Nyandarua district was among these, and was settled from 1968 to 1970.

The implementation of these policies led to a massive land transfer operation, which provided reconciliation and a new generation of farmers. These farmers engaged in practices aimed at poverty reduction by growing high value cash crops and keeping improved breeds of livestock for meat and milk production. Resettlement policy implementation is a success story carried out over a short transition period at minimal cost. However, due to rapid increases in human population, land fragmentation has continued unabated, making some parcels unreliable for economic agricultural production. This problem is highlighted in the case studies.

In Kajiado, for example, this included land-use conflicts between farmers and nomadic pastoralists and with the wildlife protected areas. In Nyandarua there were reduced farm sizes leading to lower incomes and thus reduced spending on education, and in Thika migration to urban areas and dependence on off-farm income. In Mwea, where land is leased, land fragmentation problems do not impact on farm sustainability however, population growth puts pressure on land use types.

Formation of quasi governmental bodies

In order to support the emerging small-scale commercial farmers, and in an attempt to correct the market failures that existed immediately after independence, the government formed state run corporations to undertake processing, marketing, financing and providing inputs to producers. These included institutions such as the Agricultural Finance Corporation (AFC), Kenya Farmers' Association (KFA) later known as the Kenya Grain Growers' Co-operative Union (KGGCU), Kenya Tea Development Authority (KTDA), Kenya Coffee Growers' Association, Coffee Research Foundation, Kenya Planters' Cooperative Union, Coffee Board of Kenya (CBK), Kenya National Seed Quality Control Service (KNSQCS) as well as financial, research, extension and legal institutions. This motivated farmers to speed up agricultural development by intensifying agricultural production although the same organisations became so inefficient in their operations that they were a burden to farmers.

Research and extension policies

Agricultural research

Policies were put in place to continue funding public research organisations for the purposes of generating new technologies such as high yielding, disease resistant crop varieties and improving the *productivity of crops and livestock necessary to stimulate agricultural* productivity. These organisations culminated in the formation of the Kenya Agricultural Research Institute (KARI). Research policy has since been developed by the Government with little participation from the end users but more community involvement is being introduced through approaches such as farming systems, training and extension; participatory rural appraisal and rapid rural appraisal. Regional research and extension committees comprised of professional personnel and farmers' representatives are also consulted in the formulation of research policies. Commodity-based research has given farmers information useful in the production and marketing of tea, pyrethrum, cotton, sisal, and coffee.

Agricultural extension

The government also adopted and financed an extension policy whose objective was to transfer the technologies developed by researchers to farmers. Farmers were taught new production techniques through demonstrations, farm walks, lectures, evening debates, cinema and informal discussions. Despite this effort, the farmer-extension-research linkages have remained poor thus making most research findings unavailable to farmers. The policy also lacked effective implementation because staff motivation, morale and job satisfaction remained low. Extension workers often lack adequate material and back-up in the field and face poor remuneration and conditions of service, particularly during the structural adjustment programme.

Natural resource management policies

Soil conservation policies

These policies aim to manage and conserve natural resources, reduce land degradation and increase farm productivity. Measures include terracing, cut-off drains, contour cultivation, the planting of grass on top of terraces, mulching and prohibiting cultivation on very steep slopes, all aiming to conserve soil moisture, and prevent water run-off and soil erosion.

However, from 1930 to 1962 these policies were enforced through administrative directives and vigorously supervised, especially in the African reserve areas. Forced soil and water conservation measures failed to get community support and as soon as coercion was relaxed were more or less completely abandoned. After independence in 1963, education, training and extension have been used to encourage implementation. From the mid-1980s a new thrust known as the "Community Catchments Approach" (Box 11) was introduced. Through this approach, PRA is conducted in an identified area where the community would be mobilised and trained to implement relevant conservation measures. After an initial period of training and supervision by government personnel, the community takes over the running of conservation efforts in their area (Kiara 1998).

In Nyandarua, the participatory 'Community Catchment Approach' has been in operation since 1988. Every year soil conservation measures in a new catchment of about 2,000 acres are implemented and sustained by the particular community. Thus over 20,000 acres of land are being conserved through this approach, whereby farmers have taken complete responsibility for, and ownership of, the conservation programme.

Box 11 Nyandarua community catchment approach

Soil and water conservation in Geta became necessary in 1975 when soil fertility started to decline. Soil erosion was rampant due to the continued cultivation of the steep slopes and interference with the water catchment area. The participatory catchment approach was introduced in the area in 1988 after the system that was based on land users' free choice and with on farm focus failed. The community-based approach has concentrated on specific catchments.

More than 12 catchment areas of about 200 hectares each have been implemented since 1988. The approach involves sensitising the community to plan and implement the conservation activity. They are involved in mobilising their resources in order to concentrate them in a specific catchment for a period during which all the farms in the catchment are conserved. The best community-based soil and water conservation catchment though outside the study area is Mihato catchment area within Kipipiri Division.

The conservation has been very successful in maintaining a stable environment through protection and preservation of soils and its fertility on the steep slopes and water catchment area in Geta. About 87 percent of the respondents were involved in soil and water conservation measures. These included digging bench terraces (Fanya Juu) and cut-off drains.

Source: Nyoro & Muiruri (1999a)

Environmental protection policies

These policies are concerned with the use of land considered as a water-catchment area, the safe use of agricultural chemicals and pesticides, the pollution of rivers and water sources and issues of general health concern. Implementation of these policies has been difficult because people generally have no perception of the environmental costs of production. In Thika, there was coffee pulp and effluent dumping in the

rivers. In Mwea, there was a high contamination of water from agricultural chemicals and waste leading to high incidences of water-borne and water related diseases. In Nyandarua there were regulations governing the exploitation of forest resources where the water streams originate and the water intakes in the forest were well protected.

Practices using locally available and organic yield-enhancing inputs promote sustainable agriculture and the produce from such systems is more acceptable both locally and internationally. Alternative policy options should place more emphasis on this goal. These could include for example:

- Environmental costing of damage, for example water pollution (Mwea case study)
- Changing cropping patterns, e.g., inter-cropping and crop rotation (Nyandarua and Thika).
- Including livestock in the farming system to generate organic manure (Thika).
- Providing better extension and training services in sustainable methods (Thika).

Food self-sufficiency

The purpose of these policies is to improve crop and livestock production through better husbandry, the adoption of improved crop varieties, the correct use of yield-enhancing inputs, and increasing livestock output by controlling pests and diseases, using improved husbandry, nutrition and better pasture and livestock management. The achievement of these goals has been constrained by the lack of price incentives, the unavailability of credit, poor infrastructure, unreliable weather, inadequate research and extension support, and costly inputs that are unaffordable to most farmers. The collapse of infrastructure and farmer organisations has exacerbated the situation as evidenced by frequent famines and increasing poverty in the country. Farmers in all sectors have complained of poor prices, delayed payments and unpredictable returns from their enterprises. Currently there is a lot of turmoil in the agricultural sector and so there is an urgent need to re-examine the policies and avert a crisis.

The focus of food policy in Kenya over the years has been to encourage self-sufficiency as a means of achieving food security. But production costs for most food crops are very high because of taxation in farm inputs such as diesel and machinery spare parts, poor infrastructure, use of inappropriate technologies and poor quality inputs like seeds and fertilizers. This implicit taxation of the agricultural sector invariably makes the cost of production high, making the prices of domestically produced maize, wheat, rice and sugar higher than world market prices.

Box 12 highlights some of the problems associated with given policies in the study sites.

Box 12 Policies... and problems

- **Mwea.** The National Irrigation Board, founded in 1967 dominates agriculture in Mwea. The NIB insists on rice production primarily, and has a large influence as owner of the land. Its remit has led to monocropping, and the over-use of external inputs. Farmers are allocated an acre of land for growing food crops, but this has been limited to maize and beans. However, farmers have resisted this and have introduced horticultural crops (e.g., French beans and tomatoes, although this is done illegally). The NIB also prohibits the growing of fodder crops and agro-forestry, restricting the integration of crops and animal production.
- **Kajiado.** The Wildlife Conservation Act affecting interactions between wildlife and livestock in Olgulului has caused conflicts around resource use. In the reserves, no compensation is offered for the damage to livestock and other property by wildlife. Wildlife is thus considered to be a liability, rather than a resource by the community.
- **Thika.** Following liberalisation and the privatisation of inputs supplies and marketing, extension services have been adversely affected due to a lack of facilities and the influx of many other agencies. The government extension services are low-key while NGOs, input suppliers and other agencies promote their products and services at no direct costs to farmers.

Source: Nyoro and Muiruri, (1999a, b, c)

Structural adjustment policies

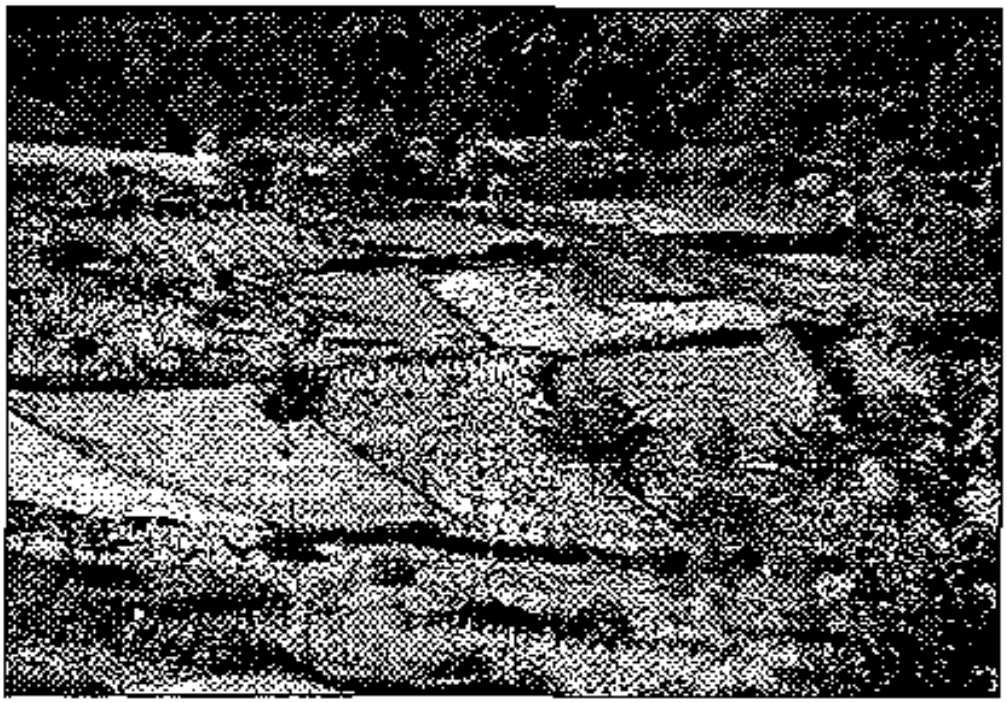
The Kenyan government has been implementing SAPs since the late 80s. These policies were intended to reduce the government's budgetary deficits. They also encouraged a reduction of government protection for domestic industries and encouraged the devaluation of the overvalued domestic currency. The impact of SAPs on both economic development and more particularly the agricultural sector has been a cause for raging debate. However, it is realistic to indicate that because of the curtailment of government expenditures, the provision of basic social needs such as education, health, water and infrastructure has been adversely affected thus promoting the adoption of less sustainable practices as strategies for survival.

The aim was to increase private sector-led agricultural performance and growth, with the government providing an enabling policy and legal environment to ensure public actions are well co-ordinated and financially sustainable. It further seeks to ensure that service providers are made transparent and accountable to stakeholders, and to create investment opportunities and responsibilities for the private sector in areas covering the provision of research and extension services, animal health, and participatory decision-making.

SAPs have had both positive and negative influences. For example, they have decreased employment through retrenchment programmes, while raising the number of people below the poverty line from 23% to 43% with a decline in income of over 50% for the bottom quartile (see Box 12 above, Thika section).

Liberalisation policies

Since 1986, when the government introduced a sessional paper on Renewed Growth and Economic Management of the economy (Sessional Paper 1 of 1996) a new policy, on the liberalisation of the economy was adopted. The objective of liberalisation policy was among other things to remove all monopolistic trends, divest the government of investment in commercial activities and encourage the private sector to get more involved in the running of formerly government-owned and



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run parastatal organisations. Subsequently, in the early 90s, the government through increased pressure from multilateral and bilateral donors implemented liberalisation and privatisation policies, albeit reluctantly. This action entailed divestiture of the government from the state corporations that hitherto served as the main and the only marketing outlets for agricultural commodities.

This restructuring process thus fundamentally affected many sectors with major influences on the cooperative institutions. Some of the reforms that were implemented included:

- Removal of price controls
- Liberalisation of domestic and external trade
- De-control of interest rates
- Introduction of foreign exchange retention schemes and subsequent liberalisation of exchange rates
- Tax reforms
- Government expenditure rationalisation

Prior to liberalisation, agricultural markets were characterised by pervasive government controls. After liberalisation, price controls on

inputs and outputs were removed; direct subsidies on some food items and farm inputs like fertilizers were also eliminated. Private traders were allowed to undertake activities that hitherto were limited to state run parastatals and cooperatives. Trade limitations and controls including foreign exchange restrictions and allocations were also abolished. The reform process was expected to reduce costs in the input and output marketing system by encouraging more private sector participation in the market.

But liberalisation of the economy has not achieved the much-desired change because of various factors. Liberalisation policies were being implemented while important commodities like coffee and tea were experiencing a decline in prices. The government also poorly coordinated the liberalisation process in such a way that it was poorly sequenced, stakeholders were unprepared and it was poorly regulated. The macro economic environment has also been harsh, thus limiting the private sector's uptake of some of the roles left open by government.

As a result, Kenya has experienced a decline in the production of key commodities like coffee, pyrethrum, cotton. Sugar, wheat, maize, and livestock thus making the attainment of sustainable agriculture nothing but a dream.

Box 13 Impacts of fertilizer price liberalisation

Fertilizer prices and marketing in Mwea were decontrolled in 1990. As a result, the number of fertilizer importers and distributors rose from 15 in 1985 to 23 in 1997 (Tegemeo 1998). The aim of this policy change was to encourage agricultural production by relaxing government controls and promoting the private sector to participate in input marketing. Liberalisation of the input markets thus encouraged free markets in agrochemicals. However, most of the agricultural inputs, particularly those that are easy to target to agriculture, could be considered to be subsidised because they are imported free of duty and other tariffs. They also are zero rated for the purposes of value-added tax. Fertilizers are also distributed to farmers at nominal prices. Such subsidies although indirect encourage farmers to adopt crop choices that are less sustainable.

Source: Nyoro & Mulruri (1999a)

Cost sharing has led to greater community initiatives in development activities and reduced the government's role in production and marketing. The ultimate goal is to gradually move from a predominantly public to private-sector development, information-sharing, infrastructure improvement and stakeholder consultation. However liberalisation and cost sharing strategies were implemented without proper preparation and education of farmers. They were therefore unprepared for change, which led to a virtual collapse of crop and animal industries.

The livestock sector is a case in point. Services such as artificial insemination (AI) and disease control programmes including dipping and vaccinations came almost to a standstill, thus negating the progress made over the last 70 years (Box 14).

Box 14 A History of an Unsustainable Livestock Sector: the case of cattle dips

- *1966 – 1977:* During this period the dips were run by farmers. Following the introduction of grade cattle, which were susceptible to tick-borne diseases, tick control activities were promoted including high-pressure sprayers and the construction of cattle dips (the latter being more predominant). The African District Councils and Co-operative Societies ran these dips through dip committees elected by farmers. The dip committees collected dipping fees, provided water to the dips, purchased acaricides and employed dip attendants. When this widespread dipping extended into the indigenous cattle areas, immunity and resistance to ticks and tick-borne diseases was lost.
- *1977 – 1984:* The government took over management of cattle dips, providing free acaricides and dip attendants. This period was characterised by the rampant shortage of acaricides, and delayed sample tests; delayed emptying of dips and a general failure to maintain and repair dips; and inadequate supervision and monitoring of dipping activities as a lack of operation and maintenance funds rendered the officers of the Department of Veterinary Services immobile. The dip attendants were also found to be undependable.
- *1984:* Prices of acaricides went up substantially and the government was no longer able to supply it. This exacerbated the problem of

shortage of acaricides and so dipping became very irregular. Dip maintenance also degenerated. The principle of cost sharing was therefore introduced and dipping charges increased from 30cts to 50cts.

- 1991: The government handed over management of cattle dips to dip committees. To get the various committees started, the government supplied acaricides. The dipping fee collected was to be deposited in a dip account in the local commercial banks to be used as a revolving fund to help in replenishing the dip with acaricides. In the interim, the market price of acaricides was increasing sharply. In 1989, the dipping fee had been increased to Ksh 1.50 per cow per dipping. In 1992, dipping fee was raised to Ksh 2 and currently it stands at between Ksh 10 and Ksh 15 in most parts of the country.

- The period beginning 1991 to date has been one of policy shift whereby the management of cattle dips reverted to dip committees in line with the principle of cost sharing and privatisation. As acaricide costs skyrocketed, dipping costs rose substantially and the number of cattle dipped plummeted. Consequently, many dips were abandoned or became non-functional, dipping activities collapsed, tick borne diseases (notably East Coast Fever, Anaplasmosis and Heart Worm) became rampant and many head of cattle were lost to tick-borne diseases. Production of milk and beef went down, prices went up as a result and consumption declined. Many dairy societies operated under capacity due to shortage of milk and many of them collapsed, as they could not pay farmers/members. There is therefore a need to initiate new approaches to tick and tick-borne disease control.

Source: Mwangi, J.G. (1999)

The reasons for these negative impacts include the tendency to use the same model or approach for solving the problems of different countries, and not allowing enough time for thorough analysis and understanding (e.g. World Bank missions are short). The haphazard application of structural adjustment policies has disrupted farming production, i.e. the necessary facilitating and protective measures to cushion farmers during the transition stage have not been put into place, or if in place they have not been enforced. During the First Structural Adjustment Programme (1982/83) a proactive policy should have been put into place, since problems had been identified very early.

On the plus side, structural adjustment programmes have empowered the private sector and restructured it to concentrate on public goods, such as maize milling (Box 15). Furthermore, opening up the country to world market demands has resulted in the incorporation of certain sustainable practices. Among other things, it has increased opportunities for new innovation and investment in the agriculture sector and the rural economy as a whole.

Box 15 Posho millers

Posho millers are a new category of traders in the maize sector, involved in the processing of maize grain into maize meal. Posho millers employ a simple hammer milling technology where the germ and the bran of the maize grain are milled together with the kernel into flour. Small-scale millers specialise in custom milling, with the customer providing the grain. Some posho milters have invested in de-hullers to produce a more refined product that is most often referred to as "Number 1". Capacity utilisation was used to distinguish these small-scale from the large-scale millers. The small-scale millers milled either Number 1 or 2 or both but were not involved in the packaging of maize meal. The flour is either sold in kilograms or is packed in bags. Most posho millers in the maize surplus regions were doing more custom milling than production milling. Investment in posho milling has expanded rapidly in the post-liberalisation period. Over the past decade, posho millers have moved from a relatively negligible share to an important proportion of the maize meal market in urban and rural grain-deficit areas.

Source: Nyoro et al., (1999)

Post liberalisation policies

The thrust of future policy has shifted towards poverty reduction in line with the interim poverty reduction strategy agreed between the government, the IMF and the World Bank. The objective is really to encourage economic growth as the key strategy to alleviate poverty while at the same time implementing strategies that could attack poverty directly. The main point of departure of this policy over the others in the past is that it intends to adopt a more participatory approach where the communities will be consulted before major decisions for development are adopted. It is hoped to increase ownership of the development process and thus make it more sustainable.

Other factors influencing Sustainable Agriculture

6.1 Strong social organisations

The successful cases of sustainable agriculture tended to be prevalent in areas where the community was organised in groups either for the purposes of undertaking certain community-based activities like soil and water conservation or marketing. In one study site (Nyandarua, Box 11), the 'Community Catchment Approach' to soil and water conservation was very successful as compared to other regions where conservation was based on individual land-users. The community approach helped communities to mobilise their own resources and develop sanctions for other members of the community who were unwilling to support the activities. It was also easy for external agents like donors or government to provide services or finances through such organised groups.

In another case study (Kajiado) where all the members of the community were members of a group ranch, sustainable practices such as controlled grazing were easy to enforce because all the members were expected to comply (Box 16). In Thika, production practices by the community were integrated with marketing and other social functions that promoted the community-based projects (Box 17).

Box 16 Enforcement of sustainable practices on community ranches in Kajiado

The communal land tenure system has influenced the sustainability of the livestock production systems in the area. The regulatory mechanisms imposed by the community such as the exclusion of outsiders, seasonal variations in grazing and social pressure ensured the sustainable management of resources (Mugambe et al, 1996). The break down in traditional authority, the division of common land into group ranches and their subsequent sub-division has undermined the capacity of the political units in the community that regulated land tenure.

Source: Nyoro & Muiruri (1999b)

Box 17 Integration of production practices with marketing and social functions in Thika

Thika is a food deficit zone. Food produced in the area tends to be consumed locally. There is therefore a predominance of retail marketing at the farm level, neighbour to neighbour and in the local markets. There used to be problems in bringing maize from other areas (districts) before liberalisation but the policies have changed, removing barriers on the movement of produce within the country boundaries. The people are now able to buy maize from outside districts through businessmen at reasonable prices. The marketing of other produce such as bananas, avocados etc., is not regulated and there are many middlemen and brokers. There is an urgent need for farmers to form their own marketing organisations in order to have adequate bargaining power for their produce. Milk marketing takes place mainly in the neighbourhood but surplus milk finds its way to urban centres through hawkers and other vendors.

A major local stakeholder is the co-operative society concerned with the supply of farm inputs and marketing of coffee. The co-operative movement is the chief vehicle for most of the farming and economic activities in these areas. Farmers get credit through co-operative societies and relevant union SACCOs. The middlemen and marketing agencies benefit from improved, sustainable production by having regular sources of income.

Source: Nyoro & Muiruri (1999c)

Where such institutions exist, a community committee is elected from amongst the members and oversees the implementation of all the activities of the community. In the case of the group ranch, the management committee of the ranch oversees the implementation of policies governing the management and running of the group ranch. These committees liase with the government extension service, other departments, NGOs and other agencies operating in the area.

Other institutional practices involve research institutions, NGOs and donor agencies that are individually undertaking certain elements of sustainable agriculture. One NGO for example is now involved in the standardisation of commodities that are produced in what could be referred to as sustainable environments. This organisation aims to create a niche market for such commodities in supermarkets and other food market outlets.

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At other levels there are numerous agencies in the country that have been established at the national, provincial, regional and district levels for the purposes of propagating government policies that may not necessarily be related to sustainable agriculture. Although the majority of such institutions are financed and managed by government, and are thus faced by many administrative bottlenecks and lack of facilities and resources, there were indications that the community was starting to demand services from them. In some cases, communities were ready to share some costs in order to ensure that some services such as extension, cattle dipping and artificial insemination were delivered. This again underlines the value of well-organised and strong community institutions.

6.2 Institutional factors

Most institutions in the country that previously supported farmers collapsed following the liberalisation of the economy in the early 1990s due to poor management, corruption or just mere inefficiency. For example, the Agricultural Finance Corporation and other institutions that provided credit to farmers collapsed. Farmers are therefore unable to access credit thus limiting their ability to procure yield-enhancing inputs.

Marketing institutions also failed to function properly. The inefficiencies and poor management of the National Cereals and Produce Board, which was a key institution in maize marketing, caused its near collapse. Others like the Coffee Board of Kenya, KTDA, the Pyrethrum Board of Kenya and the Kenya Sugar Authority were characterised by high marketing and handling costs, corruption and poor management that reduced farmers' payments. The near collapse of the infrastructure has also contributed to the failure by these institutions to reduce costs and thus enhance payments to farmers. These institutions are also heavily politicised. Institutions such as the Ministry of Agriculture, regulatory bodies and the Permanent Presidential Commission on Soil Conservation have also been affected. The politicisation of policies or processes has eroded their potential impact.

Policy options

Past development efforts have thus far not provided the much needed economic development that could spur rural development and lead to much more sustainable livelihoods and agricultural practices. The following are important policies that could work if the current trends are to be reversed and economic development sustained.

Decentralisation

In almost all cases, the process of policy formulation does not involve any consultation with key stakeholders. Even where consultations were made, the wrong stakeholders were often consulted. For example, many good policies such as controlled grazing and stocking rates and others that encouraged intercropping and soil and water conservation could have enhanced sustainable agriculture if they were widely adopted. However, the stakeholders were not consulted and instead force was used to implement these policies. The stakeholders resisted the forceful implementation of this policy leading to political uprisings and no benefits in terms of sustainability.

In independent Kenya, policies have also continued to be made without consultation, which has meant that the majority of stakeholders have largely ignored them. The current proposals to engage stakeholders in the country's constitutional review process are a step in the right direction. This could be extended to cover policies affecting sustainable agriculture (Box 18).

To revitalise rural development, it will be necessary to strengthen the decentralisation of the decision-making and development management processes to the local level. This will involve the decentralisation of power and revenue where resource allocation is changed from the national level the local authority level. This will be attained through

devolution of power backed by political commitment to the local authorities and community-based organisations.

Food policy

Kenya should adopt a policy of self-reliance as part of its food security strategy. Self-reliance involves meeting a country's requirements through a combination of production, stocks, and trade, with the mix depending on the relative costs of procurement from each source. Kenya could then make its domestic production competitive while at the same time allowing imports particularly in areas such as the coast where the landed cost of maize will be lower than when maize comes from North Rift.

NCPB's pricing and trading policies should be modified so that the Board announce why, and at what price, they intend to intervene in the market to create certainty and reduce risks and exposure to the private sector. Import bans and huge import tariffs should be eliminated as they adversely affect consumers while protecting only a few large-scale producers. These import policies impede the potential to stabilise food supplies and prices through intra-regional trade. Moreover, the uncertainty in the level of the import tariff (which has been changed and sometimes waived for certain periods of time in recent years with little prior warning) also introduces major price risks into the trading operations of all actors in the system.

Box 18 Government agencies support stakeholder participation

Approaches in the government category of stakeholders are the most diverse in comparison to others, with a bias towards the development and use of appropriate technology and stakeholder/beneficiary participation. An interesting approach mentioned by this group is the importance of the good siting of potentially damaging enterprises and supporting units such as flower growing and dips. To ensure sustainable production, this group emphasises that any farming system introduced must be supported by the farmers.

Source: Boit (1999)

Reducing costs of production

Kenyan producers can benefit from increases in productivity and reductions in domestic costs of production. This can be achieved through removal of tariffs and excise duties in diesel, tyres and machinery spare parts. Reduction in taxes on transport equipment, vehicles and spare parts and making the port of Mombasa operate efficiently could reduce the costs of transports thus making fertilizer costs reduce further.

If the government must maintain a national strategic reserve of maize, this should be done through cash rather than through marinating the actual stocks. The cash could then be used to purchase food through times of emergency. This will overcome the difficulties of turning over the physical stock.

Legal and regulatory framework

A political and legal foundation for marketing systems should be put in place to strengthen mechanisms of specifying and enforcing contracts, raising the costs of contract non-compliance, and more pluralistic procedures for developing the rules governing market activity. A well-functioning legal and political framework for market activity reduces the risks and transactions costs of private trade. These measures are important adjuncts to development.

Infrastructure

Rural infrastructure should also be rehabilitated, starting with access road repair and maintenance and provision of electricity to rural areas. Infrastructure development is likely to reduce the domestic costs of production thus making domestic production more competitive than imports. Improvement in the infrastructure will also promote off-farm activities.

Rural finance

Mechanisms for making credit available to support targeted groups to engage in activities that will enable them determine their own livelihoods in a sustainable manner must be improved. Credit supply

would be through intermediaries such as NGOs, commercial banks, CBOs/CBIs, SACCOS and warehouse receipts.

Civil service reform

Civil service reform should be implemented in order to reduce government expenditure on salaries and increase the resources available to development projects. The resources will therefore be better utilised while professionalism within the service will be upheld to enhance productivity.

Agricultural research

More sustainable agricultural research should be undertaken in order to promote research breakthroughs. New technologies are needed in order to reduce the costs of domestic production and hence make it more competitive. Higher priority should be given to environmental protection, fuel, natural resources conservation and forestry products as the basis for the research and extension programmes. Promoting a responsive and demand-driven agricultural research, technology development, and delivery system is crucial.

Extension services

Extension delivery should be separated from financing such that whereas the government may continue to fund extension in food crops, its delivery could be contracted from the private sector. Extension should also be made more demand-driven to reduce costs. The farmers who are the ultimate consumers of the service could also finance extension on high value crops like horticulture, coffee, tea, cotton and sugar.

Develop explicit policies to support sustainable agriculture

Explicit policies in support of sustainable agricultural practices need to be incorporated into the government's policy formulation process. The concept of sustainable agriculture in Kenya means different things to different stakeholders with the consequent lack of a focus on sustainable agriculture with regards to policy, programmes or projects. Such policies should be included in land use, food, cash and industrial crop development.

The government, in conjunction with stakeholders, should establish a national body to guide and co-ordinate all efforts that focus on sustainable agriculture and rural regeneration. Such a body should promote the exchange of ideas between key players and could also promote efficiency by reducing duplication of efforts and directing resources to where most gains can be achieved.

The lack of explicit policies that internalise environmental costs in the production process has reduced the ability of households to attain sustainable livelihoods. A strong regulatory framework involving all stakeholders should be put in place to control the use and availability of harmful chemicals and control harmful or 'unsustainable' agricultural practices.

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Appendices

9.1 The case study sites: additional characteristics

Mwea

Some households have introduced rice production outside the schemes, which is preferred by farmers because it is outside NIB control and regulation. French Beans and tomatoes are other important cash crops and are produced in the land allocated to farmers for the production of their food. Maize and beans are also important food crops in the area.

Development problems abound: low agricultural productivity, low quality and irregular supply of farm inputs, inefficient marketing of agricultural produce, underemployment and unemployment, low incomes, hunger and malnutrition, high rates of population growth, high incidences of disease and ill health, and low school enrolment. Tebere presents a major development challenge.

Yet opportunities are present: the Mwea Rice scheme has relatively high yields and a ready market for rice. Irrigation potential is greater than anywhere else in the Mount Kenya region; French beans and tomatoes are profitable cash crops in the area; and some farmers have attained satisfactory yields of maize and beans. A few farmers have relatively high incomes. The abundant water in the area is a blessing and a curse – abundant water is good for irrigation but also is conducive to the persistence and spread of water borne diseases.

Although the area experiences two rainy seasons, farmers under National Irrigation Board management grow rice in one season only. Maize and beans are produced on red soil for home consumption, but low and irregular rainfall limits crop production without irrigation. Consequently, the area suffers chronic food deficits.

While the area has an abundance of irrigation water, clean water for domestic use is virtually non-existent. Water for domestic consumption is drawn directly from the highly polluted canals, rivers and streams. Together with the abundance of open water in canals and rice fields, lack of water control is a major cause of water borne diseases. Cholera, malaria, typhoid and bilharzia are prominent. Ill health is exacerbated by malnutrition. Kwashiorkor, marasmus, anemia and vitamin deficiency diseases are common.

Kajiado

The Kajiado site was selected to represent the pastoral production systems in Kenya. These are important land use systems in Kenya considering that over 70% of Kenya falls in the ecological zones that are described as Arid and Semi-arid lands (ASAL). Communities in the pastoral production systems have evolved traditional livestock production systems that have for a long time been nomadic and have thus ensured a proper balance between the land use system and the environment. Pastoralism has therefore been considered as a sustainable production system, which to some extent has protected these lands from severe degradation over the years. ASALs are rather fragile environments and judicious management decisions are essential for sustainability. But the balance between the production system and the environment is now being threatened by external factors and thus the need to identify islands of sustainability existing in these systems and policies and policy process that influence their existence.

The human population has increased steadily from 1963 to date. The rapid population increase is negative to sustainable agriculture because it has led to overgrazing, food deficits and increased land use conflicts.

The wildlife population has increased at a high rate. Wildlife not only brings about overgrazing and land degradation on the ranch but also spreads some disease to the cattle. Wildlife is therefore considered a big menace but is protected by the Wildlife Conservation Act. The wildlife conservation policy is therefore negative to sustainable agriculture.

The trend of livestock population especially cattle seem to change in cycles of five years. It increased steadily to a peak from 1963 to 1968. The herds then gradually built up to the maximum levels the community can remember in 1993. Since then the population has been going down mainly due to severe droughts and occasional disease outbreaks.

Livestock is the main source of income for most of the respondents in this production system. Sale of hides and skins also supplement livestock sales as a source of income. Other non-livestock income sources are salary income, trading which includes buying and selling livestock and foodstuffs, and remittances. Most of the households derive their income mainly from animals with no salary or trading income. There also are some households that are relatively well due to large livestock herd sizes.

Nyandarua

Former squatters from European farms who could not be accommodated in the "one-million acre settlement scheme" at independence in 1963-1967 settled the area. A chunk of Government forest (about 8,000 acres) was delineated and sub-divided into 4-acre plots for settlement from 1968. A lot of subdivision has occurred, and continues, with increasing human population. Current holdings are on average less than one acre per family.

This is probably the major factor contributing to prevalent poverty in this area. Intensive farming with potatoes, carrots, peas, shallots and other horticultural crops is the major source of livelihood for most families. A lot of effort towards soil and water conservation is in place through the 'Catchment Approach'. There is a good deal of involvement of the community by the Government Soil and Water Conservation staff of the Ministry of Agriculture to facilitate sustainable resource use. Agro-forestry is also evident in this area.

The site represents a contrast to the other case studies in that there is excess rainfall, difficult terrain, very poor infrastructure and peculiar marketing problems not encountered in the other sites of study. There have also been concerted efforts and interventions to achieve sustainable farming.

Policies influencing agriculture in Geta location were all reflected in the problem analysis that was done with the community using PRA methodology. Policies influencing the state of sustainable agriculture and poverty alleviation in the area include poor infrastructure, market information, extension, research, credit, price policies, land tenure and marketing policies.

Agriculture in Geta was sustainable when the area was first settled in the late 1960s. Prior to this it was a virgin forest. However, due to various problems, sustainability of agriculture and the ability of the farms to sustain rural families have been threatened in recent years. Most of these problems could however be easily addressed through policy interventions. For example, due to the poor roads and lack of access to markets, agricultural productivity is low, and the value of farm outputs is also low in the area. High population growth has subjected the available land to human pressure thus reducing the average land holdings. Low incomes and widespread poverty thus are common. As a result, households are unable to pay secondary school fees, and are unable to meet the other basic necessities. Lack of education has limited job opportunities available for the young members of the community, which has thus resulted in over

dependence on land. The majority of the households are thus caught up in an inescapable cycle of poverty.

The condition of roads in the area is the most important constraint, which must be tackled first if the potential in this area is to be exploited and if the cycle of poverty in the area is to be broken. As the roads are improved, transport costs are reduced as a result of which farm gate prices of outputs are improved. More traders are attracted to the area and due to competition in the market prices for outputs could increase. Farm inputs also become cheaper. Farmers change cropping patterns and adopt more sustainable forms of agriculture that also could improve household incomes and employment. Land and labour productivity thus is increased which also creates demand for farm and off-farm activities. Food security for the households thus is ensured as incomes grow, are saved and invested on or off the farm. The households are also able to afford school fees in secondary schools, colleges and university. As children are educated, the chances of them getting jobs are increased which also encourages them to settle outside thus reducing the pressure on land.

Thika

Thika is a new district that was created through the merging of Gatundu Division of Kiambu District, Gatanga Division of Muranga District, and the Thika sub-district. It borders Nyandarua district to the west along the Aberdares range, Muranga district to the north, Machakos district to the East, and Kiambu district to the south. The district is very well endowed with resources and industries, e.g. coffee and pineapple estates, horticultural farms, and the industrial Thika town itself. There are abundant water resources and the major dams supplying water to Nairobi are in this district. The modern dual carriage highway from Nairobi to the Mt. Kenya area transects through the eastern part of the district. Feeder roads branch from the main highway to the rural agricultural areas and centres.

A sustainable agriculture study was conducted in Thuita sub-location of Kihumbuini location, Gatanga division of Thika district. The sub-location is approximately 30kms Northwest of Thika town and about 70kms north of Nairobi. The sub-location is in the coffee/star grass zone. The land is undulating with steep ridges on the lower slopes of Aberdares Mountains. The sub-location is easily accessible by road though the terrain has a number of valleys and steep hills. Generally the farms run from the road at the top of a ridge down to the valley bottom where there is normally a stream or river.

9.2 Pivotal policy milestones

Pivotal Policy Milestones

Colonial Agriculture Policy (circa 1900-1960) to develop white settler economics by under-developing the African ones.

Land Consolidation Policy (from 1940s) to consolidate farm holdings into economic sizes to maximise returns.

The Land Tenure Policy (1940s/50s) enabled people to get credit, which they used to acquire land and to invest heavily in agriculture.

Controlled Grazing and Stocking Rate Policy (1920s) To ensure livestock stocks that did not degrade resources or lower productivity.

The Land Sub-division Policy (1980s) aimed to provide individual land ownership rights to farmers who communally owned land and to settle the landless. Had a negative impact on some production but encouraged other fruit and vegetable cropping that are more drought- and disease-resistant than exotic crops.

Mixed cropping (1940s) promoted sustainable agriculture and poverty alleviation by utilising the soil and available moisture more efficiently.

The role of co-operatives in agricultural development (from 1930s onwards) Co-operatives have supported sustainable agriculture by providing inputs to farmers on credit.

Natural Resource Management and Conservation Policy (from 1930s onwards) include increased ground water recharge, dry season river flows and water availability.

The Soil and Water Conservation Policy (from 1930s) seeks to promote and maintain a stable agriculture, protect the environment and conserve soil and its fertility on slopes and catchment areas.

The Swynnerton Plan Policy (from 1954) sought to allow Africans security of land tenure, preserve European interests by creating a sizeable African WA owning class, stimulate agricultural development as a means of diffusing political pressure and ensuring national stability.

The African Socialism Policy (post-independency 1960s) made it possible for Africans to own land anywhere in the country and to access schools, jobs, and businesses previously reserved for Europeans.

Human Settlement (late 1950s) facilitated the development of high value and cash crops as well as the keeping of grade animals for beef and milk production.

Allocating Forest Land to Individual Policy (from 1960s) gives Kenyans a means of livelihood but interferes with water catchment.

Kenya's food self-sufficiency and food security (from colonial era) encouraged head husbandry, adoption of improved varieties, yield-enhancing inputs, pest and disease control, improved husbandry and animal nutrition and better pasture and livestock management.

Kenya's Agricultural Research (ongoing) development of disease control vaccines, new varieties, better ways of controlling livestock internal parasites and managing grass-legume mixture, stocking rates, environmental conservation and farm management.

Nation's Extension Policy (ongoing) to abandon top-down in favour of demand-driven, farmer-led, participatory approaches to planning and implementing interventions to farmers problems.

Rural Financing Policy (ongoing) seeks to increase the amount of credit available to farmers.

The Agricultural Inputs Policy (ongoing) to ensure adequate and quality inputs are available to farmers.

SAPs Reform Policy (from 1980s) to ensure that public actions are effectively co-ordinated and financially sustainable; service providing institutions are transparent and accountable to stakeholders and functions that are best performed by the private sector are divested.

Marketing Policy (ongoing) seeks to increase and improve the nation's marketing and storage capacities.

The Liberalisation Policy (1990s) has enabled farmers to produce and sell farm products in deficit areas, removed food shortages that previously characterised the system of price controls, given farmers a wider market, provided employment and income for people moving agricultural products from surplus to deficit areas, and made efficiency the key to success.

Anti-Corruption policy (1990s) seeks to stamp out all forms of corruption from public and private institutions.

East African Cooperation (1990s) that seeks to create a single market and investment area for the three partner states.

Source: Mwangi J.G. (1999)

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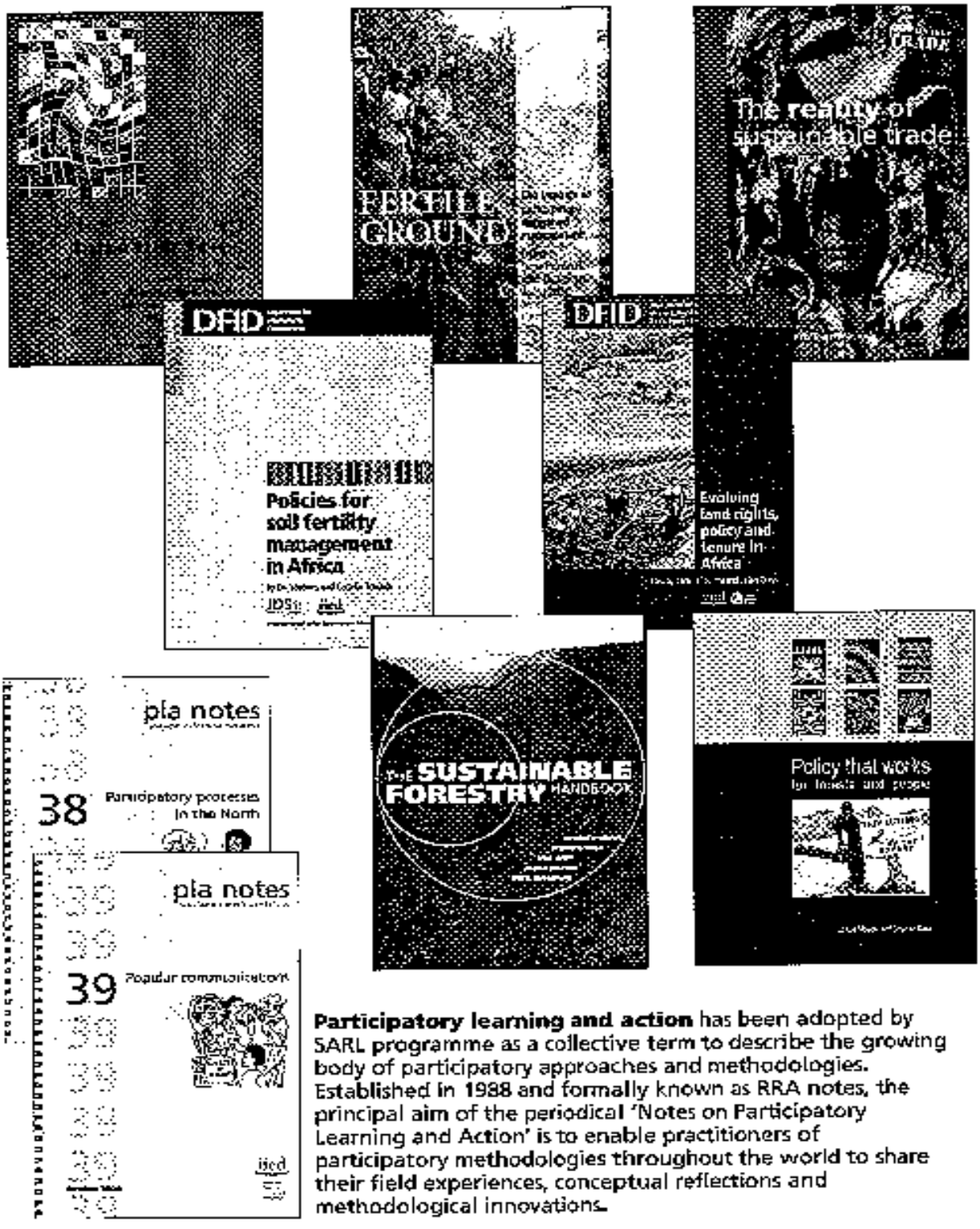

Participatory learning and action has been adopted by SARL programme as a collective term to describe the growing body of participatory approaches and methodologies. Established in 1988 and formally known as RRA notes, the principal aim of the periodical 'Notes on Participatory Learning and Action' is to enable practitioners of participatory methodologies throughout the world to share their field experiences, conceptual reflections and methodological innovations.

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